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**Mover Stayer Winner Loser - A study of income
effects from rural migration**

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Abstract: The accepted rural-urban migration theory suggests that economic gains are made by moving from a rural to an urban area. Its premise is: “If you stay, you lose.” However, are losses still the rule? And, if so, how big is the economic loss once other factors are controlled for? In this paper, we specifically focus on the income effects of migration decisions among young individuals from rural areas, using microdata for Sweden. We find that, contrary to accepted theory, staying in a rural region most often is insignificant in relation to an individual’s income level. When taking housing values into account, it can even be financially beneficial for some to stay in a rural area. Only for highly educated individuals is it consistently financially beneficial to move to an urban area, also after controlling for housing costs.

Keywords: rural-urban youth migration, income, mover, stayer

JEL classification codes: R23, P25, J1

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Introduction

“What if cities are no longer the land of opportunity for low-skilled workers? Dense cities have long promised higher wages, but now [this] is primarily true [only] for workers with more education.” So stated a recent New York Times article (Badger and Bui, 2019) based on a presentation by M.I.T. economist David Autor.

Urban areas have long experienced a large inflow of young, skilled individuals, while rural areas are often ‘left behind’ (Rodríguez-Pose, 2018). In many rural towns, the result is depopulation, an increased share of elderly, and a less skilled labor force. Economists have identified this common migration pattern as an effect of greater urban economic opportunities as well as more lifestyle options. The underlying premise is that individuals will migrate if the expected net present value of moving exceeds the costs, taking both monetary and non-monetary factors into the valuation account.

Human capital theories also suggest that highly skilled workers are more likely to move than low skilled ones. They face larger relative wage differences across the rural/urban divide, and so have potentially more to win from migrating (e.g Mincer, 1977; Nakosteen & Zimmer, 1980; Sjaastad, 1961). Other regional research also highlights the greater diversity of consumer services, culture, and other experiences that create additional influential factors prompting youth to move from rural to urban areas (Florida, 2002; Glaeser et al., 2001).

Still other studies highlight the role of such economic and social gains from rural-urban migration, but mostly from the perspective of developing countries (eg. Glaeser & Kohlhase, 2003; Lucas, 2004) or from a historical perspective among developed Western countries (Gollin et al., 2016). Some empirical studies on rural-urban migration focus on other types of gains that can be achieved. But what seems to be the most significant in the more developed nations of the world are the labor market opportunities and benefits (Hansen & Niedomysl, 2009; Storper & Scott, 2009) and diversity of lifestyle choices (Florida, 2002; Glaeser et al., 2001).

A related area of research has been examining the strong effects that migration into attractive urban areas has had on home prices and the dynamics on the housing market. Edlund et al. (2016) show how demand for centrality and a reduced tolerance for commuting have been drivers of increased urban housing values since the 1980s. Glaeser et al. (2001) argue that urban rents have increased faster than wage levels. In the most attractive urban areas, the rise in housing values has by far outpaced the national averages (Gyourko et al., 2013). Even if wage

levels are significantly higher, far from everyone earns enough to cover the extra housing costs that living in a big city requires (Florida, 2017).

In the past few years, the migration patterns of young and highly skilled individuals have stirred up an intense debate in Sweden, the country of the authors, and the search for understanding the reasons has become critically important for policy making. The economic gains theory is most often suggested, while some claim that individuals leave rural areas more so due to a decreased supply of services affecting the quality of life (Swedish Government, 2015). Rural interest organizations have suggested that young people leave rural areas less based on true economic opportunities than on an “urban norm structure” – a sort of myth that implies that cities are viewed as the place to be “if you want to become successful.” The norm suggests that young people who stay in rural areas develop the feeling of being considered as “losers.” In this framework, the perceived gains reaped from making the rural-urban move are partly constructed from such widespread “urban norm” notions (Rönnblom, 2014; Stenbacka, 2011).

In contrast, a recent study shows that not all rural regions can be bundled together as losing propositions. There is significant variety across rural areas, and some are actually well-equipped for positive economic development and innovation that could attract youth to stay home (Rodríguez-Pose and Wilkie, 2018).

The purpose of this article is to discover if the rural-urban move is indeed a consistent winning financial proposition, as well as what other factors might weigh in the decision to move or stay in a rural area. We examine the extent of real financial losses if one decides *not* to move from a rural to an urban area, once other factors have been controlled for, such as personal characteristics and housing values. Based on a large amount of microdata, we track all individuals with a rural residential location who were 20 years old in the year of 2005. We then follow up with them at the age of 30 and identify their current residential location (did they stay or move?) and examine their incomes, relative to their regional and individual characteristics. We examine income based on classic economic factors, including education, occupation, employment, and gender, but we also consider whether the individual stayed or moved from their home rural region. While we cannot examine the influence of the urban norm on their lives, we can evaluate possible economic gains from migration to see if migration necessarily led to higher incomes for these individuals leaving rural areas compared to those staying. This result in turn would suggest that the migration decision may have been economically driven.

Theory and concepts

An increasing economic divide between urban and rural areas has been transpiring for decades. Urban areas have grown and attracted young, highly educated people, mostly due to strong labor markets, better access to education, and a more diverse set of lifestyles. Rural areas, on the other hand, have generally experienced a loss of young people over time, which has resulted in several knock-on economic and demographic consequences. As population size decreases, so do many public services and other consumer amenities. This then makes remaining in rural regions even less attractive, especially for younger individuals.

A recent study from Bjerke and Mellander (2016) illustrates how almost 90 percent of moves across a municipal border are made by individuals between 18 and 35. Most of these moves are migrants shifting from smaller to bigger regions. Another study showed that only 15 percent of Swedish municipalities had more 25-year-olds in the year 2012 than they had 18-year-olds seven years earlier (Mellander, 2013). This implies that the locational preferences of the younger generation very much determine population growth or decline.

A vast literature has shown a strong relation between migration decisions and incomes, based on the human capital model. It suggests that people relocate when another location better satisfies their financial needs (Sjaastad, 1962) and that a driver for migration is to maximize real wages. However, regions with a large inflow of people increase their labor supply, which in turn tends to drive down regional wages. Migration in this context then becomes a means to even out differences in real wages across regions (Greenwood, 1973; Thirlwall, 1966).

Besides wage differentials, differences in amenities and housing costs also weigh in the migration decision. Roback (1982) suggests that all three factors must be considered to understand migration patterns and allocation of workers across locations. For example, a rural lack of amenities may be compensated for by higher wage levels in some areas. This correlation is found in a Swedish study by Backman and Bjerke (2014) in which there is a higher wage return in rural areas for individuals with a higher education degree in science, engineering and medicine.

However, migration patterns based on these three factors may not be consistent, as there appear to be alternative reasons behind migration decisions. This was observed decades ago, starting with Lowry's gravity migration study (1966), which showed that economic conditions, such as wage and unemployment levels in the origin region have no effect on migration decisions. These results were further confirmed by Rabinski (1970). More recent American research also highlights that mobility across the 50 states is decreasing in situations where mobility had once

been high. Americans do not necessarily leave areas that are hit the most by economic crises with low wage levels and high unemployment rates. Neither are individuals moving towards regions where economic conditions are better and where more jobs and higher wages are available (Schleicher, 2017). Other factors thus influence individuals to choose to remain in low wage and rural areas.

In the U.S., the rural-urban migration patterns are also influenced by the fact that the country has many “micropolitan areas,” places that offer a small-town lifestyle, but are within commuting distance to big city amenities. A limited number of studies of micropolitan areas in the U.S. was noted by Vias (2012), who lists several ways in which these areas still play a significant role in the urban migration hierarchy. With access to digital infrastructure, such places are attractive from a labor market perspective. He also illustrates how micropolitan areas are often locational choice of businesses, due to lower wage levels and housing costs. This conclusion is also in line with McGranahan and Wojan (2007) who show how natural amenities explain migration patterns to rural parts of the U.S.

Mitchell (2004) defines three types of ‘counter-urbanization’ in the U.S. -- ex-urbanization, displaced-urbanization, and anti-urbanization -- and differentiates between the forces that make individuals move downwards in the urban hierarchy. While the ex-urbanizers and anti-urbanizers move towards micropolitan regions to get access to the amenities and lifestyle they provide, the displaced urbanizers move to decrease their cost of living since they cannot afford to live in a more urban setting. Partridge et al (2010) find some support that individuals move from urban to rural areas for quality-of-life reasons. However, in accordance with Mitchell, migration can equally be caused by financial restrictions.

Foulkes and Schafft (2010) examine the role of financial means and migration and show how poor people. are equally inclined to migrate long distances as their richer counterparts – contradicting human capital theory. However, attracted by more affordable housing, their target destination is more often another poor micropolitan area, which in turn increases poverty rates in many micropolitan regions.

In developed nations, a potentially important relation to emphasize is also that between housing markets and migration decisions. Differences in housing values across regions can hinder migration, mostly in the rural-to-urban direction. Regions with higher housing demand strengthens real estate markets, which means that movements from rural areas to urban areas are hampered by access to capital, rather than by any other characteristics (Bover et al., 1989; Mc Cann, 2013). The relatively faster increase in housing values in urban areas (Gyourko et al.,

2013; Edlund et al., 2016; Florida, 2017) may imply that a relatively higher wage level would still not be enough to cover the extra cost for housing.

A recent stream of Swedish studies (Svensson, 2006; Rönnblom, 2014) perceive the migration decision as a function of social pressure. The studies suggest that young people's migration from rural to urban areas is driven by a so-called "urban norm" rather than by economic incentives. By portraying cities as the places where one finds the most success, rural areas are implicitly thought of as less advantageous. This would potentially affect young individuals making locational decisions, particularly those living in rural areas who might choose to relocate so as not to be perceived as "losers" among their social cohorts. Currently, this stream of research is primarily based on case studies in specific locations. For example, in one study of a rural region in Sweden, Svensson (2006) shows that only about 30 percent of the young stayers thought that local policy makers considered them to be an asset. Among the young movers, nearly 70 percent said they would be considered a local asset if they moved back home. In other words, the stayers portrayed themselves as less desirable—hence, successful—than the movers.

While differences in wages and the supply of amenities go a long way to explaining migration patterns, so do many individual characteristics, particularly those related to different life stages. Educational investments (Faggian et al., 2007a), marital status (Edlund, 2005), changes in marital status (Graves & Linneman, 1979; Mincer, 1974), age (Pandit, 1997; Rogers, 1988) as well as gender (Faggian et al., 2007b) all may play a role, singly or in combination, in the explanatory mix of migration patterns.

Mover-Stayer models (Blumen, 1955) propose that certain groups are more likely to move, such as the young and the highly educated. The young have far more to gain from relocating as they have a longer time to capture returns from their investment in moving. The highly educated have a larger incentive for higher wages and the ability to optimize work in a tight labor market (DaVanzo, 1983; Schwartz, 1976).

Migration can also be the result of a path trajectory, such as an individual who decides to move to attain higher education, and who then is less reluctant to move again (DaVanzo, 1983; Faggian & McCann, 2009; Schwartz, 1976).

Using Swedish data, Bjerke and Mellander (2016) show that mobility peaks around the age of 25 and that the likelihood to move drops sharply after 35. So, contrary to frequent migration, older and married people are more likely to stay. These stayer groups are assumed to have also developed more location-specific advantages such as local personal networks and social capital,

work-oriented advantages, and infrastructure – assets that would lose much of their value in case of a relocation.

In the remaining part of this paper, we will examine to what extent the locational choices of young, non-urban individuals influence their income. Our assumption is that income incentives may be a significant explanatory factor in explaining rural-urban migration among young individuals. We identify all individuals at the age of 20 in the year 2005 who have a rural origin¹ and what their income is. We next follow-up on with these individuals to see where they live ten years later, in 2015, and what their income is. We build the estimation around a classic Mincer equation in combination with this locational choice, but also control for other personal characteristics and labor market conditions. Our question is: To what extent are earnings affected by the urban-rural locational choice at the latter point in time, once other factors have been controlled for? We also take regional housing prices into account in an extended version of our regression model.

Methodology

We explain income based on classic economic factors, including education, industry of work, labor market experience, gender, marital status, and foreign background, in combination with current regional characteristics. We also consider whether the individuals decided to 1) move away from that specific region, 2) move and come back to it, or 3) not move at all. We can evaluate possible economic gains from migration to see if migration necessarily leads to higher incomes once we take the regional characteristics into account. More specifically, we examine if migration towards urban regions still pays off economically for these individuals with a rural origin.

Data and background

The central hypothesis concerns whether staying in a rural region is a winning or losing choice financially for young individuals. To test this, we employ register micro data from Statistics Sweden. This register data contains information about all individuals in Sweden and includes information about factors such as location, gender, age, educational length, working profession, and more. There are 290 municipalities and, using a compound measure, they can either be characterized as rural or urban.² (A municipality is approximately the equivalent to an American

¹ We define a rural origin based on if the individual lived in a rural area at the age of 18, the year of high school graduation.

² Categorization according to The Swedish Agency for Growth Policy Analysis (2015).

county.) A ‘rural’ region in this context can roughly be compared to an American micropolitan region, while an ‘urban’ region would be approximately an American metropolitan region.

The analysis is performed in two steps and tracks all individuals of rural origin who were 20 years old in the year 2005. That age is the starting point of what could be described as a migration wave. Figure 1 (below) illustrates the overall migration frequency across municipal borders and the age when these moves take place in Sweden. Three peaks are noticed, two smaller and one much bigger. The first peak are children moving with their parents and the third peak are those moving around retirement age. The largest peak is when mobility is at its highest between 20 and 35 years old. It starts to rise just after finishing high school, and continuously increases to the age of approximately 25, then drops sharply around ages 30 to 35. There are many potential reasons why migration is overrepresented in this age span. Clearly, educational opportunities affect a major part of these moves, but also labor market conditions and other lifestyle-related factors such as family compositions (see e.g. Bjerke & Mellander, 2016; Fischer & Malmberg, 2001; Van Dijk et al., 1989).

(Figure 1 about here)

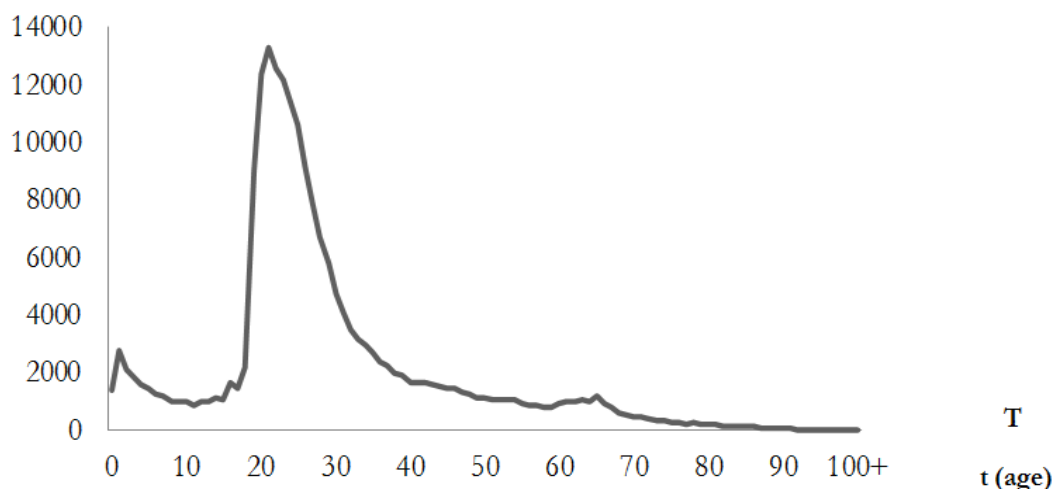


Figure 1 Interregional migration for all ages of individuals in Sweden 2015 (Bjerke & Mellander, 2016)

Our data do not contain information about region of birth. As a proxy for “home region” we use the region of living at the age of 18, which is one year before most adolescents finish high-school. This may be an even better proxy for home region than actual birth region, since the parents may have relocated since starting a family. Only those 20-year-olds with a rural (not urban) home region are selected in the analysis and they are 28,604 in number, slightly more men than women (see Figure 2).

(Figure 2 about here)



Figure 2 Locational and educational choices of individuals living in rural areas in 2003

In the second step, we study these same individuals ten years later at the age of 30, and map where they live as well as their current income. We also track their migration patterns, education, and work for the ten years that have passed.

The middle set of boxes in Figure 2 shows the distribution of locational choices of these individuals. When they are 30 years old, 11,583 have moved away from their home region, while 12,845 still (or again) live in their “home region,” and 4,176 remain in their LLM (local labor market), meaning individuals who, for example, move for a job but still live geographically close to their home region. Our data also indicates (though not shown) that as many as 10,627 individuals among the “same region” group have never resided in another region during this 10-year period.

The middle set of boxes in Figure 2 also breaks down the gender differences. The largest difference appears in the category of those living in their home region when they are 30 years old. Men have a higher representation in that group (56.6%), which is in line with previous literature showing that more women than men move to urban areas (Edlund, 2005).

The bottom set of boxes in Figure 2 illustrates the educational attainment of the study group (at least 3 years of university education for a BA or above). About 15 percent of those that are in their home region when they are 30 have graduated from a higher education institution. The corresponding numbers for those living somewhere outside their home region is about 44 percent. About 26 percent of those living in the same LLM region, but not in the same municipality, has a higher education. Overall, women tend to have higher education and the largest difference between gender appears for those being in their rural home region in 2015.

Rural movers vs. rural stayers

We select the individuals at the age of 20 in the year 2005, with a rural origin and study their total income level 10 years later, at age 30. The focus is to capture these individuals at a stage in life when most of them have decided upon a more permanent residential location. From previous literature, we assume the income to be affected by individual experiences as well as regional characteristics. We primarily estimate the regression as a linear cross-sectional model:

$$Y = Income_i = \beta_1 Same\ residential\ municipality_i + \beta_2 Same\ residential\ LLM_i + \beta_3 House\ price_i + [Individual\ characteristics_i]' \beta_4 + [Regional\ characteristics_r]' \beta_5 \quad Eq. 1$$

The dependent variable, $Y (ln)$ is a compound measure of gross wages from employment and/or net income from self-employment in the year 2015. Entrepreneurship can sometimes be a necessity and may be specifically true for some in rural areas, located on the outskirts of a labor market region. Either you become self-employed or you need to migrate for a job.³ We do not separate these sources of incomes in the empirical model since we are interested in the total monetary net or gain, irrespective of how they achieve it.

Since urban regions in general have higher costs of living, we also take housing prices into account in an extended version of our model. The price levels and price dynamics of the housing market are very much related to regional population density. House prices tend to vary with incomes in the long run but are also influenced in the short-term by supply and demand. Hort (1998) shows this for the Swedish housing market. These perspectives lead us to assume that housing prices can affect the migration decision, though indirectly through the relationship between incomes and housing prices. We try to capture this indirect relationship in a two-step-

³ Self-employed in areas with such challenges tend not to be significantly further job-creating (Stockdale, 2006).

model. First, we build our dependent variable by estimating incomes as a function of regional average house prices ($house\ price_i$) and create the vector of fitted values, \hat{Y} .⁴ So, in the main empirical model, we use the dependent variable \hat{Y} as the (orthogonal) projection of Y onto the space of average housing prices.

$$\hat{Y} = \beta_1 Same\ residential\ municipality_i + \beta_2 Same\ residential\ LLM_i + [Individual\ characteristics_i]' \beta_3 + [Regional\ characteristics_r]' \beta_4 \quad Eq. 2$$

Figure 3 are two maps illustrating the dependent variable \hat{Y} (to the left) but also average regional income levels (to the right). Starting with \hat{Y} , the white and the patterned regions (municipalities) are those with negative values and the regions in shades of grey are those of positive values. The latter seems to appear in southern parts of Sweden, particularly within and around larger cities, and in the very northern parts. Income levels mirror this pattern, and strong labor markets in the north stand out in terms of relatively high incomes but one can otherwise argue that incomes are highly related to population density

(Figure 3 about here)

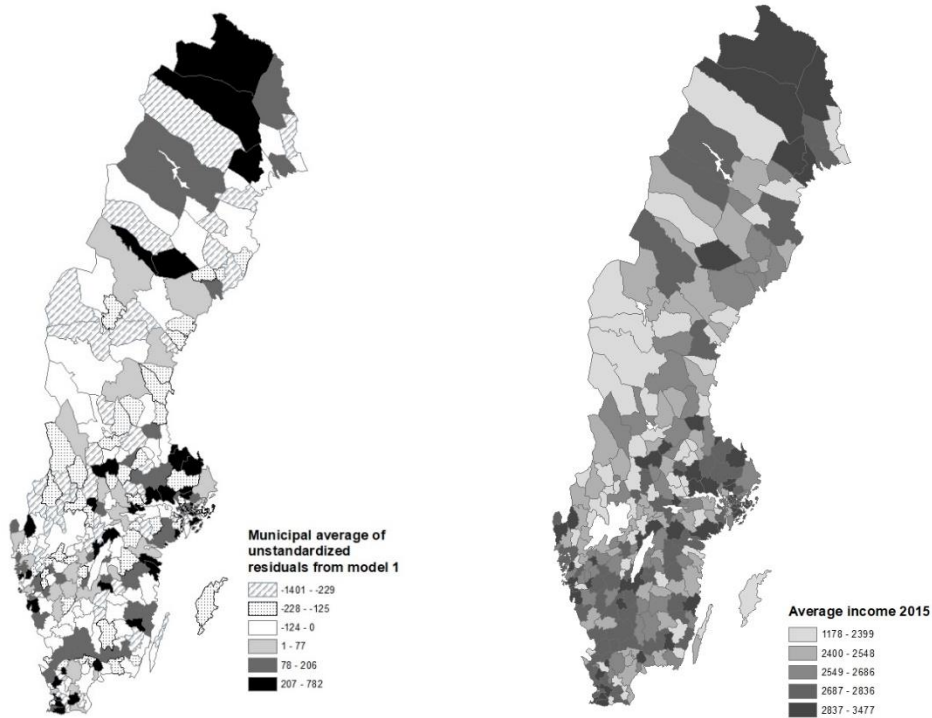


Figure 3 To the left: Unstandardized residuals, used as dependent variable in Model 4 and Model 5. To the right: Average income 2015.

⁴ Our register data do not contain information of yearly housing costs at the individual level.

Independent variables

We now describe the independent variables used in this empirical analysis:

Locational choice:

Local residence at the age of 30: This captures whether an individual resides in his or her rural home region (municipality) at the age of 30 years old, or if he or she resides somewhere else.

Regional residence at the age of 30: This indicates whether an individual lives in his or her home labor market region (LLM), but not in their home municipality. One can say that these people live close to home, or in reasonable reach of it, but not completely in the home blocks. Some of the attraction of living in the home region might be to be close to already familiar factors, such as old networks and family ties. This is sometimes referred to as family motivation of migration (Mitchell, 2004). If this is true, geographical distance is important, but one may also believe that “commuting distance” to such familiar ties is enough, as is the case within larger labor market regions.

Migration frequency: As an attempt to see whether the migration pattern affects income, this is a variable illustrating the number of times the individual has changed his or her residential municipality during the last ten-year period.

Individual characteristics: Data include information about gender (man =1), civil status (in a relationship=1), and if they are foreign-born (foreign-born=1). Civil status is included in the analysis since being single can decrease the transaction cost related to migration decisions and thereby indirectly potentially affect income. Our variable for labor market experience captures the number of employment years between 20 and 30 years old. Higher education reflects whether the individual has a university education longer than two years, equivalent to a college graduation. We also assume that educational length affects migration patterns in Sweden (Bjerke and Mellander, 2016).

Regional characteristics: The main regional character used in this model is the average housing price (in thousand SEK) in their residential region. We also control for several other regional characteristics related to their residential location at the age of 30. House prices are somewhat related to incomes which also means that we can assume rural locations are related to lower average house prices.

We also include shares of employees within manufacturing-, agriculture-, mining-, and the hospitality sectors respectively. The industry structures in rural areas are primarily dominated by these sectors in terms of employment opportunities and economic growth. Their distribution

across municipalities is shown in Figure A2. It varies vastly even across rural areas, but we see that agriculture, mining, and the hospitality sectors are significant ones in the labor market in the northern parts of Sweden. The center of the south is also characterized by rural areas but here, manufacturing is the dominating sector. We also control for the creative, knowledge-based sector which normally is over-represented in urban areas. One should also note that many rural areas closer to urban areas have a very low in- and out-commuting quota, being closer to a “bedroom community.” A measure of accessibility to population is included in the empirical model to capture such access to thicker labor markets.⁵

(Table 1 about here)

Table 1 Descriptive statistics

Variables	Mean	Std.dev	Min	Max
<i>Dependent variables:</i>				
Income	2 478	1 547	0.1*	16 630
Income - Housing price residual	-1.23 e ⁻⁶	1 538	-11 348	13 959
<i>Locational choice variables:</i>				
Same residential municipality at the age of 30 (1 if same municipality) as at the age of 18	0.45	0.50	0	1
Same residential LLM at the age of 30 (1 if LLM, but not municipality) as at the age of 18	0.15	0.35	0	1
Migration frequency	1.33	1.40	0	10
<i>Individual characteristics:</i>				
Gender	0.52	0.50	0	1
Married	0.49	0.50	0	1
Experience	9.60	2.55	0	10
College Grad	0.28	0.45	0	1
Foreign-Born	0.06	0.23	0	1
<i>Regional characteristics:</i>				
Housing price	2 372	1 742	307	10 182
Manufacturing	0.13	0.33	0	1
Agriculture	0.02	0.13	0	1
Mining	0.00	0.07	0	1
Hospitality	0.03	0.16	0	1
Creative	0.07	0.26	0	1
Accessibility	210 414	274 099	3 084	994 733
N=28 604				
*Those with negative or zero income has been assigned a value of 0.1. These are 8.7 % of the observations. Controls for robustness of this data modification show no major changes of results, either by removing them or adding a dummy.				

⁵ Accessibility is measured as an exponentially decreasing function of distance. For a presentation of the full model see Johansson et al. (2003).

Findings

We now turn to the results of our analysis. We examine income effects from staying in a rural region versus moving away from it. Standardized and unstandardized coefficients are presented to get around the different units of our predictors. Five models were run; the first three use income (in logged form) as dependent variable. Model 1 (Equation 1) is the base model and is followed by models 2 and 3 controlling for effects from access to denser, urban areas – one based on access to thicker labor markets (Model 2) and one based on housing prices (Model 3). Models 2 and 3 intend to capture the individual's ability to commute for work from a rural location into a denser area. From previous research we also know that such accessibility is a proxy for other labor market characteristics, e.g., urban-related industries (see, for example, Andersson & Karlsson, 2007). The high inter-relation between population density and housing prices (a Pearson bivariate correlation coefficient of 0.86) leads to multicollinearity issues when combined in the same model and is therefore used separately in model 2 and 3 respectively. The last two models (4 and 5) still employ income as the dependent variable, but this time after controlling for regional housing prices (Equation 2). Table 2 illustrates the results:

(Table 2 about here)

Table 2 Regression results, unstandardized β -coefficients, t-statistics in italics and standardized β -coefficients in bold.

	Dependent variable: Total income (ln) 2015			Dependent variable: Housing price residual	
	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Focus variables -Locational Choice</i>					
Same municipality	-0.14*** (-3.54) -0.023	-0.04 (-0.86) -0.006	-0.01 (-0.30) -0.002	126.26*** (5.71) 0.041	71.27*** (3.00) 0.023
Same LLM	-0.02 (-0.52) -0.002	1.68e ⁻³ (-0.04) -0.002	0.02 (0.46) 0.002	23.96 (1.02) 0.006	13.23 (0.56) 0.003
Migration freq.	-0.10*** (-3.65) -0.023	-0.11*** (-3.87) -0.050	-0.10*** (-3.87) -0.049	-42.29*** (-2.74) -0.038	-39.00*** (-2.53) -0.035
(Migration freq.) ²	0.008 (1.42) 0.017	0.01 (1.49) 0.018	0.01 (1.38) 0.016	-2.75 (-0.86) -0.011	-2.94 (-0.92) -0.012
<i>Individual characteristics</i>					
Gender	0.63*** (22.28) 0.106	0.62*** (22.18) 0.106	0.62*** (22.10) 0.105	889.32*** (55.59) 0.289	891.00*** (55.72) 0.289
Married	-0.19*** (-6.86) -0.032	-0.17*** (-6.27) -0.029	-0.16*** (-5.81) -0.027	-286.23*** (-18.37) -0.093	-294.62*** (-18.86) -0.096
LM experience	0.71*** (131.01) 0.613	0.71*** (130.74) 0.612	0.71*** (130.56) 0.611	238.35*** (77.45) 0.395	239.14*** (77.69) 0.396
Long education	0.52*** (13.41) 0.079	0.48*** (12.15) 0.073	0.46*** (11.69) 0.070	393.26*** (17.77) 0.115	416.39*** (18.57) 0.122
Immigration background	0.06 (1.12) 0.005	0.04 (0.73) 0.003	0.04 (0.76) 0.003	-57.12* (1.75) -0.009	-44.99 (1.38) -0.007

<i>Interaction: Longedu*stay</i>	-0.17*** (-2.46) -0.014	-0.12* (-1.81) -0.010	-0.11 (-1.53) -0.009	-99.65*** (-2.55) -0.016	-123.61*** (-3.15) -0.020
<i>Regional characteristics</i>					
Housing price			8.24e-5*** (8.63) 0.049		
Manufacture	0.49*** (11.68) 0.055	0.50*** (11.93) 0.057	0.52*** (12.30) 0.058	385.47*** (16.05) 0.083	379.68*** (15.81) 0.082
Agriculture	1.10*** (10.53) 0.048	1.13*** (10.82) 0.049	1.13*** (10.88) 0.050	48.32 (0.81) 0.004	31.75 (0.54) 0.003
Mining	0.66*** (3.32) 0.015	0.75*** (3.78) 0.017	0.69*** (3.48) 0.016	1195.59*** (10.63) 0.053	1145.70*** (10.17) 0.005
Hospitality	0.60*** (7.16) 0.033	0.60*** (7.18) 0.033	0.59*** (7.00) 0.032	-240.55*** (-5.03) -0.025	-241.11*** (-5.04) -0.025
Creative	0.49*** (9.12) 0.043	0.47*** (8.83) 0.042	0.46*** (8.69) 0.041	617.80*** (20.32) 0.105	626.13*** (20.59) 0.106
Accessibility		0.10*** (6.58) 0.037	<i>a</i>		-52.15*** (-6.28) 0.039
Constant	-0.37*** (-5.70)	-1.51*** (-8.17)	-0.60*** (-8.50)	-2798.10*** (-75.58)	2180.82*** (-20.76)
Adj R2 N=28 604	0.415	0.415	0.416	0.304	0.305
<i>a Accessibility and housing price are highly correlated (0.86) and are therefore used separately</i>					

Focus variables - Locational choice

We start with model 1 and the relation between income and locational choice. Our two focus variables (same region and same local labor market (LLM)) are binary and take the value 1 if, after ten years an individual is still residing in the home rural municipality, or (ii) in another municipality located within the same labor market. We find a significant negative effect from staying in the local rural home municipality; i.e., a *rural wage loss*, compared to those people leaving their rural region to reside somewhere else. However, the effect of staying in another municipality within the home local labor market is not significantly related to the individual's current income level.

In model 2, we control for accessibility to a bigger labor market. Now, neither of our locational choice focus variables become significant. The intuitive explanation for this is that if the rural home municipality is within a labor market with a reasonable commuting distance to a bigger market, then the rurality does not affect the individual's income level. In terms of labor market opportunities, the "rurality" is now of minor importance, though in terms of an individual's locational choice, it can matter for other reasons. Rural regions on the outskirts of larger

metropolitan regions have an in-to-out-commuter ratio⁶ way below 1, which means that they are less dependent on their own labor market than a region in less dense areas with lower accessibility. This seems to be specifically true for individuals with university degrees, since the interaction variable “long edu-stay” now only becomes significant at the 10 percent level (compared to 1 percent in model 1).

In model 3, we remove the accessibility measure in favor of a more direct reflection of the housing market in the specific municipality. In this version, the income effect from staying is insignificant. The results are consistent, but the interaction between staying and having a higher education is now completely insignificant.

We now move on to models 4 and 5, where we change the dependent variable from total income to the income-housing residual (Equation 2), which is the individual’s income given the municipal housing prices. This dependent variable is, in other words, the residual from a regression where the individual income is explained by housing values.

Starting with model 4 (without the accessibility variable), we see that staying in the rural home region is now positively related to income, given house prices. It seems that the lower income levels coming from a decision to stay in the rural home region (shown in the earlier models) can be compensated through lower house prices. As in models 1, 2 and 3 we only have significant results from this locational choice when individuals decide to be in their very local rural home municipality. The choice of staying within the local labor market but in another municipality than their origin, however, is not significantly related to income given the house prices. In model 5, where the accessibility variable is added, the effect from staying in the home municipality decreases in magnitude compared to the result in model 4.

The migration frequency captures the residential mobility and to what extent it relates to the individual’s income. In this context, higher mobility is negatively related to income. This is not in line with previous literature on job mobility where mobility is related to upward movements on the career ladder. However, we focus on residential migration rather than change of jobs, which sometimes but not always are intertwined with each other. Going back to Table 1, we could see that the average residential mobility rate is relatively low for these individuals, with an average just above one move for this specific ten-year cycle. Some individuals may move for studies and thereafter settle down rather quickly. There is a decreasing mobility trend in

⁶ This is shown and commented upon in the final report from the governmental committee on future rural development policy (SOU 2017:01- *På väg mot en ny politik för Sveriges landsbygder- landsbygdernas utveckling, möjligheter och utmaningar*), published January 2017.

Sweden, as in many countries, and this is often regarded as an increasing problem for labor market dynamics (Fischer & Malmberg, 2001). People are tied to a place for reasons beyond jobs and, once settled, are reluctant to move, which implies that being rooted in a place is not the equivalent to being stuck (Florida, 2008). This may explain the negative figure of mobility rate in the model, even though the income effect is negative.

Individual Characteristics Variables

The individual characteristics variables are very consistent across all five permutations of our model. Starting with gender, men have higher income than women and looking at the standardized coefficients, gender has a relatively high impact on income. In Figure 2 we also noted that there are significant differences between the migration patterns for men and women, but the difference is foremost related to educational levels. In general, women are more educated than men and gender differences seem to be even larger when focusing on those staying in the home region. Out of those highly educated that decide to stay, about 70 percent are women. The estimated positive effect on income of being a man may therefore reflect these structures rather than being an education premium. One of these structures may be related to labor market differences and the fact that agriculture, mining and manufacturing are, in many rural regions, dominated by men and suffer from a low employee diversity (Bjerke et al., 2014).

As an extension of these gender differences, in Table 3 we illustrate employment distribution of women and men in rural areas. The table shows the six largest industries of each gender respectively. For women these six industries accumulate to a bit more than 64 percent of *all* women employed. The same number of top industries only employs a bit more than 36 percent of all men. Female employment is concentrated into fewer industries, mostly within the public sector. The third and sixth columns illustrate the average income in these industries in rural areas for both men and women. The columns to the right of these show the distance from the mean values of incomes in the group. About 13.7 percent of women in rural areas are employed in the industry of *residential care and activities*. They have an average yearly income of 192 200 SEK which is about 8 per cent lower than the average income of all women in rural areas.

Turning to the right block of the table, it shows how men have an overall higher income but also how the “most popular” industries pay off in terms of income. A bit more than 12.7 percent of the men in rural areas are employed in the industry of *specialized construction activities*. They have an average income of 312 500 SEK which is nearly 6 percent higher than the average

income of men in rural areas. All in all, the estimation results on gender presented in Table 2 are all expected given the occupational and income structures presented in Table 3.

(Table 3 about here)

Table 3 Distribution of employment of men and women in rural areas

Women in rural areas 2015				Men in rural areas 2015			
Industry	Distribution of employment (%)	Average Income (100 sek)	Difference from mean (%)	Industry	Distribution of employment (%)	Average Income (100 SEK)	Difference from mean (%)
Residential care activities	13.67	1 922	-8.0	Specialised construction activities	12.74	3 125	5.8
Education	13.45	1 849	-12.2	Manufacture of fabricated metal products	5.67	3 239	9.1
Social work activities without accommodation	12.93	1 790	-15.9	Land transport and transport via pipelines	4.93	3 276	10.2
Retail trade	11.04	1 903	-9.0	Retail trade	4.45	2 683	-9.7
Human health activities	7.73	2 333	11.1	Construction of buildings	4.40	3 296	10.7
Public administration and defence	5.29	2 468	16.0	Wholesale trade	4.30	3 161	6.9
<i>Accumulated sum</i>	<i>64.12</i>			<i>Accumulated sum</i>	<i>36.48</i>		

Turning our focus to Table 2 again, being married is negatively related to income. Our individuals are in the beginning of their 30s in the year 2015, which is just above the age when women on average give birth to their first child, but there is a relatively large regional variation. The oldest first-time parents are to be found in the largest cities (32.1 for mothers and 34.3 for fathers) while the youngest first-time parents live in rural areas (25.2 for mothers and 28.2 for fathers).⁷ Marriage is by no means a precondition of having children but studies show that the transition to being a parent is highly correlated to also being in some union (cohabitation or marriage) and that this is relatively high in Sweden (Baizán et al., 2004).

Labor market experience and a university education are both positive and highly significant. Looking at the standardized coefficients, labor market experience outperforms higher education in terms of magnitude of effects. This may have several combined explanations, but one may be the very low educational premium in Sweden. In fact, it is the lowest in OECD.⁸ The accumulated life income may therefore be higher for those starting to work immediately after

⁷ These figures of nativity are yearly provided by statistics Sweden. The average ages are calculated for the period 2011 to 2015 since some rural regions have very few births per year and not all are first-time parents.

⁸ Education at a glance 2017- OECD indicators.

high school. This may specifically be expected at a thinner labor market where matching between labor supply and labor demand is less efficient than in denser areas (Duanton & Puga, 2004). This is also supported by the interaction variable included in the model, isolating the effect of those individuals combining higher education with also staying in their rural home region. This effect is negative, which suggests that staying if you also have acquired a higher education is a monetary loss. However, adding it does not drastically change the remaining variables. Having an immigrant background is not significant in this model set up.

Individual characteristics are similarly related to the dependent variables in all permutations of the model with the statistically relatively weak exception of having an immigrant background. It is negative and significant on our income-housing price residual. However, one needs to emphasize that accessibility itself is now negative in this model. A location with high accessibility implies higher income but which also drives up housing prices in the area.

Regional Characteristics Variables

The results for regional industrial structure are rather consistent across our models, with a few exceptions. The relatively strong result for agricultural sector employment is only significant in model 1-3, while it is insignificant in relation to the housing price residual. The mining employment share variable is consistently strong and positive and indicates that in municipalities where this sector is strong wages are also higher, and that wages are high enough to cover the possible extra cost for housing.

As opposed to the mining industry, a relatively large share of employees within the hospitality sector is only positive and significant if housing values are not accounted for. The coefficients become negative and significant when housing relative incomes are used as dependent variable. This suggests that rural areas that create job opportunities provide higher wages, but that the higher wages do not cover the extra cost for housing that tourism brings.

Being in a municipality with a larger share of employees in the manufacturing sector is positive for income also when housing values are considered. This suggests that a strong manufacturing industry pays relatively well, but the same municipalities may be less attractive places to live in and housing values here are still at relatively low levels. While the creative sector is more dominant in urban regions, the results suggest that having more employees in this sector is positively related to incomes also in rural areas.

Summary and concluding discussion

Our research has examined the monetary effect based on the choice of staying or moving away from the home rural region, both with and without housing values being considered. We focused only on the individuals with a rural origin, tracked them from the age of 20, and examined their wage levels at the age of 30 relative to their locational decision.

We assumed that individuals migrate if they expect a net present value of moving to be positive, and that higher human capital increases the incentives for such move. However, our findings suggest that staying in a rural region is rarely negatively related to an individual's income level, and more often insignificant. If we also take housing values into account, it is instead consistently financially beneficial to stay in a rural region. Considering this, our results may add to the understanding of why people choose to stay in a rural region rather than move away from it. First, if you are an individual with a rural background, you have choices to make, just as your urban counterparts. However, in terms of the ability to increase your income, opportunities may be fewer if you stay than if you move away. There are also fewer educational opportunities and if you graduate, there may also be fewer job opportunities to choose from. If one does not wish to move, your choices become rather restricted.

Second, we find that if one stays in their rural region and attains a higher education, a monetary loss from that choice of location can be expected. On the one hand, rural regions in Sweden may not have a labor market large enough to offer jobs that match different sorts of human capital. Labor demand and labor supply are both larger in cities which makes it possible to increase labor productivity through better matching (Glaeser & Mare, 2001). So, in such cases a job at a rural location would generally be related to lower income even if you have a higher education, while the human capital wage premium in urban regions may be large enough to cover the extra housing cost (Florida, 2017).

On the other hand, not all of income is related to higher education. As shown in a recent report (Eklund & Pettersson, 2017), the overall picture is that the educational system is incapable to saturate the labor market with perfectly matched competences. Also, the education premium in general is overall very low in Sweden. This could partly be supported by our results since labor market experience seems to have a higher pay-off than education. Since we know that knowledge tends to agglomerate in space, the decision to stay in a rural region may therefore be better combined with the decision *not* to achieve a higher education. The result of this may be fatal for many rural regions, who are now in a situation searching for human capital to keep up with increased global competition.

Third, our results suggest that regional characteristics of the “stay region” are of importance for incomes - both in terms of sectorial structure and overall labor market. Following traditional agglomeration theory and empirical evidence on urban wage premium, this is not at all a surprising result (Yankow, 2006). Since we have narrowed our focus to individuals with a rural home region, the results are unique and highly policy relevant. Subsidies directed to rural regions are today distributed with little attention on “degrees of rurality’s” and how these acquire diverse types of support, if any at all. Rural areas can be close to urban areas, but they can also be located very far away from labor market opportunities. One might expect that rural areas located nearby urban areas are, to a lesser extent, in any need of support. Those individuals can access urban amenities without losing their rural amenities.

However, individuals may stay in their rural area for many reasons. Rural areas can potentially compensate lower incomes with lower housing prices. The role and magnitude of this seems to vary with type of region, specifically its industry structure. Rural regions in Sweden are highly heterogenous in this respect and this also causes differences in the housing market. Due to industry structures, some regions have relatively high incomes which are not completely reflected in housing prices. Some other regions have relatively low incomes but have housing prices driven up by external demand.

In sum, this research suggests that there are winners and losers, but they differ depending on the focus. Getting a university degree almost consistently adds to income, with some exceptions, and with such an education level, leaving a rural area will likely generate a higher paycheck. In our selected group of individuals, about 30 per cent had a university degree by the age of 30, and for them moving to an urban area would be the better choice financially – even when the higher housing costs have been considered. However, among the remaining 70 percent, it may actually be wiser to stay in a rural location, since the possible higher wage level most likely will not cover the extra cost for housing.

This work contributes to the small but growing literature on the rural-urban divide and the migration flows that helped shape it over time. This research is just a start, and much more work is needed, not the least to create a better understanding of the factors behind the divide in order to develop more sustainable future policies in rural areas.

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Appendix A

(Figure A1 about here)

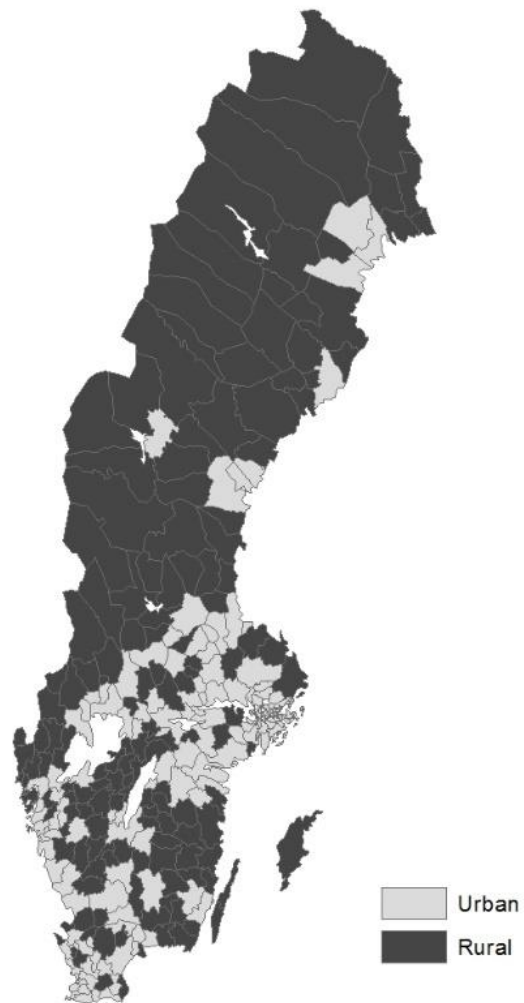


Figure A1 Rural and urban regions

(Figure A2 about here)

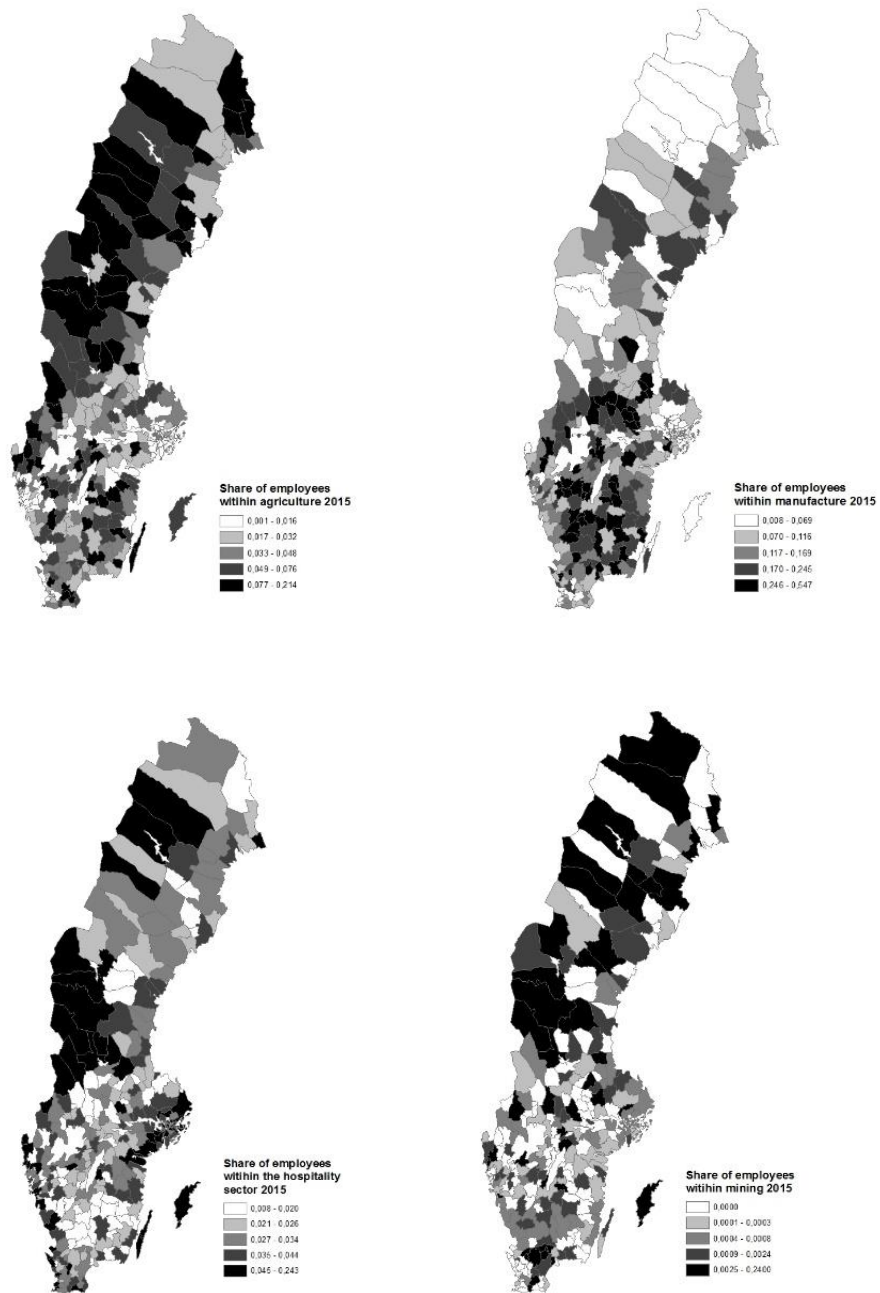


Figure A2 Municipal employment shares within the agricultural sector, manufacturing sector, hospitality sector, and mining sector respectively 2015