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**The migration patterns of highly educated individuals in  
Sweden**

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# Moving home again? Never!

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**Abstract:** Two major challenges in Europe’s rural areas are an ageing population and the diminishing share of human capital. While this pattern is not new, the effects are becoming increasingly visible and acute. The long-term loss of younger individuals has in many ways “drained” the labor market and the economic market power of rural areas. This is the focus of our research. Using micro data covering the entire Swedish population, we identify all university graduates from the year 2001. We analyze them with respect to whether they live in a rural or urban region before starting university and where they live at two points in time after graduation. We use a series of multinomial logit regressions to determine what factors affect their short-term and long-term choices of location. We find only minor differences on between these two time-perspectives with a few important exceptions related to civil status and background.

**Keywords:** urban-rural youth migration, highly educated

**JEL classification codes:** I250, R000

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## I. Introduction

In this paper, we find that individual characteristics such as civil status play an important part in the location decisions of university graduates after graduation. However, there are only minor variations looking at it from both short- and a long term perspectives. Economists have long sought to identify the factors that influence migration patterns and individual location choice, primarily based on perceived economic rewards that result from geographic movements. Much of this research focuses on the factors that shape in-migration. Here, the biggest and most diverse regions have come out as “winners”. A vast amount of research has shown how big, tolerant, and diverse metropolitan regions function as magnets for young, talented, highly-educated individuals (e.g Berry & Glaeser, 2005; Florida, 2002). The flipside of this development is a sustained process of population loss in most rural areas, where the decreasing population is ageing, leaving these areas with a weakened market, and fewer public and private services. A youth population study in Sweden (Mellander, 2013) shows that 86 percent of municipalities have fewer 25-year-olds today compared to the number of 18-year-olds that they had seven years ago, a pattern that has remained stable. The only net gainers are bigger regions and college towns. While this pattern is not new, the effects have become more visible and also more acute. The long-term loss of younger individuals has in many ways “drained” the labor market as well as the economic market power of rural areas.

However, rural areas are heterogeneous and exhibit a range of economic trajectories. Some areas have an increasing population while others have a long history of decline. Rural areas that are closer to larger cities have generally experienced more dynamic development than those further away. Even so, most rural areas have seen a loss of young people over time. A fairly large share of this loss consists of young people moving to go to university. The share of university graduates is very limited. Efforts to attract this group to rural areas have largely proven unsuccessful. One probable reason for this is that there is limited knowledge of who the highly educated individuals that move to rural areas really are, and therefore the strategies become inefficient and policies are inaccurate. Greater knowledge about returning migrants would benefit many of these rural areas where population numbers are declining. Further, if there are regional qualities that affect migration decisions, rural areas could develop these qualities more strategically as they try to attract more highly educated young people. Thus, rural areas do not only lack young people, they also lack knowledge about who may be willing to return once they have graduated from university (or migrate there despite a

background in another region) and what factors could attract them to a rural location. This narrows the focus of this paper. Using a micro data set covering the entire Swedish population, we identify all individuals with a university degree in 2001. We divide these into two main groups one that lived in a rural area before attending university and one that lived in an urban area prior to university. This allows us to study which graduates moved back to the area they came from and which graduates decided to live elsewhere. We are also able to identify individuals who lived in an urban area before entering university, but who decided to migrate to a rural area after receiving the degree. We follow these individuals at two points in time. First we examine where they lived five years after graduating (short-term). We assume that this is a location decision related to career choice. We also follow up on the same individuals ten years after receiving their degree (long-term). At this point in time, the average age of these individual is 40. The average age of Swedish women having their first child is around 30, but varies greatly between regions. We therefore expect this location choice to be not only related to career choice, but also to where individuals want to start their family and raise their children. In the analysis, we account for individual characteristics such as age, gender, immigration background, and if they commute to work, but also examine the regional qualities the regional share of human capital, wage levels, the presence of a university, as well as a number of amenities found at the choice of location.

## 2. Theory and concepts

There is a vast literature on the advantages of locating in larger regions. One major motive is the stronger labor market that these regions exhibit. Bigger regions clearly offer higher wages but they also offer access to alternative employers and a more effective and faster interaction with other highly educated and skilled individuals. In other words, by locating in a bigger region, the individual gets access to a so-called “urban productivity premium,” which increases as the market size increases (see e.g. E. L. Glaeser & Mare, 2001; Yankow, 2006). Based on a lifecycle approach (McCann, 2001) it would be especially advantageous for young highly educated to move to a bigger city, since that could boost their careers at an early stage. The flipside for rural areas is that they most often have weaker labor markets, and are therefore less attractive for young highly educated individuals wanting to reap the benefits of their educational investments. Urban regions are also home to a larger share of jobs that demand a high skill level (Florida et al. 2011) show how highly skilled jobs have become more concentrated in bigger cities over time, while less skilled, routine jobs tend to locate in

areas where land is less expensive and the need for well-educated workers is low. Extensive studies of young, highly educated people with a special focus on individuals with degrees in creative cultural fields in Britain suggest that the likelihood of getting a high-skill job increases when moving to London. Furthermore, the best students go to London, while students with lower grades are more likely to return home after graduating (Faggian & McCann, 2009a, 2009b).

But attractive labor markets are not the only reason urban areas grow faster. Berry and Glaeser (2005) suggest that highly educated people move to bigger cities because they like to be around other highly educated people. They show how places that had a higher share of highly educated people in 1990 increased the human capital gap compared to places that were less educated to start with. Much research also focuses on the role of consumption in attracting highly educated. Florida (2002) introduced a new occupational class, the creative class, which is paid to think. Creative workers are more aware of their locational options, and tend to have a shared preference for urban qualities. Glaeser et al. (2001) suggest that growing cities are places for consumption rather than production, and they suggest that consumption is related to a number of aspects: products and services, experiences, esthetic aspects of the city, as well as public services. This is in line with Quigley (1998) who showed how individuals have a taste for variety, which in turn advantages urban areas, because they have a larger variety of consumption options. Glaeser et al. (2001) as well as Glaeser (2011) show how the consumption component of locational decisions has become more important than ever as incomes are increasing.

Much of this research illustrates how urban regions have a major consumption advantage which helps attract young, highly educated individuals. However, there is also a stream of research that suggests the existence of an amenity-led rural growth (Deller, Tsai, Marcouiller, & English, 2001) even so in a rural-urban interdependence perspective (Irwin, Isserman, Kilkenny, & Partridge, 2010). Glaeser et al. (2001) point out that urban migration is amenity-driven, but so is rural migration (Irwin et al., 2010). Irwin et al. point to how rural development is less and less farm-based and instead driven by rural amenities, like climate, but also proximity to surface water and other recreational amenities (McGranahan, 1999). Irwin et al. (2010) point out that there is not necessarily a dichotomy between the urban and the rural; rather, there is strong interdependence between the two. Kahn et al. (2001) illustrate how rural residents often commute long distances and can therefore benefit from market

places as far as 50 miles away. Nilsson (2013) shows that rural housing costs in close proximity of bigger areas have increased during the last decade but that open landscape amenities are important determinants of urban house prices and thereby urban quality of life. Thus, she shows that such amenities are valued higher where undeveloped land is scarce and population density is high.

Much research has shown how regional qualities affect population migration and growth, but there is also a vast amount of research showing how this is conditioned by life-cycle factors, such as marriage (P. E. Graves, 1983; Philip E. Graves & Linneman, 1979; Mincer, 1977) but also individual factors like age and gender (Edlund, 2005; Faggian, McCann, & Sheppard, 2007). Edlund argues that women are more likely to move to urban areas based on both labor and marriage market deliberations, while Faggian et al. (2007) found that women are more likely to stay than men. However, once they have left, women are more likely to keep on moving than men.

While most migration studies focus on the qualities of destination regions, there is also a stream of research focusing on departure regions. Wolpert (1965) argues that three individual-level characteristics are crucial in order to understand migration: perceived utility from the current location (the departure region), expected utility in alternative destination regions, and the constraints of getting information about both of these. Wolpert also argues that an individual's ability to get this information is formed and filtered by their current location and experiences, which means that any decision to relocate is affected by the personal setting of lived experience. Based on this, we would expect individuals growing up in rural areas to have a different perception of rural areas than individuals growing up in urban areas. Mellander et al. (2011) also suggest that the characteristics of and satisfaction from the current location explain the likelihood of staying more than individual factors.

In this paper, we use a Swedish micro dataset that includes all university graduates from the year 2001. We identify where these individuals lived before entering university and we examine how personal and regional characteristics of the destination region affect their likelihood of locating in an urban, rural or peri-urban region (a rural area near a Stockholm, Gothenburg or Malmö). We also examine the likelihood of them moving back to where they lived before entering university. We do this for two points in time. First we examine where individuals lived five years after graduating (short-term). We assume this locational decision

to reflect career choice. We also examine where they lived ten years after graduating (long-term). This is approximately the average age Swedes start a family, and thus we assume that the locational choice at this point reflects where they want their children to grow up. In other words, the locational choice at this point in time probably reflects a combination of career and family decisions, as compared to the prior choice of location five years earlier.

### 3. Methodology and Concepts

The data includes information about all individuals in Sweden between 1996 and 2011 and comes from Statistics Sweden. It is a panel and contains yearly information on location of residence and location of work. Location is specified as a municipality which in turn is located in a functional region. Sweden is made up of 290 municipalities, which can be both urban and rural in characteristic. For every individual, the dataset contains detailed information about gender, age, educational length, educational type, marital status, family type, type of work or if he or she is a migrant or not. Unfortunately, the data does not reveal location of birth which is why we use a proxy - the municipality where the person resided five years before graduation (year 1996), in other words where they most likely lived before they entered university (here called the home region). In examining the home region of each individual, we divided municipalities into two major groups: rural and urban.. As we follow-up on these people later in their lives, we examined if their current location (the destination region) is urban or rural. We also separated rural areas based on their proximity to one of the largest metros in Sweden, i.e. peri-urban regions. We also examined whether or not an individual moved back to the home region. Table 1 below illustrates the distribution of these individuals:

**(Table 1 about here)**

**Table 1:** Graduates from 2001 - Number and share of individuals with rural and urban home regions and distribution of their residential choices in 2006 and 2011

	<b>Rural</b> No. /percent	<b>Urban</b> No. /percent
<b>1996</b>		
	12,638/27.4	33,461/73.0
<b>2006</b>		
Home	6,158/48.7	17,385/52.0

Rural	116/9.2	2,089/6.2
Peri-urban	255/2.0	579/1.7
Urban	5,064/40.1	13,408/40.1
<b>Total</b>	<b>12,638</b>	<b>33,461</b>
<b>2011</b>		
Home	6,014/47.6	16,178/48.3
Rural	1,286/10.2	2,422/7.2
Peri-urban	280/2.2	716/2.1
Urban	5,058/40.0	14,145/42.3
<b>Total</b>	<b>12,638</b>	<b>33,461</b>

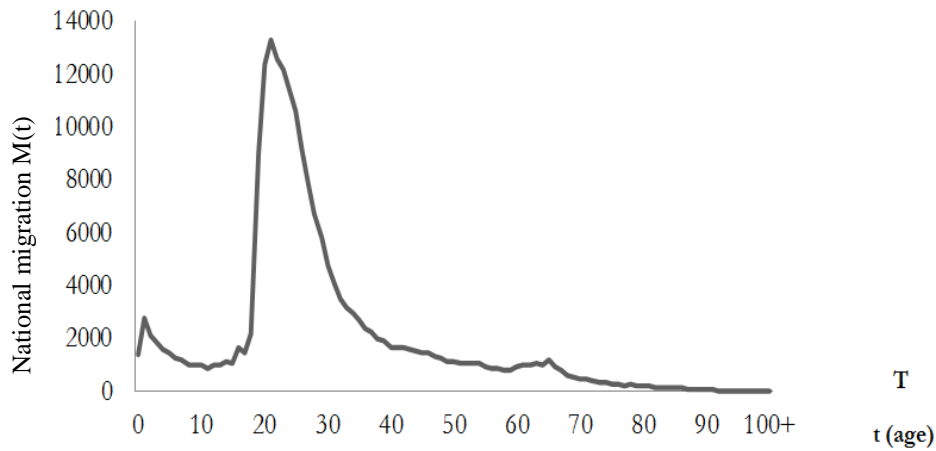
In total, the number of graduates from 2001 that remains in our dataset throughout the whole time period (1996 to 2011) adds up to 46,099 individuals. Table 1 shows how they were distributed across urban and rural areas in 1996 (home region), where they were located in the beginning of our time period (2006), and at the end of it (2011), ten years after graduation (destination regions). A little less than 30 percent of them start in a rural home region which corresponds well to the distribution of the Swedish total population. Five years after graduation, nearly 49 percent of “rural graduates” still live in their home regions. This number is slightly larger for “urban graduates”, where 52 percent still live in their home region. This means that for both types of graduates, about half of them are *not* back in their home region at this point in time. They live somewhere else and in both groups, 40 per cent choose an urban region. At this point, about nine percent of graduates with a rural background have chosen another rural region. Only 6 percent of graduates with an urban background choose a rural region five years after graduation.

Moving forward another five years to 2011, most patterns are similar to the ones five years earlier. However, more of these individuals have now, somewhat surprisingly, chosen to move away from their home region. At this point in time, the share of rural residence is more than 10 percent among those with a rural background and 7 percent of those coming from an urban region – in other words, we experience a small increase compared to five years earlier. The difference is the same as in 2006 but a few more individuals actually choose a rural region. As in the case of 2006, the likelihood of moving to an urban region is undoubtedly the largest in relation to all other choices, but a bit more common among those with an urban background.

Figure 1 shows inter-regional migration for all ages in Sweden in 2011 and it illustrates the increased likelihood of migrating during the age years we focus on in this study:



**(Figure 1 about here)**



**Figure 1:** The relationship between number of domestic in-migrants (national migration) and age in 2011 (data provided by Statistics Sweden)

The peak hits approximately at the age of 25-30 and sharply drops at the age of 30-35 and flattens out at the age of 40. This likely reflects that a large share of the migration happens in relation to when individuals move to get an education as well as in the years following graduation and starting a family. To a large extent, this also means that the group we are examining in this paper consists of the individuals during their most mobile years.

We now move on to a description of the included variables in the analysis.

***Dependent variable: place of location five and ten years after graduating***

All 290 Swedish municipalities are subdivided into two categories based on if they are urban or rural areas. These are defined with respect to population density, commuting patterns, and the share of day and night population (full description can be provided from the authors upon request). Besides this, the group of rural municipalities with a maximum distance of 45 minutes (by car) to either Stockholm, Gothenburg or Malmö city centers are considered rural regions with an urban proximity. These are labelled peri-urban regions. The location choice is modeled as a multinomial choice based on the originate place: graduates who initially came from an urban region and graduates who lived in an urban region before entering university

(based on their location in 1996, five years before graduating). The locational choice outcome can be of four different types based on if; (i) they move to a rural region, (ii) an urban region, (iii) to a peri-urban region, or (iv) ended up in the home region where they lived before entering university. This gives us four locational choices for two types of individuals (rural or urban origin) examined at two points in time: 2006 (five years after graduating) and 2010 (ten years after graduating). The analysis will take into account the starting point as well as the locational choice five and ten years after graduating.

### ***Independent variables***

The independent variables are divided into those related to the individuals themselves and those who are related to the region where they choose to reside.

*Individual variables:* Data include all individuals with a university degree from 2001. As many as 80 per cent of these have a degree which is three years or longer and these are specifically taken into consideration with a dummy variable. We have information on gender but also examine age, if they are immigrants, whether or not they commute to another work region, and whether they have creative occupation (based on the Florida, (2002) definition of the creative class). Data also allow us to control for civil status and if they have children or not. Some of these variables will not vary between 2006 and 2011 (e.g. gender and immigration status) but some of them can (e.g. occupation, civil status and commuting).

*Region variables for destination region:* This dimension of explanatory variables aims to capture regional attractiveness perceived by this group of graduates at two points in time - 2006 and 2011. We include the following variables: the regional share of employees (day population) with a higher degree (“high education level”), regional average wage (“wage level”), and whether it is a region with a university (“university city”). Most of these variables will be positively related to urban areas. We also include a number of variables more related to rural areas: the areal share of recreational areas, the areal share of big lakes, and the kilometers of coastline. These data are provided by Statistics Sweden and the County Administrative Board. To some degree, these three variables can be considered rural amenities but not for all cases. As an example, we know that Stockholm as well as Gothenburg and Malmö are all located by the coast. But for space reasons, these “rural amenities” can be larger in rural areas (such as wild life reserves, large forests, and numerous lakes). However, there are more than 3000 preserved areas in Sweden, where a large part of

these amenities are easily accessible from smaller and larger cities and they often have good car park possibilities.

## 4. Findings

We use multinomial logit regression analysis to examine the relative effects of individual- and community-level factors on the locational decisions of young, highly educated individuals at two points in time. We also take into consideration the characteristics of the individual as outlined above. We present the marginal effects for the short-term (5 years) locational outcomes for those with a rural origin in Table 2 (the regression results for these are available in Appendix 1):

**(Table 2 about here)**

**Table 2** Marginal effects for individuals with a rural origin (short term 5 years)

	$\frac{\delta\Pr(y = home)}{\delta}$	$\frac{\delta\Pr(y = rural)}{\delta}$	$\frac{\delta\Pr(y = urban)}{\delta}$	$\frac{\delta\Pr(y = periurban)}{\delta}$
<b><i>Individual characteristics</i></b>				
Gender	-0.0195 (0.0187)	0.00164 (0.00609)	0.0179 (0.0209)	6.76e-06 (0.00129)
Exam age	0.0424*** (0.00873)	-0.00479* (0.00281)	-0.0376*** (0.0101)	-1.74e-05 (0.00330)
(Exam age) <sup>2</sup>	-0.000299** (0.000125)	4.58e-05 (4.01e-05)	0.000253* (0.000143)	2.12e-07 (4.03e-05)
Long education	-0.0912*** (0.0190)	0.0127** (0.00582)	0.0785*** (0.0212)	1.55e-05 (0.00295)
Immigrant	-0.128*** (0.0344)	0.00556 (0.0124)	0.123*** (0.0407)	5.97e-06 (0.00114)
Commuter	-0.204*** (0.0181)	-0.00914 (0.00574)	0.213*** (0.0211)	1.20e-05 (0.00229)
Partner with children	0.426*** (0.0804)	-0.0428 (0.0303)	-0.384*** (0.0460)	0.000293 (0.0558)
Single without children	-0.0943*** (0.0191)	0.0286*** (0.00711)	0.0656*** (0.0223)	4.39e-05 (0.00835)
Creative occupation	-0.0595*** (0.0187)	0.00444 (0.00620)	0.0550*** (0.0207)	-2.32e-05 (0.00441)
<b><i>Regional characteristics</i></b>				
High education level	-14.60*** (0.721)	-2.853*** (0.205)	17.45*** (0.542)	-0.00246 (0.468)
Wage level	-7.60e-06*** (6.83e-07)	-1.46e-06*** (2.23e-07)	9.06e-06*** (4.68e-07)	-3.81e-09 (7.25e-07)

University city	-0.450*** (0.0198)	-0.0698*** (0.00863)	0.549*** (0.0209)	-0.0290*** (0.00388)
Tax rate	0.0741*** (0.0112)	0.0249*** (0.00349)	-0.0990*** (0.0135)	-8.39e-05 (0.0160)
Recreational areas	-0.750*** (0.0679)	-0.201*** (0.0251)	0.951*** (0.0831)	0.000182 (0.0345)
Big lakes	-0.0279 (0.0287)	-0.00440 (0.00968)	0.0323 (0.0314)	0.000100 (0.0190)
Seawater	0.130*** (0.0410)	0.00533 (0.0133)	-0.135*** (0.0451)	5.81e-05 (0.0111)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Among those with a rural origin, we find that they that are more likely to move back home if they are older (exam age), with a shorter university education. Individuals with an immigration background are less likely to move back to the same rural area they lived in before entering university. Clearly, the strongest explanatory variables in order to explain who moves back to the rural area they lived in before entering university is if the individual has a partner and children. Five years after graduating, individuals who are single and without children are less likely to move back. The regions that attract rural returning migrants are characterized by lower education levels and also lower wages and higher tax levels. These areas tend to be regions with a coastline but not large recreational areas.

Among the individuals that originate from a rural area and who live in another rural area five years after graduating, we find younger individuals with longer university educations. Single people without children are also more likely to belong to this group. We would expect these moves to be driven by something other than economic opportunity, since the rural regions that attract this group are characterized by lower education levels, lower wage levels, and higher tax rates. Neither do these regions have more recreational areas (negative and significant), lakes, or coastlines (insignificant). Thus these rural regions which become homes for these graduates just five years after graduation are not characterized by large spacious green areas; one might say they are rural without the rural amenities. It may be that these regions would compensate the individual with a higher wage due to regional lack of skills and/or a large excess in labor demand. However, these individuals are neither more nor less likely to have a creative, knowledge job.

The individuals that initially came from a rural municipality but who live in an urban area five years after graduating are younger and they have a longer university education. Among the

personal characteristics, we see that an immigration background increases the likelihood of locating in an urban area. They are also more likely to have a creative job and they are more likely to commute to work. Again, we find that one of the strongest separators at this point in time is whether an individual is in a relationship with children or not. Five years after graduating, singles without children with a rural origin are more likely to live in an urban area. The regional characteristics in the urban areas that to a larger extent attract these individuals are places with higher shares of human capital, higher wage levels, lower taxes, and with a university present in the region. These regions also have more recreational areas, but not with an access to coastlines.

For the last group – individuals who initially came from a rural area and five years after graduating live in a rural areas near Stockholm, Gothenburg or Malmö (peri-urban) – we see very few significant results which can be a result of too few observations. In fact, the only significant variable is the negative relation for the likelihood of the place to be home to a university. For all other variables, the results are insignificant.

Moving on next to the group of individuals who instead initially came from an urban area and their locational choices five years after graduating (Table 3):

**(Table 3 about here)**

**Table 3** Marginal effects for individuals with an urban origin (short term 5 years)

	$\frac{\delta \Pr(y = home)}{\delta}$	$\frac{\delta \Pr(y = rural)}{\delta}$	$\frac{\delta \Pr(y = urban)}{\delta}$	$\frac{\delta \Pr(y = periurban)}{\delta}$
<i>Individual characteristics</i>				
Gender	-0.0257*** (0.00630)	0.000127 (8.76e-05)	0.0255*** (0.00629)	2.06e-09 (6.48e-07)
Exam age	0.0298*** (0.00364)	-7.43e-06 (4.66e-05)	-0.0298*** (0.00364)	1.67e-09 (5.27e-07)
(Exam age) <sup>2</sup>	-0.000103** (5.22e-05)	-5.13e-07 (6.63e-07)	0.000103** (5.23e-05)	-3.10e-07 (4.05e-07)
Long education	-0.107*** (0.00714)	0.000620*** (0.000109)	0.107*** (0.00714)	1.13e-08 (3.56e-06)
Immigrant	-0.0497*** (0.00942)	-1.67e-05 (0.000143)	0.0497*** (0.00942)	8.12e-09 (2.55e-06)
Commuter	-0.128*** (0.00654)	-0.000730*** (0.000124)	0.129*** (0.00654)	-1.33e-08 (4.18e-06)
Partner with children	0.337***	0.00158	-0.339***	-3.38e-08

	(0.0464)	(0.00208)	(0.0464)	(1.06e-05)
Single without children	-0.0549***	0.000395***	0.0545***	1.03e-08
	(0.00661)	(0.000113)	(0.00661)	(3.25e-06)
Creative occupation	-0.0640***	0.000139	0.0638***	2.45e-09
	(0.00627)	(8.75e-05)	(0.00627)	(7.71e-07)
<b>Regional characteristics</b>				
High education level	-0.207***	-0.0760***	0.283***	-1.50e-06
	(0.0691)	(0.00899)	(0.0690)	(0.000473)
Wage level	3.26e-07***	-1.92e-08***	-3.07e-07***	3.14e-07
	(5.21e-08)	(4.16e-09)	(5.20e-08)	(5.26e-07)
University city	0.165***	-0.00140***	-0.160***	-0.00436
	(0.0342)	(0.000286)	(0.0368)	(0.0691)
Tax rate	0.0601***	0.000375***	-0.0604***	-2.34e-08
	(0.00417)	(6.43e-05)	(0.00417)	(7.37e-06)
Recreational areas	-0.0954***	-0.00151***	0.0970***	7.32e-08
	(0.0281)	(0.000354)	(0.0281)	(2.30e-05)
Big lakes	-0.0225*	-0.000452***	0.0229*	6.61e-08
	(0.0126)	(0.000154)	(0.0126)	(2.08e-05)
Seawater	-0.110***	2.12e-05	0.110***	3.26e-08
	(0.0161)	(0.000173)	(0.0161)	(1.02e-05)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Similar to individuals with a rural origin, for individuals with an urban background, we find that moving back home were older and less likely to have a long university education. They were also less likely to have an immigration background. They were, however, more likely to be women, a result that differs from those with a rural background. Again, having a family and children made them more likely to move back home five years after graduation. They were also less likely to have a creative job and less likely to commute. The regional characteristics of the home regions where these individuals reside five years after graduating had similar characteristics to individuals with a rural background, with lower human capital levels, and higher taxes. However, in this case, the regions were more likely home to a university and they were also characterized by higher average wages.

For the group of individuals who had an urban background but moved to a rural region at this point in time, we found significant results for the length of education - these individuals have a longer university education. They were more likely to be single and without children, and less likely to commute to work. The kind of rural areas they moved to had lower education levels, lower wages, higher taxes, and were less likely to be home to a university. This, coupled with reforms of decentralization in the 1990s, could also explain why, of the 50

locations in Sweden with the right to confer university degrees, many are located in smaller cities.

Individuals who initially came from an urban area and moved to *another* urban area after graduating were more likely to be young and have a longer university education. They were also more likely to be male, and to have an immigration background. They were more likely to have a creative job and to commute to work. Again, the civil status matters; singles without children are more likely to belong to this group while individuals with a family with children were less likely. Interesting enough, these are regions with higher shares of human capital, but not with higher average wages. Again, as in the case of individuals with a rural background moving to a different rural region (table 2), the *new* residence region which has attracted the individual may compensate for the lack of higher wages with other things. These urban regions have more recreational areas and more access to water (lakes and coastlines).

As in the case above, we find no significant results for this group with an urban background that locate in a peri-urban region five years after graduating.

Taken together, we can see that the shift in family structure (from single without children to family with children) seems to be the most likely reason for highly skilled individual locating in their home region. This is true both for individuals with a rural and urban background. We also find that individuals with an immigration background are more likely to move to urban areas after graduating, which may be due to a weaker attachment to the area they lived in before going to university. We notice that younger individuals, as well as individuals with a longer university education, are among those that are likely to move to an urban area, but that it is also partly true for individuals that move to another rural area than the one they came from initially. For individuals that decided to move to a rural area we cannot find any (negative) significant results for the likelihood of having a creative job, even though we would expect rural areas to have a lower share of these types of jobs. Further, to a certain extent, we find that individuals who moved to a rural area, most often seem to have a shorter commute than those located in urban areas five years after graduating.

We now move on to the same kind of analysis, but this time we examine the long-term locational choices, ten years after graduating (residence location in 2011). While we would expect the short-term (five-year-after-graduation analysis) to be more strongly related to

locational choices related to career moves, we now assume that a majority of these individuals have started a family and that this change would be taken into account when choosing where to live (following Figure 1).

Just as in the short-term analysis, we begin with the individuals who lived in a rural area before entering university. Table 4 illustrates the results:

(Table 4 about here)

**Table 4:** Marginal effects for individuals with and rural origin (long term 10 years)

	$\frac{\delta \Pr(y = home)}{\delta}$	$\frac{\delta \Pr(y = rural)}{\delta}$	$\frac{\delta \Pr(y = urban)}{\delta}$	$\frac{\delta \Pr(y = periurban)}{\delta}$
<i>Individual characteristics:</i>				
Gender	-0.0196 (0.0172)	0.00351 (0.00549)	0.0161 (0.0198)	7.02e-06 (0.00109)
Exam age	0.0483*** (0.00771)	-0.00337 (0.00246)	-0.0449*** (0.0103)	-3.50e-05 (0.00542)
(Exam age) <sup>2</sup>	-0.000394*** (0.000110)	3.54e-05 (3.48e-05)	0.000358*** (0.000138)	4.28e-07 (6.63e-05)
Long education	-0.0722*** (0.0182)	0.00891* (0.00530)	0.0633*** (0.0209)	1.56e-05 (0.00242)
Immigrant	-0.120*** (0.0292)	-0.00184 (0.0106)	0.122*** (0.0346)	-1.42e-05 (0.00219)
Commuter	-0.244*** (0.0191)	-0.00843 (0.00517)	0.252*** (0.0222)	8.30e-06 (0.00129)
Partner with children	0.0766 (0.151)	-0.0466** (0.0208)	-0.0296 (0.161)	-0.000348 (0.0536)
Single without children	-0.0656*** (0.0198)	0.0184** (0.00716)	0.0472** (0.0229)	-1.21e-05 (0.00187)
Creative occupation	-0.0590*** (0.0167)	-0.00144 (0.00535)	0.0604*** (0.0195)	1.47e-05 (0.00228)
<i>Regional characteristics</i>				
High education level	-12.49*** (1.175)	-2.558*** (0.271)	15.06*** (0.434)	-0.00812 (1.258)
Wage level	-4.12e-06*** (7.63e-07)	-1.02e-06*** (1.89e-07)	5.15e-06*** (5.82e-07)	-6.97e-09 (1.08e-06)
University city	-0.346*** (0.131)	-0.0564** (0.0250)	0.420*** (0.103)	-0.0172 (0.253)
Tax rate	0.0659*** (0.0136)	0.0237*** (0.00332)	-0.0894*** (0.0247)	-0.000231 (0.0357)



Recreational areas	-0.668*** (0.0628)	-0.163*** (0.0213)	0.830*** (0.108)	0.000495 (0.0766)
Big lakes	-0.0188 (0.0327)	-0.0129 (0.00920)	0.0314 (0.0413)	0.000346 (0.0536)
Seawater	0.0855** (0.0414)	-0.0156 (0.0123)	-0.0700 (0.0453)	0.000195 (0.0303)

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Ten years after getting their degree, we now see some minor variations compared to the short-term five-year-results we saw in Table 2, but overall the results are very similar. Starting with the individuals who live in their home regions, the biggest difference compared to the short-term-results is that we now find the variable “partner with children” insignificant. This factor was positive and significant in the short-term-analysis. In other words, it is more likely that individuals who had children at an early age, soon after getting their university degree are moving back home, while this factor does not remain significant five years later. It may be that individuals at this age have older children, but also that individuals are less dependent on help from their family, even if the children are young, because they have more established careers and higher incomes. Therefore, living close to their family may be less important.

We still see how family structure is a dividing factor though. Still, being single and without children significantly reduces the likelihood of an individual choosing to live in the home region at this point (which is similar to the short-term results). The individuals are also still less likely to have an immigration background, have a creative job and to commute to work. At the regional level, the long-term results are very similar to the ones we had in the short-term analysis.

For individuals who moved to another rural area than the one they originated from, we again find some change in the results related to family structure. Now, individuals with a partner and children are less likely to be found in this group (a variable that was insignificant in the short-term analysis). However, single individuals without children are still more likely to belong to this group. It may be that having access to schools nearby as well as to many public services becomes more important when children arrive, and that this makes these individuals more likely to choose another location once the family structure changes. Again, the regional characteristics results are very similar to those generated in the short-term analysis.

For the group of individuals with a rural origin and who live in an urban area ten years after graduating, we find very similar results as for the short-term analysis. However, in the short-term, being in a relationship and having children decreased the likelihood of such a move.

This is no longer the case, and this variable is now insignificant. Being single without children is still positive and significant. The regional variables in this case remain more or less unchanged compared to the short-term analysis. The peri-urban analysis again generates no significant variables at all.

Moving on to the long-term (10 years) location decision for individuals with an urban background (Table 5):

(Table 5 about here)

**Table 5:** Marginal effects for individuals with an urban origin (long term 10 years)

	$\frac{\delta \Pr(y = home)}{\delta}$	$\frac{\delta \Pr(y = rural)}{\delta}$	$\frac{\delta \Pr(y = urban)}{\delta}$	$\frac{\delta \Pr(y = periurban)}{\delta}$
<i>Individual characteristics:</i>				
Gender	-0.0239*** (0.00647)	5.95e-05 (7.07e-05)	0.0239*** (0.00647)	8.36e-09 (3.78e-06)
Exam age	0.0306*** (0.00340)	2.13e-05 (3.56e-05)	-0.0307*** (0.00340)	6.96e-10 (3.15e-07)
(Exam age)2	-0.000134*** (4.82e-05)	-6.96e-07 (5.05e-07)	0.000135*** (4.82e-05)	-2.14e-07 (3.06e-07)
Long education	-0.102*** (0.00745)	0.000392*** (7.62e-05)	0.102*** (0.00745)	2.41e-08 (1.09e-05)
Immigrant	-0.0587*** (0.00955)	-7.99e-05 (0.000111)	0.0588*** (0.00955)	1.18e-08 (5.32e-06)
Commuter	-0.158*** (0.00672)	-0.000750*** (9.40e-05)	0.159*** (0.00672)	-4.66e-08 (2.11e-05)
Partner with children	0.281*** (0.0482)	-0.000697** (0.000335)	-0.280*** (0.0482)	-4.40e-08 (1.99e-05)
Single without children	-0.0247*** (0.00763)	0.000360*** (0.000109)	0.0243*** (0.00763)	5.30e-08 (2.40e-05)
Creative occupation	-0.0760*** (0.00643)	0.000127* (6.99e-05)	0.0758*** (0.00643)	1.19e-08 (5.40e-06)
<i>Regional characteristics:</i>				
High education level	0.131 (0.0847)	-0.0615*** (0.00568)	-0.0698 (0.0848)	-3.97e-06 (0.00180)
Wage level	-6.05e-07*** (1.49e-07)	-1.39e-08*** (1.96e-09)	6.18e-07*** (1.49e-07)	-2.10e-07 (3.26e-07)
University city	0.169*** (0.00861)	-0.000702*** (0.000145)	-0.167*** (0.00862)	-0.00144*** (0.000225)
Tax rate	0.0726*** (0.00377)	0.000306*** (4.50e-05)	-0.0729*** (0.00377)	-5.57e-08 (2.52e-05)
Recreational areas	-0.229*** (0.0283)	-0.00262*** (0.000351)	0.231*** (0.0283)	1.53e-07 (6.92e-05)

Big lakes	-0.0238** (0.0114)	-0.000409*** (0.000127)	0.0242** (0.0114)	1.77e-07 (8.01e-05)
Seawater	-0.0554*** (0.0160)	-0.000253* (0.000143)	0.0557*** (0.0160)	6.84e-08 (3.10e-05)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Again, we find very similar results to the ones we saw for the individuals with an urban background but more short-term. Starting with individuals who ten years after graduating are living in the home region, they are still more likely to have children, be a non-immigrant, be older with a shorter university education, and less likely to have a creative job and to commute to work. It is worth noting that they are more likely to live in their home region if they have children, a factor that was insignificant in the long-term analysis for individuals with a rural background. It may be that the urban home region in this case offers both access to family as well as access to a larger variety of schools and other public services, especially at this point in life.

At the regional level, we find a few differences and some similarities compared to the short-term analysis for the same group. The regional educational level is now insignificant (it was positive and significant five years earlier) and the regional wage level is now again positive and significant, just as it was five years earlier.

Individuals with an urban background who locate in a rural area ten years after graduating are less likely to have children and more likely to be single without children. In the short-term analysis having a partner and children was insignificant. The regional variables remain more or less unchanged (with the exception of access to seawater which now is weakly negative and significant). This result is difficult to interpret but one reason might be that there are factors outside this analysis explaining a move from an urban to a rural area, a decision that is very different from the majority of individuals.

For those with an urban background who live in another urban region ten years after graduating, we again find similar results compared to the short-term analysis. Still, they are more likely to be men, younger, with a longer university education, and with a creative job. Still, having a partner and children is negative and significant, and being single without children is positive and significant. At the regional level, the educational level is no longer significant, and the average wage level is now positive and significant (a factor that was negative and significant in the short-term analysis).

For the group of individuals who have an urban background but have chosen to live in a peri-urban region ten years after graduating, we still have basically no significant results, with the exception of the negative and significant relation to the University City variables.

## 5. Conclusions

Our research has examined the locational choices of highly educated individuals in light of their origin as well as four types of destination regions: a home region, a rural region, an urban region, and a peri-urban region. We have done this for two points in time: five years after graduating (short-term) and ten years after graduating (long-term). We expected the short-term locational choice to more likely be related to a career move, while the long-term move more likely took family considerations into account since many of these individuals by then would have started a family.

To do so, we employed a series of multinomial logit regression analyses on individual level data for all Swedish university graduates in the year of 2001. We tracked the place they lived in before entering university, as well as their locational choice five and ten years after graduating. Our findings suggest that family structure is one of the strongest dividers in determining the location of highly educated individuals.

At the individual level, we also found that an immigration background clearly decreases the likelihood of locating in an area other than an urban one. This is true whether or not the individual lived in an urban or rural area before university, or if it is five or ten years after graduating. Clearly, the individuals who moved to an urban area (both short- and long-term) were more likely to have a creative job, but also a longer commute to work.

The individuals that returned home were clearly more likely to have a family and children. At the same time, this move is costly in the sense that they were more likely to end up in a region with fewer amenities and worse labor market conditions. They were also less likely to have a creative job, and this is true no matter if “home” is an urban or rural area.

It is interesting to notice how highly skilled individuals that chose a rural location (but not the home location) were neither more nor less likely to have a creative job. In many cases they were also less likely to commute to work. It may be that these individuals, to a larger extent, were self-employed, something we were unable to control for, and that they created their own jobs in labor markets that normally consist of a lower share of such jobs. However, again, we

find that being single without children increases the likelihood of belonging to this group, and it may be that this type of lifestyle becomes more difficult once they start a family.

It is surprising that we find relatively weak results for rural amenity variables in rural areas. In fact, many of them are even negative and significant. Rather, we find positive results for the urban locational choices, and it may be that these are stronger dividers in urban areas. In other words, we would find less variation of these variables across rural areas, but they may separate one urban area from another, and add to the attractiveness of the urban areas that can provide these qualities.

Generally speaking, we find that family structure seemed to determine the locational choices of individuals more than other individual factors. From a Swedish perspective this is interesting, since many sparsely populated areas with declining market sizes have experienced a decomposing of the offered public services related to health care and education. With fewer children and families around, many schools and local clinics are closing down. As a result, individuals need to travel longer distances to have access to these services. At the same time, it seems as if these factors could be crucial for these places. For example, we find that single people with children are more likely to locate here after graduating, but that they also are more likely to move away when they have children. It could be that many of these individuals would have considered staying if family-related services had been more readily available.

As noted, a strong divider in the locational choices among highly educated individuals was whether or not they had an immigration background. In all versions of this model, no matter where they originated from, if we examined a short- or long-term aspect, individuals with an immigration background were less likely to choose something a non-urban region. It may be that, on average, they had lived in their “home region” for a shorter time period and therefore felt less attached to it, and also that they had developed less location-specific advantages (e.g. weaker networks both in terms of long-term friendships and labor market relations). It may also be that, in general, smaller places have a more homogenous population, and bigger urban areas are more diverse in terms of immigration backgrounds which makes it easier to fit in. This would be in line with Florida’s (2002) arguments about bigger cities being more open and tolerant towards minority groups.

Another factor that separates the outcomes is the likelihood of getting a creative knowledge job. The urban movers are most likely to have such a job, while the individuals moving back home are the least likely to have one. In our analysis, we treat all highly educated with a

university degree as homogenous. It may be that the results would have been different if we would have separated the groups based on the type of education they received. The length of education seems to matter, and it may be that a longer university education is a proxy for a more costly investment in one's education, and that therefore, an urban move is needed for a more creative, knowledge job which also more likely is better paid. However, we find it interesting that the creative job variable is insignificant in the rural and peri-urban regressions, which indicates that a move to such an area at least should affect the knowledge job opportunities negatively.

In a time of urbanization with many declining, sparsely populated areas, there is an urgent need to better understand locational choices, especially for young, highly educated individuals who are among the least likely to migrate to such an area. However, the results of our analysis show that factors such as having a family and/or being born in Sweden increase the likelihood of making such a move significantly. Being able to provide people with basic public services such as schools and healthcare, and, to a certain extent, broadband infrastructure, is probably of significant importance in order to make the "single individuals without children" stay more long-term.

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### Appendix 1 Short term multinomial logit regression results (year 2006)

	Rural origin	Urban origin
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	<b>Urban</b>	<b>Rural</b>	<b>Peri-urban rural</b>	<b>Urban</b>	<b>Rural</b>	<b>Peri-urban rural</b>
<b>Individual characteristics</b>						
Gender	0.0823 (0.95)	0.0584 (0.81)	0.0976 (0.67)	0.105*** (4.07)	0.145** (2.11)	0.107 (1.08)
Exam age	-0.176*** (-4.30)	-0.141*** (-4.44)	-0.236*** (-4.51)	-0.122*** (-8.20)	-0.0573 (-1.53)	-0.000398 (-0.01)
(Exam age)2	0.0012** (2.06)	0.0011** (2.50)	0.0024*** (3.39)	0.00042** (1.97)	-0.00023 (-0.44)	-0.0012 (-1.38)
Long education	0.374*** (4.16)	0.331*** (4.57)	0.316** (2.15)	0.452*** (14.95)	0.752*** (9.19)	0.559*** (4.75)
Immigrant	0.554*** (3.35)	0.354*** (2.68)	0.341 (1.29)	0.202*** (5.31)	0.0751 (0.64)	0.315** (2.04)
Commuter	0.927*** (10.76)	0.328*** (4.79)	0.544*** (3.97)	0.528*** (19.58)	-0.385*** (-5.47)	-0.193* (-1.92)
Partner with children	-3.112** (-2.38)	-1.311* (-1.79)	0.651 (0.84)	-2.110*** (-3.38)	0.360 (0.49)	-18.34 (-0.00)
Single without children	0.350*** (3.90)	0.514*** (7.00)	0.557*** (3.80)	0.224*** (8.29)	0.398*** (5.33)	0.398*** (3.66)
Creative occupation	0.252*** (3.94)	0.173** (2.37)	-0.0857 (-0.57)	0.263*** (10.18)	0.221*** (3.15)	0.185* (1.86)
<b>Regional characteristics</b>						
High education level	71.29*** (34.66)	-4.002*** (-2.95)	7.947*** (2.66)	1.034*** (3.64)	-60.33*** (-41.90)	-45.42*** (-22.96)
Wage level	3.70e-05*** (10.52)	-1.76e-06 (-0.86)	-1.78e-05*** (-3.55)	-1.30e-06*** (-6.05)	-1.59e-05*** (-8.82)	-3.01e-05*** (10.37)
University city	2.461*** (18.71)	0.145 (0.67)	-18.02 (-0.03)	-0.667*** (-18.70)	-1.277*** (-10.90)	-19.73 (-0.64)
Tax rate	-0.387*** (-9.12)	0.142*** (3.63)	-0.876*** (-12.28)	-0.248*** (-14.44)	0.195*** (5.50)	-0.816*** (-15.72)
Recreational areas	3.792*** (12.15)	-0.846*** (-3.13)	3.075*** (7.00)	0.396*** (3.43)	-1.042*** (-4.45)	2.391*** (7.85)
Big lakes	0.134 (1.06)	0.00469 (0.04)	0.923*** (4.98)	0.0935* (1.80)	-0.322*** (-2.73)	2.050*** (13.62)
Seawater	-0.585*** (-3.14)	-0.198 (-1.24)	0.244 (0.84)	0.452*** (6.81)	0.206 (1.45)	1.180*** (5.82)
Constant	-7.02*** (-4.44)	-2.51 (-1.74)	30.71*** (11.85)	10.17*** (17.13)	7.984*** (5.88)	37.65*** (18.47)
Pseudo R2	0.53					
Observations	12638					

z-values in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Home region is the baseline.

**Appendix 2** Short term multinomial regression results (year 2011)

	<b>Rural origin</b>	<b>Urban origin</b>
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	<b>Urban</b>	<b>Rural</b>	<b>Peri-urban rural</b>	<b>Urban</b>	<b>Rural</b>	<b>Peri-urban rural</b>
<b>Individual characteristics</b>						
Gender	0.0800 (1.08)	0.0945 (1.37)	0.0714 (0.52)	0.0964*** (3.70)	0.0976 (1.52)	0.139 (1.58)
Exam age	-0.207*** (-5.71)	-0.164*** (-5.68)	-0.231*** (-4.46)	-0.124*** (-9.03)	-0.0375 (-1.16)	-0.0487 (-1.08)
(Exam age)2	0.00167*** (3.24)	0.00144*** (3.51)	0.00234*** (3.25)	0.000543*** (2.79)	-0.000376 (-0.83)	-0.000136 (-0.22)
Long education	0.299*** (3.61)	0.293*** (4.23)	0.225 (1.60)	0.418*** (13.37)	0.571*** (7.66)	0.480*** (4.66)
Immigrant	0.563*** (3.75)	0.325** (2.47)	0.303 (1.18)	0.236*** (6.15)	0.0395 (0.37)	0.241* (1.77)
Commuter	1.138*** (14.17)	0.553*** (8.42)	0.695*** (5.25)	0.644*** (23.31)	-0.400*** (-5.97)	-0.254*** (-2.80)
Partner with children	-0.234 (-0.37)	-1.092* (-1.83)	-15.66 (-0.01)	-1.362*** (-4.15)	-1.395* (-1.80)	-1.117 (-1.06)
Single without children	0.260*** (2.76)	0.395*** (4.99)	0.133 (0.78)	0.0987*** (3.22)	0.343*** (4.33)	0.567*** (5.24)
Creative occupation	0.264*** (3.39)	0.131* (1.91)	0.196 (1.45)	0.307*** (11.75)	0.255*** (3.98)	0.277*** (3.13)
<b>Regional characteristics</b>						
High education level	60.05*** (34.56)	-1.881 (-1.52)	5.544** (2.03)	-0.395 (-1.16)	-55.38*** (-43.56)	-45.63*** (-26.51)
Wage level	2.01e-05*** (10.03)	-2.97e-06* (-1.86)	-1.18e-05*** (-3.24)	2.47e-06*** (4.08)	-1.13e-05*** (-7.82)	-1.75e-05*** (-8.44)
University city	1.905*** (14.74)	0.214 (-0.02)	-13.87 (-19.16)	-0.682*** (-19.16)	-0.928*** (-8.30)	-17.72 (-0.02)
Tax rate	-0.336*** (-9.24)	0.141*** (3.77)	-0.894*** (-13.05)	-0.293*** (-19.28)	0.140*** (4.25)	-0.771*** (-15.58)
Recreational areas	3.259*** (11.22)	-0.441* (-1.78)	3.233*** (7.51)	0.928*** (8.13)	-1.928*** (-8.68)	2.172*** (7.68)
Big lakes	0.107 (0.91)	-0.119 (-1.07)	1.141*** (5.74)	0.0969** (2.11)	-0.323*** (-2.91)	2.069*** (14.72)
Seawater	-0.348** (-1.96)	-0.416*** (-2.72)	0.404 (1.50)	0.224*** (3.48)	-0.124 (-0.96)	0.885*** (4.90)
Constant	60.05*** (34.56)	-1.881 (-1.52)	5.544** (2.03)	-0.395 (-1.16)	-55.38*** (-43.56)	-45.63*** (-26.51)
Pseudo R2	0.53					
Observations	12638					

z-values in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Home region is the baseline