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The differences in migration behaviour of graduates between the cities Groningen, Tilburg, Maastricht and Rotterdam.



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Groningen, December 2010
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Acknowledgements

This thesis was created with the help of several people whom I would like to thank. First of all, I wish to thank Professor Leo van Wissen for all his comments and recommendations about my research. Furthermore I am grateful to Viktor Venhorst drs, for providing the data that I have used in this study and also for the comments and recommendations about my research. Besides, I am very grateful to all the other staff members of the Master Population Studies for their very interesting and useful courses. Furthermore I would like to thank Ilse Russcher for her help with Geographical Information System and Liili Abuladze for reading my thesis and improving my English. And last but not least I would like to thank my family and friends for all their love and support.

Abstract

Objective: The objective of this research is to describe and explain the differences in migration behaviour of graduates between the cities of Groningen, Rotterdam, Tilburg and Maastricht. **Methods:** The research is a quantitative study and secondary data is used. The data in this thesis contains survey data collected by the Research Centre for Education and Labour market. This survey is has been held among all university graduates in the Netherlands, but in this research only the cities of Groningen, Rotterdam, Tilburg and Maastricht are researched. Two different methods will be used to answer the research questions. First a description of the results will be made by making cross tabs of the dependent variable divided by the different independent variables. For the explanatory part of the research, the multinomial logistic regression analysis will be used. **Results:** Most graduates stay after study in the region of study, except for the University of Groningen. Remarkable is that for the Universities of Groningen and Maastricht, graduates are much more moving to the core region, compared to the other universities. Graduates that lived at age sixteen in the region of study stay after graduation more often in the region of study. Besides, graduates that have moved before are more likely to migrate again. Big differences can be found between the University of Rotterdam and other universities in the migration pattern of the graduates of different sectors of study. Graduates that move to the core region are mostly found among the sectors Economics and Humanities, except for the University of Rotterdam. For the University of Rotterdam, graduates of the sector Medical Science are most often moving to the core region. Only the Universities of Tilburg and Maastricht show differences in the migration behaviour between the sexes. Both universities show that female graduates stay more often in the region of study and male graduates move more often to the core region. The young graduates also stay more often in the region of study. **Conclusion:** The main conclusion for this research is that the Universities of Groningen, Tilburg and Maastricht show similarities in the migration behaviour of graduates. On the contrary, the University of Rotterdam shows a completely different migration pattern. The explanation could be that the University of Rotterdam is situated in the core region and therefore shows different migration patterns than the other universities.

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1 Introduction

1.1 Background

The number of students that are studying at a university has been rising during the last ten years. In the study year 1999-2000, 162.954 students were studying at a university in the Netherlands. In the study year 2009-2010, 233.254 students were studying at a university in the Netherlands. Also the number of graduates has risen in the past years. In the study year 1999-2000, 20.200 students graduated from a university and in the study year 2007-2008 the number of students that graduated was 28.300 (Netherlands Statistics, 2010).

The role of these higher educated people becomes more important in a knowledge driven economy. According to Faggian and McCann (2006), the most competitive regions are the regions with a high level of human capital. The growing number of university graduates in the Netherlands is positive with respect to the competitive role of the Netherlands compared to other countries. But also within the Netherlands, regional economic disparities can be found. The Randstad is the area in the Netherlands which is called the core region. Most economic activities take place in that region, therefore also most jobs can be found within that area. The Randstad is located in the provinces Noord-Holland, Zuid-Holland and Utrecht. Unemployment rates in these provinces are very low compared to other regions in the Netherlands. In 2009 the unemployment rates were respectively 4.7%, 4.8% and 4.0% (Statistics Netherlands, 2010). Especially in the provinces Groningen, Drenthe and Limburg the unemployment percentages are much higher, respectively 6.5%, 6.2% and 5.9% (Statistics Netherlands, 2010). These high unemployment percentages have partially caused the movement of many high educated people to the Randstad.

In this thesis the differences in the migration behaviour of graduates of the Universities of Groningen, Rotterdam, Tilburg and Maastricht will be researched. The Universities are located in different parts of the Netherlands and therefore it will be interesting to see what the differences are in migration behaviour between the universities. Besides, other forms of migration behaviour could also be important in examining the migration patterns of graduates, like returning to the region of origin.

Another point of research in this thesis is whether the type of study of graduates is influencing the migration behaviour of graduates. The Randstad is an important region regarding the employment but also other regions are important. All regions have their own qualities and every region can attract graduates with skills that are significant to that region. It will be interesting to examine whether there are particular types of study which are dominant in a specific region. Besides, the influence of sex and age will be researched in this thesis.

1.2 Objective

The objective of this thesis is to describe and explain the differences in migration behaviour of graduates between the cities of Groningen, Tilburg, Maastricht and Rotterdam.

1.3 Research questions

Main question:

What are the differences in migration behaviour of graduates between the cities Groningen, Tilburg, Maastricht and Rotterdam and how can these differences be explained?

Sub-questions:

- What is the influence of regional economic disparities on the migration behaviour of graduates?
- What is the influence of the living place at age sixteen on the migration behaviour of graduates?
- In which way could the different branches of science influence the migration behaviour of graduates?
- In which way could sex influence the migration behaviour of graduates?
- In which way could age influence the migration behaviour of graduates?

1.4 Structure

This thesis will be divided into six different chapters. This first chapter is the introduction part of the thesis. The second chapter includes theoretical background, literature review, the conceptual model and hypothesis. The theoretical chapter is important because it will be the basis of the research. The hypotheses for the research are formulated from the theory and these hypotheses will be tested. In the third chapter the data and methods will be expounded. The chapter includes the study design, the conceptualisation and operationalisation, the description of the quality of the data, the ethical issues and also the description of used methods. The fourth chapter will include the descriptive results. Cross tables will be made and the chi-square test will be used to distinguish the significant variables. In chapter five the explanatory results are presented by using the multinomial logistic regression analysis. Besides, the results will be explained by the theory. The last chapter will conclude the thesis, discusses the findings and will give some recommendations for further research.

2. Theoretical framework

In this chapter different theories will be adopted to make a good theoretical framework for the research. After the theory part an overview of the previous literature about the mobility of graduates in the Netherlands and Groningen is given. The conceptual model and the hypothesis are given in the last two paragraphs of this chapter.

2.1 Theory

In this part of the chapter, the most relevant theories for the research are explored. At first the endogenous human-capital model of migration will be explained. Thereafter the regional economic disparities in the Netherlands are discussed. Then the life course approach is expounded. This life course approach will be divided into three different sub-paragraphs. First some general notions of human behaviour will be given, which will be followed by theories about the early participation in the labour. In the last sub-paragraph the influence of migration experience on the migration decision is explained. The last theoretical paragraphs include theories about the influence of gender and age in the migration decision.

2.1.1 The endogenous human-capital model of migration

Many approaches of analyzing the nature of inter-regional labour migration are present. In this paragraph the endogenous human-capital model of migration will be discussed. The endogenous human-capital model of migration is based on the consideration of the microeconomic characteristics of individual migrants. The basis of this theory is the human-capital model of migration. An important person in developing this theory was Sjaastad (1962). He established the idea about weighting up the costs of a migration against its returns. An important idea of the human-capital theory is that rational and well-informed individuals invest in personal education and training to increase their human capital, in order to maximize their expected income and job satisfaction. Individuals with higher human-capital have the goal to reach the optimum employment opportunities and are investing in the optimum training possibilities. Thus, individuals with higher human-capital search for employment opportunities over a wider geographical area than individuals with lower human-capital. The result will be that individuals with higher human-capital will be more migratory than individuals with lower human-capital, because the first have more expectations due to their greater investments in education and their higher expectations of wages. Another important reason could be that higher human-capital individuals are better informed about the employment opportunities across regions because of easier personal access to informal employment networks. A consequence of this migration on the higher human-capital individuals is that the differences between the regions may be exacerbated by the migration process (McCann, 2001). In the next paragraph the regional economic disparities in the Netherlands will be further discussed. Then the transition will be made to the life course approach, because the influence of the life course could also be an important factor in explaining migration behaviour.

2.1.2 Regional economic disparities in the Netherlands

Each place in the world has various characteristics that define the region and that can be used to compare or contrast with other regions. Not all economic regions are composed in

the same way. Some are extremely specialized; others have more varied activities (Claval, 1998).

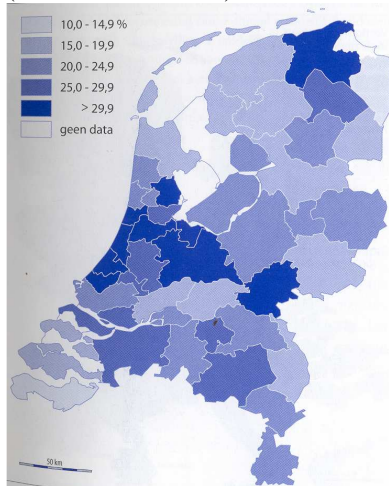
According to research conducted by the Consultative Council of Science and Technology (1990), the Netherlands can be divided into three regions: the centre, the halfway-zone and the periphery. The centre consists of the Randstad, the halfway-zone consists of the following provinces: Flevoland, Gelderland, and Noord-Brabant. The other parts of the Netherlands belong to the periphery (Waalkens et al, 1995).

Also according to Van der Velden and Wever (2000), Randstad is the centre of the Netherlands. They refer to the book called: 'The West and the other part of the Netherlands' published in 1956. The book mentions the three western provinces (Noord-Holland, Zuid-Holland and Utrecht) as the engine of the economy of the Netherlands, because the western provinces were the core of the economy of the Netherlands. The remaining part of the Netherlands had much higher unemployment rates. Besides, Van der Velden and Wever (2000) state that the economical interest of 'the remaining part of the Netherlands' is rising.

Especially the provinces Gelderland and Noord-Brabant experience economic growth. A reason for this could be that these provinces take advantage of the enlargement of the economic activities of the Randstad. But also the other provinces outside the Randstad became economically more powerful. Because the provinces outside the Randstad have much more space available for the building of new companies, a lot of companies move away from the Randstad. Moreover, many areas in 'the remaining part of the Netherlands' experience endogenous development. One of the most important explaining variables in explaining the economic growth of the remaining Netherlands is the concept of 'regional production environment'. This concept includes all corporate external factors, which have influence on both the choice of the location of companies and on the operation of the companies after establishment. During the last decades the regional disparities in the production environments have decreased. This means that the conditions of the different regions in the Netherlands show less disparities. Around sixty years ago, the government started with improving the conditions in regions in 'the remaining part of the Netherlands'. Through these improvements the deficits of 'the remaining part of the Netherlands' were for a large part eliminated. This means that more regions became suitable for the establishments of various forms of economical activities (Van der Velden and Wever, 2000).

Another important explaining variable in explaining the economic growth of the remaining Netherlands is the concept of 'production structure'. Sixty years ago the production structure was aimed at a limited number of basic activities such as: Oil industry, shipbuilding and textile industry. These activities had very specific demands on their location: deep-sea ports. The current production structure is very different than the production structure six decades ago. The current production structure has less specific demands on their locations. For companies in business services and the modern industry, aspects such as accessibility and high qualified staff are very important (Figure 2.1). Because of these demands companies can also exist outside the western part of the Netherlands.

Figure 2.1: Percentage of highly educated people of the labor force divided by Corop-region in 1997 (master and bachelor).



Source: Vander Velden and Wever (2000)

The third important explaining variable in explaining the economic growth of the remaining Netherlands is the increased spatial extent of companies. Even small companies do not just operate on the regional market anymore.

Largely on the basis of the three explaining variables which are mentioned above, Atzema and Wever (1999) state that at the moment a large part of the Netherlands consists of a so-called 'urban field'. This is defined as an area which has small variation inputs and where almost the whole area can satisfy the spatial conditions needed for the business activities. This does not mean that there are no differences anymore. The production environment of Amsterdam is still better than the production environment in the Achterhoek (Atzema and Wever, 1999 cited by van der Velden and Wever, 2000). The urban field theory of Atzema and Wever (1999) fits with the consideration of Van Engelsdorp Gastelaars (2000). He introduced the concept of the 'outlying suburban'. This is defined as: the areas which have a lot of nature and where the building density is too small to be an urban environment, but where the building density is on the other hand too large to define the area as the countryside. According to Engelsdorp Gastelaars (2000), this 'outlying suburban' has more attractive residential opportunities than the urban areas. Although a lot of companies can operate in different parts of the Netherlands, this is not the case for all companies. There are still regions with clusters of very specialized companies (Van der Velden and Wever, 2000).

2.1.3 The life course approach

Migration is the most variable aspect of demographic behaviour. The probability to migrate is changing over an individual's life course. Different stages in life show different chances of migration. But migration is also a dynamic aspect when noticed over historical time. The economic circumstances are very important in making the decision to invest in housing or to search a new job somewhere else. Sometimes, a shortage in the housing stock prevents people to move and other times people will be stimulated to move

because of new housing projects. Also the norm of migration changes over time. There are periods that an early leave of the parental home might be stimulated and children leave the parental home very early. But in other periods children might be stimulated to stay longer in the parental home. Moreover, the decision where to migrate is also fluctuating over time. In some periods, the government is stimulating to migrate to the sub-urban areas. But in other years the government might influence people to move to the urban areas, because the government wants to develop the cities (Mulder, 1993). In this part of the theoretical framework the influence of the life course on migration decision is explained. The different elements are further explained in the next sub-paragraphs.

2.1.3.1 General notions of human behaviour

In Mulder (1993) four assumptions are mentioned which will be necessary to make the combination of a life course and cohort perspective a sensible and a useful way of studying the behaviour of individuals. The first assumption has a relation with one's goals in life. Lindenberg (1990) identified two general goals in life, namely: physical well-being and social approval. Each individual has also specific goals, which are called preferences. General goals are assumed to be universal and preferences are not. Preferences could vary between individuals and during an individual's life course. Important external factors are formed by the societal context in which the person lives. Some preferences are more socially acceptable than others (Lindenberg, 1990 cited by Mulder, 1993 pp. 17-18).

The second assumption comprises the relationship between people's behaviour and their preferences. There is assumed that people behave rationally, with rationality defined as 'the deliberate employment of means in order to reach ends' (De Bruijn, 1992 cited by Mulder, 1993 p. 18). In this way, the term rationality is not used as the neo-classical approach, but rather as satisfying behaviour. This rationality also includes the procedural type of rationality. A share of the behaviour of people is arising from fixed procedures and these procedural influences make people avoid to take individual decisions. Society codifies these procedures by determining a 'decision environment' consisting of institutional form and cultural patterns (McNicoll, 1980 in Mulder, 1993 p.18). This entails that people do not behave very differently than other people in the same societal setting.

The third assumption is that of biographical continuity. What people did in the past determine the means and capabilities they have accumulated and will condition what people will do in the future (Elchardus, 1984 in Mulder, 1993 p.18). Mulder (1993) made the assumption that people act and think with a long-term perspective in mind. People have some ideas about what they want in the future and so they adapt their current behaviour to long-term preferences. People want to rule their lives along reasonably consistent paths or indicated as careers, for example: an occupational career or a migration career. This individual complex system of careers is indicated as a life course. According to Feijten et al (2007), the previous spatial life-path is influencing the migration decision. A lot of factors that drive return migration are specific to the location, like having friends or family there, or owning a house there. Moreover, people who have lived in a place change the awareness of and attitudes towards the type of residential environment. This could contribute to the choice for returning to that place and it could

also contribute to a living place somewhere else, but in the same type of residential environment.

The last assumption contains the societal change. In respect to resources (economic opportunity structures) and to the acceptability of certain preferences (social opportunity structures), the fact that society changes is taken for granted. The four assumptions that are mentioned imply that people both influence and are influenced by society through their behaviour and preferences. People make their own new procedures, rather than follow codified behavioural procedures mechanically. These new procedures could be taken up by other people and can be developed into new codes. This will provide that society's institutional forms are constantly re-shaped (Lesthaeghe, 1983 cited by Mulder, 1993 p.19).

These four assumptions about human behaviour give the basic rational point, underlying in the study of human behaviour from a life course and cohort perspective. The assumptions show how the coherence in individual life courses goes together with macro-level societal change. People who are born in the same birth cohort have been grown up in the same societal context, with equal opportunity structures and common social norms concerning behaviour and careers. People from the same cohort experience certain life events, like leaving the parental home, entry to the labor market and retirement, at about the same time. The contribution of these cohort and generations research to the social sciences is very important (Mulder, 1993).

2.1.3.2 The early participation in the labour force

In the article of Haapanen and Tervo (2009), about the migration behaviour of Finnish graduates, it is proved that the chance to migrate is enlarging two years before and during the graduation year, and reducing gradually thereafter. This result is found for both the students who study in their home region and also for students who study outside their home region. Onward and return migration is occurring quite often, especially of the students from outside the region. The data shows that graduates studying in their home region have much lower tendency to migrate compared to the graduates studying outside their home region. However, the economic model of Haapanen and Tervo (2009) states that the differences in migration are explained by the observed characteristics and behavioural differences of the graduates coming from inside and outside the region. The economic model shows that the comparison of the same observed characteristics shows a similar migration chance.

A high amount of unemployment in a region will contribute to the out-migration. If the local unemployment rate is high, the migration chance would enlarge, because the chance to find a job in the home region is low. Haapanen and Tervo (2009) state that graduates originating from university sub-regions and regions with good labour market opportunities are more likely to move back, while others either stay or move on. Also the field of education has an influence on the migration decisions of graduates. The spatial distribution of jobs could differ from the spatial distribution of the students who are graduated. Haapanen and Tervo (2009) mention: 'For example, medical training in Finland is only given in five universities, whereas technical training is given in nearly all universities. Since jobs are spread out across the country in both cases, the net benefits from moving are likely to be greater for graduates with medical training'.

A strong relationship exists between the educational and occupational career. Mulder (1993) mentioned a triggering and a conditioning component of this relationship. The triggering effect includes the long distance migration that both the educational and occupational career will experience. A conditioning effect of the occupational career includes the amount of location-specific capital built up in a specific type of job. A self-employee will build up an important location-specific capital in the sense of relations with clientele and business partners. In general, paid workers are more flexible in changing their workplace. Also the level of income is important in making the migration decision. If the income in the new workplace is very high, people are more likely to migrate. This can be connected to the educational background, because the level of income is strongly connected to the level of education. A supplementary argument for the role of education is that the highly educated people have made a greater investment in human capital. These highly educated people are probably more work-oriented and would rather like to move for their job than lower educated people. This is also stated in the endogenous human capital model, which was discussed before. In a study of Hartog et al (1987) it is proved that the higher educated change their workplace more often than average employees.

2.1.3.3 Previous migration experience

The first migration decision of a person is made in the absence of any relevant prior experience. People know things about migration because they heard about it from other people but they do not have personal experience. The first time someone migrates has in general a higher variance in the migration costs and benefits. Later on, the chance of formulating accurate costs and benefits will become higher. Someone with migration experience should therefore be more successful in their migration decision (Bailey, 1993).

Besides, someone who migrated before might a higher chance to migrate again than a person who never migrated. Bailey mentioned two explanations for this difference (Morrisson, 1967 cited by Bailey, 1993 pp. 315-316). The first explanation states that migration is a learned strategy. Someone with migration experience is sensitized to spatial and temporal fluctuations in opportunities. The migration experience ensures that people respond efficiently to labour market signals. The other explanation states that migration is a selective process. That means that the less successful migrants are, the more likely they migrate again. People who have a lot of migration experience are the less successful migrants. Therefore, regions with a high number of 'chronic migrants' will have inefficient labour markets.

This contribution of migration experience to the migration career applies also to the migration of graduates. Kodrzycki (2001) mentioned that recent college graduates were more likely to move to a different state if they had moved previously. Movement to another state to attend college was an especially strong factor.

2.1.4 Differences in gender of graduates

There are good reasons to expect that the decision-making about the location differs substantially between men and women. But not all researchers agree in what direction this difference can be found. According to Detang-Dessendre and Molho (2000), the decision-making of women are probably different than that of men. Women would more

appreciate that family and friends live closely in the neighbourhood. The educational background of women seems also to be very important in relation to the migration-decision. The chance of migration increases with a higher educational background of women to a degree comparable to that of men. But also the marital status of the women seems to be important in the decision-making process of migration. Being single reduces the chance of short- and long-distance migration for women more than for men. A reason could be that women don't move far from their parental home until they are married. Moreover, the employment status transitions will have a greater impact on the long-distance migration decisions of men than of women. This again relates to the greater impact of family and friends on women. Different than the employment status, having a permanent job has more influence on the long-distance migration of women (Detang-Dessendre and Molho, 2000).

Research of Hughes and McCormick (1981, 1985) shows that males, those without children, better educated, and younger generations are consequently found to be the most mobile persons. But not all researchers agree with the higher migration rate of males. According to Faggian et al. (2007) female graduates are more mobile than male graduates. A reason for this could be that migration is a way of compensating for gender discrimination in the labour market.

2.1.5 Differences in age of graduates

According to the research of the German Institute for Economic Research (2007), the probability of staying increases for graduates who are graduating at a higher age. Besides this, the probability of out-migration decreases with every year that the graduate stays longer in the study region. In the existing literature, no explanations can be found for this difference in migration behaviour between the different ages of the graduates. An explanation for this could be that the longer somebody stayed in a region, the more the person is embedded in society. Older students will more often be in cohabitation or have already children. This could be an explanation for staying in the region of study. Another explanation could be that, younger graduates are more career oriented. Older graduates studied longer, and will generally not be the best students. The more career oriented graduates are more willing to migrate for a better job.

2.2 Literature review: Related Research

In this part of the chapter previous research about the migration of graduates will be discussed. In the first paragraph the previous research about bachelor graduates in the Netherlands will be discussed, thereafter the research about the master graduates in the Netherlands will be discussed and in the last paragraph a review is given about the previous research of graduates in Groningen.

2.2.1 Bachelor graduates in the Netherlands

Allen (2009) did research on the spatial mobility of bachelor graduates divided in region and branch in the Netherlands. They found that around 19% of the bachelor graduates lives one and a half year later in the city of study, 58% lives in the same province and 72% lives in the same part of the country. The other 28% of the graduates lives outside the Netherlands or in another part of the country. A big difference is found between the different regions, the bachelor graduates of the western part of the Netherlands have the

lowest migration rate and the bachelor graduates of the eastern and northern part of the Netherlands have the highest migration rate. Differences could also be found in the mobility between the bachelor graduates of the different branches. The bachelor graduates of the agricultural sector have the highest mobility, more than 50% of these graduates have moved to another part of the country. Graduates of the arts sector have the lowest mobility; the focus of these graduates is strongly directed on the city of study. However, this difference is found on a very low number of graduates that attended these particular specialisations. These both fields are very limited spread around the country, but the outcome of both studies is different. This difference can be declared due to the different level of employment in both branches. Graduates of the art sector are mainly situated in the bigger cities, while graduates of the agricultural sector are mainly situated in the cities in the eastern and northern part of the Netherlands. Venhorst et al. (2008) showed that the direction of the migration differs between the different branches. Graduates of the educational sector and the medical care are more directed on the northern, eastern and southern part of the Netherlands than the other branches. Graduates of the economic sector and the technical sector are more directed to the western part of the Netherlands.

2.2.2 Master graduates in the Netherlands

Bachelor graduates play a more important role in the local region than master graduates, but also master graduates are important for the local economy (Cörvers and Ramaekers, 2010). According to the economical literature, the interest of universities to the provinces, in which the universities are located, will be supported in two different ways (Faggian and McCann, 2009 in Cörvers and Ramaekers, 2010): At first, there are positive multiplier effects on the economic growth and the employment. More high educated people in a region will ensure that the local consumption will be higher, the local facilities will be better and the employment level will rise, for both higher and lower educated people. Second, the education and development part of universities will ensure the innovation in the region. By the presence of a university in a region, new high-technology companies and a clustering of education and development activities may be attracted. In the education and development activities graduates can play an important role.

In the research of Cörvers and Ramaekers (2010), the regional mobility of graduates will be researched from the aspect of the relation between university and graduates in the region, the place of living at age sixteen of graduates, the present work-region of graduates and the connection between education and employment of master graduates. The geographical division in the research of Cörvers and Ramaekers (2010) are provinces.

The connection between graduates and the graduation region can be measured by the geographical mobility of the graduate, before and after the graduation. According to Van Dijk and Venhorst (2009), there are both binding effects and escalator effects. The binding with the region of origin, because of family contacts and the social and professional network increase the chance to stay in the region of origin or to go back after graduation. These students, which study in the same region as where they lived at age sixteen and also stay in the same region after graduation, have a very high binding with the region and are important for the maintenance of knowledge in the region. These

people are contributing to the knowledge conservation. Besides, there are students that study outside the region of origin, but go back after graduation. These students contribute to the knowledge of the region of origin, this is called knowledge return. Escalator effects will ensure that students, who do not want to go back to the region of origin and want to develop in the academic world, take the possibilities to rise on the social ladder. Escalator effects ensures that people who have already experienced spatial mobility are more likely to migrate to another region than people who have never migrated before (Davanzo and Morrison, 1981 in Cörvers and Ramaekers, 2010). This includes three groups of students: First, students that studied in the region of origin but work after graduation in another region. This is called knowledge withdrawal. Second, students that studied outside the region of origin and stay in the region of study after graduation. These graduates will form the knowledge profit of the region. Without existence of a university in this region, the chance was small that this person would work in the region. The last group of graduates are the graduates that studied in a region, different than the region of origin and after graduation moved to a completely different region, different than the region of origin and different than the region of graduation. This is called knowledge circulation. For the explanation of the mobility of graduates, both the location and the width in the offer of studies of the universities play a role. The peripheral provinces or provinces with less concentration of highly qualified employment, are expected to have a higher than average knowledge withdrawal. For more speciality universities, the knowledge circulation will be higher because of the small offer of studies. From the students of the universities of Amsterdam (UvA), Rotterdam, Leiden and Tilburg is for one out of the three students the region of origin the same as the region of study and stay also in the same region after graduation. This large group of students, mainly from the Randstad, has a high binding with the region. Because a lot of students who study in the universities of Zuid-Holland and Noord-Brabant come from the same region, and so these regions have a high knowledge withdrawal. The knowledge withdrawal of the universities of Twente and Wageningen is the lowest, but this is caused by a relatively few percentage of students who lived in these regions at age sixteen. The part of the graduates that come from another region and that stay after graduation in the region of study, the knowledge profit, is only for the most universities in the Randstad higher than the average of 22%. The knowledge conservation and knowledge profit measure the percentage of graduates that stay in the province of graduation. For the universities of Noord-Holland, Zuid-Holland and Noord-Brabant this is around 50%, but for the universities of Groningen, Twente, Wageningen, Utrecht and Maastricht this is significantly less. Universities with the highest knowledge circulation are situated in the periphery. Also a lot of students in the peripheral provinces go away after graduation. Graduates of Groningen, Wageningen and Utrecht are going back to the region of origin most often. The high share of students that is not working in the region of origin nor in the region of graduation is going to the provinces with the most employment. A relatively high share of students is going after graduation to another part of the country to the western part. Moreover students that have their origin in the western part of the Netherlands could be less mobile due to the high employment in the western part of the Netherlands. This results in a big pull out of graduates from the periphery to the Randstad. Only the province of Groningen is not losing its high educated to the Randstad. A reason for this could be that the province of Groningen has the only university in the Northern part of

the Netherlands. This result also in the amount of employment related to a university (Cörvers and Ramaekers, 2010).

2.2.3 Graduates in Groningen

Van Dijk and Venhorst (2008) did research on the spatial mobility of graduates in Groningen.

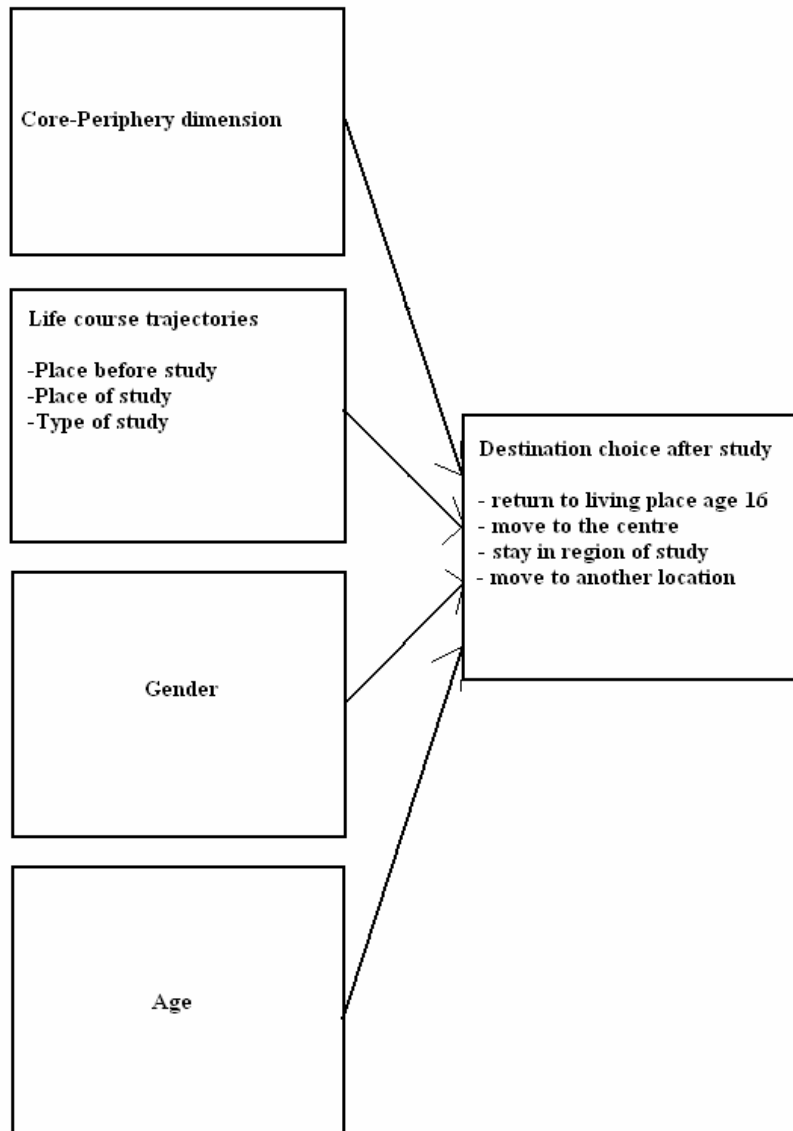
According to Van Dijk (2008), 40% of the students of the University of Groningen came from parts of the country outside the north. However 60% of the students move outside the north when they are graduated. This big outflow of students is called the braindrain of the north. According to Van Dijk this braindrain should not be seen as a negative term. There are not enough jobs available for all graduates, therefore graduates could better migrate to the western part of the Netherlands instead of staying in the north and becoming unemployed. However, Cörver and Ramaekers stated before that Groningen is the only peripheral province that is not losing their higher educated people to the Randstad

Big differences can be seen by the different branches of science. Economists, business administrators and law students leave more than medicals. Also different motives will influence the decision to stay in the northern part of the Netherlands or to go to other parts of the Netherlands. Some people will find a good job in other parts of the Netherlands, but other people will stay in the north because of their family and friends (Venhorst, 2008).

2.3 Conceptual model

In this paragraph the theories will be combined into a conceptual model. Some regions have better economic opportunities than other regions. The regional economic disparities in the Netherlands are important in the decision making process of graduates whether to migrate or not. The theory of the life course approach of Mulder (1993) has also an important contribution to the conceptual model. According to the theory, the living place before study, the place of study, and the living place in study years are important factors in the relocation behaviour of graduates. The theory of Haapanen and Tervo (2009) about the influence of the type of study on relocation behaviour of graduates is important as well. Another important factor in the research is the influence of gender in the migration decision of graduates. The theory states that there is an influence of gender on the migration decision of graduates, but the different theories are not clear in which way gender has influence on the migration decision and their relocation behaviour. Also the age of the graduate could be important, because the theory states that the younger the graduate, the higher the probability to migrate.

Figure 2.2: Conceptual model



Source: Own creation

Besides, there are other factors that can have an influence on the relocation behaviour, but they are not researched in this thesis. For example Kodrzycki states that the migration decision of graduates is also influenced by their family's moving patterns. Someone who migrated between birth and high school graduation was more likely to migrate again than someone who had never migrated between birth and high school graduation. The only migration pattern that is researched is the migration from high school to university and from university to a first job; the prior moves a student made are not researched in this thesis. Also the theory of van Wissen (2008) about the influence of better housing on migration behaviour will not be researched in this thesis. Besides the theory about the importance of the quality of living environment of the Glasgow Quality of life Group is not researched in this thesis (Boyer and Savageau 1989 cited by Boyle et al 1998 p. 134).

2.4 Hypothesis

In this paragraph different hypothesis are made, which will be researched in this thesis. The hypotheses are conducted from the theories, research questions, conceptual model and the previous research. The Universities among study are the Universities of Groningen, Rotterdam, Tilburg and Maastricht. These universities are chosen because a comparison could be made between the core, University of Rotterdam, the halfway zone, University of Tilburg, and the periphery, Universities of Groningen and Maastricht. The following hypothesis will be researched:

1. Because of the regional economic disparities in the Netherlands, more graduates migrate to the western part of the Netherlands than to the other regions.
2. For the Universities of Tilburg and Rotterdam more students will stay after graduation in the province than for the universities of Groningen and Maastricht.
3. Graduates of the University of Rotterdam stay more often after graduation in the study region than graduates of the universities of Groningen, Tilburg and Maastricht.
4. Graduates who lived at age sixteen in the Randstad experience more often return migration than graduates of the other regions.
5. If there are a lot of universities with a particular type of study, the graduates of this type of study will not migrate so much. If there are not so much universities with a particular study, more graduates will migrate.
6. Graduates of the University of Groningen who are graduated in the economical studies and law studies migrate more often than graduates of the medical studies.
7. There is a difference in the number of males and females that migrate after graduation.
8. The homesickness factor is higher for female graduates than for male graduates.
9. The lower the age at graduation, the higher the chance of return migration.

3. Data and methods

This chapter will include a description of the data and methods that will be used to research the migration behaviour of graduates who graduated in 2005-2006 in Rotterdam, Tilburg and Maastricht and the graduates who graduated in 2006-2007 in Groningen. The data and methods that will be used in the research will be explained in this chapter and will shape a clear basis to the following chapters. First, the study design will be explained. In the first sub-paragraph of the study design the level of analysis will be described. In the second sub-paragraph a description of the data will be given. Thereafter the concepts that will be used in the research will be described and operationalised. The quality of the research will be discussed and also the ethical aspects will be mentioned. The last part of the chapter will include the methodology.

3.1 Study design

This research will be a quantitative study and secondary data will be used. The main purpose of the research is descriptive, because the research will describe the migration behaviour of graduates. Besides, explanations will be made to explain the migration behaviour of the graduates. The university graduates of Tilburg, Rotterdam and Maastricht of 2007 and the university graduates of Groningen of 2008 are the units of analysis in this research. The next sub-paragraph gives a description of the level of analysis.

3.1.1 Level of analysis

The type of data that will be used in this research is spatial data. This type of data consists of observations on geographical individuals which may only be well interpreted when the geographical locations have been taken into consideration (O'Brien, 1992). The type of spatial analysis that will be used in this research is associated with zonal data. Zonal data analysis means that disaggregate information from individual persons has been aggregated and is displayed by a system of geographical zones (O'Brien, 1992). It is very important to define accurately the meaning of the concept of 'region' in the research. Viskil (1994) states: 'Definitions are very important by obtaining knowledge, to understand the meaning of other people and to solve different kind of problems. Through the definition of a word, knowledge can be provided, ambiguities can be declared, misunderstandings can be prevented and demarcation problems can be solved'. Region is a concept that can be defined in several ways. According to Dietvorst (1975), the content of the concept of region is indefinite. Several authors that have worked with region as a concept have had all different frameworks of the concept. For example: the administrative framework or a natural framework that is made on the basis of physical geographical characteristics.

Dietvorst (1975) mentioned the concept system as a new approach to the interpretation of the concept region. The concept system is used because of the created insight that regions consist of a number of characteristics. The concept system is defined in the following way: 'a collection of elements that are mutually related with each other and with the environment'. An important relation with the concept system has the concept scale. This important relation exists because the choice of the definition that will be used for the concept system is dependent on the choice of the scale in the research. The meaning of the concept system is important for the understanding of the concept region. Even the

definition of the concept system can be used for the concept region. The term scale is also a very important term in defining the concept region (Dietvorst, 1975). According to Arbia (1989) the conclusions of a study will depend on the scale that is chosen in the study. 'Generalizations made at one level do not necessarily hold at another level, and conclusions we derived at one scale may be invalid at another' (Haggett, 1965 in Arbia, 1989). Arbia (1989) states: 'For example the distribution of income can be close to a situation of equity at a regional level, but very unequal at a county level'. This problem is also called the scale problem or the problem of the level of resolution. Moreover, if there are associations between two or more variables, the correlation coefficient changes with different scales of areal units. This applies both to direct correlation analysis and also to indirect analysis, like the multivariate techniques based on correlation, such as factor analysis. In the literature it is not unusual to find data aggregated to a level, so that high correlation is shown (Arbia, 1989). The choice of the 'best' scale for the research is difficult and depends on the needs of the research. The complexity of the research will increase by using more boundaries. Also the number of respondents in the sample is important. If in a particular area a few respondents are present it is difficult to draw conclusions on this area (Arbia, 1989). The problem of measured relationships changing with the type and number of zones that will be used in the research is called the 'modifiable areal unit problem' (O'Brien, 1992). In this research, regions are very important, because an important goal in the research is to study the relationship between a graduate's place of living at age sixteen, the city of study of the graduate and the graduate's current living place. Return migration is an important concept in this research. This return migration should not be studied in too small areas, because the research will be too complex (O'Brien, 1992). Also the number of graduates will be very small when many boundaries are used. Moreover the exact living place of the graduate is not very important in this research. The municipality and corop boundaries will be too small in this research. The goal of the research is more on the national scale. It is for example important to study which graduates stay in the northern Netherlands and which graduates will go back to the western part of the Netherlands. An interesting distinction could be made according to the different provinces. However this will be difficult, because the dataset contains the city of study of the graduates and not the city of living place in study years. It may be assumed that not all graduates lived in the city of study, especially the persons that lived at age sixteen close to the city of study. Return migration will be difficult when the boundaries in the study area are small. When the boundaries are larger, there can be assumed that, for example, a person from the western part of the country did not stay in that part of the country, while studying in the northern part of the country. However, the multinomial logistic regression analysis could not be done when the number of cases of a specific destination choice is too small. For example, the University of Groningen will not have any cases in the model for return migration to the northern part of the Netherlands. This will be the same as staying in the region of Groningen. Therefore it is not possible to take the part of the land, as the level of analysis. The province will be the best level of analysis, although it is important to keep in mind that not all graduates lived in the province of study.

3.1.2 Description of data

In this thesis survey data of the WO-monitor will be used. The WO-monitor is a postal survey, which is carried out each year among university graduates of the year before. The survey is headed by the association of Universities but is carried out by the Research Centre for Education and Labor market. The goal of the survey is to collect data about the labour market entry of graduates. The survey is held among all persons who have graduated on a university level the year before the survey is conducted. The response percentage of the survey is around 40 percent each year and this percentage is high enough to be representative for the population among study (The Netherlands Institute for Social Research, 2010). In this research only the Dutch graduates will be researched. This will be done because when the graduates, who originated from outside the Netherlands, will be used in the thesis, the results will be biased. This would be the case, because the dataset contains a very large group of graduates who originated from outside the Netherlands and who graduated from the University of Maastricht and a very small group of these graduates that graduated from the other three universities. Besides, these graduates do not add information to the research interest.

Not all variables of the WO-monitor are relevant in this research. In this chapter only the variables that will be used in this thesis are mentioned.

The WO-monitor is done among all university graduates in the Netherlands. In this research only the survey data of graduates of the Universities of Groningen, Rotterdam, Tilburg and Maastricht are used. The year of study is not for all universities the same: Rotterdam, Tilburg and Maastricht are studied in the year 2007 (graduation cohort 2005-2006) and the University of Groningen is studied in the year 2008 (graduation cohort 2006-2007). The study year for the University of Groningen is different because 2008 is the first year of the collection of information about the home municipality. The other universities had collected this information from the year 2007.

Table 3.1 shows the descriptive statistics of the independent variables: gender, age and type of study. Because the cases are weighted, it is better to mention the percentages than to mention the number of cases. However it is important to mention the total number of cases in this study, namely 6613 cases. This means that of the universities of Groningen, Rotterdam, Tilburg and Maastricht, 6613 graduates filled in the survey. The response rate is approximately 45%.

Of the persons that had responded, 54.7 percent was female and 45.1 percent was male. Also some missing values were present. Probably this is caused by mistakes in filling in the survey. The variable age in this study, is the age at time of the survey. Most people filled in the survey at age 25, namely 23.2 percent. The most popular sector of study among the graduates is the sector of economics, 37.7 percent of the graduates finished their study in economics. The least graduates were from the sector of teaching as well as engineering (table 3.1).

Table 3.1: Description independent variables: Sex, Age and Sector of study in percentage

Variable		Percent	Cases
Sex	Female	54.7	
	Male	45.1	
	Total	99.8	
	Missing values	0.2	
	Total	100.0	
Age	22	0.3	
	23	4.1	
	24	14.6	
	25	23.2	
	26	21.6	
	27	16.8	
	28	10.9	
	29	5.5	
	30	3.0	
	Total	100.0	
	Sector of study	Teaching	0.3
Engineering		0.2	
Economics		37.7	
Healthcare		13.5	
Behavioral & social sciences		21.1	
Arts, language & culture		10.4	
Law		13.5	
Natural sciences		3.2	
Total		100.0	6613

Table 3.2 presents the descriptive statistics of the independent variables: Municipality of study and part of the land of living at age sixteen. Also this table only represents the percentages because the cases are weighted. 21.2 percent of the graduates, of the four cities under study, studied in Rotterdam, 22.7 percent of the graduates studied in Maastricht, 26.1 percent of the graduates studied in Tilburg and 30 percent of the graduates had their study in Groningen. In table 3.2 it can also be seen that most of the graduates lived at age sixteen in the southern part of the land, namely 38.1 percent. 15.6 percent of the graduates lived at age sixteen in the eastern part of the country. In paragraph 3.3 the boundaries of the areas will be operationalised.

Table 3.2: Description independent variables: Municipality of study and part of the land at age 16 (in %)

Variable		Percent
Municipality of study	Groningen	30.0
	Rotterdam	21.2
	Tilburg	26.1
	Maastricht	22.7
	Total	100.0
Part of the land of living at age 16	North	17.4
	East	15.6
	West	28.9
	South	38.1
	Total	100.0

Table 3.3 presents the dependent variable of this thesis, namely: The part of the land of living at time of interview. Most of the graduates live after graduation in the western part of the Netherlands (45.3 percent). Four percent of the graduates have moved abroad after study.

Table 3.3: Description dependent variable: Part of the land of living at time of interview (in %)

Variable		Percent
Part of the land of living at time of interview	North	13
	East	7.2
	West	45.3
	South	30.5
	Outside NL	4
	Total	100

3.2 Conceptualisation

In this part of the chapter, the concepts of the conceptual model of chapter two will be defined. After this conceptualization, the concepts will be operationalised.

In this study the independent variables are core-periphery dimension, the life course trajectories, sex of the graduate and the age of the graduate. The dependent variable includes the destination choice after study.

The independent variable *core-Periphery dimension* can be defined as: The core region is the region which has the function of being the engine of the economy in a country. The remaining part of the land has most often much higher unemployment rates and is called the periphery (Van der Velden and Wever, 2000).

The independent variable *life course trajectories* can be defined as: An examination of what transitions the members of different social categories within a given cohort typically experience and put the question as to whether those transitions are of such a nature and so timed as to constitute life transitions. (Harris 1987 cited by Boyle, Halfacree and Robinson 1998, p.110).

The independent variable *gender* can be defined as: The social differences between men and women rather than the anatomical differences that are related to sex (Knox and Marston, 2007).

The independent variable *age* can be defined as: The number of years that a person has lived so far (van Dale, 2010).

The dependent variable *destination choice after study* can be defined as: Place of living after study.

3.3 Operationalisation

3.3.1 Core-Periphery dimension

The first independent variable is the core-periphery dimension. This can be divided into a core region and a peripheral region. The core region consists of the provinces Utrecht, Noord-Holland and Zuid-Holland. These are the provinces, which are according to Van

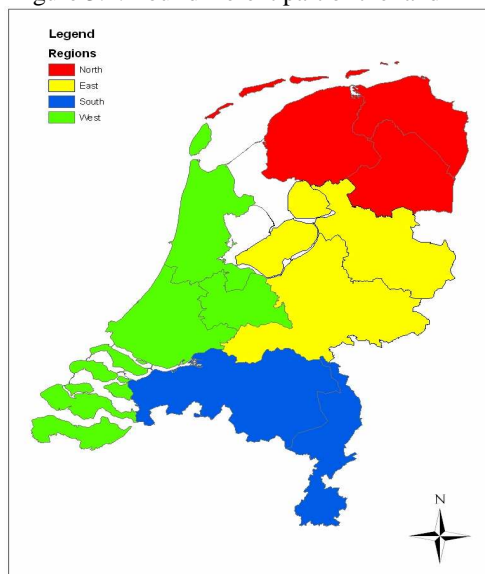
der Velden and Wever (2000) the provinces, which function as the engine of the economy in the Netherlands. Besides these three provinces, also the cities Almere and Lelystad can be counted to the core area. This is because these cities have very good transport connections to the city of Amsterdam. The periphery region consists of the other provinces in the Netherlands.

3.3.2 The higher education career as part of the life course

The concept of the independent variable the higher education career as part of the life course is operationalised in three different variables, which are all present in the survey of the WO-monitor. The first independent variable that will be used in this research is *region of living at age sixteen*. All graduates of the graduation cohort 2006-2007 in Groningen and all graduates of the graduation cohort 2005-2006 in Rotterdam, Tilburg and Maastricht were asked in the survey what their living place was at age sixteen.

For the graduates of the universities of Groningen Rotterdam, Tilburg and Maastricht, the level of analysis will be the four different regions in the Netherlands (figure 3.1).

Figure 3.1: Four different part of the land



In figures 3.2 to 3.5 it can be seen for each university separately, where the students lived at age sixteen.

Figure 3.2: Living place at age sixteen of graduates of the University of Groningen

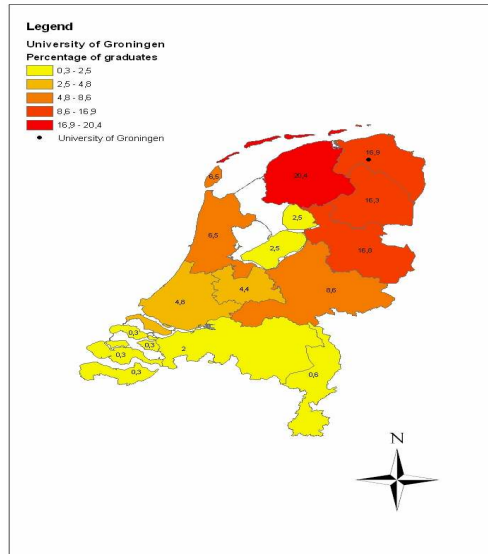


Figure 3.3: Living place at age sixteen of graduates of the University of Rotterdam

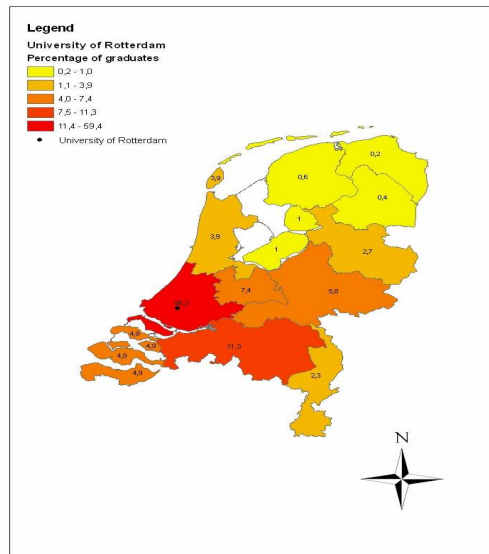


Figure 3.4: Living place at age sixteen of graduates of the University of Tilburg

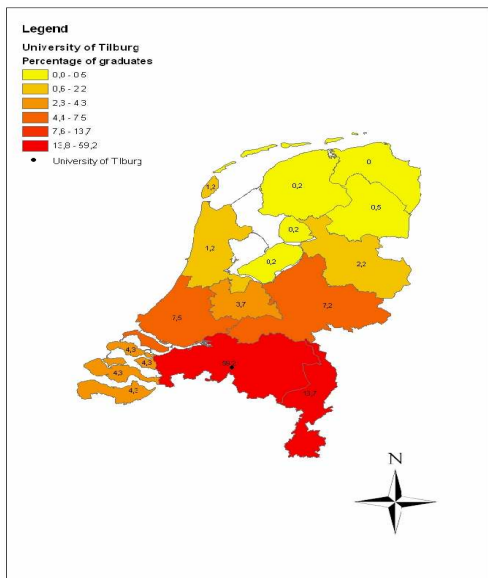
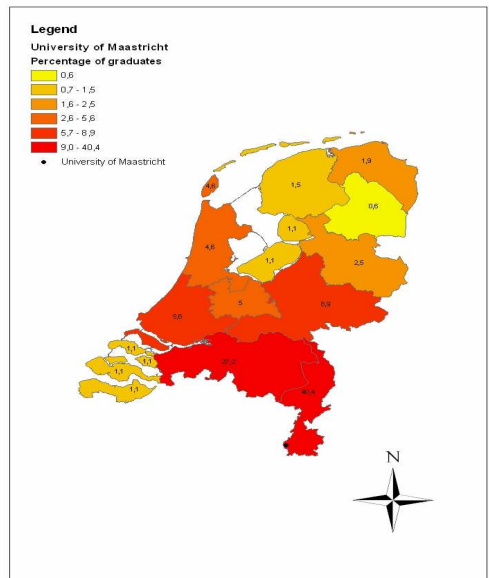


Figure 3.5: Living place at age sixteen of graduates of the University of Maastricht



The second independent variable of the concept of life course trajectories is also coming from the survey of the WO-monitor, namely *city of study*. This contains the city where the graduates had studied. In this thesis only the following cities will be researched (figure 3.1):

- Groningen
- Rotterdam
- Tilburg
- Maastricht

These cities are chosen because of the spatial differences between the cities. The research contains two peripheral cities, Groningen and Maastricht, also one city in the zone just outside the centre, Tilburg, and the last city, Rotterdam, is a city that is situated in the Randstad. It will be interesting to research the differences between these cities.

The third independent variable of the concept of life course trajectories is the *type of study*. The Research Centre for Education and Labour market made a list of sectors which represent all separate studies (table 3.1). These eight sectors can be combined in six different sectors. Arts, language and culture can be renamed into the sector of humanities. Engineering and natural sciences can be combined in the sector: science. Behavioural and social sciences, and teaching can be combined in the sector: social science. Economics, healthcare and law have their own sector because these studies represent a lot of graduates and these studies are difficult to combine with the other studies. The expectation is that these studies will have different spatial migration patterns. In table 3.4 an overview is given of the different sectors which are present in the four cities among study. So, the following sectors can be distinguished:

- Humanities
- Science
- Social science
- Medical science
- Economics
- Law

Table 3.4: Crosstable sector of study * city of study

			RIP Gemeentecode gevolgde opleiding				
			Groningen	Rotterdam	Tilburg	Maastricht	Total
sector van studeren	humanities	Count	379	116	101	92	688
		% within sector van studeren	55,1%	16,9%	14,7%	13,4%	100,0%
	science	Count	157	0	61	9	227
		% within sector van studeren	69,2%	,0%	26,9%	4,0%	100,0%
	social science	Count	435	231	603	144	1413
		% within sector van studeren	30,8%	16,3%	42,7%	10,2%	100,0%
	medical science	Count	183	101	0	609	893
		% within sector van studeren	20,5%	11,3%	,0%	68,2%	100,0%
	economics	Count	584	794	658	459	2495
		% within sector van studeren	23,4%	31,8%	26,4%	18,4%	100,0%
	law	Count	248	159	300	188	895
		% within sector van studeren	27,7%	17,8%	33,5%	21,0%	100,0%
Total		Count	1986	1401	1723	1501	6611
		% within sector van studeren	30,0%	21,2%	26,1%	22,7%	100,0%

3.3.3 Gender

The third independent variable is the *gender* of the graduate. The variable gender can be operationalised in the two different sexes:

- Men
- Women

In table 3.5 it can be seen what the distribution in the four different cities is of men and women.

The percentage of females is the most high in Groningen, namely 61.5 percent of the graduates in Groningen is female. The lowest percentage of females is found in Rotterdam, in this city the percentage of women is 44.7 percent.

Table 3.5: city of study * gender

			Gender: Female (0) Male (1)		
			Female	Male	Total
RIP Gemeentecode gevolgde opleiding	Groningen	Count	1214	759	1973
		% within RIP Gemeentecode gevolgde opleiding	61,5%	38,5%	100,0%
	Rotterdam	Count	612	788	1400
		% within RIP Gemeentecode gevolgde opleiding	43,7%	56,3%	100,0%
	Tilburg	Count	884	840	1724
		% within RIP Gemeentecode gevolgde opleiding	51,3%	48,7%	100,0%
	Maastricht	Count	907	595	1502
		% within RIP Gemeentecode gevolgde opleiding	60,4%	39,6%	100,0%
Total		Count	3617	2982	6599
		% within RIP Gemeentecode gevolgde opleiding	54,8%	45,2%	100,0%

3.3.4 Age

The fourth independent variable is the *age* of the graduates. This is the age at time of the interview. The ages 22-30 are distinguished in the dataset of the Research Centre for Education and Labour market. These ages will be combined in three different groups. This will be done by using the histogram in figure 3.6 and table 3.6. Based on the figure and table it can be seen that less than 20 percent of the graduates were 24 or younger during the time of interview. Less than 20 percent were 28 or older during the time of interview. The ages 25, 26 and 27 show much higher percentages. More than 60 percent of the graduates were 25, 26 or 27 years old at the time of the interview. Therefore the following age distribution will be used. The persons with an age at time of interview of 22, 23 or 24 will be combined in the group ‘young graduates’, People between the ages 24 and 27 will be combined in the group ‘average graduates’ and the last group of ‘old graduates’ includes 28, 29 or 30 year old at the time of interview (table 3.7).

Figure 3.6: Histogram: Age distribution of graduates

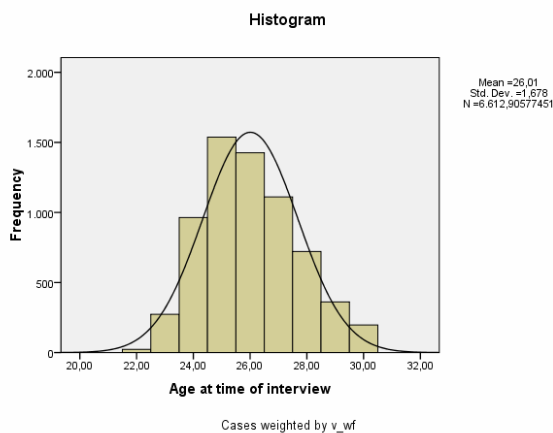


Table 3.6: age distribution of graduates

Age at time of interview					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22,00	23	,3	,3	,3
	23,00	273	4,1	4,1	4,5
	24,00	964	14,6	14,6	19,1
	25,00	1537	23,2	23,2	42,3
	26,00	1426	21,6	21,6	63,9
	27,00	1111	16,8	16,8	80,7
	28,00	721	10,9	10,9	91,6
	29,00	361	5,5	5,5	97,0
	30,00	197	3,0	3,0	100,0
	Total	6613	100,0	100,0	

Table 3.7: The three different age groups

leeftijd op datum van interview					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	young graduates	1260	19,1	19,1	19,1
	average graduates	4074	61,6	61,6	80,7
	old graduates	1279	19,3	19,3	100,0
	Total	6613	100,0	100,0	

3.3.5 Destination choice after study

The dependent variable, *destination choice after study*, is the living place after study at the time of the interview. For the graduates of Groningen it is the year of 2008 and for the graduates of Rotterdam, Tilburg and Maastricht the time of interview is the year of 2007. Four different types of destination choices can be distinguished:

- Stay in the region of study
- Going to the Centre: moving to the provinces: Utrecht, Zuid-Holland or Noord-Holland or the municipalities Almere or Lelystad
- Return to the living region at age sixteen
- Another region in the Netherlands or outside the Netherlands

For all the universities among study, the level of analysis will be the province. This choice is explained in paragraph 3.1.1. Figure 3.7 shows the twelve different provinces:

Figure 3.7: Twelve different provinces in the Netherlands



In table 3.8 it can be seen that graduates of the University of Groningen most often move to the core region, 33.4 percent. Also a lot of graduates stay in the province of Groningen, 32.6 percent. In this study the centre is defined as the provinces of Noord-Holland, Zuid-Holland and Utrecht and the municipalities of Almere and Lelystad. Graduates, who lived at age sixteen in one of the centre provinces and after graduation moved back to the same province, are counted as returnees. Also the graduates who lived at age sixteen in the municipalities of Almere or Lelystad and moved back after graduation to the same municipality or to another municipality in the province of Flevoland are counted as returnees. But when for example a graduate moved after graduation to Almere or Lelystad and was living at age sixteen in another municipality of Flevoland, the graduate will be counted as a centre migrant. Graduates who lived at age sixteen in one of the centre provinces, but moved back to another centre province are counted as centre migrants.

Table 3.8: Destination choice after study in Groningen
destination choice after study in Groningen divided by province

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid stay	647	32,6	32,6	32,6
centre	664	33,4	33,4	66,0
return	452	22,8	22,8	88,7
else	224	11,3	11,3	100,0
Total	1987	100,0	100,0	

In table 3.9 can be seen, that after graduation a very large part of the graduates stay in the province of Zuid-Holland, 67.2 percent. This part is even larger than the part that lived at age sixteen in the province of Zuid-Holland. Remarkable is that only 4.5 percent of the graduates move to another province than the centre provinces or than the province where they lived at age sixteen.

Table 3.9: Destination choice after study in Rotterdam

destination choice after study Rotterdam divided by province

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid stay	941	67,2	67,2	67,2
centre	182	13,0	13,0	80,2
return	214	15,3	15,3	95,5
else	64	4,5	4,5	100,0
Total	1400	100,0	100,0	

In table 3.10 can be seen that a lot of students stay after graduation in Tilburg, in the province of Noord-Brabant, 57.8 percent. Also a lot of graduates return to the province of living at age sixteen, 19.4 percent. 17.8 percent of the graduates in Tilburg is moving to the centre provinces.

Table 3.10: Destination choice after study in Tilburg

destination choice after study in Tilburg divided by province

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid stay	996	57,8	57,8	57,8
centre	306	17,8	17,8	75,5
return	335	19,4	19,4	95,0
else	87	5,0	5,0	100,0
Total	1724	100,0	100,0	

In table 3.11 can be seen that, like the University of Groningen, a relatively high percentage of the graduates moves to the centre after graduation, 28.5 percent. But also in Maastricht the highest percentage of graduates stay after graduation in the region, 38.0 percent. Remarkable is that a relatively high percentage of graduates is moving elsewhere in the Netherlands or outside the Netherlands.

Table 3.11: Destination choice after study in Maastricht

destination choice after study in Maastricht divided by province

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid stay	569	38,0	38,0	38,0
centre	427	28,5	28,5	66,5
return	260	17,3	17,3	83,8
else	243	16,2	16,2	100,0
Total	1499	100,0	100,0	

3.4 Data quality

The data in this thesis contains survey data collected by the Research Centre for Education and Labour market. Each graduate receives a written survey at home in the autumn of the year after graduation. This means that the survey is conducted approximately one and a half year after graduation. Of the descriptive statistics (table 3.1, 3.2 and 3.3) it can be seen that a lot of missing values are present in the dataset. It is important to keep the missing values in analysis. The quality of the data will be of good quality because the Research Centre for Education and Labour market works very

systematically. The administration of the different universities will be used to reach all the graduates of the year before. The survey is also headed by the association of Universities, what improves the quality of the survey.

3.5 Ethical aspects

At first, it is very important to take the privacy of the data into account. No specific statements can be done of individual people, only statements can be done about the whole sample. The data should only be used for the research and the data should be removed after use. It is also important to be careful in drawing conclusions about the population. Only conclusions can be made about the graduates in the specific cities and the specific years that the research was about. No conclusions can be drawn about cities and years that are out of the scope of the research. The final aspect is that the missing values have to be taken into account. Not all graduates who filled in the survey, answered all questions. If the research includes also other shortcomings, this will be discussed in the discussion part of this thesis.

3.6 Methodology

In the methodological part of this chapter it will be explained which analytical methods are used in the research. Two different methods will be used to answer the research questions in this thesis. First, a description of the results will be made by making cross tabs of the dependent variable by the different independent variables. The chi-square test will be used to distinguish the significant variables. Thereafter the multinomial logistic regression analysis will be used in the explanatory chapter. This chapter will successively describe both analytical techniques.

3.6.1 Descriptive methods

The research questions, which are explained in the introductory chapter of this thesis, will all have a descriptive and an explanatory part. In this paragraph the descriptive methods will be described.

Two programs will be used to obtain the descriptive results, namely SPSS Statistics 17.0 and Microsoft Excel 2007.

Table 3.12 shows the cross tabs which will be used in the descriptive analysis. The cross tabs will show the number of cases and the row percentages for each of the possible outcomes. The row percentages show the percentage of each outcome of the independent variables chosen for a particular destination choice (dependent variable). The chi-square statistic: Pearson Chi Square test will be used to distinguish the significant variables on a level of significance of 0.05. When the level of significance is below 0.05, the differences between the various outcomes of the independent variables in the cross tabs are significant. If the level of significance is above 0.05, the differences between the various outcomes of the independent variables in the cross tabs are not significant.

Table 3.12: Cross tabs: descriptive results

Cross tabs	
Dependent variable	Independent variable
Destination choice after study	city of study
Destination choice after study	region of living at age sixteen
Destination choice after study	sector of study
Destination choice after study	sex
sector of study	sex
Destination choice after study	age

3.6.2 Multinomial logistic regression analysis

The multinomial logistic regression analysis is used to examine the relationship between the dependent variable and a set of predictor variables. The analysis could be used by a dependent variable with more than two possible categorical outcome values. The model is called multinomial because, for each combination of the values of the independent variable, the counts of the dependent variable are assumed to have a multinomial distribution (Norusis, 2008).

In this thesis the dependent variable has four outcomes: stay, centre, return or else.

Therefore the multinomial regression analysis will be used in this research.

For each outcome category of the dependent variable a separate equation will be used to calculate the log odds. One specific outcome category should be used as the reference category. The dependent variable in this thesis contains four outcome categories; therefore three equations will be used. This will be done for all separate universities among study. The reference category of the dependent variable is *stay in the region of study* (table 3.13). This outcome category is chosen because of two reasons. The first reason is that the category *stay* is the only category which does not contain any movement. The other categories contain a movement to another region. Besides, the category *stay* is the largest category and in general the largest category is chosen to be the reference category. Also the independent variables include reference categories. An overview of the reference categories of the independent variables is given in table 3.13. In the multinomial regression analysis in SPSS Statistics 17.0, the last category of the independent variable is always used as the reference category.

Table 3.13: reference categories dependent and independent variables

reference category	
dependent variable	independent variables
stay in the region of study	Region of living place at age sixteen
	sex
	sector of study
	age group

For each group, a calculation has to be done of the log of the ratio of the probability of being in that group compared to being in the baseline group. The baseline category is *stay*, for the three different categories: centre, return and else. The three models show the natural log of the odds and are as follow:

$$\text{Ln} \frac{P(\textit{centre})}{P(\textit{stay})} = \beta_{c0} + \beta_{c1}X_1 + \beta_{c2}X_2 + \dots + \beta_{cp}X_p$$

stay = baseline category of the category centre

β_{c0} = the intercept

β_{c1} , β_{c2} and β_{cp} = logistic regression coefficients

X_1 , X_2 and X_p = independent variables

$$\text{Ln} \frac{P(\textit{return})}{P(\textit{stay})} = \beta_{r0} + \beta_{r1}X_1 + \beta_{r2}X_2 + \dots + \beta_{rp}X_p$$

β_{r0} = the intercept

β_{r1} , β_{r2} and β_{rp} = logistic regression coefficients

X_1 , X_2 and X_p = independent variables

$$\text{Ln} \frac{P(\textit{else})}{P(\textit{stay})} = \beta_{e0} + \beta_{e1}X_1 + \beta_{e2}X_2 + \dots + \beta_{ep}X_p$$

β_{e0} = the intercept

β_{e1} , β_{e2} and β_{ep} = logistic regression coefficients

X_1 , X_2 and X_p = independent variables

To interpret the results of the multinomial logistic regression analysis, the exponent of the natural log of the odds has to be taken to obtain the odds. The odds are important in measuring the relationship between the dependent variable and the independent variables. A relationship exists when the variable has a level of significance below 0.05.

4 Descriptive results

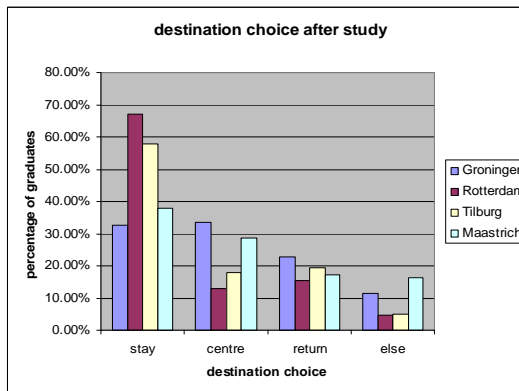
In this chapter the descriptive results will be presented. In the first paragraph the influence of the regional economic disparities on the migration behaviour of graduates will be described. Next the influence of the living place at age sixteen on the migration behaviour of graduates will be examined. In the third paragraph the influence of the different branches of science on the migration behaviour of graduates will be studied. And the last two paragraphs include the influence of the sex and age of the graduates on the migration behaviour. At the end of each paragraph a short conclusion will be given.

4.1 What is the influence of regional economic disparities on the migration behaviour of graduates?

In this paragraph the influence of the regional economic disparities on the migration behaviour of graduates will be researched. This will be done by the following cross table, which shows the destination choice after study by the city of study.

Table 4.1: Cross table: destination choice after study by city of study Figure 4.1: destination choice after study for the four universities

		destination choice after study					Total
		stay	centre	return	else		
RIP Gemeentecode gevolgde opleiding	Groningen	Count	647	664	452	224	1987
	% within RIP Gemeentecode gevolgde opleiding		32,6%	33,4%	22,7%	11,3%	100,0%
Rotterdam	Count	941	182	214	64	1401	
	% within RIP Gemeentecode gevolgde opleiding		67,2%	13,0%	15,3%	4,6%	100,0%
Tilburg	Count	996	306	335	87	1724	
	% within RIP Gemeentecode gevolgde opleiding		57,8%	17,7%	19,4%	5,0%	100,0%
Maastricht	Count	569	427	260	243	1499	
	% within RIP Gemeentecode gevolgde opleiding		38,0%	28,5%	17,3%	16,2%	100,0%
Total	Count	3153	1579	1261	618	6611	
	% within RIP Gemeentecode gevolgde opleiding		47,7%	23,9%	19,1%	9,3%	100,0%



In table 4.1 can be seen that most of the graduates stay after study in the region of study, namely 47.7 percent. Striking is that the University of Groningen, has a higher percentage of graduates that is moving to the core region, compared to the percentage that stays in the region of Groningen.

After the percentage of graduates that stay in the region of study, the highest percentage of graduates is moving to the centre provinces of the Netherlands, namely 23.9 percent. The highest percentage of graduates that move to the centre can be found for the University of Groningen. The lowest percentage of graduates that move to the centre region is found for the University of Rotterdam. This can be explained because the University of Rotterdam is situated in one of the centre provinces. Moving to the centre is for the University of Rotterdam defined as moving to the provinces Noord-Holland and Utrecht or to the cities Lelystad and Almere. Zuid-Holland is for this University the home province, so the people that stay after study in the province of Zuid-Holland are counted as stayers and are not counted as centre migrants.

Thereafter, the highest percentage of graduates returns after study to the region of origin, namely 19.1 percent. No big differences can be found among the four universities. The

University of Groningen has some higher percentage of graduates that returned to the living place at age sixteen. This can be explained because a lot of graduates of Friesland and Drenthe have studied at the University of Groningen, and when they move back to the province, they are counted as return migrants when the level of analysis is the province. However, it could be possible that they lived in the home region during their study.

The percentage of graduates that move somewhere else in or outside the Netherlands is the lowest, namely 9.3 percent. The Universities of Groningen and Maastricht show some higher percentage of graduates that moved elsewhere compared to the Universities of Rotterdam and Tilburg.

The Pearson Chi-Square test has a level of significance of 0.000. This means that, on a significance level of 0.01 and 0.05, the differences that can be found in table 4.1 are significant (table 4.2).

Table 4.2: Chi-Square Statistics: Cross table: destination choice after study by city of study

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6,379E2	9	,000
Likelihood Ratio	645,394	9	,000
Linear-by-Linear Association	55,928	1	,000
N of Valid Cases	6611		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 130,97.

Short conclusions:

- Most graduates stay in the region of study, except for the University of Groningen.
- Centre migrants are mostly found among the graduates of the University of Groningen.
- Centre migrants are the least found among the graduates of the University of Rotterdam.
- Return migrants are most often graduates of the University of Groningen.
- The highest percentage of graduates that are moving elsewhere is found among graduates of the Universities of Groningen and Maastricht.

4.2 What is the influence of the living place at age sixteen on the migration behaviour?

In this paragraph the influence of the living place at age sixteen on the destination choice after study will be researched. This will be done by the following cross table, which shows the region of living at age sixteen by the destination choice after study of the four universities together. Also some figures will be presented about the influence of the living place at age sixteen, for each university separately.

Table 4.3: Cross table: region of living at age sixteen by destination choice after study

Landsdeel woonlocatie op leeftijd 16 * destination choice after study Crosstabulation

			destination choice after study				
			stay	centre	return	else	Total
Landsdeel woonlocatie op leeftijd 16	North	Count	475	360	180	140	1155
		% within Landsdeel woonlocatie op leeftijd 16	41,1%	31,2%	15,6%	12,1%	100,0%
	East	Count	251	397	263	119	1030
		% within Landsdeel woonlocatie op leeftijd 16	24,4%	38,5%	25,5%	11,6%	100,0%
	West	Count	970	316	488	139	1913
		% within Landsdeel woonlocatie op leeftijd 16	50,7%	16,5%	25,5%	7,3%	100,0%
	South	Count	1457	507	331	219	2514
		% within Landsdeel woonlocatie op leeftijd 16	58,0%	20,2%	13,2%	8,7%	100,0%
Total	Count		3153	1580	1262	617	6612
		% within Landsdeel woonlocatie op leeftijd 16	47,7%	23,9%	19,1%	9,3%	100,0%

Figure 4.2: destination choice after study by living place at age sixteen

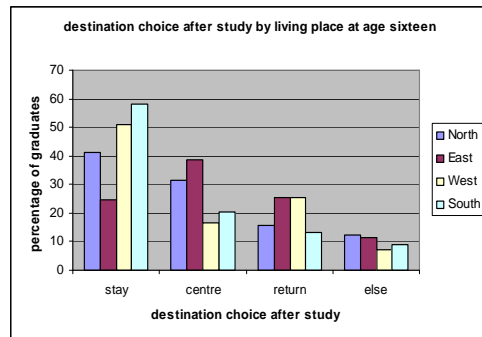


Figure 4.3: destination choice after study by living place at age sixteen (Groningen)

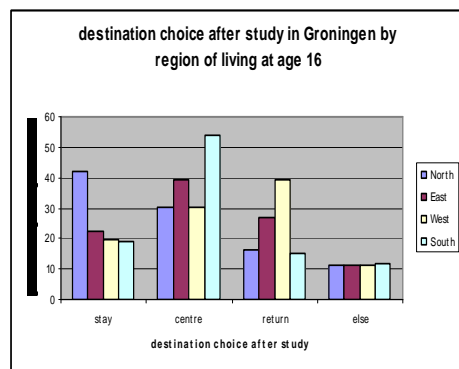


Figure 4.4: destination choice after study by living place at age sixteen (Rotterdam)

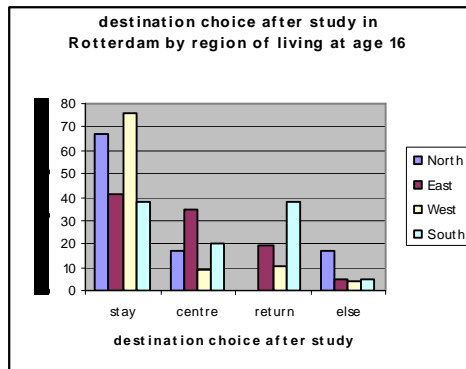


Figure 4.5: destination choice after study by living place at age sixteen (Tilburg)

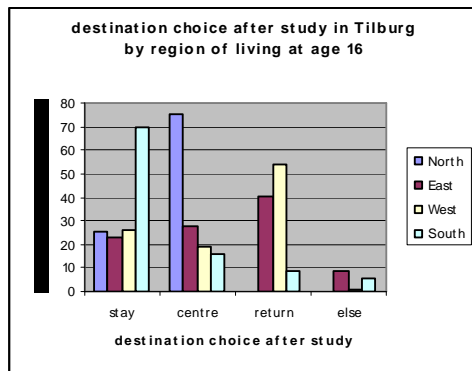
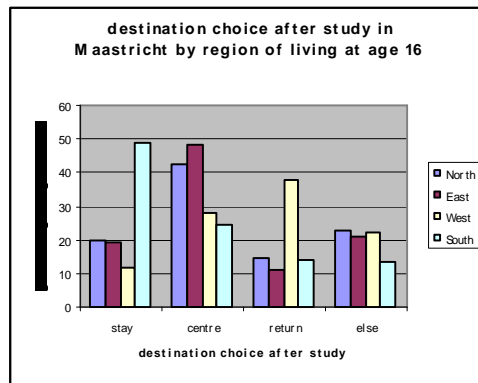


Figure 4.6: destination choice after study by living place at age sixteen (Maastricht)



In table 4.3 can be seen that graduates, who originated from the eastern part of the Netherlands, have by far the lowest percentage of stayers. Only 24.4 percent of the graduates who lived at age sixteen in the eastern part of the Netherlands stay in the region of study. The other parts of the Netherlands show much higher percentage of graduates that stay in the region of study after graduation. This can be declared because in this research is no university included which is located in the eastern part of the Netherlands. For each of the universities among study, the highest percentage of stayers can be found, among the graduates that lived at age sixteen also in the region of study.

The percentage of graduates that moved to the core region after study is the highest among the graduates of the eastern part of the Netherlands, 38.5 percent. However, the University of Groningen shows the highest percentage of graduates which originated from the southern part of the Netherlands that moved to the core region and the University of Tilburg shows a higher percentage of graduates which originated from the Northern part of the Netherlands that moved to the core region. Nevertheless the number of graduates at the University of Groningen that originated from the southern part of the Netherlands and the number of graduates at the University of Tilburg that originated from the northern part of the Netherlands is very small. For the other universities, the graduates that originated from the eastern part of the Netherlands are moving more often to the core region than graduates that originated from the other regions.

Returnees are mostly found among the graduates of the eastern part of the Netherlands. 25.5 percent of the graduates that returned, originated from the eastern part of the Netherlands and also 25.5 percent of the returnees originated from the western part of the Netherlands. However, differences could be found between the four universities separately. The University of Rotterdam shows the highest percentage of returnees among the graduates who lived at age sixteen in the southern part of the Netherlands (figure 4.4). The other universities show the highest percentage of returnees among the graduates of the western part of the Netherlands. This high percentage of graduates that originated from the western part of the country and returned after graduation can be explained by the core region being situated in the western part of the Netherlands.

Therefore it could be possible that graduates who originated from the western part of the Netherlands are returning more often.

The destination choice *else*, shows no big differences between the regions of living at age sixteen.

The Pearson Chi-Square test has a level of significance of 0.000. This means that, on a significance level of 0.01 and 0.05, the differences that can be found in table 4.3 are significant.

Table 4.4: Chi-Square statistics: cross tab region of living at age sixteen by destination choice after study

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1,469E2	9	,000
Likelihood Ratio	144,062	9	,000
Linear-by-Linear Association	51,761	1	,000
N of Valid Cases	1988		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5,89.

Short conclusions:

- Graduates that lived at age sixteen in the region of graduation, stay more often in the region of study after graduation.
- Graduates that lived at age sixteen in the eastern part of the Netherlands, stay less often than the graduates of the other regions. An explanation for this could be that there is no university in this research that is situated in the eastern part of the Netherlands.
- Graduates that lived at age sixteen in the eastern part of the Netherlands are moving more often to the core region. For the University of Groningen the graduates from the southern part of the Netherlands are moving more often to the core region and for the University of Tilburg the graduates from the northern part of the Netherlands are moving more often to the core region. However the number of graduates at the University of Groningen that originated from the southern part of the Netherlands and the number of graduates at the University of Tilburg that originated from the northern part of the Netherlands are very small.
- Graduates that return to the living place at age sixteen are mostly found among the graduates that originated from the eastern and western part of the Netherlands.
- For the four universities, the destination choice *else* shows no big differences between the regions of living at age sixteen.

4.3 In which way could the different branches of science influence the migration behaviour of graduates?

In this paragraph the influence of the different branches of science on the migration behaviour of graduates will be researched. This will be done by the following cross table, which shows the destination choice after study by the sector of study. Also some figures will be represented, about the influence of the different branches of science on the migration behaviour of graduates, for each university separately.

Table 4.5: Cross tab destination choice after study by sector of study

sector of study * destination choice after study Crosstabulation

			destination choice after study				
			stay	centre	return	else	Total
sector of study	Humanities	Count	284	214	122	68	688
		% within sector of study	41,3%	31,1%	17,7%	9,9%	100,0%
	Science	Count	112	46	42	27	227
		% within sector of study	49,3%	20,3%	18,5%	11,9%	100,0%
	Social Science	Count	831	216	269	98	1414
		% within sector of study	58,8%	15,3%	19,0%	6,9%	100,0%
	Medical Science	Count	374	210	170	139	893
		% within sector of study	41,9%	23,5%	19,0%	15,6%	100,0%
	Economics	Count	1100	680	502	210	2492
		% within sector of study	44,1%	27,3%	20,1%	8,4%	100,0%
	Law	Count	453	213	155	75	896
		% within sector of study	50,6%	23,8%	17,3%	8,4%	100,0%
Total	Count		3154	1579	1260	617	6610
	% within sector of study		47,7%	23,9%	19,1%	9,3%	100,0%

Figure 4.7: Destination choice after study by sector

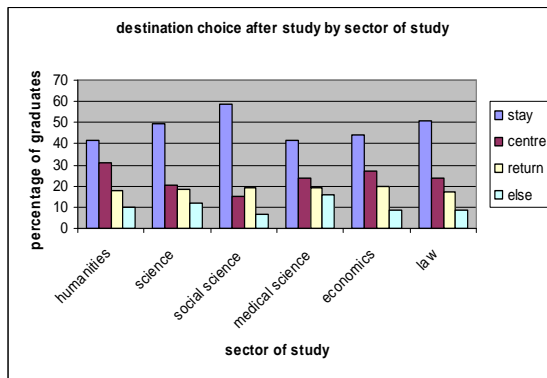


Figure 4.8: Destination choice after study in Groningen by sector

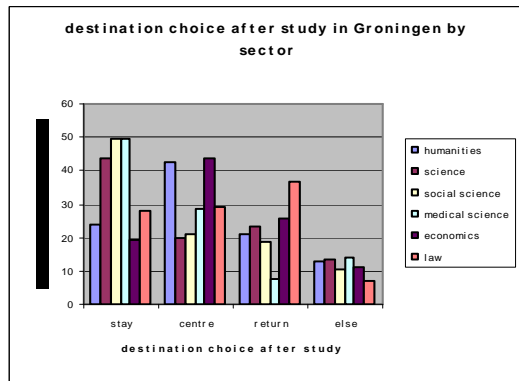


Figure 4.9: Destination choice after study in Rotterdam by sector

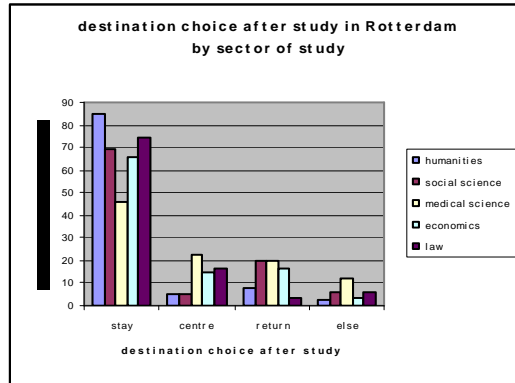


Figure 4.10: Destination choice after study in Tilburg by sector

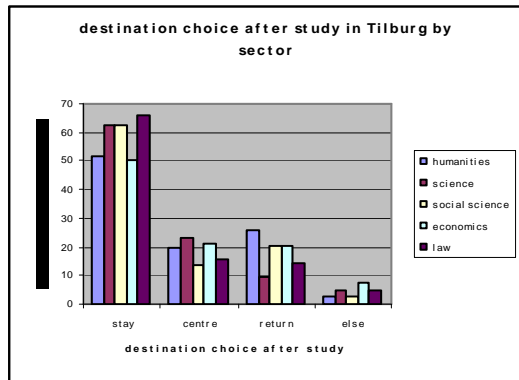


Figure 4.11: Destination choice after study in Maastricht by sector

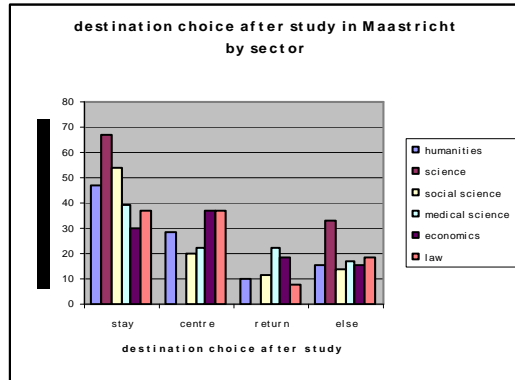


Table 4.5 represents the destination choice after study divided by the six different sectors. The table shows that the highest percentages of graduates who stay after study can be found among the sectors of Social Science (58.8 percent), Law (50.6 percent) and Science (49.3 percent). The lowest percentage of graduates that stay after study in the region is among the sectors of Humanities (41.3 percent) and Medical Science (41.9 percent). Figures 4.8 to 4.11 represent the destination choice after study divided by the different sectors, for the four universities separately. These figures show that especially in the cities of Groningen, Tilburg and Maastricht the sectors Social Science and Science have high percentages of graduates that stay after study. For the city of Rotterdam the sector Social Science has the least graduates that stay after study in the region. For the city of Rotterdam the highest percentage of stayers can be found among the graduates of the sector Humanities. The three other universities show a much lower percentage of graduates of the sector Humanities that stay after study in the region. It is also striking that the cities of Groningen and Maastricht have very low percentages of Economics' graduates who stay after graduation in the region. The percentages of graduates of the sector Economics that stay after study in the region is much higher for the Universities of Rotterdam and Tilburg. An explanation for this could be that the Universities of Groningen and Maastricht are situated in the peripheral part of the country. The

University of Tilburg is much closer to the core region and the University of Rotterdam is located in the core region.

Table 4.5 shows also that the graduates of the sector Humanities move most often to the core region (31.1 percent). Also the sector of Economics has a high percentage of graduates that migrate to the core region (27.3 percent). The lowest percentage of graduates that move to the core region is for the graduates of the sector Social Science (15.3 percent). Figures 4.8 to 4.11 show that especially for the Universities of Groningen and Maastricht, a high percentage of graduates of the sector Economics is moving to the core region. For the Universities of Rotterdam and Tilburg this percentage is much lower. Besides, the Universities of Groningen and Maastricht show very high percentages of graduates that moved to the core region and graduated from the Humanities and Law. Graduates that return after study can be mostly found among the sectors Economics (20.1 percent), Medical Science (19.0 percent) and Social Science (19.0 percent). However, the percentages are very close to each other. In figures 4.8 to 4.11 it can be seen that the four universities have differences in the sectors that return. The University of Groningen has the highest percentage of graduates of the sector Law that return. The University of Rotterdam has the highest percentage of graduates that return among the sector Medical Science and Social Science. The University of Tilburg has the highest percentage of returnees among the sector Humanities and the sector Medical Science is the sector which has the most returnees at the University of Maastricht.

The last option of the destination choice after study is moving elsewhere in the Netherlands or outside the Netherlands. The highest percentage of graduates that moved elsewhere can be found among the sector Medical Science (15.6 percent). Also the sector Science shows a relative high percentage of graduates that moved elsewhere (11.9 percent). Also this destination choice differs a lot between the four universities. For all the four universities the percentage of graduates that moved elsewhere in the Netherlands or outside the Netherlands is very low for all sectors. The singular outlier is among the graduates of the sector Science at the University of Maastricht. 33.3 percent of these graduates are moving elsewhere in the Netherlands or outside the Netherlands. However, the number of graduates in this sector is very small, only 9 graduates studied in the sector Science at the University of Maastricht.

The Pearson Chi-Square test has a level of significance of 0.000. This means that, on a significance level of 0.01 and 0.05, the differences that can be found in table 4.5 are significant.

Table 4.6: Chi-Square statistics: Cross tab destination choice after study by sector of study

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1,836E2	15	,000
Likelihood Ratio	181,115	15	,000
Linear-by-Linear Association	,092	1	,762
N of Valid Cases	6610		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21,19.

Short conclusions:

- Graduates that stay after graduation are most often found in the sectors: Social Science, Science and Law.
- The lowest percentage of graduates that stay after graduation is among the sectors Humanities and Medical Science.
- Big differences between the University of Rotterdam and the other universities in the different sectors of study that stay after study in the region of study.
- Percentage of graduates of the sector Economics that stay after study is much lower in the peripheral Universities of Groningen and Maastricht.
- Graduates that move to the core region are most often found in the sectors Humanities and Economics, except for the University of Rotterdam.
- The lowest percentage of graduates that move to the core region is for the graduates of the sector Social Science, except for the University of Rotterdam.
- The Universities of Groningen and Maastricht have high percentages of graduates of the sector Economics, Humanities and Law that moved to the core region.
- Returnees are mostly found among the sectors Economics, Social Science and Medical Science.
- The sectors Medical Science and Science are mostly found among the graduates that moved elsewhere in the Netherlands or outside the Netherlands.

4.4 In which way could gender influence the migration behaviour of graduates?

In this paragraph the influence of the sex of graduates on the migration behaviour of graduates will be researched. This will be done by the following cross table, which shows the destination choice after study by sex for all universities together and also some figures, of each university separately, will be represented.

Table 4.7: Cross table destination choice after study by sex

			destination choice after study				Total
			stay	centre	return	else	
Gender: Female (0) Male (1)	Female	Count	1749	838	697	333	3617
		% within Gender: Female (0) Male (1)	48,4%	23,2%	19,3%	9,2%	100,0%
	Male	Count	1402	738	555	284	2979
		% within Gender: Female (0) Male (1)	47,1%	24,8%	18,6%	9,5%	100,0%
	Total	Count	3151	1576	1252	617	6596
		% within Gender: Female (0) Male (1)	47,8%	23,9%	19,0%	9,4%	100,0%

Table 4.8: Chi-Square Statistics: Cross table destination choice after study by sex

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2,871 ^a	3	,412
Likelihood Ratio	2,868	3	,412
Linear-by-Linear Association	,270	1	,603
N of Valid Cases	6596		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 278,66.

Table 4.7 represents the destination choice after study divided by sex. In this table it can be seen that there are hardly any differences between males and females, in the destination choice after study. Table 4.8 represents the Chi-Square Statistics of the cross table destination choice after study divided by sex. The Pearson Chi-Square of 0.412 is larger than the allowed significance level of 0.05. This means that there are no significant differences in the destination choice after study between males and females.

On the contrary, individual universities may show differences. The Pearson Chi-Square statistics of the universities Tilburg and Maastricht state that there are differences between males and females in the destination choice after study, when the significance level of 0.05 is used. Only the University of Tilburg shows even a significant difference on the level of 0.01. The Pearson Chi-Square statistics of the Universities of Groningen and Rotterdam state that there are no differences between males and females in the destination choice after study.

Figure 4.12: Destination choice after study in Tilburg by sex

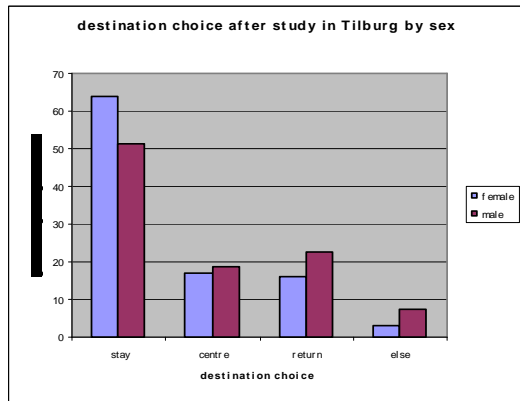


Figure 4.13: Sector of study by sex: University of Tilburg

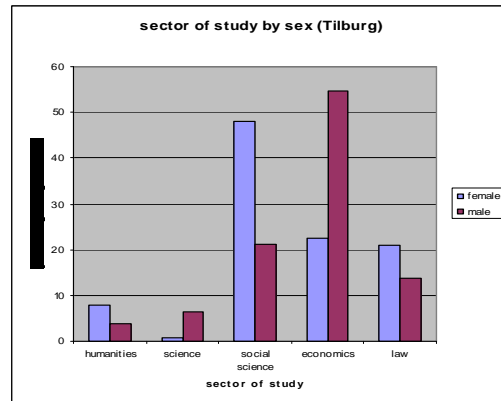


Figure 4.12 shows the destination choice after study in Tilburg divided by sex. In this figure it can be seen that females do more often stay after study in Tilburg and males move more often to the core region, return more often to the living place at age sixteen and also move more often somewhere else in the Netherlands or outside the Netherlands. Figure 4.13 shows the five different sectors of study divided by males and females for the University of Tilburg. In this figure it can be seen that females are overrepresented in the sectors Humanities, Social Science and Law. Males are overrepresented in the sectors Science and Economics. Also for the University of Tilburg the biggest difference between males and females are in the sectors Social Science and Economics. Paragraph 4.3 concludes that also for the University of Tilburg a high percentage of graduates in the sector of Social Science stays in the region of Tilburg after study and a very low percentage of the sector Economics stays in the region of Tilburg. It could be possible that this difference is caused by the sector of study but it could also be possible that this difference is caused by sex. This will be researched in the next chapter.

Figure 4.14: Destination choice after study in Maastricht by sex

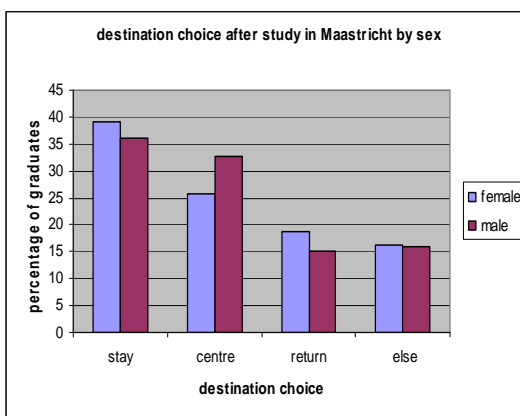


Figure 4.15: Sector of study by sex: University of Maastricht

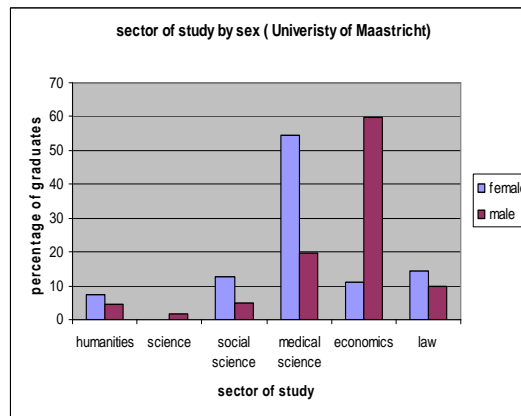


Figure 4.14 represents the destination choice after study in Maastricht divided by sex. In this figure it can be seen that females more often stay in the region of Maastricht, return to the living place at age sixteen and are moving somewhat more somewhere else in the

Netherlands or outside the Netherlands. Males are moving more often to the core region after study.

Figure 4.15 shows the six different sectors of study divided by sex for the University of Maastricht. In this figure can be seen that females are overrepresented in the sectors of Humanities, Social Science, Medical Science and Law. Males are overrepresented in the sectors Science and Economics. For the University of Maastricht the biggest difference between males and females can be found in the Medical Science and Economics sectors. In paragraph 4.3 is concluded that graduates of the sector Medical Science return more often to the living place at age sixteen than the other sectors. Also the female graduates return more often to the living place at age sixteen. Besides, paragraph 4.3 concluded that a high percentage of the graduates of the Economics sector moved to the core region after study. Males do also more often move to the core region after study. In the next chapter will be researched whether this difference can be explained by the sex of the graduate or by the sector of study.

Short conclusions:

- For all universities together there is no difference in the destination choice after study between males and females.
- The Universities Tilburg and Maastricht show differences in the destination choice after study between males and females.
- University of Tilburg: females more often stay, males more often move to the centre, return or moving somewhere else.
- University of Maastricht: females more often stay, return or moving elsewhere. Males are moving more to the centre.
- It is unclear whether the differences can be explained by sex or by sector of study. This will be researched in the next chapter of explanatory results.

4.5 In which way could age influence the migration behaviour of graduates?

In this paragraph the influence of the age of graduates on the migration behaviour of graduates will be researched. This will be done by the following cross table, which represents the destination choice after study by age for all universities together. Besides, some figures for each university separately will be presented.

Table 4.9: Cross table destination choice after study by age

			destination choice after study				Total
			stay	centre	return	else	
age	young graduates	Count	691	227	218	124	1260
		% within age	54,8%	18,0%	17,3%	9,8%	100,0%
	average graduates	Count	1822	1057	813	379	4071
		% within age	44,8%	26,0%	20,0%	9,3%	100,0%
	old graduates	Count	640	294	230	114	1278
		% within age	50,1%	23,0%	18,0%	8,9%	100,0%
Total	Count		3153	1578	1261	617	6609
		% within age	47,7%	23,9%	19,1%	9,3%	100,0%

Figure 4.16: destination choice after study by age

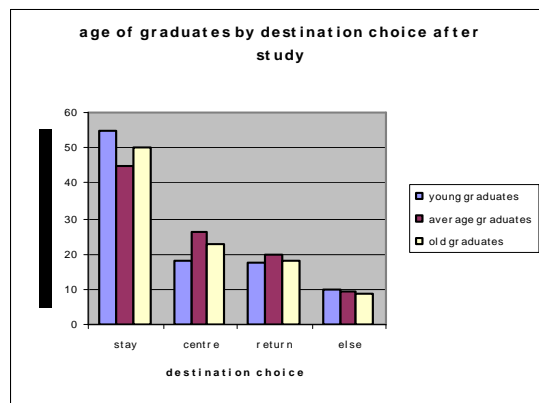


Table 4.9 and figure 4.16 show the destination choice after study divided by the age of the graduates. In this table and figure it can be seen that the youngest graduates stay most often in the region of study. The average graduates stay the least in the region of study. On the other hand, average graduates move more often to the core region and young graduates move the least to the core region. Returnees are mostly found among the average graduates. Graduates that moved elsewhere in the Netherlands or outside the Netherlands do not much differ between the different age groups.

The Pearson Chi-Square test, in table 4.10 has a level of significance of 0.000. This means that, on a significance level of 0.01 and 0.05, the differences that can be found in table 4.10 are significant.

Figure 4.17: destination choice after study in Groningen by age

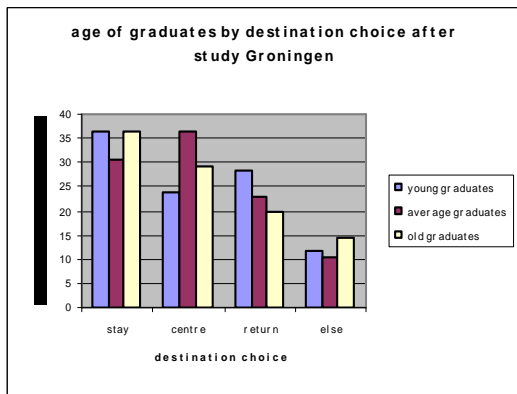


Figure 4.18: Age by sex: University of Groningen

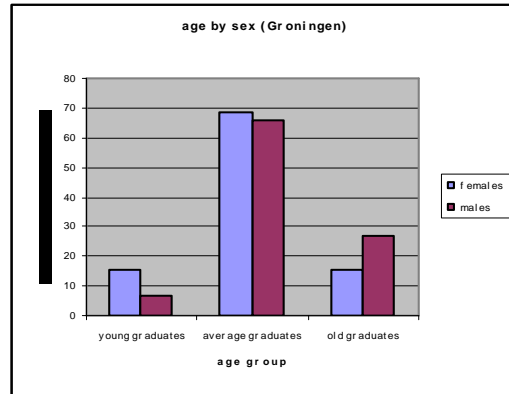


Figure 4.19: destination choice after study in Rotterdam by age

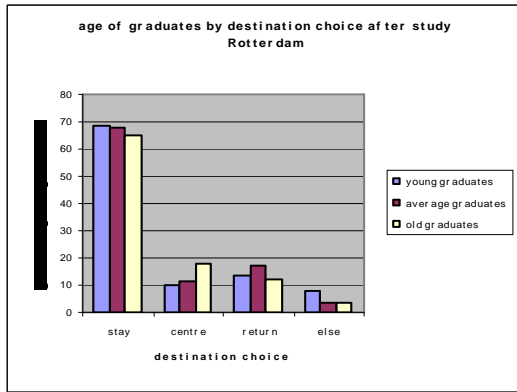


Figure 4.20: Age by sex: University of Rotterdam

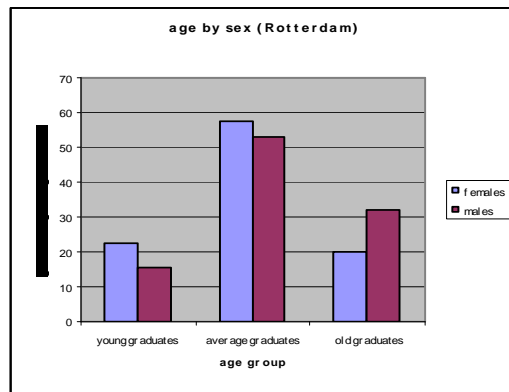


Figure 4.21: destination choice after study in Tilburg by age

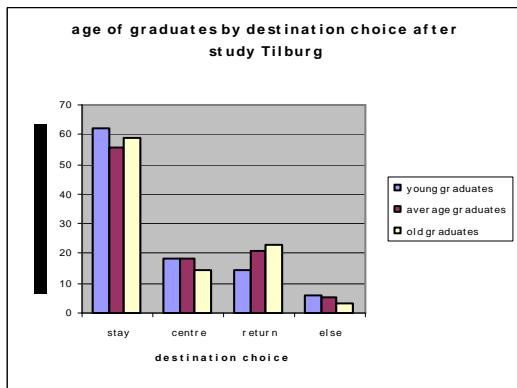


Figure 4.22: Age by sex: University of Tilburg

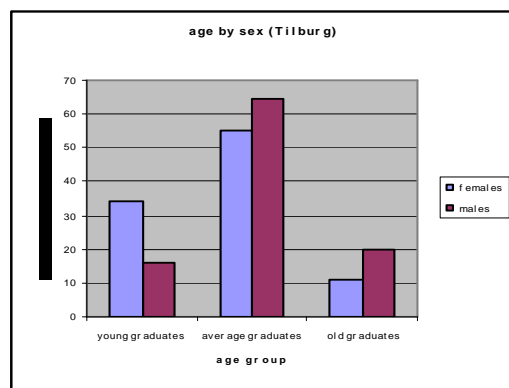


Figure 4.23: destination choice after study in Maastricht by age

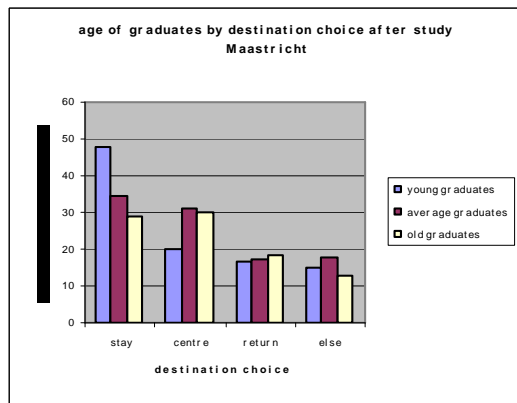
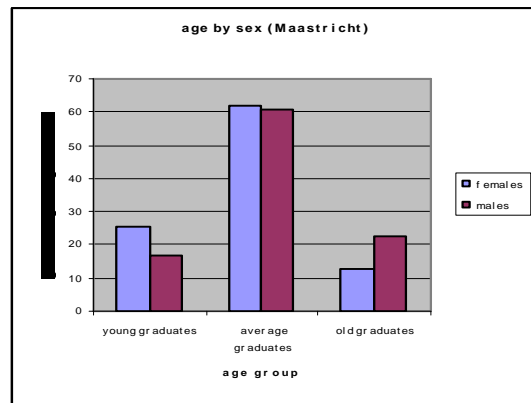


Figure 4.24: Age by sex: University of Maastricht



Figures 4.17, 4.19, 4.21 and 4.23 represent the destination choice after study for the four universities separately. The Universities of Rotterdam, Tilburg and Maastricht show all that the graduates that stay after graduation are mostly found among the youngest age group. The University of Groningen shows a somewhat higher percentage of old age graduates that stay after study in the region of Groningen. However, the difference with the group young graduates is very small. Besides, the differences between the age groups are for the University of Rotterdam less visible. For the Universities of Groningen and Tilburg, the lowest percentage of graduates that stay in the study region, is among the average age groups. For the Universities of Rotterdam and Maastricht, the lowest percentage of graduates that stay in the region of study, is among the graduates of the oldest age group.

There are differences between the four universities and the different age groups that move to the core region. For the Universities of Groningen, Maastricht and Tilburg the average age group moved most often to the core region. On the other hand, the highest percentage of graduates that move to the core region is, for the University of Rotterdam, the oldest age group.

Big differences between the universities could also be found among the age groups of the graduates that returned to the living place at age sixteen. For the University of Groningen, returnees can be mostly found among the young graduates. The University of Rotterdam shows the highest percentage of returnees among the average age group. Meanwhile, the other universities show higher percentages of the average age graduates that move to the core region.

The age pattern of the graduates that moved somewhere else is again very different between the four universities. Striking is that the university of Groningen has the highest percentage of old graduates that moved elsewhere and that the other universities show the lowest percentage of old graduates that moved somewhere else in or outside the Netherlands. For the University of Maastricht, the average age group is the biggest group that moved somewhere else in the Netherlands or outside the Netherlands. For the University of Rotterdam the youngest age group has the highest percentage of graduates that moved somewhere else. For the University of Tilburg the differences between the percentages of the different age groups are very small.

Figures 4.18, 4.20, 4.22 and 4.24 show the different age groups by the sex of the graduates. Remarkable is that for all universities, the youngest age group are overrepresented by females and the oldest age group is overrepresented by males. In paragraph 4.4 is concluded that for the Universities of Tilburg and Maastricht females more often stay in the region of study. In this paragraph is concluded that young graduates most often stay in the region of study. The young graduates are also overrepresented by female graduates. Therefore it is difficult to conclude which variable, sex or age, is more important in explaining the destination choice after study. This will be researched in the next chapter: explanatory results.

The Pearson Chi-Square test of Figures 4.17 to 4.20 states, that all the universities show significant differences on the level of 0.05. Only the University of Tilburg shows no significant differences on the level of 0.01, the other universities show also significant differences on the level of 0.01.

Table 4.10: Chi-Square statistics: Cross table destination choice after study by age

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	53,496 ^a	6	,000
Likelihood Ratio	54,556	6	,000
Linear-by-Linear Association	,766	1	,381
N of Valid Cases	6609		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 117,63.

Short conclusions:

- Youngest graduates stay most often in the region of study. The average graduates stay the least in the region of study. Only the University of Groningen shows more old age graduates that stay after study in the region.
- The average graduates move most often to the core region. Only for the University of Rotterdam, the old graduates move more often to the core region.
- The youngest graduates move the least to the core region, except for the University of Tilburg.
- In total, returnees are mostly found among the old graduates. There are differences between the four universities.
- No big differences could be found, between the age groups, for graduates that moved elsewhere.
- It is unclear whether the differences can be explained by sex or by age. This will be researched in the next chapter: explanatory results.

5 Explanatory results

In this chapter the explanatory results will be presented. The variables separately will be tested and also an interaction term is included. Each paragraph includes a description of the multinomial logistic regression analysis and an explanation of the results by the theory. First some general remarks will be given. Then paragraph 5.1 will start with the model of the destination choice after study in Groningen. In paragraph 5.2 the model of the destination choice after study in Rotterdam will be presented and explained. In paragraph 5.3 the model of the destination choice after study in Tilburg will be expounded. Paragraph 5.4 will present the model of the destination choice after study in Maastricht. The last paragraph will include a comparison of the four regions.

Tables 5.1 to 5.4 present the multinomial logistic regression analysis of the dependent variables destination choice after study in Groningen, Rotterdam, Tilburg and Maastricht. The independent variables that are used to explain the dependent variable are: sex, region of living at age sixteen, sector of study and age of the graduates. Also the interaction term, sex by age and sex by sector of study, are included in the model. However, the likelihood ratio test showed that including the interaction term *sex by sector of study* in the model is only a significant addition to the model of the University of Groningen. Therefore, the interaction is removed from the model for the Universities of Rotterdam, Maastricht and Tilburg.

The reference category in the analysis is stay; this means that the other categories of the dependent variable will be compared to the category staying in the region of study. Also each independent variable has a reference category. The variable sex has the reference category males, the variable region of living at age sixteen has the reference category south, the variable sector of study has the reference category Law and the variable age group, has the reference category old age group. It is important to mention that some variables in the tables will give very strange numbers. This is caused by the limited number of cases that these variables contain. Therefore, nothing can be concluded about these variables.

5.1: University of Groningen

5.1.1: Multinomial logistic regression analysis

Table 5.1 presents the multinomial logistic regression analysis of the dependent variable destination choice after study in Groningen.

The first comparison is made between staying in the region of study and moving to the core region. The independent variables: Regions north and west and the sector of study Medical Science show all a difference on the significance level of 0.05.

From the table can be concluded that the odds of moving to the core region over staying in the region of Groningen, are 4.651 times larger for graduates originated from the southern part of the country than for graduates originated from the northern part of the country. Besides, these odds are 2.660 times larger for graduates originated from the southern part of the country than for graduates originated from the western part of the country. This means that graduates who originated from the southern part of the country

are more likely to move to the core region, over staying in the region of Groningen, than graduates that originated from the northern or western part of the country. Besides, the sector of study Medical Science is important in explaining the differences between the graduates that stay in the region of Groningen and graduates that move to the core region after study. The odds of moving to the core region over staying in the region of study are 0.078 for graduates of the sector Medical Science compared to graduates of the Law sector. This means that graduates of the Law sector are more likely to move to the core region, over staying in the region of Groningen, than graduates of the sector Medical Science.

The odds of moving to the core region over staying in the region of Groningen are 0.589 for young male graduates compared to 0.794 for young female graduates, 1.392 for average male graduates compared to 1.287 for average female graduates and 1.000 for old male graduates compared to 0.873 for old female graduates. This means that young female graduates are more likely to move to the core region, over staying in the region of Groningen, compared to young male graduates. However, average male graduates are more likely to move to the core region, over staying in the region of Groningen, compared to average female graduates. Also old male graduates are more likely to move to the core region, over staying in the region of Groningen, compared to old female graduates. Unfortunately, the interaction term does not give a significant difference on the level of 0.05.

The odds of moving to the core region over staying in the region of Groningen are 1.665 for male graduates of the sector Humanities compared to 1.430 for female graduates of the sector Humanities, 0.531 for male graduates of the sector Science compared to 0.226 for female graduates of the sector Science, 0.828 for male graduates of the sector Social Science compared to 0.310 for female graduates of the sector Social Science, 0.078 for male graduates of the sector Medical Science compared to 0.549 for female graduates of the sector Medical Science, 1.833 for male graduates of the sector Economics compared to 2.898 for female graduates of the sector Economics and 1.000 for male graduates of the sector Law compared to 0.873 for female graduates. This means that male graduates of the sectors Humanities, Science, Social Science and Law are more likely to move to the core region, over staying in the region of Groningen, compared to female graduates of these sectors. Female graduates of the sectors Medical Science and Economics are more likely to move to the core region, over staying in the region of Groningen, compared to male graduates of these sectors. However, only the interaction term sex by Medical Science is significant on the level of 0.05.

The second category of the dependent variable is the category return. The independent variables: females, Science and Medical Science, the young and average age group are significant on the level of 0.05. The table shows that the odds of returning to the living place at age sixteen over staying in the region of Groningen are 6.138 times as large for female graduates compared to male graduates. This means that female graduates are more likely to return to the living place at age sixteen, over staying in the region of Groningen, compared with male graduates. The odds of returning to the living place at age sixteen over staying in the region of Groningen are 3.096 times as large for graduates of the sector Law compared to graduates of the sector Science and 4.444 times as large for

graduates of the sector Law compared to graduates of the sector Medical Science. This indicates that graduates of the sector Law are more likely to return to the living place at age sixteen, over staying in the region of Groningen, than graduates of the sectors Science and Medical Science. The odds of returning to the living place at age sixteen over staying in the region of Groningen are 5.718 times as large for graduates of the young age group and 3.224 times as large for graduates of the average age group, compared to graduates of the old age group. This means that graduates of the young and average age group are more likely to return to the living place at age sixteen, over staying in the region of Groningen, compared to graduates of the old age group.

The odds of returning to the living place at age sixteen, over staying in the region of Groningen, are 5.718 for young male graduates compared to 4.141 for young female graduates. The odds of returning to the living place at age sixteen, over staying in the region of Groningen, are 3.224 for average male graduates compared to 3.958 for average female graduates. The odds of returning to the living place at age sixteen, over staying in the region of Groningen, are 1.000 for old male graduates compared to 6.138 for old female graduates. This means that young male graduates are more likely to return to the living place at age sixteen, over staying in the region of Groningen, compared to young female graduates. The average and old female graduates are more likely to return to the living place at ages sixteen, over staying in the region of Groningen, than average and old male graduates. The interaction terms are all significant on a level of 0.05. Therefore it can be concluded that the old female graduates are most likely and the old male graduates are least likely to return to the living place at age sixteen, over staying in the region of Groningen.

The odds of returning to the living place at age sixteen, over staying in the region of Groningen are 0.595 for male graduates of the sector Humanities compared to 3.407 for female graduates of the sector Humanities, 0.323 for male graduates of the sector Science compared to 3.349 for female graduates of the sector Science, 0.931 for male graduates of the sector Social Science compared to 1.417 for female graduates of the sector Social Science, 0.225 for male graduates of the sector Medical Science compared to 0.412 for female graduates of the sector Social Science, 1.087 for male graduates of the sector Economics compared to 5.738 for female graduates of the sector Economics and 1.000 for male graduates of the sector Law compared to 6.138 for female graduates of the sector Law. This means that all female graduates of all sectors are more likely to move to the core region compared to male graduates. However, only the interaction term sex by Social Science shows a significant difference on the level of 0.05.

The last category of the dependent variable is the category else. The independent variable: young age group is significant on the level of 0.05. The table shows that the odds of moving elsewhere over staying in the region of Groningen is 2.880 times as large for graduates of the young age group compared to graduates of the old age group. This means that graduates of young age group are more likely to move elsewhere, over staying in the region of Groningen, than graduates of the old age group.

The odds of moving elsewhere in the Netherlands or outside the Netherlands are 2.880 for male graduates of the young age group compared to 1.399 for female graduates of the

young age group, 1.392 for male graduates of the average age group compared to 1.287 for female graduates of the average age group, 1.000 for male graduates of the old age group, compared to 0.873 for female graduates of old age group. This means that male graduates of all age groups are more likely to move elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Groningen, compared to female graduates of the same age group. However, sex by age group young is the only interaction term which is significant on the level of 0.05.

The odds of moving elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Groningen are 3.429 for male graduates of the sector Humanities compared to 5.225 for female graduates of the sector Humanities, 2.571 for male graduates of the sector Science compared to 2.435 for female graduates of sector Science, 1.668 for male graduates of the sector Social Science compared to 2.370 for female graduates of the sector Social Science, 1.646 for male graduates of the sector Medical Science compared to 2.718 for female graduates of the sector Medical Science, 3.104 for male graduates of the sector Economics, compared to 8.627 for female graduates of the sector Economics and 1.000 for male graduates of the sector Law compared to 3.116 for female graduates of the sector Law. This means that males of the sector Science are more likely to move elsewhere than females of the sector Science. For all other sectors, females are more likely to move elsewhere in the Netherlands or outside the Netherlands, than male graduates.

Table 5.1: Multinomial logistic regression analysis: Destination choice after study in Groningen

Destination choice after study in Groningen		B	Std. Error	Sig.	Exp(B)	
centre	intercept	1,085	0,521	0,037		
	sex: female	-0,136	0,466	0,77	0,873	
	sex: male	0b				
	region age 16: north	-1,539	0,400	0,000	0,215	
	region age 16: east	-0,591	0,407	0,147	0,554	
	region age 16: west	-0,977	0,425	0,022	0,376	
	region age 16: south	0b				
	study sector: Humanities	0,510	0,415	0,219	1,665	
	study sector: Science	-0,633	0,431	0,142	0,531	
	study sector: Social Science	-0,188	0,442	0,670	0,828	
	study sector: Medical Science	-2,551	0,758	0,001	0,078	
	study sector: Economics	0,606	0,365	0,097	1833,000	
	study sector: Law	0b				
	age group: young	-0,529	0,483	0,274	0,589	
	age group: average	0,331	0,208	0,112	1,392	
	age group: old	0b				
	females*age group: young	0,435	0,565	0,441	1,545	
	females*age group: average	0,058	0,314	0,854	1,059	
	females*age group: old	0b				
	males*age group: young	0b				
	males*age group: average	0b				
	males*age group:old	0b				
	females*study sector: Humanities	-0,016	0,491	0,975	0,984	
	females*study sector: Science	-0,720	0,635	0,256	0,487	
	females*study sector: Social Science	-0,846	-0,508	0,096	0,429	
	females*study sector: Medical Science	2,088	0,812	0,01	8,067	
	females*study sector: Economics	0,594	0,468	0,204	1,811	
	females*study sector: Law	0b				
	males*study sector: Humanities	0b				
	males*study sector: Science	0b				
	males*study sector: Social Science	0b				
	males*study sector: Medical Science	0b				
	males*study sector:Economics	0b				
	males*study sector: Law	0b				
	return	intercept	-0,759	0,631	0,229	
		sex: female	1,814	0,491	0,000	6,138
		sex: male	0b			
region age 16: north		-0,821	0,509	0,107	0,440	
region age 16: east		0,335	0,513	0,515	1,397	
region age 16: west		0,781	0,525	0,137	2,184	
region age 16: south		0b				
study sector: Humanities		-0,519	0,483	0,283	0,595	
study sector: Science		-1,130	0,505	0,025	0,323	
study sector: Social Science		-0,071	0,471	0,880	0,931	
study sector: Medical Science		-1,493	0,625	0,017	0,225	
study sector: Economics		0,084	0,384	0,827	1,087	
study sector: Law		0b				
age group: young		1,744	0,459	0,000	5,718	
age group: average		1,170	0,286	0,000	3,224	
age group: old		0b				
females*age group:young		-2,138	0,538	0,000	0,118	
females*age group: average		-1,609	0,369	0,000	0,200	
females*age group: old		0b				
males*age group: young		0b				
males*age group: average		0b				
males*age group:old		0b				
females*study sector: Humanities		-0,070	0,555	0,900	0,933	
females*study sector: Science		0,524	0,625	0,402	1,689	
females*study sector: Social Science		-1,396	0,531	0,009	0,248	
females*study sector: Economics		-1,211	0,750	0,106	0,298	
females*study sector: Law		-0,151	0,493	0,760	0,860	
males*study sector: Humanities		0b				
males*study sector: Science		0b				
males*study sector: Social Science		0b				
males*study sector: Medical Science		0b				
males*study sector:Economics		0b				
males*study sector: Law		0b				
else		intercept	-1,299	0,817	0,112	
		sex: female	1,136	0,737	0,123	3,116
		sex: male	0b			
		region age 16: north	-0,905	0,554	0,102	0,404
	region age 16: east	-0,262	0,563	0,642	0,770	
	region age 16: west	-0,267	0,582	0,647	0,766	
	region age 16: south	0b				
	study sector: Humanities	1,232	0,683	0,071	3,429	
	study sector: Science	0,944	0,679	0,164	2,571	
	study sector: Social Science	0,511	0,741	0,490	1,668	
	study sector: Medical Science	0,498	0,749	0,506	1,646	
	study sector: Economics	1,133	0,630	0,072	3,104	
	study sector: Law	0b				
	age group: young	1,058	0,485	0,029	2,880	
	age group: average	0,095	0,279	0,730	1,101	
	age group: old	0b				
	females*age group:young	-1,860	0,603	0,002	0,156	
	females*age group: average	-0,549	0,385	0,154	0,577	
	females*age group: old	0b				
	males*age group: young	0b				
	males*age group: average	0b				
	males*age group:old	0b				
	females*study sector: Humanities	-0,715	0,783	0,361	0,489	
	females*study sector: Science	-1,190	0,883	0,178	0,304	
	females*study sector: Social Science	-0,786	0,822	0,339	0,456	
	females*study sector: Medical Science	-0,635	0,859	0,460	0,530	
	females*study sector: Economics	-0,114	0,757	0,880	0,892	
	females*study sector: Law	0b				
	males*study sector: Humanities	0b				
	males*study sector: Science	0b				
	males*study sector: Social Science	0b				
	males*study sector: Medical Science	0b				
	males*study sector:Economics	0b				
	males*study sector: Law	0b				

a: the reference category is: stay

b: This parameter is set to zero because it is redundant

In table 5.2 the R-Square statistics are presented. The Nagelkerke test states that 22.9% of the model is explained by the variables.

Table 5.2: Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0.212
Nagelkerke	0.229
McFadden	0.091

5.1.2 Explanation of the results by the theory

The results of the destination choice of graduates after their study in Groningen show that graduates who originated from the northern part of the Netherlands are more likely to stay in the north. Especially graduates who originated from the southern part of the Netherlands are less likely to stay in the northern region. This is consistent with the theory of Morrisson (1967) in Bailey (1993), because the literature states that persons who have never migrated before are less likely to migrate than persons who have migrated before. The results show also that graduates of the southern part of the Netherlands are more likely to move to the core region. This is also explained on the basis of the same literature. Graduates of the southern part of the Netherlands would have experienced a long distance migration, in comparison with graduates of the other part of the Netherlands. Therefore it would be easier for these graduates to migrate again to a new environment.

The descriptive results showed that graduates of the sectors Humanities and Economics are moving more often to the core region than the other sectors. The large share of the graduates of the sector Economics that migrate to the core region is consistent with the literature of Venhorst et al (2008). Graduates of the sectors Science, Social Science and Medical Science migrate less frequently to the core region and according to the descriptive results these students do most often stay in the region of Groningen. The smaller part of graduates of Medical Science that migrate to the core region is also consistent with the literature of Venhorst et al (2008). However, on the basis of the literature of Haapanen and Tervo (2009), the sectors Science and Medical Science should be more mobile because these sectors of study are not taught in all of the Dutch Universities. For the University of Groningen, these students stay more in the region of Groningen. An explanation for this could be that the city of Groningen has a lot of jobs in the medical sector, for example a university medical centre.

However, according to the interaction term, female graduates of the sector Medical Science are more likely to move to the core region compared to male graduates.

Returnees are mostly found among graduates of the sector Law.

Young graduates move less often to the core region after study than the average and old graduates. Older graduates stay more often in the region of study, but the percentage is almost the same for young graduates. According to the theory the older graduates would stay more often in the region of study, because they are more embedded in society. A possible explanation for the small difference could be that in this research the young graduates start more often another study after completion of their study. In this research, 45.1 percent of the young graduates, 31.9 percent of the average graduates and 24.4 percent of the old graduates are doing another study after graduation. The results also show that old graduates are less likely to return to the living place at age sixteen than young and average graduates. This is in line with the theory that the younger the graduate

the higher the chance that the graduate moves back to the living place at age sixteen. According to the theoretical framework, an explanation for this could be that the young graduates will be more connected to the home region, because they lived for a short time outside the home region.

Moreover, the interaction term showed that old female graduates are most likely and that old male graduates are less likely to return to the living place at age sixteen.

5.2: University of Rotterdam

5.2.1 Multinomial logistic regression analysis

Table 5.3 presents the multinomial logistic regression analysis: Destination choice after study in Rotterdam. Also in this table, the first comparison is made between graduates that stay after study in Rotterdam and graduates that move after graduation to one of the other core regions. The independent variables: Region west, Humanities and Social Science show a difference on the significance level of 0.05.

From the table it can be concluded that the odds of moving to the core region over staying in the region of Rotterdam are 5.076 times larger for graduates originated from the southern part of the country than for graduates originated from the western part of the country. This means that graduates who originated from the southern part of the country are more likely to move to the core region, over staying in the region of Rotterdam, than graduates originating from the western part of the country.

The odds of moving to the core region over staying in the region of Rotterdam are 4.348 times as large for graduates of the sector Law than for graduates of the sector Humanities and 4.016 times larger for graduates of the sector Law compared to graduates of the sector Social Science. This indicates that graduates of the sector Law are more likely to move to the core region, over staying in the region, than graduates of the sectors Humanities and Social Science.

The odds of moving to the centre over staying in the region of Rotterdam are 0.594 for young male graduates and 0.781 for young female graduates, 0.776 for average male graduates and 0.424 for average female graduates, 1.000 for old male graduates and 1.341 for old female graduates. This means that female graduates of the young and old age groups are more likely to move to the core region, over staying in the region of Rotterdam, compared to male graduates of these age groups. Male graduates of the average age group are more likely to move the core region, over staying in the region of Rotterdam, compared to female graduates of the average age group. Only the sex by age group average shows a significant difference on the level of 0.05.

The second comparison is made between graduates that stay after study in Rotterdam and graduates that return to the region of origin. The independent variables regions East and West, the sectors of study: Social Science, Medical Science and Economics, the average age group and the interaction term females by young age group, are all significant on a level of significance of 0.05. Table 5.4 shows that the odds of returning to the region of origin over staying in the region of Rotterdam are 2.618 times as large for graduates of the southern part of the country compared to graduates of the eastern part of the country and 7.042 times as large for graduates of the southern part of the country compared to

graduates of the western part of the country. This means that graduates who originated from the southern part of the country are more likely to return, over staying in the region of Rotterdam, than graduates of the eastern and western part of the country.

The odds of returning to the region of origin over staying in the region of Rotterdam is 5.181 times as large for graduates of the sector Social Science, 7.440 times as large for graduates of the sector Medical Science and 5.725 times as large for graduates of the sector Economics, compared to graduates of the sector Law. This means that graduates of the sectors Humanities, Social Science, Medical Science and Economics are more likely to return to the living place at age sixteen, over staying in the region of Rotterdam, than graduates of the sector Law. The odds of returning to the living place at age sixteen over staying in the region of Rotterdam are 1,890 times higher for graduates of the average age group compared to graduates of the old age group.

The odds of returning to the living place at age sixteen, over staying in the region of Rotterdam, are 0.422 for young male graduates and 1.912 for young female graduates, 1.890 for male graduates of the average age group and 1.208 for female graduates of the average age group, 1.000 for old male graduates and 1.315 for old female graduates. This means that female graduates of the young and old age groups are more likely to return to the living place at age sixteen, over staying in the region of Rotterdam, compared to male graduates of the young and old age group. On the level of significance of 0.05 only the interaction term sex by young age group shows a significant difference. Besides, on the level of 0.10 also the average age group shows a significant difference.

The last comparison is made between graduates that stay after study in Rotterdam and graduates that moved somewhere else in the Netherlands or outside the Netherlands. The only variable that shows a significant difference on the level of 0.05 is the sector Medical Science.

From table 5.3 it can be concluded that the odds of moving elsewhere over staying in the region of Rotterdam are 3.006 times as large for graduates of the sector Medical Science compared to graduates of the sector Law. This would indicate that graduates of the sector Medical Science are more likely to move elsewhere, over staying in the region of Rotterdam, compared to graduates of the sector Law.

The odds of moving elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Rotterdam, are 1.212 for young male graduates and 1.912 for young female graduates, 0.903 for male graduates of the average age group and 0.303 for female graduates of the average age group, 1.000 for old male graduates and 0.745 for old female graduates. This means that young female graduates are more likely to move elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Rotterdam, compared to young male graduates. Besides, male graduates of the average and old age groups are more likely to move elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Rotterdam, compared to female graduates of these age groups. Unfortunately the interaction term is not significant on the level of 0.05.

Table 5.3: Multinomial logistic regression analysis: Destination choice after study in Rotterdam

Destination choice after study in Rotterdam		B	Std. Error	Sig.	Exp(B)
centre	intercept	0.068	0.350	0.847	
	sex: female	0.293	0.321	0.361	1.341
	sex: male	0b			
	region age 16: north	-0.736	0.713	0.302	0.479
	region age 16: east	0.262	0.297	0.378	1.299
	region age 16: west	-1.623	0.241	0.000	0.197
	region age 16: south	0b			
	study sector: Humanities	-1.468	0.503	0.004	0.23
	study sector: Social Science	-1.390	0.397	0.000	0.249
	study sector: Medical Science	0.503	0.376	0.181	1.653
	study sector: Economics	-0.140	0.258	0.587	0.869
	study sector: Law	0b			
	age group: young	-0.521	0.371	0.160	0.594
	age group: average	-0.254	0.240	0.289	0.776
	age group: old	0b			
	females*age group: young	-0.019	0.543	0.972	0.981
	females*age group: average	-0.898	0.403	0.026	0.407
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group:average	0b			
	males*age group:old	0b			
return	intercept	-1.807	0.504	0.000	
	sex: female	0.274	0.361	0.448	1.315
	sex: male	0b			
	region age 16: north	21.435c	0.000		4.91E-07
	region age 16: east	-0.961	0.301	0.001	0.382
	region age 16: west	-1.954	0.206	0.000	0.142
	region age 16: south	0b			
	study sector: Humanities	0.397	0.576	0.49	1.488
	study sector: Social Science	1.645	0.475	0.001	5.181
	study sector: Medical Science	2.007	0.528	0.000	7.440
	study sector: Economics	1.745	0.447	0.000	5.725
	study sector: Law	0b			
	age group: young	-0.863	0.483	0.074	0.422
	age group: average	0.637	0.252	0.012	1.890
	age group: old	0b			
	females*age group: young	1.237	0.608	0.042	3.445
	females*age group: avarage	-0.721	0.413	0.080	0.486
	females* age group: old	0b			
	males*age group: young	0b			
	males*age group:average	0b			
	males*age group:old	0b			
else	intercept	-1.587	0.578	0.006	
	sex: female	-0.295	0.549	0.591	0.745
	sex: male	0b			
	region age 16: north	0.588	0.799	0.462	1.800
	region age 16: east	-0.207	0.579	0.72	0.813
	region age 16: west	-0.752	0.404	0.063	0.471
	region age 16: south	0b			
	study sector: Humanities	-0.948	0.707	0.18	0.387
	study sector: Social Science	0.063	0.465	0.892	1.065
	study sector: Medical Science	1.101	0.527	0	3.006
	study sector: Economics	-0.621	0.416	0.136	0.537
	study sector: Law	0b			
	age group: young	0.192	0.484	0.691	1.212
	age group: average	-0.103	0.399	0.797	0.903
	age group: old	0b			
	females*age group: young	0.173	0.727	0.811	1.189
	females*age group: avarage	-0.789	0.691	0.248	0.451
	females* age group: old	0b			
	males*age group: young	0b			
	males*age group:average	0b			
	males*age group:old	0b			

a: The reference category is: stay

b: This parameter is set to zero because it is redundant

c: No observations

In table 5.4 the R-Square statistics are presented. The Nagelkerke test states that 23.4% of the model is explained by the variables.

Table 5.4: Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0.199
Nagelkerke	0.234
McFadden	0.116

5.2.2 Explanation of the results by the theory

The results of the destination choice after study in Rotterdam show that graduates of the western part of the Netherlands are less likely to move to other parts of the core region after study. This could be explained by the fact that Rotterdam is already situated in the core region and a very high percentage of graduates lived at age sixteen also in the region of Rotterdam (59.3 percent). The graduates of the University of Rotterdam do not have to move to the core region because of the economic disparities. The graduates who lived at age sixteen in the region of Rotterdam are probably less likely to migrate because they are more attached to the region than graduates of the other parts of the country.

According to the results of the multinomial logistic regression analysis and the results of chapter four, the graduates of the southern part of the Netherlands are more likely to return to the living place at age sixteen. According to the literature of Haapanen and Tervo (2009) an explanation for this could be that graduates originating from the regions nearby the University region are more likely to move back than graduates of the more distant regions.

Opposite to the University of Groningen, graduates of the sector Humanities are more likely to stay in the region of Rotterdam and less likely to move to the other parts of the core region. However, graduates of the Medical Sector of the University of Rotterdam are less likely to stay in the region and are more likely to move to the core region, compared to the other sectors. Graduates of the Medical Sector are also returning often to the living place at age sixteen and are more likely to move elsewhere in the Netherlands or outside the Netherlands. This is in line with the research of Haapanen and Tervo(2009), that graduates of the sector Medical Science will be more mobile, because Medical Science is not taught at every university. Therefore graduates of the sector Medical Science will be more spread over the country.

For the University of Rotterdam, the variable sex is not significant in the explanation of the destination choice after study.

The interaction term showed that especially young female graduates are returning most often to the region of living at age sixteen. This could be a combination of the theory of Detang-Dessendre and Molho (2000), and my own explanation. Detang-Dessendre and Molho (2000) mentioned that women would more appreciate that family and friends live closely in the neighbourhood. According to my own theory, young graduates would more often return to the living place at age sixteen, because they have lived a short time outside the region.

5.3 University of Tilburg

5.3.1 Multinomial logistic regression Analysis

Table 5.5 presents the multinomial logistic regression analysis: Destination choice after study in Tilburg. Just like the other tables, the first comparison of this table is made between the graduates that stay after study in Tilburg and graduates that move after graduation to the core region. All regions of the living place at age sixteen and the sector Economics are significant on the level of significance of 0.05.

The table shows that the odds of moving to the core region over staying in the region of Tilburg are 11.912 times as large for graduates originated from the northern part of the country, 5.358 times as large for graduates originated from the eastern part of the country

and 3.661 times as large for graduates of the western part of the country, compared to graduates who originated from the southern part of the country. This indicates that graduates of the northern, eastern and western part of the country are more likely to move to the core region, over staying in the region of Tilburg, compared to graduates of the southern part of the Netherlands. The odds of moving to the core region over staying in the region are also 1.649 times higher for graduates of the sector Economics compared to graduates of the sector Law. This means that graduates of the sector Economics are more likely to move to the core region, over staying in the region, compared to graduates of the sector Law.

The odds of moving to the core region, over staying in the region of Tilburg, are 1.405 for young male graduates and 0.994 for young female graduates, 1.271 for male graduates of the average age group and 1.259 for female graduates of the average age group, 1.00 for old male graduates and 0.898 for old female graduates. This means that male graduates of all age groups are more likely to move to the core region, over staying in the region of Tilburg, compared to female graduates of the same age group. However, the interaction term does not show a significant difference on the level of 0.05.

The second comparison is made between graduates that stay after study in the region of Tilburg and the graduates that returned to the living place at age sixteen. The variables: Sex, region east and region west are significant on the level of significance of 0.05. The odds of returning to the living place at age sixteen over staying in the region of Tilburg are 2.857 times as high for male graduates compared to female graduates. This means that male graduates are more likely to return, over staying in the region of Tilburg, than female graduates. The odds of returning to the living place at age sixteen over staying in the region of Tilburg are 13.260 times as high for graduates originated from the eastern part of the Netherlands and 18.179 times as high for graduates originated from the western part of the Netherlands, compared to graduates originated from the southern part of the Netherlands. This indicates that graduates of the eastern and western part of the Netherlands are more likely to return, over staying in the region, than graduates of the southern part of the Netherlands.

The odds of returning to the living place at age sixteen, over staying in the region of Tilburg, are 0.851 for young male graduates and 0.310 for young female graduates, 0.981 for male graduates of the average age group and 0.691 for female graduates of the average age group, 1.000 for old male graduates and 0.350 for old female graduates. This means that males of all age groups are more likely to return to the living place at age sixteen, over staying in the region of Tilburg, compared to female graduates of the same age group. However, the interaction term does not show a significant difference on the level of 0.05.

The last comparison is made between graduates that stay after study in Tilburg and graduates that moved somewhere else in the Netherlands or outside the Netherlands. The variables region east and the interaction term females by average age group are significant on a level of 0.05.

From table 5.5 it can be concluded that the odds of moving elsewhere over staying in the region of Tilburg are 4.462 times as large for graduates originated from the eastern part

of the Netherlands compared with graduates originated from the southern part of the Netherlands. This would indicate that graduates originated from the eastern part of the Netherlands are more likely to move elsewhere, over staying in the region of Tilburg, compared to graduates originating from the southern part of the Netherlands. This does not match with the results in paragraph 4.2.

The odds of moving elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Tilburg, are 1.630 for young male graduates and 1.444 for young female graduates, 2.391 for male graduates of the average age group and 0.345 for female graduates of the average age group, 1.000 for old male graduates and 0.848 for old female graduates. This means that male graduates of all age groups are more likely to move somewhere else in the Netherlands or outside the Netherlands, over staying in the region of Tilburg, compared to female graduates of the same age group. However, only the interaction term sex by average age group shows a significant difference on the level of 0.05.

Table 5.5: Multinomial logistic regression analysis: Destination choice after study in Tilburg

Destination choice after study in Tilburg		B	Std. Error	Sig.	Exp(B)
centre	intercept	-1.850	0.289	0.000	
	sex: female	-0.108	0.388	0.781	0.898
	sex: male	0b			
	region age 16: north	2.478	0.697	0.000	11.912
	region age 16: east	1.679	0.237	0.000	5.358
	region age 16: west	1.298	0.200	0.000	3.661
	region age 16: south	0b			
	study sector: Humanities	0.266	0.327	0.415	1.305
	study sector: Science	0.396	0.378	0.295	1.485
	study sector: Social Science	-0.163	0.210	0.440	0.850
	study sector: Economics	0.500	0.203	0.014	1.649
	study sector: Law	0b			
	age group: young	0.340	0.334	0.308	1.405
	age group: average	0.240	0.271	0.377	1.271
	age group: old	0b			
	females*age group: young	-0.238	0.477	0.619	0.788
	females*age group: average	0.098	0.424	0.818	1.103
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group: average	0b			
males*age group: old	0b				
return	intercept	-1.936	0.284	0.000	
	sex: female	-1.050	0.386	0.006	0.350
	sex: male	0b			
	region age 16: north	16.680c	6.284,294	0.998	5.70E-05
	region age 16: east	2.585	0.231	0.000	13.260
	region age 16: west	2.900	0.182	0.000	18.179
	region age 16: south	0b			
	study sector: Humanities	0.378	0.348	0.277	1.460
	study sector: Science	-0.277	0.525	0.598	0.758
	study sector: Social Science	0.238	0.229	0.298	1.269
	study sector: Economics	0.378	0.231	0.102	1.460
	study sector: Law	0b			
	age group: young	-0.162	0.343	0.638	0.851
	age group: average	-0.019	0.255	0.941	0.981
	age group: old	0b			
	females*age group: young	0.040	0.505	0.936	1.041
	females*age group: average	0.590	0.426	0.166	1.804
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group: average	0b			
males*age group: old	0b				
else	intercept	-2.881	0.503	0.000	
	sex: female	-0.165	0.746	0.825	0.848
	sex: male	0b			
	region age 16: north	-17.386c	0.000	.	2.82E-05
	region age 16: east	1.496	0.341	0.000	4.462
	region age 16: west	-0.541	0.617	0.381	0.582
	region age 16: south	0b			
	study sector: Humanities	0.021	0.673	0.975	1.022
	study sector: Science	-0.373	0.681	0.584	0.688
	study sector: Social Science	-0.342	0.375	0.361	0.710
	study sector: Economics	0.343	0.324	0.29	1.409
	study sector: Law	0b			
	age group: young	0.489	0.569	0.390	1.630
	age group: average	0.872	0.466	0.061	2.391
	age group: old	0b			
	females*age group: young	0.044	0.867	0.960	1.045
	females*age group: average	-1.772	0.873	0.042	0.170
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group: average	0b			
males*age group: old	0b				

- a: The reference category is: stay
- b: This parameter is set to zero because it is redundant
- c: No observations

In table 5.6 the R-Square statistics are presented. The Nagelkerke test states that 29.4% of the model is explained by the variables.

Table 5.6: Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0.261
Nagelkerke	0.294
McFadden	0.138

5.3.2 Explanation of the results by the theory

The results of the destination choice after study in Tilburg show that graduates of the southern part of the Netherlands stay more often in the region of Tilburg than graduates of the other parts of the Netherlands. Graduates of the northern, eastern and western parts

of the Netherlands are more likely to move to the core region than graduates of the southern part of the Netherlands. This could again be declared by the theory of Morrisson (1967) in Bailey (1993). This theory states that graduates who migrated before are more likely to migrate again. Moreover, the results show that graduates of the eastern part of the Netherlands are more often moving somewhere else in the Netherlands or outside the Netherlands. This could also be declared by the theory of Morrisson (1967) in Bailey (1993). The results show also that graduates of the eastern and western part of the Netherlands are more returning to the living place at age sixteen than graduates originated from the southern part of the Netherlands. This could be explained by the fact that Tilburg is situated near to the border of the eastern and western part of the country. Therefore the theory of Haapanen and Tervo (2009) that graduates originating from the regions nearby the University region are more likely to move back than graduates of the more distant regions. Another important explanation of the large share of returnees of the western part of the country is the theory about the economic disparities between the regions.

Like the University of Groningen, graduates of the sectors Humanities and Economics are less likely to stay in the region of Tilburg compared to other sectors. The graduates of these sectors are, together with graduates of the sector Science, more likely to move to the core region.

The results show that female graduates are more likely to stay in the region of Tilburg and male graduates are more often moving to the core region, returning and moving somewhere else in the Netherlands or outside the Netherlands. This is connected with the research of Hughes and McCormick (1981, 1985) who state that males, those without children, the better educated and younger generations are consequently found to be the most mobile persons. The interaction term showed that male graduates of the average age sector are most likely to move elsewhere in the Netherlands or outside the Netherlands and female graduates of the average age sector are most likely to move elsewhere in the Netherlands or outside the Netherlands.

5.4 University of Maastricht

5.4.1 Multinomial logistic regression analysis

Table 5.7 presents the multinomial logistic regression analysis: Destination choice after study in Maastricht. Also for this table, the first comparison is made between graduates that stay after study in the region of Maastricht and graduates that move after study to the core region. The variables females, all regions, the sectors Social Science and Medical Science and the age group young are significant on the significance level of 0.05.

Table 5.7 shows that the odds of moving to the core region over staying in the region of Maastricht are 4.757 times as large for graduates who originated from the northern part of the Netherlands, 5.377 times as large for graduates of the eastern part of the Netherlands and 4.722 times as large for graduates of the western part of the Netherlands, compared to graduates of the southern part of the Netherlands. This means that graduates of the northern, eastern and western part of the Netherlands are more likely to move to the centre, over staying in the region of Maastricht, compared with graduates who originated from the southern part of the Netherlands.

The odds of moving to the core region over staying in the region of Maastricht are 2.494 times as large for graduates of the sector Law compared to graduates of the sector Social Science and 2.033 as large for graduates of the sector Law compared to graduates of the sector Medical Science. This indicates that graduates of the sector Law are more likely to move to the core region, over staying in the region of Maastricht, than graduates of the sectors Social Science and Medical Science.

The odds of moving to the core region over staying in the region of Maastricht are 2.174 times as large for male graduates compared to female graduates. This means that male graduates are more likely to move to the core region, over staying in the region of Maastricht, compared with female graduates.

The odds of moving to the core region over staying in the region of Maastricht are 4.695 times as large for graduates of the old age groups compared to graduates of the young age group. This means that graduates of the old age group are more likely to move to the core region, over staying in the region of Maastricht, compared to graduates of the young age sector.

The odds of moving to the core region, over staying in the region of Maastricht, are 0.213 for young male graduates and 0.450 for young female graduates, 0.795 for male graduates of the average age group and 0.815 for female graduates of the average age group, 1.000 for old male graduates and 0.460 for old female graduates. This means that females of the young and average age groups are more likely to move to the core region, over staying in the region of Maastricht, compared to male graduates of these age groups. Male graduates of the old age group are more likely to move to the core region, over staying in the region of Maastricht, compared to female graduates of the old age group. The interaction term shows a significant difference for all variables.

The second comparison is made between graduates who stay in the region of Maastricht and graduates that return to the living place at age sixteen. The variables region east, region west, Medical Science, Economics and the young age group are significant on the significance level of 0.05.

From the table it can be concluded that the odds of returning to the living place at age sixteen over staying in the region are 1.902 times as large for graduates who originated from the Eastern part of the Netherlands and 10.577 times as large for graduates who originated from the Western part of the Netherlands, compared to graduates who originated from the southern part of the Netherlands. This indicates that the graduates who originated from the eastern and western part of the country are more likely to return to the living place at age sixteen, over staying in the region, compared to graduates of the southern part of the Netherlands. The odds of returning to the living place at age sixteen over staying in the region of Maastricht are 2.399 times as large for graduates of the sector Medical Science and 3.277 times as large for graduates of the sector Economics, compared to graduates of sector Law. This means that graduates of the sectors Medical Science and Economics are more likely to return to the living place at age sixteen, over staying in the region of Maastricht, compared to the sector Law. The odds of returning to the living place at age sixteen over staying in the region of Maastricht are 5.076 times as large for old graduates compared to young graduates. This means that old graduates are

more likely to return to the living place at age sixteen, over staying in the region of study, compared to graduates of the young age group.

The odds of returning to the living place at age sixteen, over staying in the region of Maastricht, are 0.197 for young male graduates and 0.661 for young female graduates, 0.602 for male graduates of the average age group and 0.758 for female graduates of the average age group, 1.000 for old male graduates and 0.581 for old female graduates. This means that female graduates of the young and average age groups are more likely to return to the living place at age sixteen, over staying in the region of Maastricht, compared to male graduates of these age groups. Besides, male graduates of the old age group are more likely to return to the living place at age sixteen, over staying in the region of Maastricht, compared to female graduates of the old age group. Moreover, all variables show a significant difference on the level of 0.05.

The last comparison is made between graduates who migrated elsewhere in the Netherlands or outside the Netherlands and graduates who stay after study in the region of Maastricht. All regions are significant on the significance level of 0.05. From table 5.7 it can be concluded that the odds of moving elsewhere over staying in the region of Maastricht are 4.498 times as large for graduates who originated from the northern part of the Netherlands, 4.157 times as large for graduates who originated from the eastern part of the Netherlands and 6.962 times as large for graduates who originated from the western part of the Netherlands, compared to graduates who originated from the southern part of the Netherlands. This means that graduates who originated from the northern, eastern and western part of the Netherlands are more likely to move elsewhere, over staying in the region of Maastricht, compared to graduates who originating from the southern part of the Netherlands.

The odds of moving elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Maastricht, are 0.909 for young male graduates and 0.841 for young female graduates, 1.503 for male graduates of the average age group and 1.386 for female graduates of the average age group, 1.000 for old male graduates and 0.880 for old female graduates. This means that male graduates of all age groups are more likely to move elsewhere in the Netherlands or outside the Netherlands, over staying in the region of Maastricht, compared to female graduates of the same age group. Unfortunately, the interaction term does not show a significant difference on the level of 0.05.

Table 5.7: Multinomial logistic regression analysis: Destination choice after study in Maastricht

Destination choice after study in Maastricht		B	Std. Error	Sig.	Exp(B)
centre	intercept	0.039	0.273	0.886	
	sex: female	-0.777	0.340	0.022	0.46
	sex: male	0b			
	region age 16: north	1.560	0.373	0.000	4.757
	region age 16: east	1.682	0.224	0.000	5.377
	region age 16: west	1.552	0.239	0.000	4.722
	region age 16: south	0b			
	study sector: Humanities	-0.546	0.316	0.084	0.579
	study sector: Science	-20.192c	0.000		1.70E-06
	study sector: Social Science	-0.915	0.288	0.002	0.401
	study sector: Medical Science	-0.709	0.213	0.001	0.492
	study sector: Economics	0.224	0.235	0.339	1.252
	study sector: Law	0b			
	age group: young	-1.545	0.369	0.000	0.213
	age group: average	-0.23	0.263	0.382	0.795
	age group: old	0b			
	females*age group: young	1.525	0.48	0.001	4.597
	females*age group: average	0.801	0.379	0.035	2.228
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group: average	0b			
	males*age group: old	0b			
return	intercept	-1.554	0.387	0.000	
	sex: female	-0.542	0.39	0.165	0.581
	sex: male	0b			
	region age 16: north	0.873	0.466	0.061	2.394
	region age 16: east	0.643	0.300	0.032	1.902
	region age 16: west	2.359	0.237	0.000	10.577
	region age 16: south	0b			
	study sector: Humanities	-0.173	0.487	0.723	0.841
	study sector: Science	-18.921c	0.000		6.07E-06
	study sector: Social Science	0.005	0.407	0.989	1.005
	study sector: Medical Science	0.875	0.319	0.006	2.399
	study sector: Economics	1.187	0.346	0.001	3.277
	study sector: Law	0b			
	age group: young	-1.625	0.465	0.000	0.197
	age group: average	-0.508	0.317	0.109	0.602
	age group: old	0b			
	females*age group: young	1.753	0.575	0.002	5.772
	females*age group: average	0.774	0.442	0.08	2.168
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group: average	0b			
	males*age group: old	0b			
else	intercept	-1.216	0.369	0.001	
	sex: female	-0.128	0.428	0.765	0.88
	sex: male	0b			
	region age 16: north	1.504	0.412	0.000	4.498
	region age 16: east	1.425	0.259	0.000	4.157
	region age 16: west	1.940	0.252	0.000	6.962
	region age 16: south	0b			
	study sector: Humanities	-0.452	0.382	0.237	0.637
	study sector: Science	0.245	0.770	0.237	0.637
	study sector: Social Science	-631	0.337	0.061	0.532
	study sector: Medical Science	-0.318	0.25	0.204	0.728
	study sector: Economics	-0.093	0.285	0.743	0.911
	study sector: Law	0b			
	age group: young	-0.096	0.428	0.823	0.909
	age group: average	0.407	0.351	0.247	1.503
	age group: old	0b			
	females*age group: young	0.050	0.555	0.928	1.051
	females*age group: average	0.047	0.470	0.920	1.048
	females*age group: old	0b			
	males*age group: young	0b			
	males*age group: average	0b			
	males*age group: old	0b			

a: The reference category is: stay

b: This parameter is set to zero because it is redundant

c: Too few observations

In table 5.8 the R-Square statistics are presented. The Nagelkerke test states that 22.3% of the model is explained by the variables.

Table 5.8: Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0.207
Nagelkerke	0.223
McFadden	0.087

5.4.2 Explanation of the results by the theory

The results of the destination choice after study in Maastricht show that graduates of the southern part of the Netherlands stay more often in the region of Maastricht than

graduates of the other parts of the Netherlands. Graduates of the northern, eastern and western regions are more likely to move to the core region compared to graduates of the southern region. This could again be declared by the theory of Morrisson (1967) in Bailey (1993). Graduates of the western part of the Netherlands are most likely to return to the living place at age sixteen. This could be declared by the economic disparities in the Netherlands. The western region is for the greater part situated in the core region and in this region the job possibilities would be better. The graduates of the northern, eastern and western region are moving more often somewhere else in the Netherlands or outside the Netherlands than graduates of the southern part of the Netherlands.

The results show that graduates of the sector Social Science are staying more often in the region of Maastricht and are less likely to move to the core region, together with graduates of the sector Medical Science. This corresponds to the research of Venhorst et al. (2008), that graduates of the sector Medical Science are less directed on the western part of the Netherlands. The sectors Law and Economics are more likely to move to the core region. Graduates of the sectors Medical Science and Economics are returning more often to the living place at age sixteen.

The comparison between the sexes shows that female graduates do more often stay in the region and male graduates move more often to the core region after study. However, the interaction term showed that female graduates of the young and average age group move more often to the core region compared to male graduates of these age groups. This indicates, in relation with the former chapter, that the age group of the graduates is a better explaining factor of the choice of staying in the region than sex of the graduates. Male graduates of the old age group are moving more often to the core region compared to old female graduates. Besides, females do more often return to the living place at age sixteen. Also the interaction term showed that female graduates of the young and average age groups are returning more often to the living place at age sixteen compared with male graduates of the same age groups. Like the results of the University of Groningen, these results could be connected to the literature in the way that female graduates are more often returning to the living place at age sixteen because female graduates would more appreciate that family and friends living close to their neighbourhood.

The results show also that young graduates are more likely to stay in the region of Maastricht and old graduates are moving more often to the core region. It could be possible that this higher percentage of young graduates is caused by the higher percentage of young graduates who are doing another study after graduation. Old graduates do more often return to the living place at age sixteen. Average age graduates are more likely to move somewhere else in the Netherlands, compared to the other ages.

5.5.1 Comparison of the four regions

Remarkable is that for all the four universities, most of the graduates of the own region stay after study in the region and graduates originated of their own region are moving less to the core region compared to the other regions. This corresponds with the theory of Morrisson (1967) in Bailey (1993), because this theory states that persons who have never migrated before are less likely to migrate than persons who have migrated before. Graduates of the University of Groningen, Tilburg and Maastricht, who lived at age sixteen in the western part of the Netherlands, are more likely to return to the living place at age sixteen compared to the other regions. This corresponds to the theory of Haapanen

and Tervo (2009) that graduates originating from regions with good labour market opportunities are more likely to move back to the region of origin. The Universities of Groningen, Tilburg and Maastricht show largely the same pattern in the different branches of science. The sector Economics show for the three universities the lowest percentage of graduates that stay in the region of study, also the sector Humanities show that the graduates of this sector are less likely to stay in the region of study. The graduates of these sectors are more likely to move to the core region. The University of Rotterdam shows just that the graduates of the sector Humanities are more likely to stay in the region of Rotterdam and graduates of the sector Humanities and Economics are just less likely to move to the other core regions. However for all the four universities, graduates of the sector Social Science are more likely to stay in the region of study and less likely to move to the core region. The destination choice, returning to the living place at age sixteen, shows different patterns for all universities. The sector Medical Science has compared to the other sectors, a relatively high amount of graduates that move to the destination choice elsewhere. This could be explained by the fact that the work sites of graduates of the sector Medical Science are spread across the country. Female graduates of the Universities of Tilburg and Maastricht stay more often in the region of study and male graduates are more likely to move to the core region. Besides, graduates of the sector Social Science have a higher percentage of female graduates and the Economics has a higher percentage of male graduates. Graduates of the sector Social Science are more likely to stay in the study region and graduates of the sector Economics are more likely to move to the core region. It could be possible that the influence of the study sector is explanatory for the differences between males and females. Unfortunately, the interaction could only be tested for the University of Groningen, because the number of cases will be too small for the other Universities. The destination choices: returning and moving elsewhere, do not show similarities between the Universities of Tilburg and Maastricht. The Universities of Rotterdam and Groningen show no significant differences between the destination choice of males and females. The Universities of Tilburg and Maastricht show that the young graduates are more likely to stay in the region of study compared to graduates of the old and average age group. An explanation for this could be that a high percentage of the young graduates is following another study after graduation, 45.1 percent, compared to 31.9 percent for graduates of the age group average and 24.4 percent for the graduates of the age group old. The University of Groningen does not show big differences between the young and old graduates that stay in the region of study. The other destination choices: moving to the core region, returning and moving elsewhere, do not show arrangements by age group for the four universities. Also the interaction term: sex by age group does not show arrangements for the four universities.

In general, the conclusion is that the Universities of Groningen, Tilburg and Maastricht show similarities in the migration behaviour of graduates. Therefore, the next paragraph will test these results in the multinomial regression analysis for the Universities of Groningen, Tilburg and Maastricht together. On the contrary, the University of Rotterdam shows completely different results of the independent variables on the destination choice after study.

5.5.2 Multinomial logistic regression analysis of the Universities of Groningen, Tilburg and Maastricht

In this paragraph the Universities of Groningen, Tilburg and Maastricht will be combined into one multinomial regression analysis. In the analysis it will be researched which variables are significant for the three universities together. Table 5.9 presents the multinomial regression analysis of the Universities of Groningen, Tilburg and Maastricht. Only the significant variables will be discussed.

The table states that graduates of the Universities of Groningen and Tilburg are less likely to move to the core region, over staying in the region of study, compared to graduates of the University of Maastricht. However, the descriptive results show that for only the University of Groningen the percentage of graduates that is moving to the core region is higher than the percentage of graduates that stay in the region of study. Graduates of the Universities of Groningen and Tilburg are more likely to return to the living place at age sixteen, over staying in the region of study, compared to graduates of the University of Maastricht. Besides, graduates of the University of Maastricht are more likely to move elsewhere in or outside the Netherlands, over staying in the region of study, compared to graduates of the Universities of Groningen and Tilburg.

From the table it can be concluded that graduates who originated from the southern part of the Netherlands are more likely to stay in the region of study, over moving to the core region, compared to graduates who originated from the northern, eastern and western part of the Netherlands. Graduates of the southern part of the Netherlands are less likely to return to the living place at age sixteen, over staying in the region of study, compared to graduates of the northern, eastern and western part of the Netherlands. Besides, graduates of the southern part of the Netherlands are less likely to move elsewhere in or outside the Netherlands, over staying in the region of study, compared to graduates of the northern, eastern and western part of the Netherlands. An explanation for this could be that the Universities of Tilburg and Maastricht are both located in the southern part of the Netherlands. From the former results it can be concluded that graduates who studied in the region of origin are more often staying than graduates who did not study in the region of origin.

Table 5.9 shows that graduates of the sector Economics are more often moving to the core region, over staying in the region of study, compared to graduates of the sector Law. Graduates of the sector Medical Science are less often moving to the core region, over staying in the region of study, compared to graduates of the sector Law. This corresponds to the former results about each university separately. Besides, the table shows that graduates of the sector Science are less likely to return to the living place at age sixteen, over staying in the region of study and graduates of the sector Economics are more likely to return to the living place at age sixteen, over staying in the region of study, compared to graduates of the sector Law. Graduates of the sector Economics are also more likely to move elsewhere in the Netherlands or outside the Netherlands, over staying in the region of study, compared to graduates of the sector Law. From this results can be concluded that graduates of the sector Economics are more likely to move to the core region, to

return or to move somewhere else, over staying in the region of study, compared to graduates of the sector Law. This was also stated in the former paragraph.

From the model can be concluded that young graduates move less often to the core region, over staying in the region of study, compared to graduates of the old age group. This can be explained by the high percentage of young graduates that is following another study after graduation, this is also explained in the previous paragraph. Graduates of the average age group are more likely to return to the living place at age sixteen, over staying in the region of study, compared to graduates of the old age group. Graduates of the average age group are also more likely to move somewhere else in or outside the Netherlands, over staying in the region of study, compared to graduates of the old age group.

Male graduates of the sector Social Science are more likely to move to the core region, over staying in the region of study, compared to female graduates of the sector Social Science. Looking back to paragraph 5.5.1, in which was mentioned that the study sector could be an explanation for differences in the migration behaviour of females and males, there can be concluded that, for the sector Social Science, the destination choice after study could be better explained by the sex of the graduates than by the sector of study of the graduates.

Female graduates of the sector Science are more likely to return to the living place at age sixteen, over staying in the region of study, compared to male graduates of the sector Science. Besides, male graduates of the sector Social Science are more likely to return to the living place at age sixteen, over staying in the region of study, compared to female graduates of the sector Social Science.

The variable sex and the interaction term sex by age do not show significant differences.

Table 5.9: Multinomial regression analysis: Destination choice after study in Groningen, Tilburg and Maastricht

Destination choice after study in Groningen, Tilburg and Maastricht		B	Std. Error	Sig.	Exp(B)	
centre	intercept	-0.614	0.207	0.003		
	University of study: Groningen	-0.435	0.138	0.002	0.647	
	University of study: Tilburg	-1.015	0.107	0.000	0.362	
	University of study: Maastricht	0b				
	sex: female	-0.251	0.264	0.324	0.771	
	sex: male	0b				
	region age 16: north	0.702	0.145	0.000	2.018	
	region age 16: east	1.622	0.131	0.000	5.065	
	region age 16: west	1.329	0.128	0.000	3.778	
	region age 16: south	0b				
	study sector: Humanities	0.362	0.260	0.164	1.437	
	study sector: Science	-0.414	0.276	0.134	0.661	
	study sector: Social Science	-0.017	0.235	0.942	0.983	
	study sector: Medical Science	-0.905	0.293	0.002	0.404	
	study sector: Economics	0.539	0.188	0.004	1.714	
	study sector: Law	0b				
	age group: young	-0.479	0.206	0.020	0.619	
	age group: average	0.182	0.135	0.178	1.199	
	age group: old	0b				
	females*age group: young	0.520	0.271	0.055	1.681	
	females*age group: average	0.327	0.205	0.110	1.387	
	females*age group: old	0b				
	males*age group: young	0b				
	males*age group: average	0b				
	males*age group:old	0b				
	females*study sector: Humanities	-0.017	0.311	0.956	0.983	
	females*study sector: Science	-0.324	0.473	0.493	0.723	
	females*study sector: Social Science	-0.796	0.281	0.005	0.451	
	females*study sector: Medical Science	0.514	0.330	0.120	1.671	
	females*study sector: Economics	0.046	0.25	0.853	1.047	
	females*study sector: Law	0b				
	males*study sector: Humanities	0b				
	males*study sector: Science	0b				
	males*study sector: Social Science	0b				
	males*study sector: Medical Science	0b				
	males*study sector:Economics	0b				
	males*study sector: Law	0b				
	return	intercept	-1.729	0.241	0.000	
		University of study: Groningen	-0.307	0.147	0.037	0.736
		University of study: Tilburg	-0.414	0.121	0.001	0.661
University of study: Maastricht		0b				
sex: female		0.411	0.288	0.153	1.509	
sex: male		0b				
region age 16: north		0.833	0.161	0.000	2.299	
region age 16: east		1.927	0.140	0.000	6.872	
region age 16: west		2.535	0.125	0.000	12.618	
region age 16: south		0b				
study sector: Humanities		0.097	0.308	0.753	1.102	
study sector: Science		-0.702	0.345	0.042	0.496	
study sector: Social Science		0.35	0.252	0.165	1.419	
study sector: Medical Science		-0.095	0.306	0.755	0.909	
study sector: Economics		0.419	0.210	0.046	1.521	
study sector: Law		0b				
age group: young		0.115	0.223	0.606	1.122	
age group: average		0.334	0.157	0.033	1.397	
age group: old		0b				
females*age group:young		-0.275	0.285	0.334	0.759	
females*age group: average		-0.247	0.221	0.265	0.782	
females*age group: old		0b				
males*age group: young		0b				
males*age group: average		0b				
males*age group:old		0b				
females*study sector: Humanities		-0.229	0.365	0.531	0.795	
females*study sector: Science		0.981	0.475	0.039	2.666	
females*study sector: Social Science		-0.987	0.299	0.001	0.373	
females*study sector: Medical Science		-0.302	0.349	0.387	0.739	
females*study sector: Economics		-0.290	0.281	0.302	0.748	
females*study sector: Law		0b				
males*study sector: Humanities		0b				
males*study sector: Science		0b				
males*study sector: Social Science		0b				
males*study sector: Medical Science		0b				
males*study sector:Economics		0b				
males*study sector: Law		0b				
else		intercept	-1.700	0.309	0.000	
		University of study: Groningen	-0.845	0.174	0.000	0.429
		University of study: Tilburg	-1.570	0.152	0.000	0.208
	University of study: Maastricht	0b				
	sex: female	0.583	0.373	0.118	1.792	
	sex: male	0b				
	region age 16: north	0.782	0.189	0.000	2.187	
	region age 16: east	1.438	0.169	0.000	4.210	
	region age 16: west	1.401	0.163	0.000	4.058	
	region age 16: south	0b				
	study sector: Humanities	0.565	0.372	0.129	1.760	
	study sector: Science	0.404	0.368	0.272	1.498	
	study sector: Social Science	-0.099	0.379	0.794	0.906	
	study sector: Medical Science	0.168	0.352	0.633	1.183	
	study sector: Economics	0.668	0.282	0.018	1.949	
	study sector: Law	0b				
	age group: young	0.336	0.259	0.194	1.399	
	age group: average	0.401	0.192	0.036	1.493	
	age group: old	0b				
	females*age group:young	-0.585	0.336	0.082	0.557	
	females*age group: average	-0.443	0.267	0.097	0.642	
	females*age group: old	0b				
	males*age group: young	0b				
	males*age group: average	0b				
	males*age group:old	0b				
	females*study sector: Humanities	-0.424	0.443	0.338	0.654	
	females*study sector: Science	-0.633	0.610	0.299	0.531	
	females*study sector: Social Science	-0.400	0.433	0.356	0.670	
	females*study sector: Medical Science	-0.267	0.404	0.508	0.765	
	females*study sector: Economics	-0.562	0.373	0.132	0.570	
	females*study sector: Law	0b				
	males*study sector: Humanities	0b				
	males*study sector: Science	0b				
	males*study sector: Social Science	0b				
	males*study sector: Medical Science	0b				
	males*study sector:Economics	0b				
	males*study sector: Law	0b				

a: The reference category is: stay

b: This parameter is set to zero because it is redundant

6 Conclusion

6.1 Conclusion

This chapter will conclude the thesis by presenting the main findings of the research. This will be done by answering the research questions. Besides, the hypothesis of paragraph 2.4 will be reviewed again.

First, each sub-question will be answered and each hypothesis will be reviewed in the end the final conclusion will be made on the basis of the main-question: *What are the differences in migration behaviour of graduates between the cities Groningen, Tilburg, Maastricht and Rotterdam and how can these differences be explained?*

What is the influence of regional economic disparities on the migration behaviour of graduates?

The four universities among study are situated differently in the Netherlands. The Universities of Groningen and Maastricht are located in the peripheral part of the Netherlands, the University of Tilburg is situated just outside the core region and the University of Rotterdam is located in the core region. These regional economic disparities play an important role in explaining the differences in migration behaviour of graduates between the four universities. The first thing that strikes is the fact that graduates of the Universities of Groningen and Maastricht are much more moving to the core region than graduates of the Universities of Tilburg and Rotterdam. Especially for the University of Rotterdam, a high percentage of graduates are staying after study in the region. This can be explained by the fact that Rotterdam is situated in the core region. Besides, the lowest percentage of returnees could be found among the graduates of the University of Rotterdam.

Hypothesis 1: Because of the regional economic disparities in the Netherlands, more graduates migrate to the western part of the Netherlands than to the other regions. Most of the graduates stay after study in the region of study. However, as graduates migrate, more graduates migrate to the western part of the Netherlands than to the other parts of the Netherlands, especially graduates of the Universities of Groningen and Maastricht. Therefore this hypothesis is verified by the research.

Hypothesis 2: For the Universities of Tilburg and Rotterdam more students will stay after graduation in the province than for the Universities of Groningen and Maastricht. The Universities of Tilburg and Rotterdam have a much higher percentage of stayers compared with the Universities of Groningen and Maastricht. Therefore this hypothesis is verified by the research.

Hypothesis 3: Graduates of the University of Rotterdam stay more often after graduation in the study region than graduates of the universities of Groningen, Tilburg and Maastricht.

The University of Rotterdam shows the highest percentage of graduates that stay after study in the region. Therefore this hypothesis is verified by the research.

What is the influence of the living place at age sixteen on the migration behaviour of graduates?

It is remarkable that the graduates who already lived at age sixteen in the region of graduation, stay more often in the region of study after graduation. Graduates of the eastern part of the Netherlands stay less often in the region of study. An explanation might be that in this study no university is located in the eastern part of the Netherlands. It is also striking that graduates who studied far away from the region of origin, and therefore already had a migration experience, are moving more often to the core region. This would indicate that graduates who had migrated before are more likely to migrate again. Graduates that originated from the eastern and western part of the Netherlands are returning more often to the living place at age sixteen. The high percentage of graduates from the western part of the Netherlands that returned to the living place at age sixteen can again be explained by the fact that a large part of the western part of the Netherlands is situated in the core region.

Hypothesis 4: Graduates who lived at age sixteen in the Randstad experience more often return migration than graduates of the other regions.

For the Universities of Groningen, Tilburg and Maastricht this hypothesis can be verified by the research. These three universities show all the highest percentage of graduates originated from the western part of the Netherlands that return to the living place at age sixteen. The University of Rotterdam shows the highest percentage of returnees among graduates originated from the southern part of the Netherlands.

In which way could the different branches of science influence the migration behaviour of graduates?

The different branches of science in which the graduates studied also have an influence on the migration behaviour of the graduates. Remarkable is that the University of Rotterdam shows big differences in the migration behaviour of graduates of the different branches of science, compared to the Universities of Groningen, Tilburg and Maastricht. For the University of Rotterdam, a lot of graduates of the sector Humanities stay after study in the region of Rotterdam. On the contrary the other universities show a low percentage of graduates of the sector Humanities that stay after study in the region. Besides, the Universities of Groningen, Tilburg and Maastricht show a high percentage of graduates of the sector Economics and graduates of the sector Humanities who are moving to the core region after study. For the University of Rotterdam, graduates of the sector Economics and graduates of the sector Humanities are not so much moving to the core region. However for all the regions, graduates of the sector Social Science are more likely to stay in the region of study and are less likely to move to the core region. In addition, the sector Medical Science has, compared to the other sectors, a relatively high amount of graduates moving elsewhere in the Netherlands or outside the Netherlands. This could be explained by the fact that the work sites of graduates of the sector Medical Science, are spread across the country.

Hypothesis 5: If there are a lot of universities with a particular type of study, the graduates of this type of study will not migrate so much. If there are not so much universities with a particular study, more graduates will migrate.

The sectors Science and Medical Science are not taught at each university in this research. According to the hypothesis, graduates of these studies will less often stay in the region of study. The percentage of graduates of the sector Medical Science that stay after study in the region is below average. For this sector the hypothesis could be verified. However, the sector Science shows a higher percentage of graduates that stay after study in the region. Therefore for this sector the hypothesis could not be verified.

Hypothesis 6: Graduates of the University of Groningen who are graduated in the economical studies and law studies migrate more often than graduates of the medical studies.

Graduates of the University of Groningen who are graduated in the sector Medical Science do more often stay in the region of study compared to graduates who are graduated at the University of Groningen in the sectors Economics and Law. Besides, graduates of the University of Groningen of the sector Economics and Science do also more often move to the core region and returning more often to the living place at age sixteen compared to graduates of the sector Medical Science. Therefore this hypothesis could be verified.

In which way could sex influence the migration behaviour of graduates?

Only for the Universities of Tilburg and Maastricht, differences can be found in the migration behaviour of male and female graduates. For both universities can be concluded that male graduates are moving more often to the core region and female graduates are more often staying in the region of study. These differences may also be partially explained by the sector of study. The interaction term sex by sector of study was added into the multiple regression model of the Universities of Groningen, Tilburg and Maastricht together. From the model was concluded that male graduates of the sector Social Science are more likely to move to the core region compared to female graduates of the sector Social Science. For the sector Social Science, the difference in migration behaviour could be rather explained by the sex than the sector of study.

Hypothesis 7: There is a difference in the number of males and females that migrate after graduation.

For all universities together no difference can be found in the number of males and females that migrate after graduation. For the Universities of Tilburg and Maastricht a difference can be found in the number of males and females that migrate after graduation.

Hypothesis 8: The homesickness factor is higher for female graduates than for male graduates.

For all universities together no difference can be found in the migration behaviour between males and females. Male graduates of the University of Tilburg do more often return to the living place at age sixteen than female graduates of the University of Tilburg. On the contrary, female graduates of the University of Maastricht do more often

return to the living place at age sixteen than male graduates of the University of Maastricht. Therefore this hypothesis can be rejected.

In which way could age influence the migration behaviour of graduates?

The age of the graduates is also an important variable in explaining the migration behaviour of graduates. All universities, except for the University of Groningen, show that young graduates stay more often in the region of study compared to average and old age graduates. An explanation for this could be that a much higher percentage of the young graduates is starting another study after graduation compared to average and old graduates. The University of Groningen has some higher percentage of old graduates that stay in the region of Groningen. For the Universities of Groningen, Tilburg and Maastricht the average age group moved most often to the core region. For the University of Rotterdam, the old age group moved most often to the core region. The destination choices returning and moving elsewhere are different for all universities.

Hypothesis 9: The lower the age at graduation, the higher the chance of return migration.

Young graduates do more often stay in the region of study compared to average and old graduates. Besides, young graduates do less often return to the living place at age sixteen compared to average and old graduates. Therefore this hypothesis can be rejected.

What are the differences in migration behaviour of graduates between the cities Groningen, Tilburg, Maastricht and Rotterdam and how can these differences be explained?

First, it can be concluded that there are differences in migration behaviour of graduates of the four different cities. The Universities of Groningen, Tilburg and Maastricht show similarities in the migration behaviour of graduates. On the contrary, the University of Rotterdam has a total different migration pattern. The main explanation is that the University of Rotterdam is situated in the core region and therefore shows a different migration pattern than the other universities.

6.2 Discussion

Differences can be found in the migration behaviour of graduates of the different Universities in the Netherlands. These differences are partly caused by the level of analysis that is chosen in the research. In the data and methods chapter it was already mentioned that the level of analysis in this thesis can have a major influence on the results. If this research would be done on a different level of analysis, for example using municipalities as the level of analysis, the results might probably be different. Moreover, the classification of the other independent variables is important. Especially the classification of the sector of study and the age group of the graduates will influence the results. When another classification would be used, the results would have been different.

Besides, other independent variables could be important in explaining the destination choice of graduates after their study. The influence of cohabitation or having a relationship with someone originating from the region could be another explanatory

variable. It is important to keep in mind that the variables included in the research are not the only variables that explain the spatial choice after study. Moreover, each graduate might have one or more individual reasons to make a given choice.

Another important point to mention is that the results in the multinomial logistic regression analysis could be a little bit flattered. Some variables have very few cases for a particular destination choice. This will give very strange number and these numbers can have an influence on the total model. Also for the descriptive part of the thesis, you should be cautious in making statements about certain independent variables, because some variables include very few cases.

6.3 Recommendations

The results of this thesis show that there are differences in migration behaviour of graduates between the Universities of Groningen, Rotterdam, Tilburg and Maastricht. For further research it will be interesting to include more universities. For example, in this thesis there was no university included from the eastern part of the Netherlands; this would be interesting to research.

Moreover, further research should be done about the other variables which could have an influence on the migration behaviour of graduates. In the discussion it was already mentioned that, for example, the marital status of the graduates could be important. Besides, more qualitative research should be done about the individual reasons of graduates whether to migrate or not.

Another interesting point of research will be whether the employment in a region corresponds to the sectors of study of graduates who stay in a region. Moreover, it will be interesting to research whether the sectors of study that move to another part of the country would be retained if there were more jobs in the region for that particular sector. Municipalities and provinces would benefit from this research, in the way that they could try to attract specific companies and therefore graduates would be less inclined to migrate.

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