Masterthesis

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The effect of the changes of the student-loan on the inter-regional migration of students

Research Question:
"To what extent has the distance of inter-regional migration of students changed after the implementation of the 'sociaal leenstelsel' in 2015?"

Abstract

This thesis explores the effect of the introduction of the 'sociaal leenstelsel' in 2015 within the Netherlands on the spatial mobility of students. Prior research shows that students leave the parental home at a later stage and that they therefore opt for a study facility in closer proximity. It is therefore expected that the average migration distance of students has decreased as a consequence of the introduction of the 'sociaal leenstelsel'. Since prior relocations impact the mobility at later stadia, the reduced mobility would impact the dynamics in mobility of individuals with high human capital. Reduced mobility of these intellectuals would therefore change the dynamics within the match-making process of the labour market. This study makes use of the Dutch HBO student monitor data, which offers cross-sectional data about the career paths and their mobility of graduated Dutch applied university students. This research shows that the inter-regional migration distance of students has increased after the introduction of the 'sociaal leenstelsel'. This since a higher percentage of students leaves the parental home. The relocation distance of students that relocate has decreased after the introduction of the 'sociaal leenstelsel'.

Preface

At first thank you Viktor, for supporting me to work on this subject for my master thesis. This thesis originated from intrinsic curiosity and therefore being able to dive into it has been a pleasure. Secondly, for keeping me calm when situations caused stress. You have provided the solutions or directed me towards another route and therefore offering relieve and set new goals. The advice concerning the dataset to switch to plan B was for example right on time and again offered a solution that helped me to stay on track. Overall, your comments helped me to stay sharp and to see opportunities rather than being overwhelming, while addressing the matter that the thesis should also be fun. The flexibility of you Viktor helped me incredibly, especially when problems arose and (last-minute) meetings were arranged both on-campus and digital. The process of writing this thesis challenged me in ways that I had not imagined prior, while the process remained to be fun.

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1 Introduction

Student grants function to improve the financial position of students during their study. The increase of human capital is important for both the individual as well as for society. Therefore, a subsidiary measure to stimulate the increase of human capital is beneficial for society.

Dutch students pay admission fees for the application of both the applied university and university. These fees are indifferent between in institutions (Sá et al., 2006). Furthermore, the differences in quality between the institutes are negligible. The Netherlands has replaced in 2015 their old scheme of the 'basisbeurs' by the 'sociaal leenstelsel'. The goals of this new scheme were to create more equality for students despite the financial power of the prospective students. It would therefore lead to less students refraining from studying since all students would need a similar amount of money despite the financial power. The new scheme has turned out to be disadvantageous, since the scheme has led to less application of specific categories of students (CBS, 2018). The group of students with a HAVO-degree that applied for an applied university has declined. Similarly, fewer students with an MBO-degree have applied to study at an applied university.

The 'sociaal leenstelsel' is therefore set to be replaced by a revised version of the prior scheme. A majority of the electorate introduced an agreement in this revised old scheme will be introduced in 2023 (Coalitieakkoord 2021 – 2025). Therefore, future students will be provided with a monthly payment ('basisbeurs'), dependent on parental income and whether the student lives on itself.

Current literature shows that the financial position of prospective students is a determining factor to decide whether to study and the location where to study (Sá et al., 2012; Kjellström & Regner, 1999; Ball et al., 2002 and Callender & Wilkinson, 2003). The change in the financial schemes for students is therefore likely to affect the behaviour of students. However, the effects caused by such financial reforms are hardly academically investigated. It is however assumed that particular generations have become a victim of haphazard decision making (Van der Pal, 2022). The conditions of the new scheme are currently unknown, resulting in people unwilling to start their study in the coming year (Van Baars & Van Egmond, 2022). This could be the effect of the possibility of missing out on the financial relief and thus taking a gap year could have beneficial financial effects.

Recent findings of the Dutch central bureau of statistics present that the 'sociaal leenstelsel' has led to a decreased number of HAVO students to enrol for applied universities (CBS, 2018). The introduction of this new scheme has furthermore led to a steep increase of students that remain at their parental place. This implies that the increased financial burden shows primarily in decision making in which these burdens can be reduced. Such as; opting for MBO instead of applied sciences because of the reduced financial risk and remaining at the parental home to reduce the monthly costs.

Currently there is little knowledge about the effect in mobility of the introduction of the 'sociaal leenstelsel'. This mobility of individuals and therefore the willingness to relocate is important, since it affects the match-making process between prospective students and suitable educational facilities. The mobility further affects the match-making within the labour market of these students after graduation. This paper therefore focusses on the changes in spatial mobility of HBO students after the introduction of the 'sociaal leenstelsel'. To answer the main-question; *"To what extent has spatial mobility of students altered after the implementation of the 'sociaal leenstelsel' in 2015?"*. Firstly, the current academic knowledge about the spatial mobility of students and the position of this paper are discussed. Secondly, the differences between the Dutch financial schemes are explained. Whereafter these prior findings are aggregated to provide a conceptual framework that identifies the factors that affect student mobility. Additionally, the methodology is presented, in which the data set and the type of calculations are discussed. Next to that the results are presented in graphs, maps and a regression. Whereafter the paper the methodology and findings are debated within the discussion of this paper. Finally, the results will form the basis to answer the main question within the conclusion.

The next page contains BOX 1 which explains the Dutch context of the student grant system and clarifies the changes between the 'basisbeurs' and the 'sociaal leenstelsel'.

BOX 1: The changes within Dutch student grant system

The Dutch financial schemes for students are prone to change over the years (Vossenstein, 1999). In 2015 the 'basisbeurs' has been replaced by the 'sociaal leenstelsel'. This box explains the key differences between the two grant systems.

The Basisbeurs is a student grant which is transferred as a gift after a student successfully finishes the study (DUO, 2022a). Students that are 18 years or older are eligible for the student grant. The eligible amount of the grant is dependent on the financial situation of the parents. When the financial support of the parents is below a certain threshold the student is eligible for an additional grant. The 'basisbeurs' furthermore distinguished the living situation of the student. An overview of the financial changes between the 'basisbeurs' and 'sociaal leenstelsel' are presented within Figure 1.

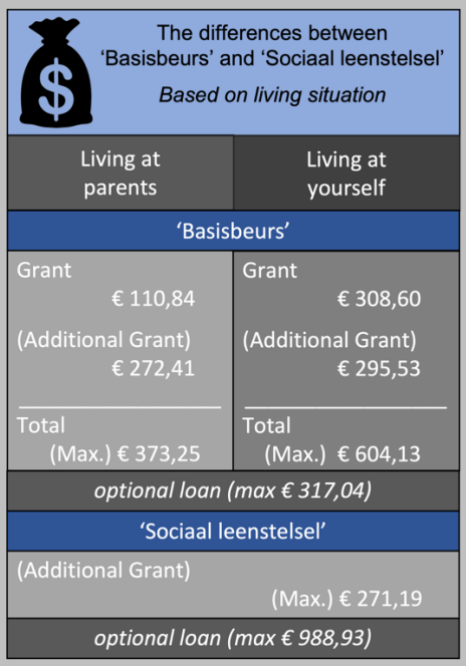

Figure 1 - Differences between student grants

Figure 1 provides an overview of both the 'basisbeurs' and the 'sociaal leenstelsel' and uses the information provided by DUO (2022a & 2022b). The figure furthermore allows for comparison of both financial schemes. It shows how the prior financial scheme differentiated between the residential address of the student. Living outside of the parental home results in an additional 200 euros that is eligible as a gift after finishing the study. For students of whose parental situation cannot offer full financial support are eligible for an additional 20 euros when they are living outside their parental home. If a student does not finish the degree within 10 years the grant has to be paid off within 15 years (DUO, 2022b). When a student opts for an additional loan, this loan furthermore has to be paid off within 15 years after completing the study.

The 'sociaal leenstelsel' (DUO, 2022a), introduced in 2015, abolished the differentiation based on the living situation of the student. The base grant is furthermore disposed. Thus, students are since 2015 no longer financially supported by government for their study. Students of whose parents are unable to financially support are eligible for an additional grant. A lack of financial resources can be complemented with the optional loan. The built-up loan of the student has been paid off within 35 years after completing the study. When a student is eligible for an additional grant and finishes a degree within 10 years, the additional grant turns into a gift. The build-up optional loan plus interest has to be paid within 35 years.

These changes in student grants have a negative effect on the financial position of Dutch students that started studying in 2015.

2 Theoretical Framework

The academic focus on students is explained by the effect that these intellectuals have on the gross economy. According to Nijkamp and Poot (1998), a positive effect on the gross economy and therefore on region in which they settle. Furthermore, the migration of these individuals can have a profound effect on the economics within lower regional scalar level (Faggian & McCann, 2009). According to Bartel (1979) higher skilled jobs are concentrated within urban cores, while lower-skilled jobs are spread more evenly across space. Education facilities tend furthermore to become more centralised as the skill level increases. This creates an asymmetry between the location of high-skilled jobs or education and the origin of these people. This origin of these high-skilled people is namely assumed to be equally spread over place (Bartel, 1979). This asymmetry fuels migration of high-skilled towards agglomerated locations. The positive effect of the migration of high-skilled on the economy for the destination locations of these individuals therefore justifies the interest of academics on the migration decision of students and graduates. An example is the research of Venhorst (2012) which focusses on migration pattern of high-skilled individuals after graduation.

The thesis assesses two main issues; the effect of the financial position of the student and the factors influencing the migration of students. This chapter explores the findings of existing literature, on both the international level and within the Dutch context.

2.1 Financial position of student

The financial position of students is widely discussed within academia. The findings focus on the effect that financials have on the enrolment and migration decisions. Thus, influencing spatial mobility of the students. The financial position of a student is influenced by multiple factors; the parental support, government support and tuition fees.

2.1.1 Parental support

The financial situation of the parents determines the parental support that they are able to offer. This financial support shows to have effect opportunities for a student. Studies within the United States discovered that lower socio-economic background leads to lower probabilities of enrolling for a university. (Bellfield & Morris, 1999; Jones, 2002; Kerckhoff & Macrae, 1992). Additionally, the research of Christie (2007) shows that British students with a lower socio-economic background are more prone to live at the parental home. This corresponds with the results discovered by Sá et al. (2012) that state that students of less affluent families face higher barriers in their decision-making process than students from different financial backgrounds. Governments can counter these effects of the parental support by offering student financial support themselves.

2.1.2 Governmental support

Governments can support students in various manners. Most common is a student grant, however governments can furthermore lower tuition fees or compensate other costs associated with studying, such as travel costs.
Student grants are offered by the government to stimulate the participation within higher level of education (Doyle, 2006). These grants support students to finance their study, this can be based on financial situation or on academical performance. The revision in 1994 of the student grants within the UK has led to more students living at their parents (Christie, 2007). Due to the declined financial position of the affected student. The revision furthermore led to a decline of students of less affluent family to apply for university. Similar results are published by Berg & van Gaalen (2018) and by Berg (2020). The research by Berg & van Gaalen shows that the introduction of 'sociaal leenstelsel' has led to a decline of HAVO students that transition towards an applied university.

Since tuition fees account to a large extent of yearly costs, some governments contribute by intervening in the amount of tuition fees. The research by Neill (2009) discovered that an increase of $1000 reduces the enrolment rate between 2.5 and 5 percent points. This effect showed to have the smallest effect on students of affluent families, showing that these students can cope with these increased financial burdens. To stimulate the participation of different wealth levels in higher education, governments can lower the tuition fees. This is for

example carried out by the Swedish government therefore making the financial burden of Swedish students relatively low (Kjellström & Regnér, 1999).

Governments can furthermore compensate the travel costs of students, since students that live over larger distance from university face higher costs in comparison to student that live within close proximity (Kjellström & Regnér, 1999). The compensation of travel costs by government is for example carried out in the Netherlands and Sweden. Within the Netherlands the students receive a subscription for public transport. In Sweden students receive financial compensation dependent on the distance of the university that. Despite this compensation the study of Kjellström & Regner (1999) shows that majority of Swedish students opts for a university in close proximity to their parental home.

The differences between the 'basisbeurs' and the 'sociaal leenstelsel' are prior explained within BOX 1. These differences between these student grants have a negative effect on the financial position of Dutch students who started studying after 2015. The effects as a consequence of the introduction of the 'sociaal leenstelsel' has been assessed by academia. These researches discovered that less students leave the parental home (Berg & van Gaalen, 2018) and that students leave the parental home at a later moment (Berg, 2020). Berg (2020) concludes that this postponed migration is caused by the loss of financial power as a result of the introduction of the 'sociaal leenstelsel'.

2.2 Location and migration decisions of students

The location decision behaviour of students has received a diverse interest among academia. Within literature the enrolment and migration decisions are described. This chapter summarises the findings on the location decision behaviour of students. These decisions are distinguished in three categories; distance, personal differences and geographical differences.

2.2.1 Distance and its effect on enrolment decisions

Distance has according to multiple academia a negative effect on enrolment. Swedish students are according to Kjellström & Regnér (1999) negatively affected by both absolute and relative distances. Sá et al. (2004) summarizes similar results on the effect of distance on enrolment within the United States.

Within the Netherlands distance has a similar effect on enrolment decisions (Sá et al., 2004). De Jonge (2017) contributes to these findings by adding that higher distances between students and educational facilities increases the chance of migration. The paper by de Jonge (2017) emphasises that when the distances are below a threshold, students are willing to daily commute towards the facility.

The willingness to daily travel these distances is according to Sá et al (2006) affected by local ties, the talent of the students as well as the geographical accessibility of the facility. These factors are interlinked with personal differences that are discussed in the next paragraph.

For this paper it is expected that the effect of distance on enrolment decisions has increased as a consequence of the introduction of the 'sociaal leenstel'. This since students opt for a study in closer proximity while staying at the parental home.

2.2.2 Personal traits and its effect on migration decisions

The personal traits have according to academia a profound effect on the migration decisions. These traits can vary from traits such as; sex, age, educational level or from attachment and background.

The findings of de Jonge (2017) show that women and students at a higher age are more likely to relocate towards their study. The studies of Sá et al (2006) and Berg & van Gaalen (2018) shows that a higher level of education increases the chance of moving out of the parental home. Additionally, the study of Christie (2007) shows that students of a non-traditional university background are more likely to remain living at the parental home. The incline of students living at their parental home after the revision in 1994 (discussed in 2.1.2), is according to Ball et al. (2002) and to Callender & Wilkinson (2003) further explained by cultural values and debt aversion. Local ties can furthermore affect the decision-making process. This since Pugsley (1998) discovered that students with strong

local ties and emotional attachment are more likely to attend local university. These local ties and attachment explain to a large extent the return migration of students after finishing their study (Venhorst, 2013).

The research conducted by Baryla & Dotterweich (2001) discovered that students originating from rurality prefer small scale institutions, in contrast to students who grew up in urbanity. These preferences overlap with the geographical traits of regions, discussed in the next paragraph.

It is expected to find a positive effect between age and chance of relocation and thus on migration distance. This since the financial burden for students to live on themselves has increased after the introduction of the 'sociaal leenstelsel'. We expect that the introduction has no effect on gender difference. The effect of the level of education is likely to be positive, since students that have studied at a higher level are more likely to opt for a specialistic applied university and therefore migrating over larger distances. Within this research there is no emphasis on the background of the student nor on the financial situation of the parent. It is assumed that local ties and attachment will have a stronger impact on the relocation decision since the student will be more hesitant to move out of the parental home.

2.2.3 Geographical traits and its effect on migration decisions

The geography of regions furthermore affects the decision-making process of students. The distance involved with the geography of regions is discussed within 2.2.1. The geographical differences concern about socio-economics, differences in institutions, accessibility and housing cost.

The socio-economic situation differs between regions. Research conducted by Baryla & Dotterweich (2001) focusses on how these differences of universities affect location decision behaviour of students. This research shows that movers tend to have a preference to move towards regions that are socio-economically favourable. The findings correspond with the findings by de Jonge (2017), which state that a region with an average higher income increases the chance of students migrating towards this region. These findings are backed by the research conducted by Venhorst (2011). This research focusses on the spatial mobility of Dutch students and discovered that students of applied universities favour location with higher job-opportunities.

The quality and the financial burden of an educational facility are according to the work of Christy (2007) a determining factor. This in contrast to the study of Baryla & Dotterweich (2001), in which the quality of the institution or the financial motives are less determinate within the decision-making process. The differentiating between the institutions, based on quality or financial is according to Sá et al. (2006) negligible for the Dutch context. The admission fees are equal between institutions and are furthermore considered to be low. The quality of the educational facilities is furthermore negligible. The spatial distribution of the colleges within the Netherlands is according to Florax et al. (2006) considered to be evenly spread.

Other geographical differences concern about accessibility and housing costs. The accessibility within a region and in particular public transport connectivity affects migration decisions of students. The research by de Jonge (2017) states that higher public transport connectivity negatively effects migration behaviour. The differences between regions in housing costs furthermore affects according to Sá et al. (2012), the migration decisions. This makes rent an important determinant. High cost of living within areas shows to negatively effect on migratory flows of students towards these places (Baryla & Dotterweich, 2001). High rents furthermore indicate housing shortage and therefore making it hard for students to find a room.

This paper assumes that socio-economic regions with a favourable climate have a larger effect on migration decisions. This since a migration decision is an investment of students in themselves, opting for the best future outcome. It is not expected to find any difference regarding the quality and financial burden of applied university. This since both factors have remained similar over the time spawn. The accessibility of educational facilities is likely to have become more relevant since more students remain living at the parental home over longer periods. Therefore, the students have to commute towards the educational facilities. It is likely that the housing costs have caused more students to remain at the parental home.

2.2.4 Position of this thesis

This paper combines the academic focus of geographical decision making and the financial burden of studying. Prior research (Ball et al., 2002; Berg, 2020) shows that the financial position of the students affects their migration behaviour. The financial burden of studying has increased as a consequence of introduction of the 'sociaal leenstelsel' in 2015. The paper therefore aims explore the change of the spatial mobility of students after the change in student grant. Additionally, the biggest financial gap between the cohort is the biggest when a student leaves the parental home, this since compensation for living outside the parental home is abolished with the introduction of the 'sociaal leenstelsel'.

Prior academical papers on the 'sociaal leenstelsel' and student migration have focussed on the moving out of the parental home (Berg, 2020; Procé, 2016). The research of Berg (2020) uses event history analysis to identify changes in behaviour between the two student cohorts. The research of Procé (2016) uses indicators of living circumstances, financing and distance between the dwelling and education facility, however the study was unable to find significant results. This outcome could be the consequence of a sampling bias or caused by the limit power of the small number of survey-data, since other literature suggests differently.

This paper therefore uses a cross-sectional data set on a national level, preventing sampling bias, to find out whether there is an alteration in mobility. The study of de Jonge (2017) shows that students that face higher daily commutes towards the study facilities are more inclined to relocate towards their study location.

Higher financial burdens for students are many of the academical works suggested to affect to diminish the likelihood to leave the parental place. Spatial mobility of students therefore decreases, as a consequence of the financial consequence of the 'sociaal leenstelsel'. This results in other location decision making and to different geographical outcomes. This thesis therefore focusses on how the 'sociaal leenstelsel' impacts the spatial mobility of students in comparison to the cohort within the 'basisbeurs'. These changes within inner-migratory flows are interesting, since academic literature shows that location behaviour is substantially motivated by familiarity with a region (Venhorst, 2013). Therefore, people studying more local could lead to strengthening of local ties and thus making these students stronger locally orientated. This could result in a higher return migration rate or lower, since fewer strong attached individual have not left the parental home. The next chapter explains the influence of the prior discussed concepts on the migration of students.

3 Conceptual Framework

The spatial mobility of students is as stated within the *'Theoretical Framework'* chapter explained by multiple factors. This thesis aims to explore change in spatial mobility of students as a consequence of the introduction of the 'sociaal leenstelsel' in 2015. The spatial mobility will be assessed on whether or not students relocate and the distance between the location of the parental home and the location of the residence at the last year of study. Furthermore, the migration after graduation is assessed to explore how the potential effects continue through after finishing the study. According to literature the spatial mobility of students is affected by financial situation, sex, age, social ties and spatial traits of the region of origin.

The financial situation of students can be distinguished in two parts. At first there is financial family support in which students are financially supported by their parents (Bellfield & Morris, 1999; Jones, 2002; Kerckhoff & Macrae, 1992; Kjellström & Regner, 1999). Additionally, there is the support that governments can offer (Kjellström & Regner, 1999; Christie, 2007). Higher financial support increases the chance of migration (Kjellström & Regner, 1999).

Personal traits such as age, sex, educational level and field of study have found to affect the migration distance towards their study location. The works of Procé (2016) and Berg (2020) show that students with a higher age migrate over larger distances than similar students at a younger age. De Jonge (2017) furthermore describes that students at a younger age a more inclined to find a study facility in closer proximity to the parental home. Therefore, prospective migration towards the study of students starting at a younger age are likely to be over smaller distance as a consequence of the younger enrolment age. Next to that, differences in gender influence the distance of migration according to Sandberg-Thoma et al. (2015) and Berg (2020). According these works women have a higher tendency to leave the parental home at a younger age. This leads to a difference in migration distances between the two sexes. According to both academic works, the migration distance for males is on average shorter than for females.

The level of secondary education before enrolling for a (applied) university affects the migratory distance of students. According to the research by both Sá et al (2006) and Berg & van Gaalen (2018) the prior educational level affects the chance of the student migrating. Within the paper it is stated that students with a VWO-degree are more likely to move out of the parental home and therefore have a higher inter-regional migration distance, than peers than have obtained a HAVO-degree.

The field of study in which a person studies furthermore affects the spatial mobility of students (Venhorst, 2011). The research shows that students studying 'Behavioural and Social Sciences' are significantly less mobile than students of other fields of studies. The study that a student applies for therefore has explanatory power for its migration decision and thus for the inter-regional migration distance of this individual.

Further academic works show that the traits of a place influence the decision-making process of a student. Higher rents deter students to relocate towards these places (Sá et al., 2012). A place within a subjective acceptable commuting distance diminishes the chance of relocating (Jonge de, 2017).

The traits of an area work as push and pull factors on prospective students. These traits are the socio-economic environment, the level of amenities and housing costs. At first the socio-economics of a region have according to the findings of Baryla & Dotterweich (2001) an effect on the relocation decision behaviour. According to the academic work of Venhorst (2011) the socio-economics such as labour market conditions have explanatory power for migration decisions. Students tend to migrate towards affluent regions with favourable labour market conditions. Furthermore, places with a higher level of amenities increase the attractiveness of a place and therefore the pull students of these places (Sá et al., 2006). The study of Berg (2020) used this theory to assess to what extent the introduction of the 'sociaal leenstelsel' has altered this behaviour. It is concluded that the introduction has not led to a dichotomy between rural and urban students. According to the works of Sá et al. (2012) and by Baryla & Dotterweich (2001), housing costs are a decisive factor for the location decision making of a student. Higher rents

refrain students from migrating (Baryla & Dotterweich, 2001; Venhorst, 2011). To counter the high living costs, students remain at the parental home. The introduction of the 'sociaal leenstelsel' has led to a less subsidiaries when leaving the parental home and therefore remain over a longer period in the parental home (Berg, 2020). This makes the rent price an important factor in the process of leaving the parental place and thus the location to where the student relocates.

Social ties furthermore refrain students from moving over larger distances because of their social ties in their current location (Kjellström & Regner, 1999). High-school clusters are furthermore regarded as social ties and lead to clustered streams towards higher education (Sá et al., 2006). These high-school clusters lead to clustered streams towards particular higher educational facilities.

These financial situations, personal and regional differences and social norms affect the spatial mobility of students and these factors are aggregated within the conceptual framework (Figure 2).

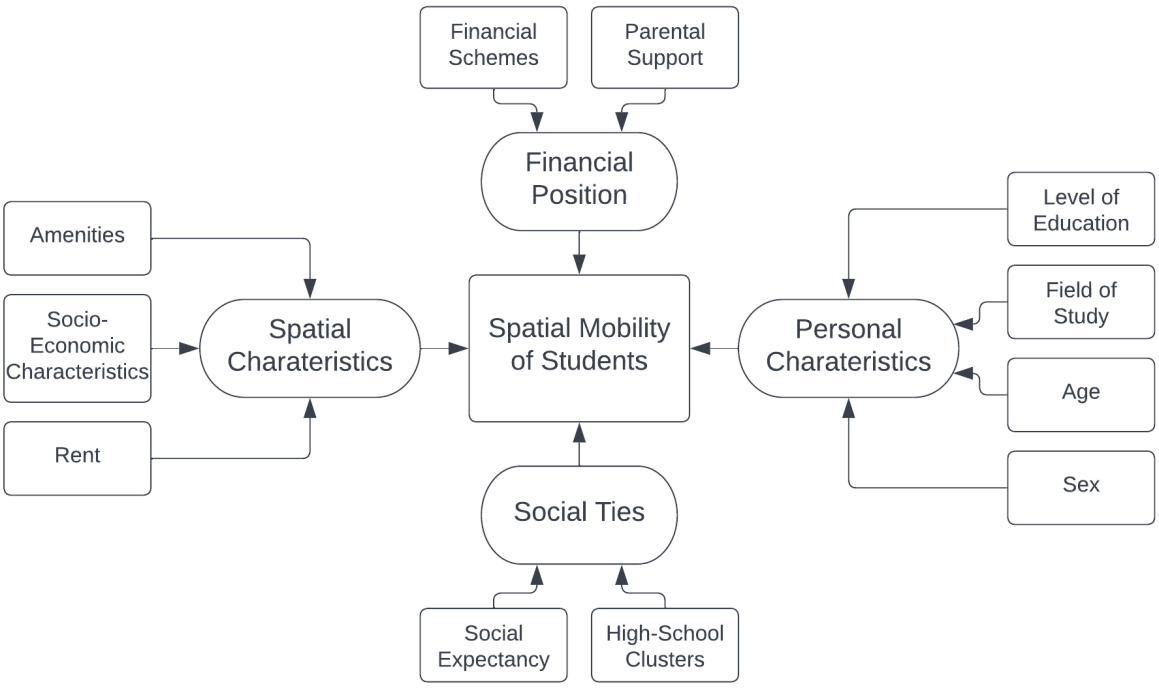

Figure 2 - Conceptual Framework

4 Methodology

This thesis focusses on the spatial mobility of students and in particular the effect of the implementation of the 'sociaal leenstelsel'. The focus of the research is on graduates with a degree in applied sciences (in Dutch; HBO). The paper analysis the effect of the change in student grant on the percentage of students relocating. students move and the distance of the student that move.

Literature shows that lower financial support results in lower spatial mobility (Kjellström & Regner, 1999). The diminished financial situation of students as a result of the introduction of the 'sociaal leenstelsel' intuitively leads to lower spatial mobility. To see whether the introduction of the 'sociaal leenstelsel' has an effect on the spatial mobility of students, this research uses 3 cohort years based on the graduation year.

The method used within this thesis is similar to the methodology used to addresses the geographical distance in the paper of Sá et al. (2006). Within their paper the location is determined of the respondent secondary education and the location of the college or university of the respondent's choice. This is analysis is carried out by using registry data. The distance between these two locations indicates the mobility of the students because of the chance in education.

In contrast to the research conducted by Sá et al. (2006), this research uses the publicly accessible HBO-monitor data of the DANS. Therefore, the research is limited to applied universities, on the other hand it opens for the opportunities of a rich cross-sectional data set. This paper uses survey data, similar to the paper of Berg (2020). However, the paper of Berg uses event history analysis is used to identify changes in behaviour between the two student cohorts. Berg (2020) focusses primarily on the moment of migration rather than on the distance of the migration. This paper focusses on the distance of migration within three cohort years, it uses rich data to identify changes in spatial mobility by calculating spatial distances between COROP-regions.

The changes are analysed through descriptive statistics and regression models. The descriptive statistics consist of tables, maps and graphs. These visualisations help to understand the data and the processes behind the data. The maps help to identify regional differences. The chart based on the cohorts visualise trends. The regression uses the migration distance (explained in: 4.2.2) as the independent variable. The cohorts (explained in: 4.1.3) are the main dependent variable to discover the effect of the introduction of the 'sociaal leenstelsel' has on the migration distances of students. The control variables (4.3) add explanatory power to the regression models to provide a more accurate analysis on the effect of the introduction of the 'sociaal leenstelsel'.

4.1 Data

This chapter explains the data that is used and how this data is transformed for the analysis. The data that is used within this research is the HBO-monitor which will be further explained in the next paragraph. The transformation of the data concern about the selection of the data set, within this paper referred to as the 'target group'. A further distinction within the data transformation is made on the periods in this paper referred to as the 'cohorts'. The geographical measurement within the data are COROP-regions which are furthermore in-depth discussed within this chapter.

4.1.1 HBO-monitor

The HBO-monitor is a survey that each year is distribution among the graduates of applied universities. The survey on average yields a response of 40% of addressed graduates and is distributed via 90% of applied universities (HBO-Monitor, 2022). The data collected within the HBO-monitor are published by the DANS. The DANS is a data expertise centre which aims to provide publicly accessible data to improve research while making data research more transparent. Before the HBO-monitor is made publicly accessible the data is treated to prevent privacy issues. This treatment involves the aggregation of spatial data into regions. Therefore, this research uses the scalar level of COROP-regions as the smallest spatial scale, this scalar level is further explained within 'COROP-regions'. The aggregated data set, containing the six survey years, consists of 142,941 respondents. This number is reduced by focusing on a particular group of graduates, this 'Target group' is addressed in the next paragraph.

4.1.2 *Target group*

The respondents of the HBO-monitor have a broad variety of background and traits. This research therefore limits itself to a selection of 51,473 respondents (Table 1). The selection is based on prior type of education and age. The traits of the selected respondents are further explained within the chapter 'Descriptive statistics'.

People can enrol for a HBO study after finishing a HAVO or VWO degree in secondary education, or after finishing a degree at a MBO level. Since prior educational paths define the type and eligibility for the student grant. HBO students that enrol after finishing a HAVO or VWO are eligible for the student grant for their entire length of their study. Therefore, the introduction of the 'sociaal leenstelsel' impacts the HBO students with a HAVO or VWO degree the most. Thus, this research focusses exclusively on HBO graduates with a HAVO or VWO degree. This selection halves the sample population to 221,558 responses.

Since age is a determinant factor for the moment of leaving the parental place Sandberg-Thoma et al. (2015). Age furthermore correlates with other time dependent changes, such as starting at a university. These explanatory values would otherwise be lost, however since this study focusses on a specific target group, particular differences in traits are eliminated. To counteract migration behaviour explained by later stadia life occurrences such as marriage the threshold for the age of population is set at age < 25.

4.1.3 *Cohorts*

This research distinguishes three cohorts. These cohorts are throughout the paper indicated by different shadings within the graphs and map. These three cohorts consist of two consecutive years, corresponding to the years of the HBO-monitor survey data. The first cohort consists of the year 2013 and 2014 and is indicated by a **purple** shading. The second cohort consists of the year 2016 and 2017 and is indicated by a **blue** shading. The last cohort consists of the year 2019 and 2020 and is indicated by a **light-blue** shading.

The first cohort functions as a control group before the changes in the student grant system. The 'sociaal leenstelsel' is introduced in 2015, therefore the financial effects of the 'sociaal leenstelsel' on the spatial mobility of students should visible in the migration of the graduates of the last cohort (2019 / 2020). The students of the second cohort can be influenced by the announcement prior to the introduction of the 'sociaal leenstelsel'. This information could influence migration behaviour within this cohort. The last cohort are the graduates of the year 2019 and 2020 and therefore the gradates of 2019 and 2020 are the first students that faced the consequences of the 'sociaal leenstelsel', when they finish their study nominally.

4.1.4 *COROP-regions*

The Netherlands is subdivided in 40 COROP-regions, these regions are equivalent of the NUTS-3 regions on the European scalar level (CBS, 2022a). The spatial data about the residential location of student at the age of sixteen, last year of study and at the time of filling in the questionnaire are provided on the COROP scalar level. This spatial aggregating is carried out to prevent privacy issues regarding the information of individuals.

4.2 Measurements of inter-regional migration

4.2.1 Migration

To analyse whether or not student migrate during their study or after graduation. This research uses the variables of the HBO-monitor on their place on residence when 16 of age [n_w16cor], at last year of study [n_wljcor] and approximately 1.5 years after graduation [n_wnucor]. A movement between these regions is treated an administrative migration, therefore a change in COROP-region indicates a migration.

This analysis on migration behaviour is similar to the work of Venhorst (2012) in which the NUTS-2 regions are used to assess whether graduates leave the regions. This research furthermore explores whether this spatial mobility has changed over time. In contrast to the research of Venhorst (2012) this paper uses the NUTS-3 scalar level. Therefore, migration over a smaller distance is administrated since this research is also interested in short distances spatial mobility.

This research focusses on three migration types. First the migration between place of residence at the age of 16 and the last year of study. Secondly the migration between the place of residence at the age of 16 and after graduation. Thirdly the migration between the place of residence at the last year of studying and after graduation. The data on these three migrations enables this research to identify changes in migration behaviour between the three cohorts. This data on migration forms furthermore the basis for the analysis of migration distances addresses later. The syntax of the data-management is showed in appendix II.

4.2.2 Migration distance

The migration distances of each respondent are calculated by combining the data of 'the migration between COROP-regions' and the 'distances of between COROP-region'. The change of registered COROP within the HBO-monitor data enables matching of migration distances. Thus, the migration between particular COROP-regions has to be uniquely coded and matched with the corresponding distance between the COROP-regions. To calculate the distances between all 40 COROP-regions the centroids the COROP-regions are calculated through Geographical Information System software. Additional calculations of distances between these individual centroids provides data about all distances between COROP-regions. Since all COROP-regions are uniquely numbered, a transition from COROP 26 (CR26) to COROP 4 (CR4) matched to the particular migration results in a distance of 165 km (165013.9754 metres). These calculated distances between the 40 COROP-regions are displayed within appendix I.

4.3 Control variables

To analyse the effect on the inter-regional migration distances of the 'sociaal leenstelsel' other factors that influence this distance have to be controlled for. This chapter explains the factors that according to prior research affects inter-regional migration distances. The chapter is divided in four parts, the first paragraph focusses on the personal traits of students. Next the traits of the region are discussed that are controlled for. Whereafter the factor of the twelve different provinces is controlled for. Finally, the field of study is controlled for. These control variables are based on prior academic findings discussed in chapter 2 and 3. The control variables are used within the regression in chapter 0 to assess the effect of the introduction of the 'sociaal leenstelsel' on the inter-regional migration.

4.3.1 Personal Traits

The effect of personal traits on migration behaviour is described by multiple academic papers. For this research the focus is on the personal traits that influence the inter-regional migration during their period of studying. The personal traits considered within this research are; age, sex, educational level and field of study. This data is included within the survey data of the HBO-monitor over the cohorts and therefore are used to asses these results.

4.3.2 Regional Traits

The traits of regions furthermore explain the migration decision of students and therefore the inter-regional migration distances. The regional traits considered within this research are the amenities within an area and the housing costs. To assess the provision of amenities within an area the density of addresses is assessed. The provision of amenities is closely related to the density of addresses. Therefore, a higher density of addresses of the migration region has an explanatory effect the migration decision of a student. The density of addresses is assessed by using the average density per COROP-region publicly available (CBS, 2022b).

Secondly, this research considers housing costs and especially high housing costs as a deterrent for location decision making process. To assess the housing costs of an area this research uses the real estate value within the area as an approximation for the housing costs. Rent pricing and real estate value are correlated and therefore the comparison of regions by average real estate value provides a clear indication between rent prices of regions (Sirmans & John, 1991). The average real estate value price within a COROP-region uses the data of the average 'WOZ-waarde'. This data is provided by the CBS and is updated for each year (CBS, 2022c). This research uses the data from the year 2016, since this year is closest to all years assessed. The data, containing the average 'WOZ-waarde' of 2016 per COROP-region, enables the research to control for the variation of rent prices between regions. Rent prices has a large effect on the affordability of living in a region.

4.3.3 Provinces

Further variances of regionalities, such as socio-economics, social behaviour or accessibility are explained by adding the control variable of provinces. At first the socio-economics of a region such as labour market conditions and other regional difference explain migration decisions. Secondly the social ties that affect relocation decision behaviour affects the migratory decision-making process. This paper therefore assumes that socio-economics and social ties differ between provinces and therefore further explain the movement of students. Thus, the provinces help to better understand the inter-regional migration distance of individuals.

5 Results

This chapter shows the results of the HBO-monitor data. These results consist of descriptive statistics, the changes in inter-regional migration and migration. The descriptive statistics consists of a table showing the number of respondents, the mean of the main characteristics per cohort and aggregated. Next the geography of response is displayed, to further discuss the differences in regional responses. The changes in inter-regional migration show how the different migratory movements differ per cohort and how this relates to the introduction of the 'sociaal leenstelsel'. The regression part of the results explains to what extent the introduction of the 'sociaal leenstelsel' explains the changes in migration.

5.1 Descriptive statistics

After the data of the HBO-monitor is prepared the number of observations is reduced to 51,473 respondents (Table 1). This table furthermore shows that approximately 2/3 of respondents are women. To counter the underrepresentation of particular traits, such as the traits of sex and the underrepresentation of men a weighted factor is used. This weighted factor is used for the charts displayed within this chapter. For the regression the data is not weighted since this would eliminate the independence of the data.

Table 1 - Descriptive statistics

Cohort	2013/2014	2016/2017	2019/2020	Aggregated
Observations (N)	16,508	16,801	18,164	51,473
Sex (% Female)	67.2%	66.1%	66.3%	66.5%
Age (Mean)	23.01	23.09	23.05	23.06
Education (% VWO)	22.2%	18.9%	15.4%	18.7%
Relocated before last study year	24.7%	27.2%	28.7%	26.9%
Relocated ± 1.5 after graduation	24.5%	26.4%	26.4%	25.8%
Return migration	32.2%	28.2%	29.9%	30.3%

Source: HBO-Monitor

Table 1 shows that the cohort of 2013/2014 consists of a relative high percentage of people with a secondary level in VWO. Between the cohorts the spread for the mean of age is small, however this is mean is heavily influenced by the selection for the target group (discussed in 4.1.2).

5.1.1 Geography of response

To explore the spatial distribution of the respondents a cartogram is used to visualise the geography of the respondents. Cartograms are maps that visualise quantitative data of a particular area, while containing the original boundaries of an area (Nusrat & Kobourov, 2015). The area is adjusted in size according to the quantitative specifics of the region. Cartograms visualise the human geography of a region (Ballas et al., 2017). These cartograms identify the geography of the respondents, while furthermore enabling the comparison of the spatial distribution between the response (Figure 3) and the population within the Netherlands (Figure 4). The figures show that the provinces Groningen, Friesland, Drenthe, Flevoland, Utrecht and Zeeland are represented well according to the total population. The provinces of Friesland and Drenthe are underrepresented within the HBO-monitor compared to the total population, while the provinces of Gelderland and Noord-Brabant are overrepresented by the survey.

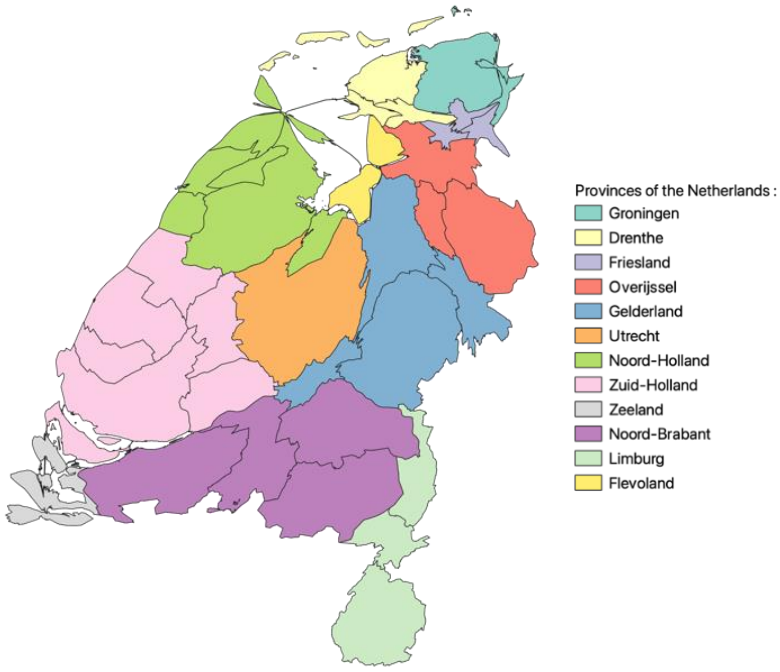

Figure 3 - Spatial distribution of response

Source: HBO-Monitor

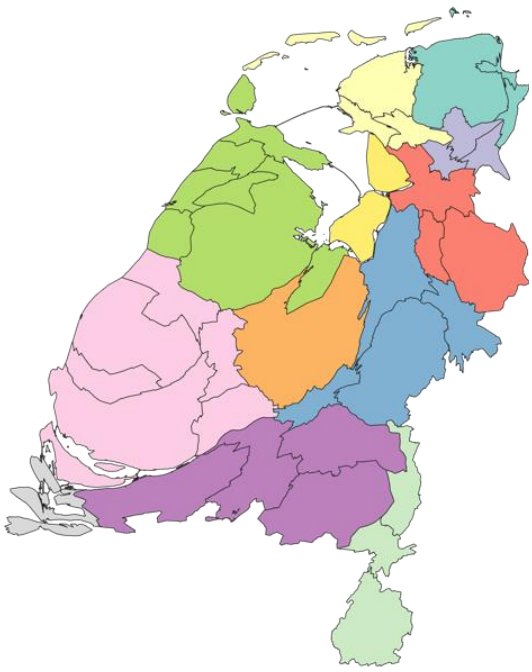

Figure 4 - Spatial distribution of student population

Source: CBS

5.2 Changes of inter-regional migration

This chapter explains how the distance and percentages of inter-regional migration has changed over the cohorts, both on the national and provincial scale. Within the national level there is a particular focus on the change in inter-regional migration distance of the student that have relocated. For both the national and provincial level, the migration of students is assessed within different stages; during the study, approximately 1.5 years after graduation and return migration. The migration during the study and after graduation are assessed using both distances and percentages. The return migration is exclusively assessed by percentages since the distances of return migration are explained by the two other forms of migration.

5.2.1 National

Figure 5 shows the national inter-regional migration distances of students differs between the three cohorts. These distances display the average migration distance between COROP-regions of students that have migrated. These average migration distances are calculated for the three cohorts and for both the inter-regional migration during the study and after graduation. The assessment on the national level is subdivided in a chapter that focusses exclusively on the distances of students that have relocated

The percentages of inter-regional student migration are displayed in Figure 5. The bar chart shows different patterns. Over the cohorts the percentage of students that migrate inter-regionally during their study increases. The percentage of inter-regional migration after graduation remains similar over the cohorts. While inter-regional return migration declines over the cohorts. The increased inter-regional migration during the study shows that more students leave the parental home. This contrasts the findings of Berg (2020) and contrasts logical reasoning. Logical reasoning would assume that the reduced financial position of students as a result of the 'sociaal leenstelsel' would lead to less students leaving the parental home. Therefore, the percentage of inter-regional migration after graduation shows to be less influenced by the introduction of the 'sociaal leenstel' than prior cohorts. The inter-regional return migration shows a declining pattern. This pattern indicates that a fewer number of students returns to their parental COROP-region after finishing their study than the prior cohorts. The percentage of students migrating between COROP-regions is relatively low. The return migration of students, the relocation back the COROP-region where the parents originate from, has decreased over the cohorts. Therefore, a higher percentage of students within the cohort of 2019/2020 leaves the parental home during their study, of which a similar

percentage relocates after graduation and fewer students move back to the parental home. The next paragraph assesses the distance of the inter-regional migration of the students that have relocated, whereafter the inter-regional migration distance of the population is assessed.

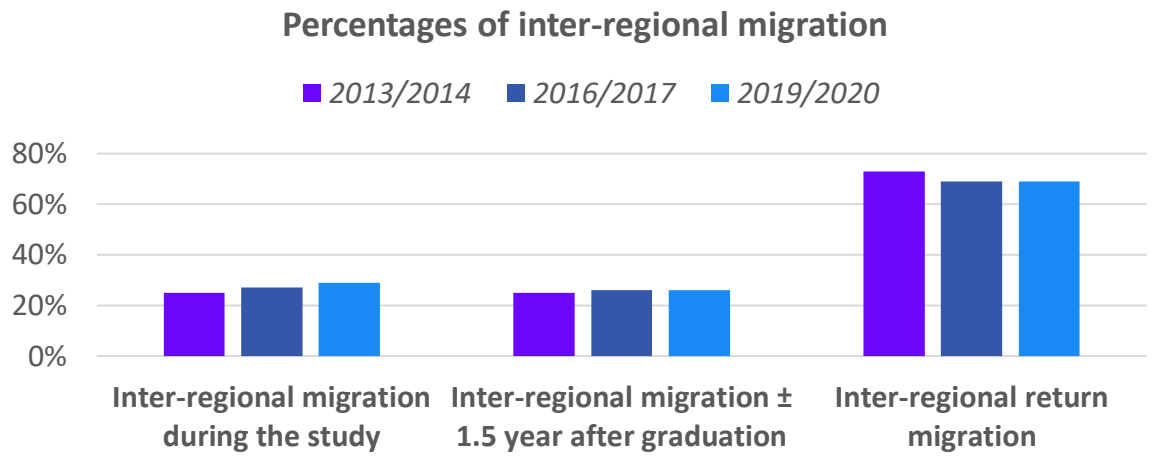

Figure 5 - Percentages of inter-regional migration

Source: HBO-Monitor

The students that have relocated between COROP-regions show a clear trend of reduced migration distances after the introduction of the 'sociaal leenstelsel' (Figure 6). This reduced inter-regional migration distance corresponds with the findings by de Jonge (2017). In this paper de Jonge (2017) shows that an increasing number of students opt for a study location in closer proximity to the parental home. Therefore, students move, in comparison to prior cohorts, at a later moment to the place in which the study in facilitated. Since the students in the last cohort opt for study facilities closer to the parental home, the inter-regional migration distance is reduced. The reduced inter-regional migration distance during the study is furthermore likely to affect the migration distance after graduation. The reduced migration after graduation can therefore be partially explained by the diminished return migration (Figure 5).

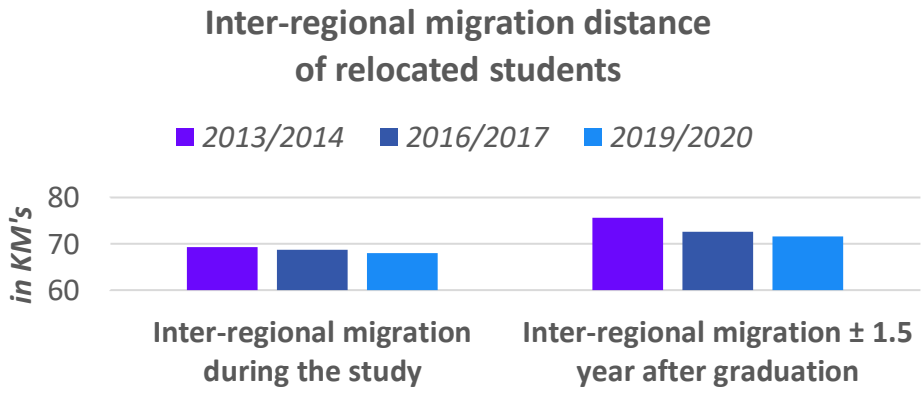

Figure 6 - Distances of inter-regional migration of relocated students during the study and after graduation

Source: HBO-Monitor

The bar-chart that visualises the inter-regional migration distances of the target population gives a different overview (Figure 7). The migration distances during the study have increased by approximately 15% over the entire population. This can be explained by the increased percentage of the population that leaves the parental home during the study. In 2013/2014 24.7 percent of the population left the parental home during their study, in 2019/2020 this percentage increased to 28.7 percent (Table 1). Therefore, although the average migration distance of students that relocated decreased (Figure 6), the overall migration distance increases since more students leave the parental home. The inter-regional migration distance after graduation shows to have a spike in 2013/2014, the

moment that the 'sociaal leenstelsel' was introduced. Whereafter the inter-regional migration distance decreases by 0.5 kilometres to a similar level compared to 2013/2014. There is no explanation for the increases inter-regional migration distance in 2016/2017. The percentage of students migrating after graduation is similar to the prior cohorts (Figure 5), while the average inter-regional migration distance has decreased (Figure 6).

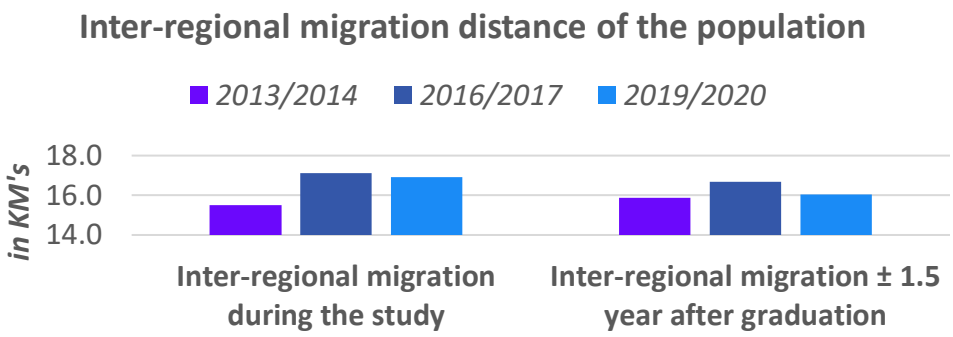

Figure 7 - Distances of inter-regional migration of the population during the study and after graduation

Source: HBO-Monitor

To provide an overview on inter-regional migration during studying within the Netherlands, the data concerning the COROP-regions is aggregated and displayed within figure 8. The shading of the COROP-regions indicates the percentual chance of students leaving the parental home between 2013 and 2020. These results show that regions such as 'Zuid-west Friesland' and 'Noord-Limburg' are grey shaded. This indicates that an increasing number of students within this region remain at their parental home in the cohort 2019/2020, in comparison to the cohort of 2013/2014. The bar-charts displays the inter-regional mobility distances of students and therefore indicate the average migration distance of a student that leaves the parental home. The regional differences can vary to a large extent. The percentual changes in the provinces of Limburg of Noord-Holland show high variances, while on the other hand the province of Drenthe shows an overall increase of student leaving their parental home, in comparison to prior cohorts.

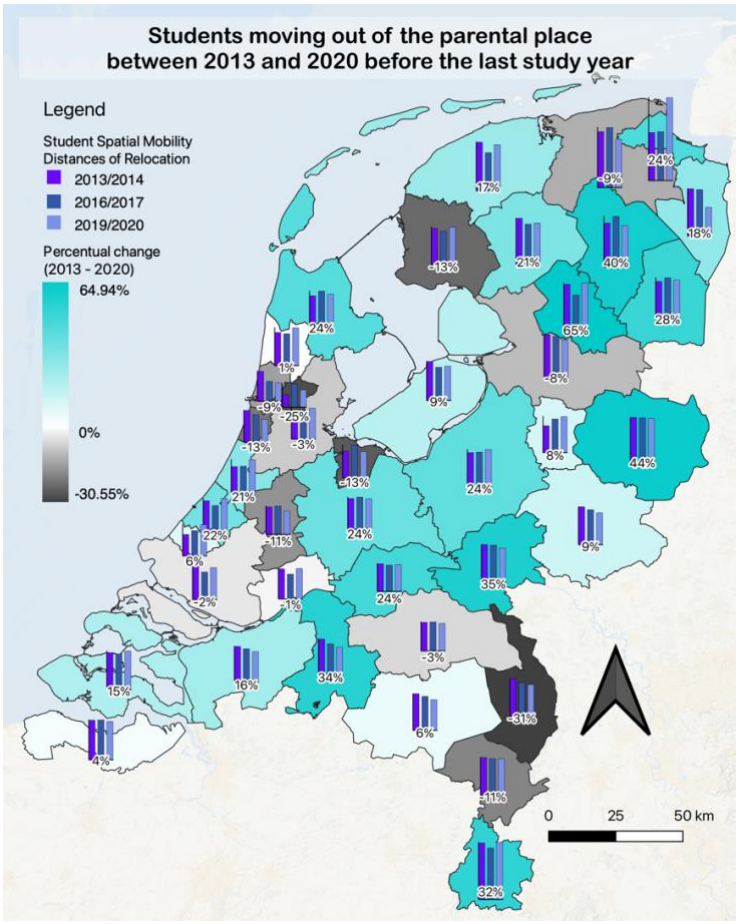

Figure 8 - Changes in student mobility across the Netherlands (appendix IV)

Source: HBO-Monitor

Figure 8 shows that moving out of the parental place differs between regions. An assessment on the provincial scale enables to further understand the regional differences of inter-regional migration within the Netherlands. This since the different provinces differ in the type and accessibility of educational facilities. It is therefore beneficial to assess the changes on a smaller scalar level, next to the national changes. The COROP scalar level would result in 40 different regions for comparison, while further offering more extreme differences in the accessibility of educational facilities. Therefore, the differences of the various types of migration are discussed on the provincial scale in the next paragraphs.

5.2.2 Provincial

Chapter 5.2.1 shows the results of the difference in inter-regional migration both in distances and percentages for the Netherlands. This chapter covers the scalar level of provinces and shows the regional differences of inter-regional migration percentages and distances over the cohorts. The percentages are displayed by bar charts and the distances by boxplots. This paragraph identifies the percentual changes and the changes in the distances of the migration of students over the cohorts and between provinces. These changes are assessed using the same stage of the study process as the national level. It starts with the inter-regional migration during the study, whereafter the migration after gradation is discussed and the change in percentage of return migration of students. The chapter concludes by assessing the changes of inter-regional migration distances on the provincial scale over the three cohorts.

Firstly, the differences in percentage of inter-regional migration during the period of studying are assessed. The bar chart (Figure 9) shows general a trend of an inclining percentage of students migrating between COROP-regions over the cohorts. This finding corresponds with the national trend discussed in the prior paragraphs. The chart furthermore shows the regional difference of the provinces. The chart shows a large difference of the percentages of students that migrate to another COROP-region. Within Zuid-Holland the percentage remains under 20% of the students, while the percentage in Drenthe for the cohort of 2013/2014 was over 40% and for the cohort of 2019/2020 was over 60%. Furthermore, the chart shows that in conversely to the national trend the provinces of Zeeland and Flevoland show a clear declining trend. The provinces of Groningen, Noord-Holland, Noord-Brabant and Limburg remain respectively stable, while the other provinces follow the national trend in a similar or amplified trend.

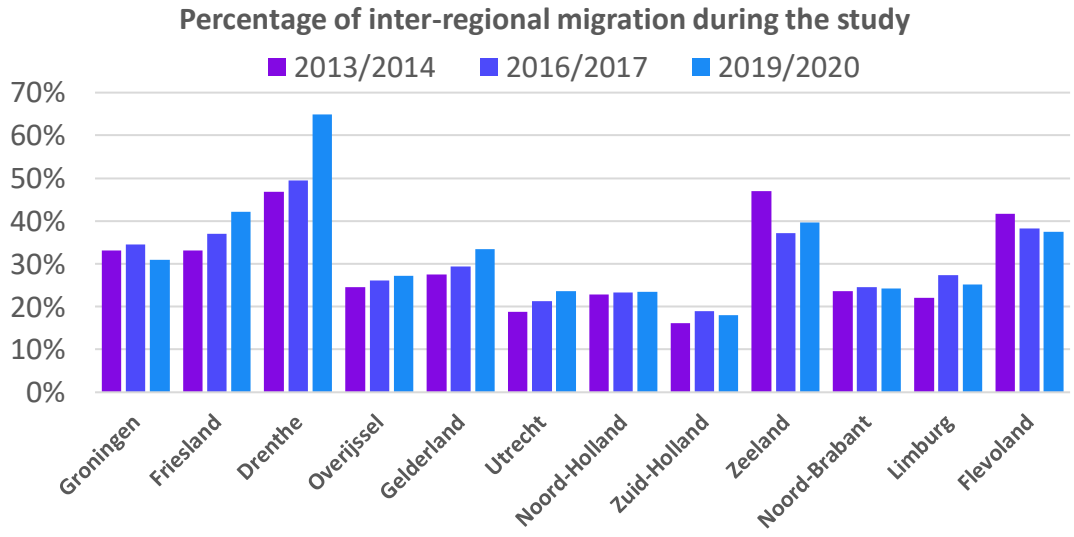

Figure 9 - Migration of students during their study (%)

Source: HBO-Monitor

Secondly, the differences in percentage of inter-regional migration approximately 1.5 years after graduation are illustrated by figure 9. The bar chart (Figure 10) provides a fuzzier image of the different provinces. Similar to the national level, there is no clear alteration over the cohorts. Some of the provinces show an inkling in the percentage of migration after graduation, while other provinces have a declining trend and other provinces are stable.

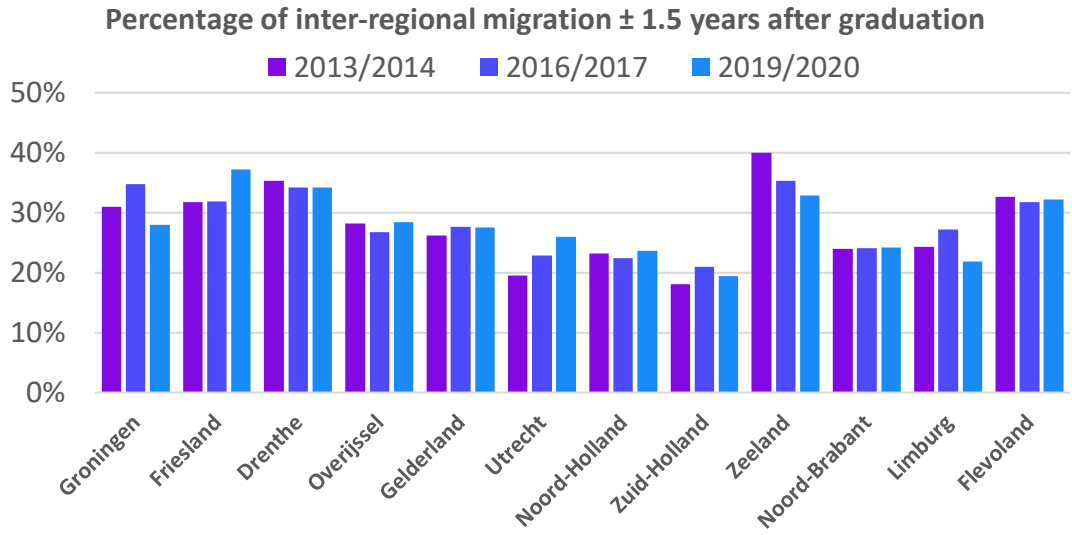

Figure 10 - Migration of students after graduation (%)

Source: HBO-Monitor

Thirdly, the return migration of students is illustrated by the bar chart below (Figure 11). As priorly shown by figure 6, the return migration is also impacted by the introduction of the 'sociaal leenstelsel'. Figure 11 shows that the twelve provinces vary in alteration of the percentages of return migration over the cohorts. In general, the percentage of return migration decreases which is in line with the national pattern. However, the province of Flevoland shows an upward trend in return migration. Furthermore, it is interesting to see that the return migration rate for Drenthe is around 20%. Conversely the rate of Utrecht is towards 40%, showing that there are distinguishable regional differences for return migration.

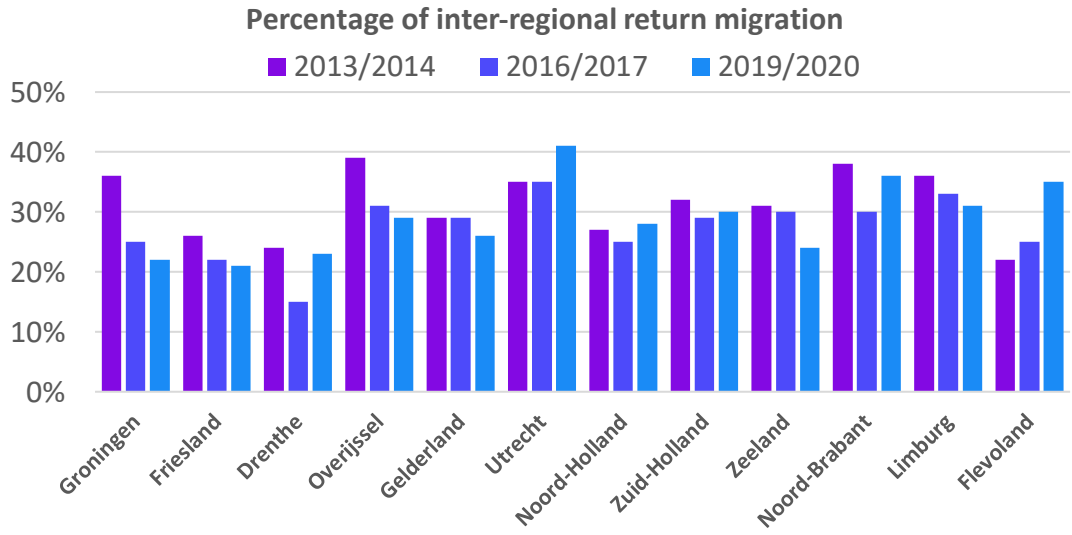

Figure 11 - Percentage of inter-regional return migration

Source: HBO-Monitor

The inter-regional migration distances are assessed by using box-plots. A box-plots provides detailed information such as the median and the spread of the data. Therefore, in contrast to the other data used for the analysis the data used for the boxplots is non-weighted, to show the variance in data of the inter-migration distances. The boxplots provide information concerning the distribution of the individual migration distances of

those who have relocated. The median of the boxplots indicates the middle point of the data for the inter-regional migration distance of a student. The shading of the boxplot indicates the 25% to 75% of the migration distances of the inter-regional migrants. Interpreting these shadings shows the migration differences between the cohorts of the majority of students within the provinces. The outliers provide further detail about the data, for the understanding about the changes as a consequence of the introduction of the 'sociaal leenstelsel' it has little explanatory power. The boxplots are similarly differentiated by migration during their study and approximately 1.5 years after graduation.

The boxplot concerning the inter-regional migration distance during the study (Figure 12) provides a confounding overview. The results differentiate between the provinces. When considering the median, there are few provinces indicating a clear trend. Most of the provinces show a stable pattern indicating that on average students have not altered the distance over which they migrate. Some provinces such as Gelderland, Zuid-Holland, Noord-Brabant and Limburg show a declining migration distance. This declining migration distance is small, but it is in line with the national trend of average national migration distance (Figure 6).

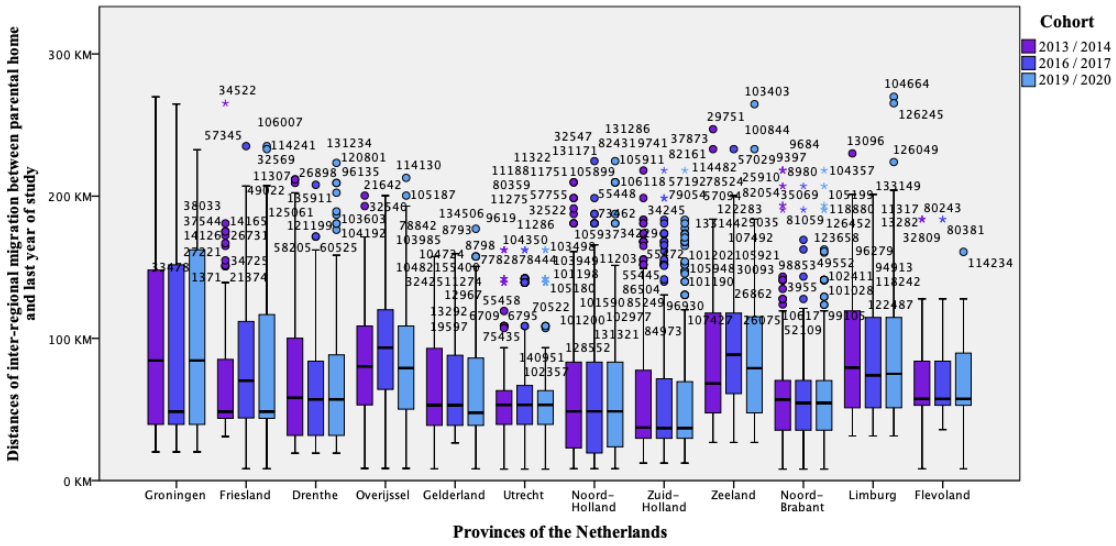

Figure 12 - Migration distances between parental home and last study year

Source: HBO-Monitor

The boxplot in figure 13 illustrates the inter-regional migration distance approximately 1.5 years after graduation. The figure shows, when looking at the medians of the provinces, more alterations in comparison to the migration distances during the study. Most of the medians of the provinces show a declining trend over the cohorts. This trend is similar to the national trend displayed in figure 5. The provinces of Utrecht, Zuid-Holland, Zeeland and Flevoland contrast this trend. The provinces of Friesland and Noord-Holland seem to barely affected by the introduction of the 'sociaal leenstelsel', when considering the median. The shading of the boxplots that indicates the majority of the variance in migration supports the interpretation of the medians. The declination of the medians is by most provinces followed by lower distances of the 25% to 75% of the students that migrate. The province of Groningen and Noord-Holland show however are more complex to interpret. The median of the province Groningen lowers, while the majority of students shows to migrate over similar distances. The 25% to 50% of the student migrants migrate over smaller distances than prior cohorts, while the 50% to 75% has a much broader spread over distance between 90 kilometres and 150 kilometres. The province of Noord-Holland shows a more stable migration distance when considering the median. The spread of migration distances however increases.

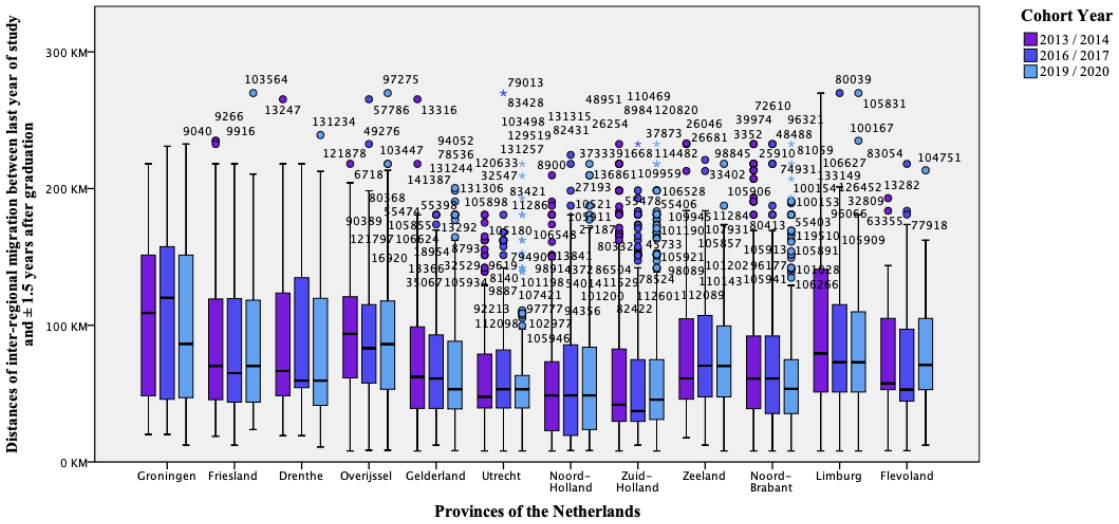

Figure 13 - Migration distances between last study year and after graduation

Source: HBO-Monitor

The charts and boxplots show that the migration distances of some province contrast the national outcomes. Other provinces follow the national trend, while particular provinces show an extreme variant of the national pattern. The boxplots show that the variance in migration distance holds further explanatory power next to the value of the median. The migration distance during the study of the Flevoland (Figure 12) shows a stable median distance, while ¾ of the population has an increased migration distance by approximately 10 kilometres. The median is unaltered, while the shading shows increased distance in contrast to the national trend.

This chapter shows that the inter-regional migration distances of students differ between provinces. The effect of the introduction of the 'sociaal leenstelsel' therefore affects the twelve provinces in different manners. The results on a national level therefore can impact a certain area differently than the national outcomes suggest. The next chapter continues on the national level and uses a regression, to discover to what extent the introduction of the 'sociaal leenstelsel' impacts the migration distance of students.

5.3 *Regressions of student migration distance*

The analysed data in the previous chapter shows evidence that the introduction of the 'sociaal leenstelsel' has overall led to an increased percentage of students leaving the parental home and a decreased inter-regional migration distance during their study. This chapter aims to discover the effect of the 'sociaal leenstelsel' on the distance of inter-regional migration during studying and the chances on relocation during the study, relocation after graduation and return migration. The used control variables are based on prior academical research and are discussed within paragraph 4.3. At first the effect of the introduction of the 'sociaal leenstelsel' on inter-regional migration distance during studying is assessed. Whereafter, the chances of relocation during the study period, after graduation and return migration are assessed for the factors and cohorts.

The regression concerning the inter-regional migration distance during studying consists of 8 models. The first model is the base model and it uses the cohorts as the dependent variable, the reference category is the year 2013/2014. The second model adds personal traits, that consists of the age, sex and level of education of the student. The next model adds regional traits such as real-estate value and address density. The fourth model adds the regionalities of the provinces. Whereafter the fifth model adds the field of study. The last three models show the effect of all variables on the individual cohorts.

The fifth model has the highest R-squared at 0.114, indicating that 11.4% of the variance in the inter-regional migration is explained by the model. The model furthermore shows that in reference to the cohort 2013/2014 the migration distances of the 2019/2020 cohort are .815 km higher at a 1% probability. This is in contrast to the bar-chart (Figure 6) that shows a decline of the national mean of inter-regional migration over the three cohorts. The positive value can be explained by the matter that more students in the cohort of 2019/2020 leave the parental home during their study (Table 1). The average inter-regional migration distance of the total population has therefore increased (Figure 7), while the average migration distance of the students that moved declines (Figure 6).

A similar regression with exclusively students that relocated shows negative values for the later cohorts in reference to the cohort 2013/2014 (Appendix V). This supports the findings presented in the bar-chart that concerns about migration distances of students that relocated (Figure 6).

The lasts three models (models six, seven and eight) show the effect of variables on the individual cohorts. A comparison between these models shows that the personal traits have over the years increased the impact on inter-regional migration distance when other variables remain similar. Conversely, the regional traits have lost their impact on the migration distance in comparison to the prior cohorts when other variables remain equal.

The average inter-regional migration distance for women is higher than for men. Model 5 shows an additional 6.8 km migration distance for women ceteris paribus. These average distances for this personal trait changes over the cohorts and is the highest for the cohort 2016/2017. It can therefore not be concluded that the introduction of the 'sociaal leenstelsel' has led to higher disperse in migration distances between men and women.

Since the announcement of the introduction of the 'sociaal leenstelsel' the migration distance of graduated VWO students that opt for an education at applied university increases. This higher migration distance can be explained by a declining percentage of VWO-students opting for education at applied universities (Table 1). The students that remain opting for an education at applied universities are likely to be willing to migrate over larger distance because of a specific field of study and motivation to attain to these applied universities.

The regression concerning the migration distance during the study shows that the introduction of the 'sociaal leenstelsel' has led to different alterations in migration distance and factors affecting it. It shows that for the entire population the migration distance has increased as a consequence of the introduction. Conversely, the migration distance has decreased when targeting exclusively the students that have relocated. Students that have an VWO-degree are likely to relocate over larger distances after the introduction. The chances of relocation during the study, after graduation and the return migration can furthermore be predicted. This can be predicted by using a logistic regression. The next paragraphs focus on the change in the chance of relocation during the study, after graduation and for return migration.

The chance of relocation is predicted by using a logistic regression. This thesis calculates the chance of relocation during the study, after graduation and for return migration. These regressions are included within the appendix (VI – VIII). The models are similarly constructed as the regression concerning the migration distances. Therefore, the base model contains the cohort years as an explanatory factor, whereafter the personal and regional traits are added. The fourth model adds the provinces and the fifth model adds the field of study.

The logistic regression concerning the chances of relocation during the study (appendix VI) shows that the chances of leaving the parental home have not altered after the introduction of the 'sociaal leenstelsel'. A comparison between the models 6 and 8 shows that the age has become a larger predictor for the chance of leaving the parental home. This finding corresponds to the findings by de Jonge (2017). The chance of relocating during the study as a women compared to a man has additionally decreased.

The chance of relocation after graduation through the logistic regression (appendix VII) shows the introduction of the 'sociaal leenstelsel' has little effect on the chances of relocation. The coefficient of the cohort 2016/2017 is similar to the cohort of 2019/2020 and therefore the introduction has barely an effect on relocation decision. The comparison between the models 6 and 8 show that the age has a larger effect on the chance of relocation after graduation over the cohorts. The effect of having a VWO-degree on the chance of relocation after graduating has decreased.

The logistic regression that focusses on the chance of return migration shows that the introduction of the 'sociaal leenstelsel' has a negative effect. The values for the last two cohort years are negative, and thus indicating that since the introduction of the 'sociaal leenstelsel' the chance on return migration decreases. Furthermore, the negative effect of having a VWO-degree on return migration diminishes, while the negative effect of age slightly increases in the for the last cohort.

The chances of relocation provide a deeper understanding of the change in dynamics of the introduction of the 'sociaal leenstelsel'. This despite the relatively low explanatory power of the models, indicated by low pseudo R-squares. These low values indicate that a low percentage of the variance of the independent variable is explained by the dependent variables. The regression nevertheless provides an indication of the dynamics.

Table 2 - Regression of student migration distances during study of the population (KM's)

	(1) base|model	(2) +Personal Traits	(3) +Regional Traits	(4) +Provinces	(5) +Field of Study	(6) 2013/2014	(7) 2016/2017	(8) 2019/2020
Cohort *(ref: 2013/2014)*								
2016/2017	1.631***	1.545***	1.38***	1.23***	1.12***			
	(.441)	(.438)	(.436)	(.419)	(.417)			
2019/2020	1.403***	1.718***	1.684***	1.208***	.815**			
	(.429)	(.427)	(.425)	(.409)	(.407)			
Age		3.274***	3.027***	2.715***	2.774***	2.697***	2.579***	3.033***
		(.224)	(.223)	(.215)	(.214)	(.376)	(.381)	(.355)
Sex *(ref: Male)*								
Female		5.139***	4.842***	4.337***	6.776***	6.022***	7.433***	6.763***
		(.372)	(.37)	(.356)	(.4)	(.711)	(.719)	(.657)
Education (*ref: HAVO)*								
VWO		6.211***	6.283***	6.388***	6.419***	5.275***	7.159***	7.072***
		(.48)	(.477)	(.459)	(.458)	(.742)	(.806)	(.844)
RE-Value			-.028***	.033***	.033***	.039***	.044***	.014
			(.004)	(.005)	(.005)	(.009)	(.01)	(.009)
Address density			.004***	.009***	.009***	.008***	.008***	.01***
			(0)	(0)	(0)	(0)	(0)	(0)
Provinces *(ref: Zuid Holland)*								
Groningen				26.881***	26.487***	26.069***	27.54***	25.882***
				(1.171)	(1.164)	(2.009)	(2.067)	(1.975)
Friesland				28.188***	27.338***	23.589***	27.154***	30.62***
				(.997)	(.991)	(1.725)	(1.857)	(1.602)
Drenthe				37.859***	37.529***	36.775***	33.626***	41.113***
				(1.193)	(1.186)	(2.121)	(2.125)	(1.936)
Overijssel				21.23***	21.239***	19.557***	22.319***	21.578***
				(.73)	(.726)	(1.29)	(1.246)	(1.243)
Gelderland				18.422***	18.487***	17.696***	17.81***	19.826***
				(.664)	(.66)	(1.146)	(1.174)	(1.111)
Utrecht				4.908***	4.849***	2.817**	3.499**	8.195***
				(.816)	(.811)	(1.387)	(1.438)	(1.389)
Noord-Holland				-1.378**	-1.347**	-.283	-2.642**	-.815
				(.683)	(.678)	(1.217)	(1.178)	(1.14)
Zeeland				39.803***	39.836***	38.976***	39.954***	40.528***
				(1.061)	(1.054)	(1.839)	(1.958)	(1.709)
Noord-Brabant				11.79***	11.276***	11.203***	10.4***	12.219***
				(.623)	(.62)	(1.063)	(1.118)	(1.044)
Limburg				22.428***	22.218***	19.961***	22.718***	24.226***
				(.748)	(.744)	(1.26)	(1.344)	(1.27)
Flevoland				24.731***	23.896***	28.536***	22.239***	22.149***
				(1.328)	(1.32)	(2.473)	(2.291)	(2.139)
Field of Study (ref: General)								
Agriculture					-13.491			-15.678
					(19.438)			(19.439)
Teaching					-35.185*	-22.89***	-22.829***	-36*
					(19.428)	(1.834)	(1.864)	(19.419)
Engineering					-27.271	-16.412***	-14.701***	-27.091
					(19.426)	(1.767)	(1.704)	(19.409)
Economics					-28.758	-16.772***	-17.539***	-28.231
					(19.423)	(1.678)	(1.637)	(19.402)
Health					-32.122*	-19.111***	-21.364***	-32.093*
					(19.425)	(1.776)	(1.732)	(19.408)
Humanities					-32.82*	-18.645***	-22.863***	-33.03*
					(19.425)	(1.814)	(1.762)	(19.41)
Arts					-21.534	-15.14***	-12.39*	-7.926
					(19.64)	(4.249)	(7.122)	(20.186)
Constant	15.493***	-64.451***	-59.754***	-87.866***	-60.969***	-70.616***	-68.863***	-64.581***
	(.31)	(5.16)	(5.207)	(5.046)	(20.055)	(8.968)	(9.097)	(21.106)
Observations	40716	40716	40716	40716	40716	13263	12980	14473
R-squared	0	.016	.027	.102	.114	.099	.119	.126

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

6 Discussion

This work shows that the 'sociaal leenstelsel' has led to a higher percentage of students leaving the parental home, which contrasts the findings by Berg (2020). These differences in outcome can be the result in the different measuring techniques. The study of Berg (2020) uses administrative data and conducts an event history analysis in contrast to the focus on two moments within this research. This research therefore is 'blind' for the moment when the relocation occurs. Nevertheless, over the same period the study of Berg (2020) still shows a decline of students leaving the parental home. This could also be explained by the fact that the data is administrative rather than survey data. The change of residential location is therefore registered when the student registers within another municipal area. The incentive to register at another municipality has decreased after the introduction of the 'sociaal leenstelsel', since the eligible amount of student grant is since the introduction no longer dependent on residential circumstances.

This thesis makes exclusively use of the data concerning of student at applied universities (HBO). Prior literature shows that the migration motives between the student of applied universities and regular universities differ (Sá et al., 2012). Additional, according to the research conducted by Venhorst (2011) the students of applied universities are less spatial mobile than regular universities students. Distance between the parental home and the higher education institution is therefore stated to be smaller for students of applied university students (Berg, 2020). The effect of the introduction of the 'sociaal leenstelsel' therefore affects the diversity among the student population differently. The findings within this research are therefore exclusively representative to students that study at an applied university.

The multi-location of applied universities that are stated by Sá et al. (2012) make the decision-making processes of students more convoluted. Universities are located more centralised within specific cities. The migration of university students is therefore more clustered towards specific regions. This makes the assessment of migration behaviour furthermore possible on the inflow of people towards these regions.

Therefore, it is academically beneficial to do a similar analysis on the change of student migration distance using data of the university student population. This data is managed by the ROA, it is however not publicly available because of the privacy limitations concerning the addresses of the students.

The changes of grant systems are prone to have an effect over time, therefore this thesis assesses the short-term changes on both a national and provincial scale. Since the migration decisions are furthermore influenced by social norms and expectations, the underlying effects are currently unaddressed. The long-term changes therefore have to be assessed at a later moment in time, since the most recent data concerns 2020.

The relative low R-square of the regression leads to little explanation of the distance by the model, therefore other factors should hold explanatory power that are currently unaddressed. Additional control variables could strengthen the regression models and could provide different a different outcome.

The addition of a later cohort after the year 2020 would be beneficial, since all graduated students will have been prone to the consequences of the 'sociaal leenstelsel'. This would further help to see whether the trend discovered stabilise or continue over the years.

7 Conclusion

The figures showing the national average inter-regional migration distance indicate a trend of declined migration distance. This trend is visible in figure 6 and shows a decline between the years 2013 and 2019. These findings correspond with the findings of de Jonge (2017), stating that students prefer a study location in close proximity to the parental home. The inter-regional migration distances are therefore shorter since the distance towards the education facility needs to be commuted prior to relocating. Further data on the national level shows that the inter-regional migration rate during the study increases while the return rate decreases. This contrasts the findings of Berg (2020), stating that fewer students leave the parental home or leave at a later moment. The inter-regional migration rate after graduation remains similar over the cohorts. It can therefore be concluded that more students within the 2019/2020 cohort leave the parental home during their study and less return after finishing compared to prior cohorts. The migration distances are however over shorter distances, since assumingly these students have commuted this distance prior to relocating.

The data on the provincial level shows that the introduction of the 'sociaal leenstelsel' leads to differentiated outcomes. These outcomes are likely to differ since the geography of the regions differs, the availability of the study facilities furthermore differs. The motivation of students to study at a particular location differs, however can be considered to be spread equal over geography. Particular locations have a higher pull-factor than other locations, however since the data concerns province of origin the dynamics of the likeable student locations are negligible. When considering individuals provinces, Drenthe shows an overall exodus of students. The students that originate from Drenthe have been more likely to leave the COROP-regions before the introduction of the 'sociaal leenstelsel'. After the introduction the percentage of students leaving the COROP-regions has increased (Figure 9). The average migration distance of these students has however decreased (Figure 12). This makes the province of Drenthe an extreme case of the national trend.

The regression has a relatively low R-squared, therefore the explanatory power of the model only explains a fraction of the variance of the data. The regression however shows that the cohort of 2019/2020 positively affects the inter-regional migration distance. This implies that the introduction of the 'sociaal leenstelsel' has led to higher migration distances. This contrasts the findings of prior academia and the interpretation of the charts showing the migration patterns. The effect of being a woman or having graduated with a VWO-degree leads to higher migration distance in comparison to prior cohorts.

It can be concluded that students have altered their migration behaviour after the introduction of the 'sociaal leenstelsel'. The percentages of students that move during the study shows that more students leave the parental home in comparison to the cohort before the introduction of the 'sociaal leenstelsel'. The national average of student migration distance shows that the distance migrated has declined over the years. In some provinces these effects are more present than in others, while in particular provinces the effect is barely noticeable in the data or conversely. The regression does not back the results of the individual assessed data and contrasts prior academic findings.

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Appendices

Appendix I - Distances between COROP-regions in metres

ID	CR01	0	CR03	CR04	CR05	CR06	CR07	CR08	CR09	CR10
CR01		30945.46502	39460.39817	84431.67407	96355.76267	64815.03038	33057.0313	34271.11319	58641.79936	76083.56546
CR02	30945.46502	0	20189.04565	67967.35344	90246.01211	62368.98166	41742.28019	59514.91042	70937.98185	90211.98073
CR03	39460.39817	20189.04565	0	48487.79826	70248.45561	43691.55848	31735.47827	57106.95903	58239.14444	77311.81319
CR04	84431.67407	67967.35344	48487.79826	0	34921.08126	35554.3858	59454.20328	87293.01953	66507.58528	79075.52933
CR05	96355.76267	90246.01211	70248.45561	34921.08126	0	31680.68913	64377.61873	85931.25604	54811.46778	59038.72632
CR06	64815.03038	62368.98166	43691.55848	35554.3858	31680.68913	0	32723.75731	56220.3548	30998.35231	44421.7395
CR07	33057.0313	41742.28019	31735.47827	59454.20328	64377.61873	32723.75731	0	28644.02237	29329.7613	48524.39567
CR08	34271.11319	59514.91042	57106.95903	87293.01953	85931.25604	56220.3548	28644.02237	0	34479.90406	47080.51453
CR09	58641.79936	70937.98185	58239.14444	66507.58528	54811.46778	30998.35231	29329.7613	34479.90406	0	19306.24871
CR10	76083.56546	90211.98073	77311.81319	79075.52933	59038.72632	44421.7395	48524.39567	47080.51453	19306.24871	0
CR11	98820.88079	116967.8723	105481.7175	106396.805	81773.55746	72729.92736	75371.35277	65827.34438	47278.03242	28830.83922
CR12	88262.17349	113163.3184	107026.0894	121649.6937	104212.4035	86100.15057	75323.89883	54330.26106	55312.81547	45173.9406
CR13	125796.8852	140004.363	125715.536	115060.3579	83918.71264	86443.01811	98521.50504	94443.07504	69193.17545	50187.86099
CR14	123713.7666	146502.8215	137697.6338	142734.9166	117915.8775	108554.9995	106297.5626	89451.71747	80825.83873	64146.37298
CR15	151730.2558	169975.6102	157555.0372	150670.2917	119821.1201	120721.172	128266.7542	118145.9682	99489.06883	80264.23666
CR16	178681.616	192248.0369	177028.9704	159504.8018	125330.3566	135644.0477	151056.1383	146955.151	121789.2638	102992.7477
CR17	169212.9907	178975.6595	162206.4982	139246.1855	104437.064	119229.3431	139152.2339	139941.8009	110728.5689	93418.62493
CR18	145527.2756	140187.0847	120090.6137	78338.29201	50077.63707	80817.52984	112820.8363	130450.1992	96376.49581	91849.36015
CR19	161900.8484	159460.088	139610.6411	100211.823	69475.7036	98245.70489	128855.3992	143192.3642	108713.8009	100445.901
CR20	173001.8851	172518.4804	152921.4745	115257.5415	83343.11207	110581.5589	139987.8676	152058.0494	117794.5704	107357.0594
CR21	183648.9421	185009.8342	165713.2656	129786.0226	97000.40582	122717.9872	150839.7897	160748.2111	126996.2502	114767.1808
CR22	165818.4009	166694.2338	147369.0063	111851.6118	78742.67174	104434.9975	132914.3608	143830.4976	109767.808	98563.10638
CR23	167393.6879	170242.4004	151339.0147	118347.7753	84335.26941	107884.3412	134807.7875	143596.2796	110131.8148	97326.47087
CR24	158661.0297	165721.7388	148070.3054	121870.4228	86949.67088	104528.3201	127303.4941	131594.1072	100093.273	84513.98219
CR25	196482.5116	199955.6149	181076.9937	147245.8696	113689.2225	137607.5317	164106.6447	171509.2045	138674.3101	124675.1932
CR26	212844.9299	217164.8511	198438.1215	165013.9754	131400.9318	154875.665	180724.3857	186924.2144	154671.1224	139888.7839
CR27	224487.1889	229248.7887	210598.5101	177318.797	143706.5162	167001.2886	192518.0399	198067.4338	166161.7514	150990.4243
CR28	194661.8299	201369.0887	183384.5057	154096.8604	119466.9948	139713.3307	163288.2262	167177.5333	136070.1992	120135.1865
CR29	230287.2554	236931.386	218786.4348	187830.5338	153617.3241	175095.3735	198972.8388	202405.7082	171669.7537	155454.996
CR30	206037.2101	215718.7573	198688.7235	173198.5203	138289.7127	155428.4008	176042.0908	176339.956	147605.1983	130119.1857
CR31	297497.6232	306128.171	288427.9927	258369.4775	224116.9569	244798.0516	267137.3757	267817.5562	238974.3913	221643.2935
CR32	275693.2346	282826.6679	264703.6123	233088.721	199148.027	221012.3621	244647.7477	247101.0497	217051.6289	200385.5491
CR33	238604.5363	249355.3486	232588.0908	207298.6528	172406.3232	189460.8249	209263.4705	207984.5222	180507.9528	162522.606
CR34	215361.0759	228878.2451	213395.0718	193542.7064	158853.8932	171500.6572	187768.1064	183391.0352	158518.1516	139735.1047
CR35	186750.1541	203913.1741	190502.2919	178701.1279	145687.917	151519.6157	162180.3716	153369.4775	133032.5331	113728.9664
CR36	212589.269	230982.1454	218115.8213	207061.3892	173973.8763	179678.1742	189250.0568	178763.9697	160305.3845	141014.8849
CR37	192628.4279	214518.5139	204181.1359	201254.1209	170933.428	170092.0345	173492.9179	158357.5578	146070.6726	127499.8665
CR38	223979.7408	245694.013	235009.4568	230055.9828	198626.888	199893.383	204532.2381	189708.7633	176805.5486	158019.4183
CR39	257609.2039	280124.1149	269886.1065	265334.5452	233742.8084	235164.3724	239190.3388	223382.3571	211747.0292	193078.1942
CR40	115763.6023	122321.3066	104976.2705	83949.40685	50375.31054	61778.21385	83973.63691	90687.8094	57618.96111	44527.55396

ID	CR11	CR12	CR13	CR14	CR15	CR16	CR17	CR18	CR19	CR20
CR01	98820.88079	88262.17349	125796.8852	123713.7666	151730.2558	178681.616	169212.9907	145527.2756	161900.8484	173001.8851
CR02	116967.8723	113163.3184	140004.363	146502.8215	169975.6102	192248.0369	178975.6595	140187.0847	159460.088	172518.4804
CR03	105481.7175	107026.0894	125715.536	137697.6338	157555.0372	177028.9704	162206.4982	120090.6137	139610.6411	152921.4745
CR04	106396.805	121649.6937	115060.3579	142734.9166	150670.2917	159504.8018	139246.1855	78338.29201	100211.823	115257.5415
CR05	81773.55746	104212.4035	83918.71264	117915.8775	119821.1201	125330.3566	104437.064	50077.63707	69475.7036	83343.11207
CR06	72729.92736	86100.15057	86443.01811	108554.9995	120721.172	135644.0477	119229.3431	80817.52984	98245.70489	110581.5589
CR07	75371.35277	75323.89883	98521.50504	106297.5626	128266.7542	151056.1383	139152.2339	112820.8363	128855.3992	139987.8676
CR08	65827.34438	54330.26106	94443.07504	89451.71747	118145.9682	146955.151	139941.8009	130450.1992	143192.3642	152058.0494
CR09	47278.03242	55312.81547	69193.17545	80825.83873	99489.06883	121789.2638	110728.5689	96376.49581	108713.8009	117794.5704
CR10	28830.83922	45173.9406	50187.86099	64146.37298	80264.23666	102992.7477	93418.62493	91849.36015	100445.901	107357.0594
CR11	0	32662.94712	30852.97245	36480.60031	53203.00018	81635.93396	78501.49367	102861.8173	105296.3604	108029.34
CR12	32662.94712	0	61526.22065	36696.04435	71574.71969	107024.3488	108647.7474	133036.8709	137299.9787	140608.9493
CR13	30852.97245	61526.22065	0	46697.62195	35904.90733	52894.80572	47676.80524	88599.76541	84898.04135	84022.16259
CR14	36480.60031	36696.04435	46697.62195	0	38795.12512	77470.65692	86166.0599	133492.8221	131493.2753	130545.0716
CR15	53203.00018	71574.71969	35904.90733	38795.12512	0	39199.50565	53234.57375	119948.1592	111640.2387	106474.4441
CR16	81635.93396	107024.3488	52894.80572	77470.65692	39199.50565	0	26427.46025	109148.0388	94207.63645	84205.25257
CR17	78501.49367	108647.7474	47676.80524	86166.0599	53234.57375	26427.46025	0	83303.55219	67782.6998	58100.46183
CR18	102861.8173	133036.8709	88599.76541	133492.8221	119948.1592	109148.0388	83303.55219	0	22926.83171	38936.26846
CR19	105296.3604	137299.9787	84898.04135	131493.2753	111640.2387	94207.63645	67782.6998	22926.83171	0	16076.85451
CR20	108029.34	140608.9493	84022.16259	130545.0716	106474.4441	84205.25257	58100.46183	38936.26846	16076.85451	0
CR21	111592.9716	144213.0013	84770.99099	130165.253	102255.0164	75228.33712	50500.9944	54544.89283	31793.72607	15746.87815
CR22	98317.92061	130932.6085	74121.1647	120658.6437	97102.73247	76596.01308	50220.54741	38937.92497	18394.37436	9902.468796
CR23	93928.68793	126569.9467	67679.77717	113635.985	87956.29903	65771.59842	39480.51664	48701.48603	29311.96773	18821.00822
CR24	75419.42133	107533.4932	46590.18333	91168.22395	64192.60953	45185.54001	19366.97382	64036.72811	49725.402	42387.6894
CR25	117278.9931	149336.0654	88088.67222	130800.9961	98807.49327	66349.56341	45602.43674	73409.57163	50822.78074	34837.0809
CR26	130171.9339	161528.5712	100007.4987	139994.7875	105327.7453	69047.54839	53895.34393	90765.60396	67981.374	51905.47902
CR27	140050.7698	170898.063	109534.7876	147702.0968	111744.2818	73903.15897	62389.0092	102771.7886	79913.76589	63846.93624
CR28	108154.8054	138959.3862	77591.91028	116559.0139	81937.73761	46700.88914	30617.0527	85767.4879	64787.75814	50077.84153
CR29	141773.3656	171376.144	110927.8298	145471.9234	108008.2655	68976.83662	63288.97067	115323.3352	92743.2689	76720.95981
CR30	113290.6247	141467.9228	82636.92803	113983.943	76112.8279	36967.03488	36896.13292	108607.656	88371.83311	74044.5731
CR31	204035.5733	230387.3475	173742.1941	199235.5758	160486.0808	123375.5171	128285.6307	184963.7668	162118.7743	146049.5159
CR32	184830.1162	212884.5463	154093.1533	183895.2487	145226.2364	106559.5851	107188.4986	158741.9659	135842.8509	119806.0586
CR33	143448.1183	169274.8237	113569.0722	138301.4785	99511.42522	62305.95545	70407.77897	140676.6857	119317.9523	103993.1422
CR34	117771.1739	141143.9427	89612.68209	108545.5522	70037.3673	36743.13535	54602.31472	135406.8488	116712.272	103373.9263
CR35	87954.72934	106496.1374	65135.65402	71767.53309	35382.36361	27331.40022	53465.43648	134806.7713	121023.5697	111471.6719
CR36	114276.2872	129233.4476	93236.30559	92924.6003	61076.5808	51872.75711	78045.23451	161017.9595	145657.7205	134632.3423
CR37	98817.16288	105291.1754	87025.32222	68959.68836	51160.84941	66646.99806	91527.21075	168680.2048	157471.0637	149440.1078
CR38	129532.1821	136558.4965	115047.9176	100305.736	79425.85029	83471.37304	109874.8545	191344.4092	177597.7352	167539.6871
CR39	164475.0151	169612.6009	150299.8125	133987.1946	114727.1549	115714.4257	142039.5314	224655.3845	209730.739	198662.2047
CR40	47750.27778	79251.75985	35839.06394	78218.77179	70995.70869	75639.58245	57465.70393	55583.41069	58133.58582	63196.0117

ID	CR21	CR22	CR23	CR24	CR25	CR26	CR27	CR28	CR29	CR30
CR01	183648.9421	165818.4009	167393.6879	158661.0297	196482.5116	212844.9299	224487.1889	194661.8299	230287.2554	206037.2101
CR02	185009.8342	166694.2338	170242.4004	165721.7388	199955.6149	217164.8511	229248.7887	201369.0887	236931.386	215718.7573
CR03	165713.2656	147369.0063	151339.0147	148070.3054	181076.9937	198438.1215	210598.5101	183384.5057	218786.4348	198688.7235
CR04	129786.0226	111851.6118	118347.7753	121870.4228	147245.8696	165013.9754	177318.797	154096.8604	187830.5338	173198.5203
CR05	97000.40582	78742.67174	84335.26941	86949.67088	113689.2225	131400.9318	143706.5162	119466.9948	153617.3241	138289.7127
CR06	122717.9872	104434.9975	107884.3412	104528.3201	137607.5317	154875.665	167001.2886	139713.3307	175095.3735	155428.4008
CR07	150839.7897	132914.3608	134807.7875	127303.4941	164106.6447	180724.3857	192518.0399	163288.2262	198972.8388	176042.0908
CR08	160748.2111	143830.4976	143596.2796	131594.1072	171509.2045	186924.2144	198067.4338	167177.5333	202405.7082	176339.956
CR09	126996.2502	109767.808	110131.8148	100093.273	138674.3101	154671.1224	166161.7514	136070.1992	171669.7537	147605.1983
CR10	114767.1808	98563.10638	97326.47087	84513.98219	124675.1932	139888.7839	150990.4243	120135.1865	155454.996	130119.1857
CR11	111592.9716	98317.92061	93928.68793	75419.42133	117278.9931	130171.9339	140050.7698	108154.8054	141773.3656	113290.6247
CR12	144213.0013	130932.6085	126569.9467	107533.4932	149336.0654	161528.5712	170898.063	138959.3862	171376.144	141467.9228
CR13	84770.99099	74121.1647	67679.77717	46590.18333	88088.67222	100007.4987	109534.7876	77591.91028	110927.8298	82636.92803
CR14	130165.253	120658.6437	113635.985	91168.22395	130800.9961	139994.7875	147702.0968	116559.0139	145471.9234	113983.943
CR15	102255.0164	97102.73247	87956.29903	64192.60953	98807.49327	105327.7453	111744.2818	81937.73761	108008.2655	76112.8279
CR16	75228.33712	76596.01308	65771.59842	45185.54001	66349.56341	69047.54839	73903.15897	46700.88914	68976.83662	36967.03488
CR17	50500.9944	50220.54741	39480.51664	19366.97382	45602.43674	53895.34393	62389.0092	30617.0527	63288.97067	36896.13292
CR18	54544.89283	38937.92497	48701.48603	64036.72811	73409.57163	90765.60396	102771.7886	85767.4879	115323.3352	108607.656
CR19	31793.72607	18394.37436	29311.96773	49725.402	50822.78074	67981.374	79913.76589	64787.75814	92743.2689	88371.83311
CR20	15746.87815	9902.468796	18821.00822	42387.6894	34837.0809	51905.47902	63846.93624	50077.84153	76720.95981	74044.5731
CR21	0	18350.53857	17739.88164	39078.16699	19115.4122	36221.01175	48266.45772	36007.22308	60974.22093	60099.69579
CR22	18350.53857	0	11003.76008	33340.81919	35528.52369	53273.49297	65547.40535	46930.17463	77027.58719	70203.26243
CR23	17739.88164	11003.76008	0	23763.94357	29737.97907	47226.25777	59491.12687	37292.09255	69499.42342	59917.94464
CR24	39078.16699	33340.81919	23763.94357	0	41859.85193	55595.48807	66484.04251	36012.9657	71683.99036	51481.7501
CR25	19115.4122	35528.52369	29737.97907	41859.85193	0	17769.20814	30073.38367	20988.18324	41930.29597	43852.37652
CR26	36221.01175	53273.49297	47226.25777	55595.48807	17769.20814	0	12311.08219	23490.16121	25300.01153	38095.89706
CR27	48266.45772	65547.40535	59491.12687	66484.04251	30073.38367	12311.08219	0	31946.52609	15765.86077	39185.20361
CR28	36007.22308	46930.17463	37292.09255	36012.9657	20988.18324	23490.16121	31946.52609	0	35684.89278	24102.58649
CR29	60974.22093	77027.58719	69499.42342	71683.99036	41930.29597	25300.01153	15765.86077	35684.89278	0	32076.15794
CR30	60099.69579	70203.26243	59917.94464	51481.7501	43852.37652	38095.89706	39185.20361	24102.58649	32076.15794	0
CR31	130427.9264	147265.087	140032.5639	140422.0949	111803.647	94225.12445	82205.45748	105168.2087	70538.96238	91531.67159
CR32	104296.4567	121509.3801	114827.6016	117364.2241	85981.09964	68251.61979	56046.06451	81479.93788	45917.61691	71586.16239
CR33	88788.76739	101775.4296	92211.30726	85672.45509	70201.42759	57021.42064	50062.29115	54938.16796	34603.54305	34193.3362
CR34	90301.90078	98320.27481	87507.22494	73324.54985	74823.30579	68250.14817	66693.15934	54498.5917	54756.00613	31046.13431
CR35	102490.0916	103675.2388	92938.86801	71485.08677	92671.07225	93079.61387	95841.42923	72247.60255	87695.08841	56716.0721
CR36	123823.7374	127710.7648	116743.6276	97046.54698	111098.0149	107449.829	107135.5211	90110.68159	95598.64728	69357.48748
CR37	141649.6964	141007.2628	130654.7401	107860.5898	132727.7724	133157.6511	135360.2269	112422.4867	126049.8253	96188.39846
CR38	157527.4154	160067.3137	149226.6573	128136.9795	145517.1841	142183.731	141681.8042	124539.0371	129683.5316	104091.6999
CR39	187487.6267	191803.5048	180835.312	160871.3377	173774.2321	167956.8462	165458.3589	152916.4439	151797.0501	130556.8072
CR40	70265.98945	54154.1435	52934.9682	43467.68249	81068.31216	97113.68249	108724.2432	79362.57067	115042.26	93721.7231

ID	CR31	CR32	CR33	CR34	CR35	CR36	CR37	CR38	CR39	CR40

CR01	297497.6232	275693.2346	238604.5363	215361.0759	186750.1541	212589.269	192628.4279	223979.7408	257609.2039	115763.6023
CR02	306128.171	282826.6679	249355.3486	228878.2451	203913.1741	230982.1454	214518.5139	245694.013	280124.1149	122321.3066
CR03	288427.9927	264703.6123	232588.0908	213395.0718	190502.2919	218115.8213	204181.1359	235009.4568	269886.1065	104976.2705
CR04	258369.4775	233088.721	207298.6528	193542.7064	178701.1279	207061.3892	201254.1209	230055.9828	265334.5452	83949.40685
CR05	224116.9569	199148.027	172406.3232	158853.8932	145687.917	173973.8763	170933.428	198626.888	233742.8084	50375.31054
CR06	244798.0516	221012.3621	189460.8249	171500.6572	151519.6157	179678.1742	170092.0345	199893.383	235164.3724	61778.21385
CR07	267137.3757	244647.7477	209263.4705	187768.1064	162180.3716	189250.0568	173492.9179	204532.2381	239190.3388	83973.63691
CR08	267817.5562	247101.0497	207984.5222	183391.0352	153369.4775	178763.9697	158357.5578	189708.7633	223382.3571	90687.8094
CR09	238974.3913	217051.6289	180507.9528	158518.1516	133032.5331	160305.3845	146070.6726	176805.5486	211747.0292	57618.96111
CR10	221643.2935	200385.5491	162522.606	139735.1047	113728.9664	141014.8849	127499.8665	158019.4183	193078.1942	44527.55396
CR11	204035.5733	184830.1162	143448.1183	117771.1739	87954.72934	114276.2872	98817.16288	129532.1821	164475.0151	47750.27778
CR12	230387.3475	212884.5463	169274.8237	141143.9427	106496.1374	129233.4476	105291.1754	136558.4965	169612.6009	79251.75985
CR13	173742.1941	154093.1533	113569.0722	89612.68209	65135.65402	93236.30559	87025.32222	115047.9176	150299.8125	35839.06394
CR14	199235.5758	183895.2487	138301.4785	108545.5522	71767.53309	92924.6003	68959.68836	100305.736	133987.1946	78218.77179
CR15	160486.0808	145226.2364	99511.42522	70037.3673	35382.36361	61076.5808	51160.84941	79425.85029	114727.1549	70995.70869
CR16	123375.5171	106559.5851	62305.95545	36743.13535	27331.40022	51872.75711	66646.99806	83471.37304	115714.4257	75639.58245
CR17	128285.6307	107188.4986	70407.77897	54602.31472	53465.43648	78045.23451	91527.21075	109874.8545	142039.5314	57465.70393
CR18	184963.7668	158741.9659	140676.6857	135406.8488	134806.7713	161017.9595	168680.2048	191344.4092	224655.3845	55583.41069
CR19	162118.7743	135842.8509	119317.9523	116712.272	121023.5697	145657.7205	157471.0637	177597.7352	209730.739	58133.58582
CR20	146049.5159	119806.0586	103993.1422	103373.9263	111471.6719	134632.3423	149440.1078	167539.6871	198662.2047	63196.0117
CR21	130427.9264	104296.4567	88788.76739	90301.90078	102490.0916	123823.7374	141649.6964	157527.4154	187487.6267	70265.98945
CR22	147265.087	121509.3801	101775.4296	98320.27481	103675.2388	127710.7648	141007.2628	160067.3137	191803.5048	54154.1435
CR23	140032.5639	114827.6016	92211.30726	87507.22494	92938.86801	116743.6276	130654.7401	149226.6573	180835.312	52934.9682
CR24	140422.0949	117364.2241	85672.45509	73324.54985	71485.08677	97046.54698	107860.5898	128136.9795	160871.3377	43467.68249
CR25	111803.647	85981.09964	70201.42759	74823.30579	92671.07225	111098.0149	132727.7724	145517.1841	173774.2321	81068.31216
CR26	94225.12445	68251.61979	57021.42064	68250.14817	93079.61387	107449.829	133157.6511	142183.731	167956.8462	97113.68249
CR27	82205.45748	56046.06451	50062.29115	66693.15934	95841.42923	107135.5211	135360.2269	141681.8042	165458.3589	108724.2432
CR28	105168.2087	81479.93788	54938.16796	54498.5917	72247.60255	90110.68159	112422.4867	124539.0371	152916.4439	79362.57067
CR29	70538.96238	45917.61691	34603.54305	54756.00613	87695.08841	95598.64728	126049.8253	129683.5316	151797.0501	115042.26
CR30	91531.67159	71586.16239	34193.3362	31046.13431	56716.0721	69357.48748	96188.39846	104091.6999	130556.8072	93721.7231
CR31	0	26847.19752	61134.69935	91038.2482	129691.4487	121265.0196	157741.193	146614.6712	153284.6085	183812.846
CR32	26847.19752	0	47581.60409	79045.60872	117793.7101	115184.0024	150591.3928	144795.1956	157514.3206	160807.6731
CR33	61134.69935	47581.60409	0	31481.1937	70356.71577	68940.27752	103464.122	100823.4582	119306.0147	127697.5495
CR34	91038.2482	79045.60872	31481.1937	0	38972.37623	40843.27287	72966.81858	75080.78672	99738.36443	110479.4847
CR35	129691.4487	117793.7101	70356.71577	38972.37623	0	28361.27159	40196.25338	56657.95284	90036.81848	95314.60293
CR36	121265.0196	115184.0024	68940.27752	40843.27287	28361.27159	0	36532.94548	34734.22556	64092.74089	123599.7477
CR37	157741.193	150591.3928	103464.122	72966.81858	40196.25338	36532.94548	0	31351.78123	65712.70765	122055.3633
CR38	146614.6712	144795.1956	100823.4582	75080.78672	56657.95284	34734.22556	31351.78123	0	35304.095	148785.3324
CR39	153284.6085	157514.3206	119306.0147	99738.36443	90036.81848	64092.74089	65712.70765	35304.095	0	183748.6311
CR40	183812.846	160807.6731	127697.5495	110479.4847	95314.60293	123599.7477	122055.3633	148785.3324	183748.6311	0

Eductional Level

```
COMPUTE Education=$sysmis.
if vohhbo=1 Education=0.
if vohhbo=2 Education=1.
if govohavo=1 Education=0.
if govovwo=1 Education=1.
```

Target Population

```
COMPUTE TPop=0.
if lft < 25 TPop = 1.
if Education = 0 TPop is 1.
if Education = 1 TPop is 1.
```

Migration during Study:

```
DATASET ACTIVATE DataSet1.
COMPUTE VRH_Std=1.
if(n_w16cor = n_wljcor) VRH_Std=0.
IF (SYSMIS(n_w16cor)) OR (SYSMIS(n_wljcor)) VRH_Std = $SYSMIS.
```

Migration after Graduation:

```
COMPUTE VRH_NStd=1.
if(n_wljcor = n_wnucor) VRH_NStd=0.
IF (SYSMIS(n_wljcor)) OR (SYSMIS(n_wnucor)) VRH_NStd = $SYSMIS.
```

Migration after Study & Graduation

```
COMPUTE VRH_StdHuidig=1.
if(n_w16cor = n_wnucor) VRH_StdHuidig=0.
IF (SYSMIS(n_w16cor)) OR (SYSMIS(n_wnucor)) VRH_StdHuidig = $SYSMIS.
```

Spatial Mobility between COROP

```
COMPUTE CRM_WS=100*n_w16cor+n_gocor.
if(n_w16cor =n_gocor) CRM_W_R_S = 99.
if(n_w16cor = 98) CRM_W_R_S = 98.
if(n_gocor = 98) CRM_W_R_S = 98.

COMPUTE CRM_Std=100*n_w16cor+n_wljcor.
if(n_w16cor =n_wljcor) CRM_Std = 99.
if(n_w16cor = 98) OR (n_wljcor = 98) CRM_Std = 98.

COMPUTE CRM_NStd=100*n_wljcor+n_wnucor.
if(n_wljcor =n_wnucor) CRM_NStd = 99.
if(n_wljcor = 98) OR (n_wnucor = 98) CRM_NStd = 98.
```

```
COMPUTE CRM_W_R_S=100*n_hvcor+n_gocor.
if(n_hvcor =n_gocor) CRM_W_R_S = 99.
if(n_hvcor = 98) CRM_W_R_S = 98.
if(n_gocor = 98) CRM_W_R_S = 98.

COMPUTE CRM_WW = 100*n_wnucor+n_hvcor.
if(n_wnucor =n_hvcor) CRM_WW = 99.
if(n_wnucor = 98) OR (n_hvcor = 98) CRM_WW = 98.

COMPUTE CRM_StdHuidig=100*n_w16cor+n_wnucor.
if(n_w16cor =n_wnucor) CRM_StdHuidig = 99.
if(n_w16cor = 98) OR (n_wnucor = 98) CRM_StdHuidig = 98.

Set distance no movement at '0'
if CRM_NStd=99 CRMa_NStd=0.
if CRM_Std=99 CRMa_Std=0.
if CRM_StdHuidig=99 CRMa_StdHuidig=0.
```

Appendix III – Syntax STATA

```
drop if TPop == 0
drop if lft > 24
drop if lft < 0
drop if gesl < 0
drop if gesl > 2
recode gesl (1=0) (2=1)

summarize
summarize if Cohort == 1
summarize if Cohort == 2
summarize if Cohort == 3
```

Regression of student migration distances during study of the population

```
reg CRMa_Std_KM  i.Cohort
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
        ib8.n_prcor_o
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
        ib8.n_prcor_o i.n_sector
reg CRMa_Std_KM lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
        i.n_sector if Cohort == 1
reg CRMa_Std_KM lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
        i.n_sector if Cohort == 2
reg CRMa_Std_KM lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
        i.n_sector if Cohort == 3
```

Regression of student migration distances during study of the relocated students

```
Drop if CRMa_Std_KM < 0.01
reg CRMa_Std_KM  i.Cohort
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
        ib8.n_prcor_o
reg CRMa_Std_KM  i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
        ib8.n_prcor_o i.n_sector
reg CRMa_Std_KM lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
        i.n_sector if Cohort == 1
reg CRMa_Std_KM lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
        i.n_sector if Cohort == 2
reg CRMa_Std_KM lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
        i.n_sector if Cohort == 3
```

Logistic regression of leaving the parental home

```
logit VRH_Std i.Cohort
logit VRH_Std i.Cohort lft i.gesl i.Education
logit VRH_Std i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
logit VRH_Std i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
logit VRH_Std i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
      i.n_sector
logit VRH_Std lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector if
      Cohort == 1
logit VRH_Std lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector if
      Cohort == 2
logit VRH_Std lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector if
      Cohort == 3
```

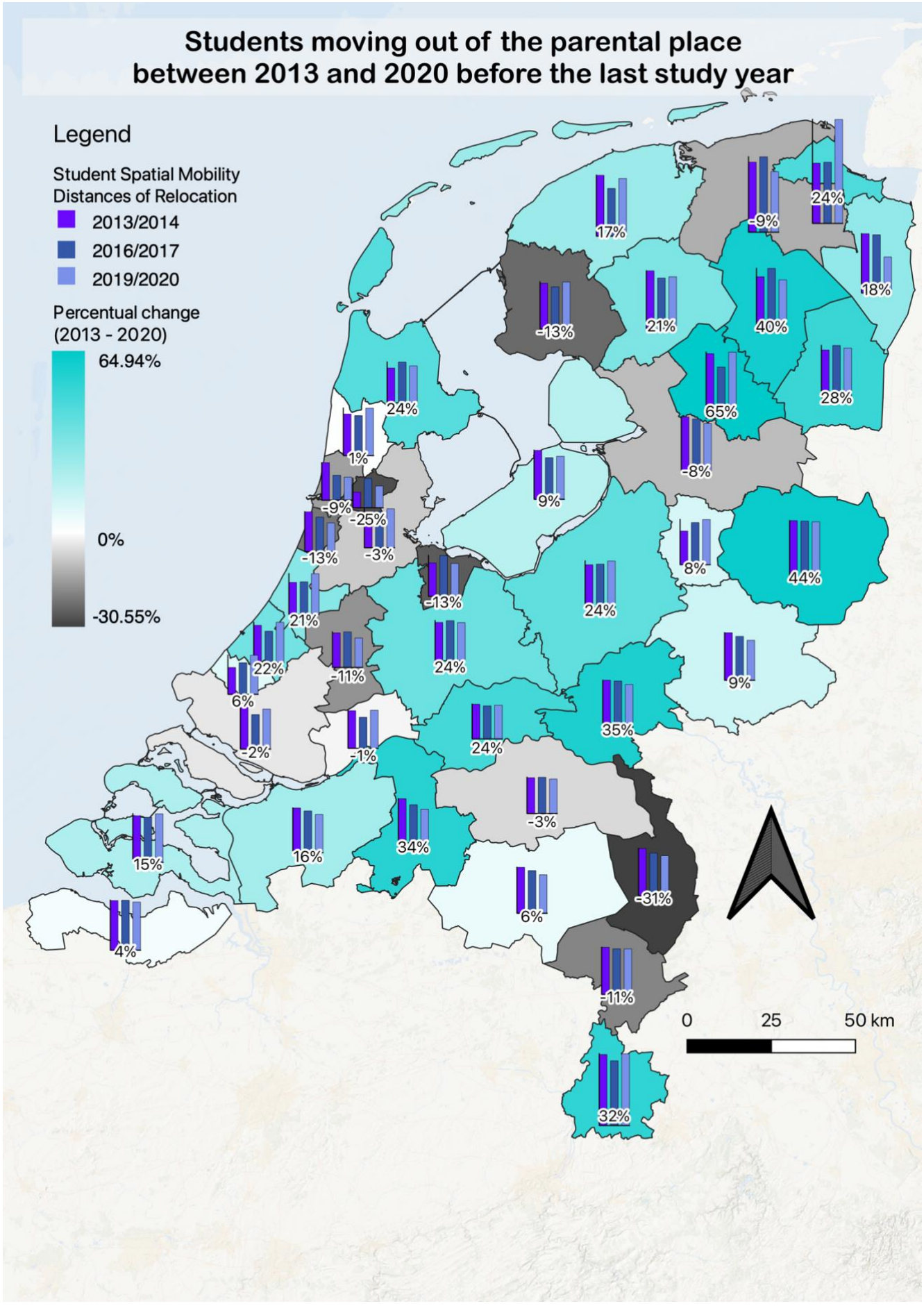
Logistic regression of relocation after graduation

```
logit VRH_NStd i.Cohort
logit VRH_NStd i.Cohort lft i.gesl i.Education
logit VRH_NStd i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
logit VRH_NStd i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
logit VRH_NStd i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
      i.n_sector
logit VRH_NStd lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector
      if Cohort == 1
logit VRH_NStd lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector
      if Cohort == 2
logit VRH_NStd lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector
      if Cohort == 3
```

Logistic regression of return Migration

```
logit RMigration i.Cohort
logit RMigration i.Cohort lft i.gesl i.Education
logit RMigration i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr
logit RMigration i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
logit RMigration i.Cohort lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
      i.n_sector
logit RMigration lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
      i.n_sector if Cohort == 1
logit RMigration lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o
      i.n_sector if Cohort == 2
logit RMigration lft i.gesl i.Education n_wljcor_REprice LJCOR_Density_Adr ib8.n_prcor_o i.n_sector
      if Cohort == 3
```

Appendix IV – Enlarged figure 5



Appendix V – Regression of student migration distances during study of relocated students (KM's)

	(1) base|model	(2) +Personal Traits	(3) +Regional Traits	(4) +Provinces	(5) +Field of Study	(6) 2013/2014	(7) 2016/2017	(8) 2019/2020
Cohort *(ref: 2013/2014)*								
2016/2017	-.461	-.462	-.217	-.597	-.739			
	(1.054)	(1.054)	(1.051)	(1.002)	(.992)			
2019/2020	-1.213	-.954	-1.018	-1.182	-1.609*			
	(1.028)	(1.031)	(1.028)	(.979)	(.973)			
Age		-.107	-.024	.504	.563	-.016	1.59*	.115
		(.548)	(.546)	(.521)	(.516)	(.969)	(.873)	(.856)
Sex *(ref: Male)*								
Female		-2.624***	-2.301**	-2**	1.015	-1.986	3.355**	1.39
		(.951)	(.948)	(.904)	(.98)	(1.882)	(1.695)	(1.567)
Education (*ref: HAVO)*								
VWO		3.608***	3.579***	4.024***	4.756***	4.843***	3.198**	6.947***
		(1.025)	(1.021)	(.974)	(.971)	(1.713)	(1.625)	(1.729)
RE-Value			-.086***	-.054***	-.055***	-.054***	-.058***	-.053***
			(.01)	(.01)	(.01)	(.018)	(.017)	(.017)
Address density			.001***	.002***	.003***	.002*	.002**	.004***
			(.001)	(0)	(.001)	(.001)	(.001)	(.001)
Provinces *(ref: Zuid Holland)*								
Groningen				39.173***	39.086***	34.409***	36.311***	46.097***
				(2.562)	(2.535)	(4.592)	(4.3)	(4.313)
Friesland				20.198***	19.895***	11.477***	21.73***	24.584***
				(2.107)	(2.086)	(3.875)	(3.759)	(3.319)
Drenthe				14.104***	14.116***	18.287***	9.494**	14.619***
				(2.136)	(2.114)	(4.082)	(3.723)	(3.333)
Overijssel				33.262***	33.139***	28.862***	35.487***	33.376***
				(1.784)	(1.765)	(3.335)	(2.882)	(3.02)
Gelderland				11.014***	11.308***	10.464***	12.479***	10.915***
				(1.509)	(1.494)	(2.75)	(2.563)	(2.486)
Utrecht				6.994***	6.414***	4.129	7.689**	7.672**
				(2)	(1.979)	(3.706)	(3.39)	(3.24)
Noord-Holland				1.585	1.26	1.193	.658	2.09
				(1.666)	(1.648)	(3.083)	(2.766)	(2.759)
Zeeland				34.672***	34.992***	29.441***	38.147***	37.361***
				(2.05)	(2.029)	(3.658)	(3.61)	(3.329)
Noord-Brabant				5.495***	5.494***	5.02*	4.06	7.47***
				(1.486)	(1.474)	(2.669)	(2.522)	(2.486)
Limburg				34.283***	34.149***	34.388***	31.517***	36.342***
				(1.816)	(1.8)	(3.329)	(3.064)	(2.991)
Flevoland				15.889***	15.742***	16.398***	14.969***	15.48***
				(2.649)	(2.622)	(4.846)	(4.435)	(4.396)
Field of Study (ref: General)								
Agriculture					27.96			25.497
					(22.538)			(22.411)
Teaching					2.131	-23.076***	-26.169***	-3.646
					(22.527)	(4.162)	(3.861)	(22.408)
Engineering					12.589	-16.51***	-15.45***	10.893
					(22.503)	(3.813)	(3.33)	(22.32)
Economics					14.453	-14.518***	-15.792***	14.354
					(22.491)	(3.521)	(3.187)	(22.293)
Health					6.854	-22.284***	-22.249***	5.974
					(22.5)	(3.764)	(3.412)	(22.322)
Humanities					4.396	-23.791***	-26.848***	4.991
					(22.503)	(3.808)	(3.486)	(22.333)
Arts					2.62	-37.722***	-26.039**	18.185
					(23.01)	(7.888)	(11.996)	(23.794)
Constant	69.234***	72.713***	89.411***	53.091***	37.941	85.128***	44.139**	42.473
	(.761)	(12.732)	(12.82)	(12.308)	(25.513)	(23.095)	(20.82)	(29.939)
Observations	9795	9795	9795	9795	9795	2968	3232	3595
R-squared	0	.002	.011	.104	.123	.109	.14	.135

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Appendix VI – Logistic regression of leaving the parental home

	(1) base|model	(2) +Personal Traits	(3) +Regional Traits	(4) +Provinces	(5) +Field of Study	(6) 2013/2014	(7) 2016/2017	(8) 2019/2020
Cohort *(ref: 2013/2014)*								
2016/2017	.133***	.13***	.115***	.11***	.102***			
	(.028)	(.028)	(.029)	(.031)	(.031)			
2019/2020	.205***	.229***	.188***	.124***	.101***			
	(.027)	(.027)	(.029)	(.03)	(.03)			
Age		.26***	.274***	.253***	.259***	.283***	.202***	.291***
		(.014)	(.015)	(.016)	(.016)	(.029)	(.028)	(.027)
Sex *(ref: Male)*								
Female		.423***	.453***	.453***	.585***	.596***	.588***	.574***
		(.024)	(.026)	(.027)	(.031)	(.056)	(.054)	(.05)
Education (*ref: HAVO)*								
VWO		.418***	.503***	.421***	.428***	.335***	.526***	.423***
		(.028)	(.029)	(.031)	(.032)	(.053)	(.054)	(.058)
RE-Value			-.001**	.002***	.002***	.003***	.004***	0
			(0)	(0)	(0)	(.001)	(.001)	(.001)
Address density			0***	.001***	.001***	.001***	.001***	.001***
			(0)	(0)	(0)	(0)	(0)	(0)
Provinces *(ref: Zuid Holland)*								
Groningen				1.405***	1.388***	1.509***	1.481***	1.203***
				(.081)	(.082)	(.145)	(.142)	(.139)
Friesland				1.919***	1.879***	1.873***	1.805***	1.95***
				(.071)	(.071)	(.127)	(.131)	(.115)
Drenthe				2.656***	2.656***	2.556***	2.512***	2.867***
				(.079)	(.08)	(.144)	(.14)	(.134)
Overijssel				1.252***	1.253***	1.277***	1.229***	1.265***
				(.057)	(.057)	(.104)	(.095)	(.098)
Gelderland				1.472***	1.483***	1.47***	1.361***	1.618***
				(.051)	(.052)	(.093)	(.09)	(.087)
Utrecht				.408***	.41***	.249**	.217*	.743***
				(.065)	(.065)	(.117)	(.113)	(.11)
Noord-Holland				-.179***	-.173***	-.045	-.354***	-.103
				(.059)	(.059)	(.107)	(.101)	(.099)
Zeeland				2.31***	2.323***	2.463***	2.177***	2.336***
				(.072)	(.073)	(.129)	(.132)	(.119)
Noord-Brabant				1.039***	1.013***	1.051***	.948***	1.058***
				(.05)	(.05)	(.088)	(.087)	(.086)
Limburg				1.341***	1.326***	1.226***	1.362***	1.421***
				(.058)	(.058)	(.104)	(.101)	(.099)
Flevoland				1.803***	1.766***	2.096***	1.619***	1.654***
				(.091)	(.091)	(.167)	(.159)	(.15)
Field of Study *(ref: General)*								
Agriculture					-.082			-.415
					(.194)			(.378)
Teaching					-1.269***	-1.331***	-1.096***	-1.558***
					(.19)	(.131)	(.127)	(.374)
Engineering					-.72***	-.767***	-.587***	-1.014***
					(.188)	(.122)	(.112)	(.37)
Economics					-.891***	-.843***	-.817***	-1.198***
					(.187)	(.113)	(.107)	(.369)
Health					-.997***	-.89***	-.994***	-1.291***
					(.188)	(.121)	(.115)	(.371)
Humanities					-.993***	-.804***	-.993***	-1.361***
					(.189)	(.123)	(.117)	(.372)
Arts						-.003	-.216	
						(.272)	(.459)	
Constant	-1.117***	-7.495***	-8.404***	-10.281***	-9.618***	-10.355***	-8.532***	-9.564***
	(.02)	(.335)	(.358)	(.382)	(.428)	(.701)	(.681)	(.737)
Observations	42696	42696	41287	40716	40713	13263	12980	14470
Pseudo R-squared	.001	.021	.042	.095	.102	.099	.105	.106

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Appendix VII – Logistic regression relocating after graduation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Cohort (ref: 2013/2014)	base|model	+Personal Traits	+Regional Traits	+Provinces	+Field of Study	2013/2014	2016/2017	2019/2020
2016/2017	.101***	.102***	.109***	.1***	.091***			
	(.028)	(.028)	(.029)	(.029)	(.029)			
2019/2020	.101***	.112***	.073***	.033	-.001			
	(.027)	(.027)	(.028)	(.029)	(.029)			
Age		.059***	.077***	.058***	.066***	.046*	.057**	.095***
		(.014)	(.015)	(.015)	(.015)	(.027)	(.027)	(.025)
Sex (ref: Male)								
Female		.055**	.059**	.042*	.254***	.294***	.203***	.275***
		(.024)	(.024)	(.025)	(.028)	(.052)	(.05)	(.047)
Education (ref: HAVO)								
VWO		.197***	.243***	.179***	.174***	.198***	.201***	.122**
		(.029)	(.03)	(.031)	(.031)	(.052)	(.054)	(.059)
RE-Value			-.001***	0	0	0	.001	-.001**
			(0)	(0)	(0)	(.001)	(.001)	(.001)
Address density			0	0***	0***	0***	0	0***
			(0)	(0)	(0)	(0)	(0)	(0)
Provinces (ref: Zuid Holland)								
Groningen				.676***	.658***	.812***	.733***	.463***
				(.078)	(.078)	(.138)	(.134)	(.137)
Friesland				.846***	.801***	.873***	.626***	.916***
				(.066)	(.066)	(.12)	(.122)	(.107)
Drenthe				.886***	.873***	1.126***	.845***	.708***
				(.077)	(.078)	(.142)	(.135)	(.129)
Overijssel				.531***	.531***	.733***	.37***	.527***
				(.052)	(.052)	(.094)	(.087)	(.089)
Gelderland				.532***	.541***	.682***	.414***	.548***
				(.048)	(.048)	(.086)	(.083)	(.081)
Utrecht				.235***	.23***	.116	.076	.476***
				(.06)	(.06)	(.109)	(.104)	(.101)
Noord-Holland				.216***	.222***	.292***	.09	.283***
				(.05)	(.05)	(.093)	(.086)	(.085)
Zeeland				1.05***	1.058***	1.29***	1.032***	.916***
				(.068)	(.069)	(.122)	(.123)	(.114)
Noord-Brabant				.366***	.33***	.5***	.193**	.32***
				(.046)	(.046)	(.081)	(.08)	(.078)
Limburg				.456***	.435***	.618***	.485***	.245***
				(.053)	(.054)	(.093)	(.092)	(.095)
Flevoland				.741***	.694***	.92***	.567***	.646***
				(.087)	(.088)	(.166)	(.15)	(.145)
Field of Study (ref: General)								
Agriculture					-.663			-.717
					(1.228)			(1.232)
Teaching					-1.993	-1.339***	-1.278***	-2.123*
					(1.228)	(.123)	(.121)	(1.232)
Engineering					-1.246	-.55***	-.637***	-1.287
					(1.227)	(.112)	(.104)	(1.231)
Economics					-1.469	-.807***	-.834***	-1.518
					(1.227)	(.106)	(.1)	(1.23)
Health					-1.648	-1.094***	-1.031***	-1.578
					(1.227)	(.115)	(.108)	(1.231)
Humanities					-1.831	-1.155***	-1.254***	-1.836
					(1.227)	(.119)	(.112)	(1.231)
Arts					-1.116	-.604**	.465	-1.61
					(1.241)	(.278)	(.427)	(1.29)
Constant	-1.127***	-2.554***	-2.774***	-3.089***	-1.889	-2.497***	-2.138***	-2.289*
	(.02)	(.328)	(.346)	(.355)	(1.278)	(.651)	(.632)	(1.367)
Observations	42802	42802	41382	40637	40637	13247	12962	14428
Pseudo R-squared	0	.002	.003	.012	.024	.029	.025	.024

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Appendix VIII – Logistic regression of return migration

	(1) base|model	(2) +Personal	(3) +Regional	(4) +Provinces	(5) +Field of	(6) 2013/2014	(7) 2016/2017	(8) 2019/2020

Cohort *(ref: 2013/2014)*		*Traits*	*Traits*		*Study*			
2016/2017	*-.201****	*-.197****	*-.189****	*-.189****	*-.186****			
	(.027)	*(.027)*	*(.027)*	*(.028)*	*(.028)*			
2019/2020	*-.201****	*-.21****	*-.202****	*-.174****	*-.15****			
	(.026)	*(.026)*	*(.027)*	*(.028)*	*(.028)*			
Age		*-.158****	*-.157****	*-.142****	*-.147****	*-.156****	*-.123****	*-.161****
		(.014)	*(.014)*	*(.015)*	*(.015)*	*(.027)*	*(.026)*	*(.024)*
Sex *(ref: Male)*								
Female		*-.178****	*-.179****	*-.162****	*-.345****	*-.356****	*-.311****	*-.38****
		(.023)	*(.023)*	*(.024)*	*(.027)*	*(.051)*	*(.048)*	*(.045)*
Education (*ref: HAVO)*								
VWO		*-.219****	*-.261****	*-.246****	*-.25****	*-.268****	*-.263****	*-.211****
		(.028)	*(.028)*	*(.03)*	*(.03)*	*(.05)*	*(.052)*	*(.055)*
RE-Value			*0*	*-.003****	*-.003****	*-.003****	*-.004****	*-.002****
			(0)	*(0)*	*(0)*	*(.001)*	*(.001)*	*(.001)*
Address density			*0****	*0****	*0****	*0****	*0****	*0****
			(0)	*(0)*	*(0)*	*(0)*	*(0)*	*(0)*
Provinces *(ref: Zuid Holland)*								
Groningen				*-1.055****	*-1.051****	*-1.006****	*-1.276****	*-.889****
				(.074)	*(.075)*	*(.134)*	*(.129)*	*(.126)*
Friesland				*-1.327****	*-1.299****	*-1.343****	*-1.177****	*-1.349****
				(.063)	*(.064)*	*(.114)*	*(.118)*	*(.102)*
Drenthe				*-1.718****	*-1.715****	*-1.691****	*-1.825****	*-1.654****
				(.074)	*(.074)*	*(.135)*	*(.132)*	*(.122)*
Overijssel				*-.681****	*-.675****	*-.77****	*-.649****	*-.632****
				(.05)	*(.05)*	*(.092)*	*(.084)*	*(.085)*
Gelderland				*-.813****	*-.814****	*-.905****	*-.746****	*-.805****
				(.045)	*(.045)*	*(.082)*	*(.078)*	*(.075)*
Utrecht				*-.025*	*-.013*	*-.028*	*.146*	*-.155*
				(.058)	*(.058)*	*(.105)*	*(.1)*	*(.096)*
Noord-Holland				*-.029*	*-.032*	*-.201***	*.113*	*-.035*
				(.048)	*(.048)*	*(.09)*	*(.083)*	*(.081)*
Zeeland				*-1.323****	*-1.317****	*-1.387****	*-1.327****	*-1.259****
				(.067)	*(.067)*	*(.12)*	*(.122)*	*(.109)*
Noord-Brabant				*-.398****	*-.367****	*-.489****	*-.361****	*-.277****
				(.044)	*(.044)*	*(.078)*	*(.076)*	*(.073)*
Limburg				*-.641****	*-.618****	*-.63****	*-.66****	*-.579****
				(.051)	*(.052)*	*(.092)*	*(.09)*	*(.087)*
Flevoland				*-1.221****	*-1.188****	*-1.635****	*-1.047****	*-.985****
				(.083)	*(.083)*	*(.156)*	*(.144)*	*(.136)*
Field of Study *(ref: General)*								
Agriculture					*.443*			*.463*
					(1.237)			*(1.246)*
Teaching					*1.212*	*.658****	*.932****	*1.143*
					(1.236)	*(.127)*	*(.12)*	*(1.245)*
Engineering					*.622*	*-.018*	*.278****	*.679*
					(1.236)	*(.119)*	*(.106)*	*(1.244)*
Economics					*.853*	*.242***	*.528****	*.886*
					(1.236)	*(.113)*	*(.101)*	*(1.243)*
Health					*1.111*	*.527****	*.82****	*1.089*
					(1.236)	*(.121)*	*(.109)*	*(1.244)*
Humanities					*1.05*	*.357****	*.809****	*1.074*
					(1.236)	*(.122)*	*(.111)*	*(1.244)*
Arts					*.275*	*-.02*	*-.072*	*-.278*
					(1.249)	*(.276)*	*(.433)*	*(1.293)*
Constant	*1.002****	*4.814****	*5.117****	*6.172****	*5.52****	*6.345****	*5.325****	*5.452****
	(.019)	*(.318)*	*(.33)*	*(.343)*	*(1.282)*	*(.637)*	*(.609)*	*(1.365)*
Observations	*42697*	*42697*	*41205*	*40636*	*40636*	*13247*	*12961*	*14428*
Pseudo R-squared	*.001*	*.007*	*.011*	*.037*	*.043*	*.042*	*.047*	*.041*

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1