



**SCHOOL OF  
ECONOMICS AND  
MANAGEMENT**

**Intergenerational Income Mobility, Regional Income Levels, and Inequality:  
Unveiling Differences in Equality of Opportunity Across Swedish  
Municipalities**

by  
Johanna Marie Fredrich

---

NEKH01  
Bachelor's Thesis (15 credits ECTS)  
Examination: 31 May 2024  
Author: Johanna Marie Fredrich  
Supervisor: Andreas Bergh

## **Abstract**

This thesis analyses the relationship between intergenerational income mobility and socioeconomic indicators across Swedish municipalities. A particular focus is on the relationship between the median regional income level and intergenerational income mobility. Additionally, other socioeconomic indicators, such as economic growth and education levels, are considered, as well as measures of inequality, such as the GINI and the P90P10 percentile measurement. This study finds that there are significant differences between the factors associated with absolute and relative mobility. Across Swedish municipalities, the findings show that an individual coming from a low-income family is more likely to achieve upward mobility in absolute terms when they grow up in a high-income region. For relative mobility, median income levels are not correlated with the level of relative mobility across the regions. Inequality is associated with both absolute and relative mobility but in different ways. A higher Gini coefficient is associated with lower absolute mobility and a high top-income concentration, measured by P90/P10, is correlated with lower relative mobility.

## **Abstrakt**

Denna avhandling analyserar sambandet mellan intergenerationell inkomströrlighet och socioekonomiska indikatorer i svenska kommuner. Ett särskilt fokus ligger på sambandet mellan den regionala medianinkomstnivån och intergenerationell inkomströrlighet. Dessutom beaktas andra socioekonomiska indikatorer som till exempel ekonomisk tillväxt och utbildningsnivåer, liksom mått på ojämlikhet såsom GINI och P90P10 percentilmätning. Studien visar att det finns betydande skillnader mellan de faktorer som är förknippade med absolut och relativ rörlighet. Det verkar vara mycket lättare för en individ som kommer från en låginkomstfamilj att uppnå uppåtgående rörlighet i absoluta termer när de växer upp i en höginkomstregion i Sverige. När det gäller relativ rörlighet är medianinkomstnivåerna inte korrelerade med nivån på den relativa rörligheten i regionerna. Ojämlikhet är förknippat med både absolut och relativ rörlighet, men på olika sätt. En högre Gini-koefficient är förknippad med lägre absolut rörlighet och en hög toppinkomstkoncentration, mätt med P90/P10, är korrelerad med lägre relativ rörlighet.

# Table of Contents

<b>1. Introduction</b>	<b>3</b>
<b>2. Aim and Research Question</b>	<b>4</b>
<b>3. Literature Review</b>	<b>5</b>
3.1. The Roots of Intergenerational Income Mobility	5
3.2. Variety of Methodologies Across the Literature	5
3.3. Gender Perspective	6
3.4. Intragenerational Mobility	7
3.5. Intergenerational Income Mobility, Income Levels, and Inequality	7
3.6. Inequality and Intergenerational Income Mobility in Sweden	8
<b>4. Theoretical Framework</b>	<b>9</b>
4.1. Intergenerational Income Mobility, Different Measures	9
4.2. Relative and Absolute Mobility	10
4.3. Intergenerational Income Mobility - A Proxy for Equality of Opportunity	11
4.3.1 A Rising Tide Lifts All Boats?	11
4.4. Policies for Increasing Equality of Opportunity	12
<b>5. Empirical Study: Method and Data</b>	<b>13</b>
5.1. Data and Model	13
5.1.2. Control variables	17
5.2. Limitations, Robustness Tests, and Correlation Matrix	18
<b>6. Results</b>	<b>20</b>
6.1. Absolute Mobility	20
6.2. Relative Mobility	22
<b>7. Discussion</b>	<b>23</b>
<b>8. Conclusion</b>	<b>26</b>
<b>9. References</b>	<b>27</b>
<b>10. Appendix</b>	<b>32</b>

## Table of Figures

Figure 1: Absolute and relative mobility as calculated by Heidrich (2017) .....	16
Figure 2: Correlation Matrix .....	19
Figure 3: Absolute mobility and income levels across Swedish regions (income in 100 SEK)...	20
Figure 4: Absolute mobility, income and control variables.....	21
Figure 5: Relative mobility and income levels across Swedish regions .....	22
Figure 6: Relative mobility, income levels and control variables .....	23

### 1. Introduction

There are many different views on what makes a fair society. For some, fairness means that the difference in income and standard of living should not vary too much in society. For others, fairness means that people are rewarded according to their efforts. Most people, however, would agree that, although outcomes may differ, everyone should have the same opportunities to achieve things through effort and merit. This is often referred to as equality of opportunity. A common way of measuring equality of opportunity is through intergenerational income mobility, which measures the dependency of an individual's income on their parent's income. According to the World Economic Forum (2020), Sweden is one of the countries with the highest level of intergenerational mobility. Parental income has a significant impact on the children's income as adults. However, To et al. (2023) find that there are large differences between municipalities in Sweden regarding intergenerational mobility. Rather than the parents, the region where a child grows up plays a more significant role in their chances of upward mobility than their family.

This thesis analyses the relationship between various socioeconomic indicators and absolute and relative mobility. The aim is to gain a comprehensive picture of how different factors are related to intergenerational mobility. There is a special focus on the correlation of mobility with median income levels across Sweden, as this relationship is widely unexplored in the literature. The goal is to gain a better understanding of what drives the differences in intergenerational income mobility. This is crucial to create better policies that can combat inequalities of opportunity across all Swedish regions. First, this study provides a comprehensive overview of the field of income mobility and previous studies on the relationship of income mobility with economic or social factors. This is followed by the theoretical framework, where different methods of measuring

intergenerational income mobility are analysed, Here, it is defined why income mobility is a good proxy for equality of opportunity. The empirical study entails the regression analysis, where the correlation between absolute and relative mobility with median income levels and other socioeconomic variables is estimated. Subsequently, the regression results are presented and finally discussed in the context of previous studies and the theoretical analysis.

## **2. Aim and Research Question**

The overarching aim of the study is to better understand the drivers of equality of opportunity in society and why there are large differences in mobility across Swedish municipalities. To examine this, equality of opportunity is measured as intergenerational income mobility, and the primary focus is on how this correlates with income levels. The study differentiates between absolute and relative mobility to gain a more nuanced understanding of the dynamics around income mobility. A cross-regional approach is applied to analyse these multifaced relationships across Swedish municipalities. Additionally, socioeconomic indicators such as inequality and education levels are added to gain a more comprehensive picture of which indicators correlate with intergenerational income mobility in Sweden.

There are many studies on intergenerational income mobility and inequality indicators, especially across countries. However, the approach of looking at mobility across Swedish regions with a focus on median income levels is unique and can give insights into the dynamics between regions in the Swedish context and possibly beyond.

For this reason, this thesis examines the following research question:

*In what way are income levels and other socioeconomic indicators correlated with income mobility across Swedish municipalities?*

The study finds that there are great differences between factors associated with relative and absolute mobility. Higher absolute mobility correlates with higher median income levels across Swedish regions. For relative mobility, the results show that income levels are not correlated. For

both relative and absolute mobility, the study finds that higher income levels are associated with lower mobility, but in different ways.

### **3. Literature Review**

#### **3.1. The Roots of Intergenerational Income Mobility**

Historically, sociologists have been mostly concerned with the association between an individual's socioeconomic background and their parents' status in society. Torche (2015) states that intergenerational mobility focusing on education, occupation, status, and class has been heavily debated among sociologists since the 1960s. Mainstream economists discovered the topic much later and focused on education and income mobility (Björklund and Jäntti, 2020). Torche (2015) provides a comprehensive interdisciplinary review of the literature on intergenerational mobility in sociology and economic literature.

Many economists have also become concerned with education and mobility (i.e. Betthäuser 2017; Haveman & Smeeding 2006), which is often framed as social intergenerational mobility and estimates the association of the socioeconomic background of parents with their children's educational attainment - a proxy for social status. Income mobility, on the other hand, is estimated by looking at the association between parents and their children's income at adult ages (Chetty et al., 2014; Björklund et al. 2012; Björklund and Jäntti, 2020). Intergeneration mobility arguably experienced its final breakthrough with the 'Great Gatsby Curve', a concept based on Miles Corak's work and coined by Alan Krueger, who used it in a speech in 2012. The concept entails the empirical observation that falling inequality is associated with higher income mobility (Durlauf and Seshadri, 2017). Solon (2004) was one of the first scholars to empirically test the Great Gatsby Curve hypothesis. His study, which was conducted across sixteen Latin American countries, confirms that falling inequality is associated with higher social mobility.

#### **3.2. Variety of Methodologies Across the Literature**

With intergenerational mobility gaining more prominence in economics, methods and measurements of mobility are becoming more diverse. Torche (2015) argues that mobility findings differ largely due to the large variety of preferred methods across disciplines. However, in recent years, interdisciplinary research on mobility has increased in the attempt to gain a more

comprehensive understanding. Differences between disciplines have become blurrier in recent years, with scholars mixing different methodologies and measurements (i.e., Björklund and Jäntti, 2020; Mitnik et al.).

Torche (2015) states that differences between absolute and relative mobility have been of major concern for both sociologists and economists for a long time. Another difference in methodology is the choice of the unit or individual to measure. For income mobility, the natural choice is often individual income or household income. Stockhausen (2021), for instance, looks at the relationship between father-and-son income levels. Heidrich (2017), on the other hand, chooses to look at both parents' income to provide a better picture of the economic situation of the whole household. Torche (2015) also states that by looking at the family level rather than individual incomes, the economic situation including the occupational and extra-occupational resources is captured in a better way.

### **3.3. Gender Perspective**

Which method and variables are the most suitable, depends of course on the objective of the study. While Heidrich (2017) aims to capture the economic situation of the household that a child grows up in, other authors were more concerned with how mothers' and fathers' incomes have different effects on their daughters or sons. The gender perspective has therefore been widely discussed in the literature. Jäntti et al. (2006) find that earning elasticities are generally lower for women than for men, across countries. In some countries, these gender differences can according to Torche (2015) be explained by differences in assortative mating and supply of female and male labour, which is found to be reduced in many countries such as the United States or the United Kingdom when women get married. However, Raaum et al. (2007) show that in Scandinavia, this seems not to be the case. In a study on the association of income mobility and inequality in Sweden, Jansson (2021), finds that the association is different for men and women. For instance, she shows that the mobility in the bottom quantile is higher for women, while for men it seems to be easier to increase income in the top quantile.

### **3.4. Intragenerational Mobility**

It should also be noted that there is a significant amount of literature on the topic of intragenerational mobility, meaning the mobility of an individual over their lifetime. Jarvis and Song (2017) study intragenerational occupation mobility in the US for a period of 40 years. He argues that intragenerational mobility is not only relevant in itself but also reveals important insights on mobility across generations. Fields et al. (2007) argue that most early studies on mobility focused on patterns of how individuals move in the income distribution. Shorrocks (1978) measures intragenerational mobility by “the extent to which the income distribution is equalised as the accounting period is extended.” (p. 378). Fields (2010) also defines an index for intragenerational mobility, but he looks at the inequality level of initial income versus the inequality level of average incomes over a certain time. Thus, Fields also takes into account whether changes are disequalising or equalising.

### **3.5. Intergenerational Income Mobility, Income Levels, and Inequality**

There is little research on the interplay between income levels and intergenerational income mobility. Equality of outcome, such as observed income disparities in society and income levels have been more widely studied. Kuznets (1955) argues that higher income levels coincide with first rising, and then falling income inequalities. With continued growth and high income levels, inequality would then stabilise at a low, acceptable level. However, today, many scholars have shown that since the 1970s income inequality has been on the rise again in most of the richest economies worldwide (Atkinson et al., 2011). It has been shown for many countries that especially those at the top of the income distribution have managed to increase their wealth quite significantly through higher labour and capital income while the incomes of the rest of society are stagnating (Atkinson & Piketty, 2007, 2010; Piketty, 2014; Waldenström, 2017, Schinke, 2023).

Rising inequality seems to coincide with diminishing opportunities for large parts of society and a strong dependence on the family background. There is a significant amount of research on the association between income inequality and intergenerational income mobility (i.e. Corak, 2013 and Durlauf and Seshadri, 2017 on the OECD, Torche 2014 on Latin America, Bloome 2015 and Torche 2015 on the USA). The scholars find empirical evidence that higher inequality is related to lower levels of income mobility across different countries and time periods. However, most



studies are on the national level, looking either at different periods or across countries. The evidence is often weak as it is very challenging to isolate mobility and inequality levels both across time and across countries. The high complexity of income mobility makes it difficult to determine related factors. With the focus on inequality, the role of income levels and intergenerational income mobility has received little attention, especially not on the regional level. Bradbury and Triest (2016), in a regional study for the USA, find that regions in the US with higher intergenerational mobility exhibit higher growth rates. So regions that show more mobility in their sample for the US were also experiencing higher growth rates over a given period. They conclude that high levels of inequality of opportunity inhibit the most efficient use of society's resources. This study offers a new perspective and suggests that the prosperity of regions may be related to income mobility.

### **3.6. Inequality and Intergenerational Income Mobility in Sweden**

Sweden is one of the countries with the smallest income disparities among the OECD countries. That is, not only between individuals but also between regions. André et al. (2021) find that while income disparities across regions are still relatively low compared to other OECD countries, they have been increasing over the last decades.

When it comes to intergenerational income mobility, Sweden seems to also be doing relatively well. et al. (2010) find that Sweden, along with its Scandinavian neighbours, shows a relatively high level of intergenerational mobility. Liss et al. (2023) find that upward mobility has been significant in Sweden with 86 per cent of women and 84 per cent of men earning more today than their parents. They also state that growth is a significant factor in achieving upward absolute mobility, which describes the improvement of real income levels. Michelangeli et al. (2021) conduct a comprehensive study on intergenerational income mobility and social factors, focusing mostly on different types of education attainment and inequality. They find that regions with higher intergenerational mobility have higher social capital accumulation, better job accessibility, higher inequality, and higher residential segregation. Especially the finding that higher mobility is associated with higher inequality is different from most other studies for other countries.

## 4. Theoretical Framework

### 4.1. Intergenerational Income Mobility, Different Measures

There are many ways to measure intergenerational income mobility. As previously discussed, the variations rank from which units and variables to use — household income or individual income, incomes or earnings that exclude or include wealth, occupations, education, etc. One of the most common ways to measure income mobility across generations is by estimating intergenerational elasticity (IGE) (see i.e. Björklund and Jäntti, 2020; Solon, 2004; Mazumder, 2005).

The basic formula for the IGE typically looks like this (Heidrich, 2017):

$$y_f^C = \alpha + \beta y_f^P + \varepsilon_f^C \quad (1)$$

Where,  $y_f^C$  is the log of the child's lifetime income in family f,  $y_f^P$  is the log of the parent's lifetime income,  $\beta$  is the parameter that measures intergenerational elasticity, and  $\varepsilon_f^C$  is the error term.

Heidrich (2017) argues that the problem with the IGE is that income over the whole lifetime of the parent and the child's generation is needed to make an accurate estimate. As access to this data is rare, estimations usually exhibit life cycle bias and attenuation bias. Therefore, Heidrich uses income ranks rather than log incomes, when constructing intergenerational income mobility data for Swedish regions. She argues that income ranks are relatively more stable, especially for individuals over 30, which reduces the life cycle bias. The individuals from the parent generation are ranked relative to other parents in percentile ranks, and individuals from the children generation relative to other children. To estimate income mobility across ranks Heidrich uses the following formula:

$$R_f^C = \alpha + \beta R_f^P + \varepsilon_f^C \quad (2)$$

where  $R_f^P$  is the rank of the parents,  $R_f^C$  is the rank for the child and  $\beta$  estimates the coefficient between the ranks of the two generations within a family. To estimate regional mobility, Heidrich

(2017) uses the same national ranks, but then assigns individuals to the regions that they are located in. She argues that this makes the regions comparable to one another.

## **4.2. Relative and Absolute Mobility**

When studying intergenerational income mobility scholars often differentiate between relative and absolute mobility. Absolute income mobility denotes the differences in what the child earns relative to their parents. Thus, upward mobility, which is what scholars are often concerned about, denotes how likely individuals are to earn more than their parents. Relative mobility, on the other hand, measures whether a child is changing their income rank in the income distribution of society as a whole compared to their parents' rank (Stockhausen, 2021).

Van der Weide et al. (2021) find that there are significant differences depending on whether absolute or relative mobility is studied. They find that absolute mobility is the lowest in the richest and the poorest countries in the world. This is, according to them, because in poorer countries there is more scope to surpass one's parents, but access to education is very restricted. In rich countries, on the other hand, the exact opposite is true. Access to education is high but there is less scope to surpass one's parents. They also find that relative mobility is the highest in the poorest and in the richest countries. There might be different reasons for this. Van der Weide et al. (2021) suggest that in middle-income countries, class and income differences are the most pronounced. Thus, it makes a significant difference whether one is born into a certain group in society. In the poorest countries, these differences may not be as pronounced to begin with and in the richest countries, social transfers and redistribution mechanisms may offset these differences.

Heidrich (2017) states that both relative mobility and the IGE give a good indication of how persistent the income position of a family is over generations. However, she argues that the problem is that a growing or diminishing income inequality is influencing the results strongly. Thus, it is not possible to tell whether relative mobility is a result of poorer families doing better or richer families doing worse. In the end, if relative mobility was high the individual might still be as poor as their parents, but with less inequality. Therefore, Heidrich (2017) argues that absolute mobility can provide a broader picture of the actual changes in income.

### **4.3. Intergenerational Income Mobility - A Proxy for Equality of Opportunity**

It has been only during the past 40 years that scholars have slowly shifted their focus from the utilitarian view of equality of outcome to equality of opportunity (Roemer and Trannoy, 2016). Roemer and Trannoy (2016) argue that Rawls (1958, 1971) was the first one to define the ethical desirability of different forms of equalitarianism, stating it should be ensured that all members of society have equal access to opportunities no matter their circumstances. Equality of opportunity is a concept that is difficult to grasp as it means different things to people to have equal opportunities. Björklund et al. (2011) define that equality of opportunity exists in society “if it is the case that what individuals accomplish, with respect to some desirable objective, is determined wholly by their choices and personal effort, rather than by circumstances beyond their control”. Thus, to determine whether an individual's income is related to their own efforts or to their circumstances, looking at intergenerational income mobility provides a good estimation of equality of opportunity.

Jarvis and Song (2017) argue that equality of opportunity is viewed normatively as an unambiguous good. Thus it is widely accepted that we should favour meritocratic societies in which the economic success of individuals is not primarily based on their parents' socioeconomic status. Björklund et al. (2012) state that most people care strongly about the nature of inequalities. Whether people judge income gaps and the concentration of income in society to be fair, depends on how the people at the top became rich. Thus, people are usually more willing to accept high inequalities if they believe that individuals get to the top through their own hard work and merit. However, reality often looks different. Piketty (2011) states “there are basically two ways to become rich: either through one's own work or through inheritance” (p.1071). He argues that the latter has become the main way to economic prosperity today.

#### **4.3.1 A Rising Tide Lifts All Boats?**

Today, many of the countries with the highest income levels show increasing inequality levels (Piketty, 2012). A popular aphorism says “a rising tide lifts all boats”. This is often used to defend inequalities in society, arguing that all parts of society benefit from rising income levels. However, Piketty and Zucman (2015) show that incomes and wealth are rising much faster for the ones at

the top of the income distribution, while many people are left behind, with little hope for climbing the income ladder.

Voitchovsky (2009) argues that overall productivity levels suffer when the poor are not given the chance to fully contribute to the economy. A main channel for this is, according to him, that the market economy is malfunctioning due to the misallocation of social capital. Even in Sweden, where education is free for everyone, family background seems to play a significant role in educational attainment. Hällsten and Thaning (2018) find that social background accounts for 25 per cent of different tertiary field attainment and around 35 per cent of choice of upper-secondary track attainment in Sweden. These differences, they argue, can reinforce future inequalities. So while education tertiary education attainment has increased significantly in Sweden and around the world (Hällsten and Thaning, 2018; Chusseau and Hellier, 2012), inequalities are being reinforced through the type of education that is chosen by different groups. Härkönen and Bihage (2011) find that educational attainment and class origin play a significant role in occupational attainment in Sweden. So despite the generally positive development of higher social capital accumulation and higher incomes in society, opportunities for individuals from disadvantaged socioeconomic backgrounds remain vastly restricted.

#### **4.4. Policies for Increasing Equality of Opportunity**

Given that inequalities are on the rise, it would be logical that the support for redistribution and equality-promoting policies should be high, especially among the low-income part of society. However, the research shows that this is often not the case. Steele (2015) finds that people tend to be more supportive of redistribution policies when they live in societies that have higher social mobility. Notably, she finds that individuals who have experienced upward mobility are often less in favour of redistribution policies, especially in countries with less social mobility. A reason for this could be that upward mobility is experienced as a more ‘scarce good’, which makes it seem excludable.

If a large part, possibly even the overwhelming part of society, cannot expect to climb the income ladder, why are they not advocating more strongly for redistribution policy? Corak (2013) argues that one explanation is the delusion of the American Dream, which stems from the US but has

spread worldwide. The baseline is that everyone who works hard enough can make it to the top, and this is so ingrained in society that people often believe that they, or if not their children, can make it. Bénabou and Ok (2001) call this the “prospect of upward mobility”, which he identifies as being the almost indestructible belief that one day, they will be at the top. However, if the feeling of hope and fairness is depressed at the bottom of the income distribution, the economic and political consequences can be severe. If an increasing number of young people see no future or hope for a better life, this will lead to frustration and might cause upheaval (OECD, 2011). Therefore, it is crucial to understand the factors that are associated with upward mobility, to understand how equality of opportunity and, thus, hope for a better future can be restored.

## **5. Empirical Study: Method and Data**

The empirical part of the thesis is a quantitative study and uses regression analysis to empirically assess the relationship between intergenerational income mobility and median income levels across Swedish regions. Other variables, such as education and inequality indicators, are used to control for possible other factors that influence intergenerational mobility. These indicators are chosen based on what the literature describes as indicators being important when looking at income mobility. This study is based on the empirical findings of Heidrich (2017), who calculates intergenerational absolute and relative mobility for Swedish regions. She gives suggestions on why these differences may occur, but she does not empirically test any indicators associated with these regional variations. This study aims to find associated socioeconomic indicators to explain these differences.

### **5.1. Data and Model**

#### *Mobility*

Heidrich calculates absolute and relative income mobility for a total of 112 out of 290 municipalities in Sweden (see appendix). To depict the influence that the environment has from early years on a person, Heidrich assigns children to the region where they have lived between the ages of 6-15 for at least six years. The sample consists of Swedish individuals born between 1968 and 1976 (927,008 raw observations). Swedish centralised registration allows Heidrich to link 99.5

per cent of the children to their parents. Heidrich takes the combined income of both parents, which provides a good picture of the socioeconomic status of the household that the child grew up in.

In Heidrich's study, values for income mobility are identical for many regions, with only a few outliers for relative mobility and somewhat more outliers for absolute mobility (see appendix). This is because Heidrich estimated a multilevel model, and the regional estimates are composed of the mean and regional random effects. Often, the estimates of the regional slopes/intercepts are not significant, and in those cases, she has set them to 0. In these regions, the regional slopes/intercepts are, therefore, equal to the average value. This exhibits a major challenge to using the data because by setting all non-statistically significant variations to 0, the nuances of the data are lost, and the regression's error term becomes much larger. This is especially the case for relative mobility, where almost all regions were set to 0.

Relative mobility measures the disparity in income rank between children from high- and low-income families within each region. Heidrich estimates how equalised children's adult incomes are, given the poorest and the richest parent's families. She then states by how many ranks the children's income differs at most. The higher the differences, the lower is mobility. In Varberg, the outcome for the children from the top and the bottom percentiles differs by only 15.58 percentiles. In Stockholm, they differ by 22.21 percentiles, which means that relative mobility is higher in Varberg. She uses this formula for relative mobility:

$$\underline{R}_{100,r}^c - \underline{R}_{0,r}^c = 100 \times \beta_r \quad (3)$$

This formula describes the difference between the average income of a child from parents that come from region  $r$  and are located in percentile  $p$ .

The measure of absolute mobility, which Heidrich calls "absolute mobility at percentile  $p$ ", indicates the average income rank achieved by a child from a certain region based on their parents' position in the income distribution. Focusing on absolute mobility at the 25th parent percentile in Swedish regions reveals insights into the adult outcomes of children from disadvantaged

backgrounds and the degree to which upward mobility is possible. To calculate absolute mobility, Heidrich takes the average rank of the children's adult income with parents at the 25th percentile.

$$\underline{R}_{25,r}^c = \alpha_r + \beta_r \times 25 \quad (4)$$

The mean income of a child with parents in the 25th percentile in region r is equal to the intercept of region r plus the slope of region r times the percentile 25.

Absolute mobility is given by the mean child rank, which depends on parents from a certain percentile (Heidrich, 2017). The average is 43.69 across the region, and the results vary from Årjäng with 40.90 to Värnamo with 43.69. This means, according to Heidrich (2017), that a child growing up in the 25th percentile in Värnamo can expect to earn 20,000 SEK more as an adult as compared to a child growing up to the same economic prerequisites in Årjäng.

To conclude, for relative mobility, a lower number indicates more mobility, for absolute mobility a higher number indicates more mobility. Figure 1 graphically illustrates this and shows the relationship between relative and absolute mobility. Region 1 and Region 3 show the same relative mobility, but absolute mobility at p=25 is higher in Region 3 for every parent rank. Therefore, a higher value for absolute mobility represents higher absolute mobility in a region. Region 1 and Region 2 show different relative mobility levels, but absolute mobility is the same at p=25. However, the higher the parents' rank individuals in Region 2 will earn more than those in Region 1, so the differences are much bigger. Therefore, a lower value of relative mobility indicates higher mobility (Heidrich 2017).



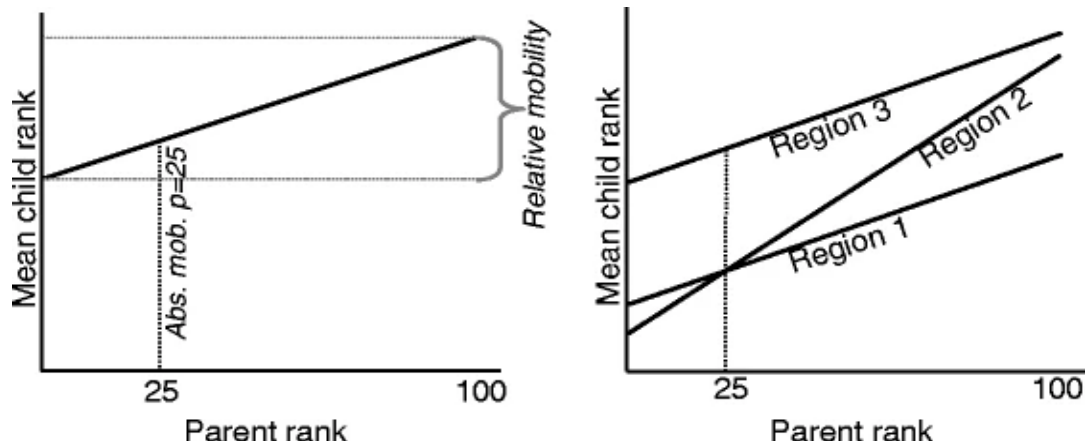


Figure 1: Absolute and relative mobility as calculated by Heidrich (2017)

Source: Heidrich (2017) section 2.2 Figure 1, For a more detailed explanation of the methodology behind the calculations see Heidrich (2017) Section 5.2.

### Income

The income level is measured as the median disposable household income for Swedish municipalities in 2022 (SCB, 2023), which is the latest data available. All 112 out of a total of 290 municipalities for which income mobility data is available are included in the study. The median income is measured across all households and in thousand SEK.

### The Regression Model

The regression is modelled in the following way: the dependent variable measures the median income for the municipalities, and the independent variable measures absolute or relative income mobility. The following model is estimated:

$$y_{Mobility} = \alpha + \beta_1 Income + \beta_2 control\ var + \beta_3 control\ var + \dots + \varepsilon_i$$

The dependent variable is intergenerational income mobility and the main independent variable is median income for each region. Regressions are made separately for absolute mobility and relative mobility. Control variables are added in a step-wise model to identify the effect of each variable on income mobility. All variables are logged to increase the compatibility of these different

measurements and to determine the magnitude of the effect. The unlogged variables are used for graphical depiction to give a better graphical representation with the exact numbers.

### **5.1.2. Control variables**

#### *Growth and education level*

Economic growth is measured as compound aggregate growth rate (CAGR) from 2012 until 2021, which is calculated with annual data on the regional GDP for Swedish municipalities provided by SCB (2023a) with this formula:

$$CAGR = \left[ \left( \frac{EV}{BV} \right)^{\frac{1}{n}} - 1 \right] \times 100$$

The growth variable was included to analyse whether regional growth during the last 10 years (before the median income measurement year used) is correlated to intergenerational income mobility. Education levels for 1992 across the regions are used as a control variable. The year was chosen as it represents approximately the parent's generation in the data. Education levels are measured by the proportion of the population with post-secondary education (levels 5-6). It can show whether the education levels of the parent's generation correlate with intergenerational income mobility. Educational levels for each municipality are taken from SCB (2023b).

#### *Other measures of inequality*

Many studies suggest that income disparities are correlated with income mobility, which is why different inequality indicators are used as control variables in this study. These inequality indicators for Swedish municipalities are all taken from the dataset by SCB (2023c) and were selected because they were judged to be the most fitting indicators available for the sample.

#### *Shorrocks Index*

The Shorrocks index measures how much income levels can change over one's lifetime, also called intragenerational income mobility. When the Shorrocks index is at 1, it indicates complete mobility. At this stage, every household, irrespective of its current income distribution, holds a 20 per cent likelihood of occupying any other position after the observed duration. Conversely,

in a scenario of total immobility, each household has a 100 per cent probability of staying within its initial quintile, which implies a Shorrocks index of 0 (Caroll and Chen, 2016).

### *Gini Coefficient*

The Gini coefficient is arguably the most common measure of inequality. It measures the dispersion of income in society. A Gini value can take any value between 0, which means perfect equality, and 100, which would mean perfect inequality.

### *P90/P10*

The P90/P10 indicator shows the ratio of incomes received by individuals at the 90th and 10th percentiles. It represents the relative distance between the 90th and 10th percentiles and indicates how concentrated income is in a region. The Gini indicates the general dispersion of incomes, while P90/P10 measures the concentration of income at the top.

### *Risk of poverty*

The at-risk-of-poverty rate is the share of people with an equivalised disposable income below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income.

## **5.2. Limitations, Robustness Tests, and Correlation Matrix**

As with any regression model, there are several limitations. It should be noted that Heidrich uses local labour markets (LLMs) which sometimes means that several municipalities are merged. This is to avoid discrepancies between where people live and where they work. For median income and the control variables, the municipalities at SCB are used, which could lead to some inconsistencies in the data comparison.

There might also be omitted variables or undetected inherent correlation or heterogeneity, which increases the noise in the model captured by the error term. To ensure the reliability and accuracy of the MLR models, each regression is tested for robustness to ensure adherence to the Gauss-Markov assumptions. The Breusch-Pagan test is used to test for heteroskedasticity, and a multicollinearity test is applied to test for misspecification.

The Breusch-Pagan test can be used to check for heteroskedasticity. If the null hypothesis that the data is homoskedastic is rejected at the five per cent level, the model most likely exhibits heteroskedasticity and robust standard errors must be used for the analysis. Multicollinearity is common in social science research. It can potentially distort regression outcomes and lead to misleading coefficient estimates (Kutner et al., 2005, p. 283). Given that many of the control variables measure inequality in different ways, it is important to test for multicollinearity. It should be noted that additional robustness tests could further enhance reliability; however, given the focus and scope of this study, prioritising these key tests was deemed sufficient for ensuring the integrity of the analysis.

The correlation matrix in Figure 2 shows the correlation of the variables used in the model. Most variables show a low correlation. The only variables showing a correlation higher than 0.5 are poverty risk and median income, being negatively correlated at -0.714. Additionally, the Shorrocks index and the Gini coefficient are negatively correlated at about -0.686. It was decided to keep both variables in the model despite this borderline correlation value as they measure very different things. Still, these correlations should be kept in mind when analysing the results.

	Median income	Absolute mobility	Relative mobility	Growth rate	Education levels 1992	Gini coefficient	Shorroks index	Poverty Risk	P90P10
<b>Median income</b>	<b>1.000</b>								
<b>Absolute mobility</b>	0.363	<b>1.000</b>							
<b>Relative mobility</b>	0.054	-0.113	<b>1.000</b>						
<b>Growth rate</b>	0.216	-0.074	0.034	<b>1.000</b>					
<b>Education levels 1992</b>	0.447	0.025	0.264	0.036	<b>1.000</b>				
<b>Gini coefficient</b>	0.293	0.179	0.159	0.008	0.173	<b>1.000</b>			
<b>Shorroks index</b>	-0.028	-0.372	-0.118	0.123	0.035	-0.686	<b>1.000</b>		
<b>Poverty Risk</b>	-0.714	-0.102	0.053	-0.243	-0.447	0.046	-0.403	<b>1.000</b>	
<b>P90P10</b>	0.171	0.106	0.361	-0.041	0.294	0.407	-0.424	0.375	<b>1.000</b>

Figure 2: Correlation Matrix

## 6. Results

### 6.1. Absolute Mobility

In the multi-step model, the first part looks at median incomes and absolute mobility for individuals whose parents are located in the 25th income percentile. The graphical depiction in Figure 3 shows that there is a positive relationship between absolute mobility and median income levels across Swedish municipalities. For a better overview, the graph depicts the absolute numbers and not the logged variables. Thus, incomes are in thousand SEK, and absolute mobility is shown as the mean child income rank from children with parents in the 25<sup>th</sup> percentile. Note that the income rank is in relation to their parents' generations' income distribution, not compared to peers in the same generation.

In Figure 1 (B), only the regions that Heidrich (2017) identified as different from the statistical mean are shown. Isolating those regions makes the relationship between the variables even more clear. Regions such as Gnosjö, Värnamo and Älmhult show high absolute intergenerational income mobility and a high median income. On the other hand, Torsby, Vansbro or Vilhelmina show low intergenerational income mobility and a low median income.

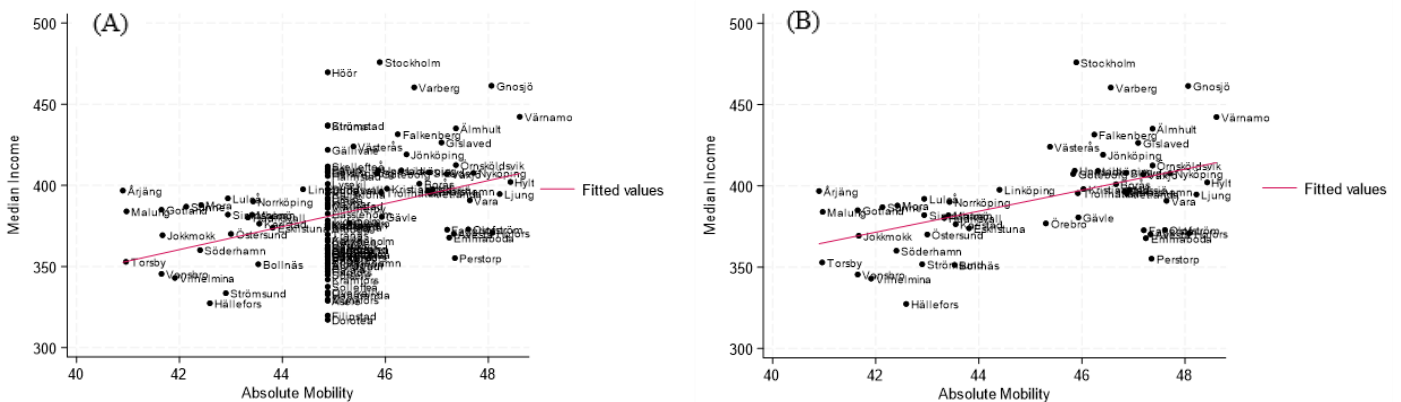


Figure 3: Absolute mobility and income levels across Swedish regions (income in 100 SEK)

A: full sample, B: outliers, note: A higher number of absolute mobility refers to a higher intergenerational dependence. So higher median income levels are correlated with lower absolute income mobility.

Figure 4 depicts the result of the regression model. Since the variables are all logged the coefficient can be interpreted as the percentage change in absolute mobility when the median income increases by 1 per cent. Median incomes are statistically significantly correlated to absolute mobility at the

1 per cent level. The coefficient shows that a one per cent increase in median incomes corresponds to a 0.159 per cent increase in absolute mobility for individuals whose parents are located in the 25th income percentile. When control variables are added the strong correlation between median incomes and absolute mobility persists. Growth and education are weakly negatively correlated in models 1.b and 1.c, but the statistical significance disappears when more control variables are added.

In models 1.b and 1.c the growth rate seems to be positively correlated, but this correlation disappears when other control variables are added. The same accounts for education levels in 1.c and 1.d. Negatively correlated at the 1 per cent level is the Shorrocks index, so intragenerational income mobility. This means that higher intragenerational income mobility is correlated to lower absolute intergenerational income mobility. The Gini coefficient is strongly negatively correlated (statistically at the 1 per cent level), meaning that lower levels of inequality are associated with higher absolute mobility. When the control variables were added, the R-value increased from 0.128 to 0.354. Thus, with the existing variables, around 35 per cent of differences in absolute mobility can be explained.

1. Regression: Absolute Mobility and Income with control variables (step-wise model)

**Dependent variable: Absolute Mobility**

<b>Explanatory Variable</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>
<b>Median income</b>	0.159*** (0.033)	0.179*** (0.038)	0.217*** (0.044)	0.204*** (0.040)	0.239*** (0.040)	0.239*** (0.040)	0.244*** (0.081)
<b>Growth rate</b>		-0.012* (0.006)	-0.013** (0.006)	-0.009 (0.006)	-0.008 (0.006)	-0.008 (0.006)	-0.008 (0.006)
<b>Education levels 1992</b>			-0.018* (0.009)	-0.016* (0.009)	-0.013 (0.009)	-0.010 (0.011)	-0.010 (0.013)
<b>Shorroks index</b>				-0.085*** (0.026)	-0.145*** (0.030)	-0.151*** (0.033)	-0.150*** (0.037)
<b>Gini coefficient</b>					-0.086*** (0.023)	-0.084*** (0.021)	-0.084*** (0.022)
<b>P90P10</b>						-0.042 (0.054)	-0.046 (0.086)
<b>Poverty Risk</b>							0.003 (0.044)
<b>R-squared</b>	0.128	0.156	0.183	0.295	0.35	0.3541	0.354

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

Standard errors in parenthesis, all robust standard errors

111 observations

*Figure 4: Absolute mobility, income and control variables.*

## 6.2. Relative Mobility

From the graphical depiction of relative mobility and median incomes, we can see that, except for Varberg, Växjö and Skövde, all regions show lower income mobility (higher value) than the rest. It also shows clearly that only very few regions vary from the mean value as identified by Heidrich (2017).

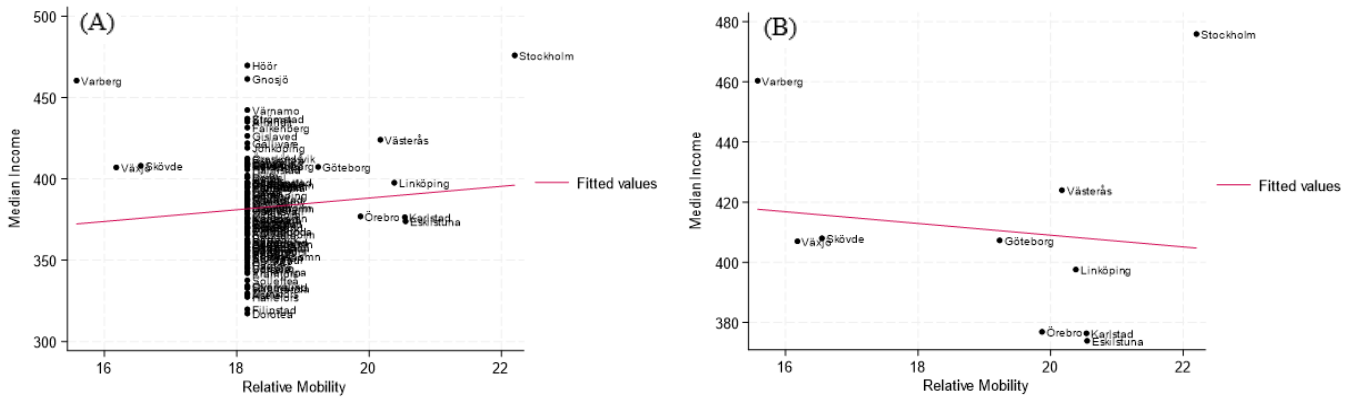


Figure 5: Relative mobility and income levels across Swedish regions

A: full sample, B: only outliers

The regression results in Figure 6 show that the main independent variable, median income levels, is not correlated. Thus, for relative mobility, differences in income levels do not seem to be associated. The only variables that show a statistically significant association are education levels and the inequality measure P90P10. A higher education level in 1992 correlates with lower mobility across the regions. Additionally, a higher concentration of income in the highest decile compared to the lowest is associated with lower mobility.

2. Regression: Relative Mobility and Income with control variables (step-wise model)

**Dependent variable: Relative Mobility**

Explanatory Variable	a	b	c	d	e	f	g
<b>Median income</b>	0.023 (0.043)	0.022 (0.045)	-0.041 (0.048)	-0.046 (0.048)	-0.055 (0.050)	-0.055 (0.048)	-0.133 (0.089)
<b>Growth rate</b>		0.002 (0.007)	0.003 (0.007)	0.005 (0.007)	0.004 (0.007)	0.005 (0.007)	0.004 (0.007)
<b>Education levels 1992</b>			0.029*** (0.010)	0.031*** (0.010)	0.030*** (0.010)	0.021*** (0.010)	0.014 (0.013)
<b>Shorroks index</b>				-0.035 (0.023)	-0.020 (0.034)	0.008 (0.034)	-0.010 (0.038)
<b>Gini coefficient</b>					0.021 (0.034)	0.013 (0.033)	0.006 (0.034)
<b>P90P10</b>						0.175*** (0.059)	0.247*** (0.092)
<b>Poverty Risk</b>							-0.047 (0.046)
R-squared	0.003	0.003	0.076	0.095	0.099	0.1696	0.178

\*\*\* $p < 0.01$  \*\* $p < 0.05$  \* $p < 0.1$   
Standard errors in parenthesis  
111 observations

Figure 6: Relative mobility, income levels and control variables

## 7. Discussion

This study aims to gain a better understanding of what indicators are related to intergenerational income mobility and potentially explore why mobility differs across regions in Sweden. A cross-regional study helps to understand differences between regions and provides insights into what drives income mobility in Sweden in general. Firstly, there seem to be relevant differences between absolute and relative intergenerational income mobility. Median income levels are strongly positively correlated with absolute mobility but not statistically correlated with relative mobility across regions. For absolute mobility, this means that the higher the median income in a region, the higher the absolute mobility. More specifically, individuals who come from low-income households (25<sup>th</sup> percentile) are more likely to achieve upward mobility in richer regions than in poorer Swedish regions. The income differences are rather small – a one per cent increase in mobility is associated with a 0.159 per cent increase in income – but the coefficient is highly statistically significant. Extrapolated it could be argued that only a slightly higher median income is correlated with a significant higher mobility rate.



The relationship between higher income levels and higher absolute mobility can be interpreted differently. These findings align with the assumption that equality of opportunity is essential for efficiently allocating economic resources (Voitchovsky. 2009). When interpreted similarly to Bradbury and Triest (2016), it can even be argued that higher mobility elevates productivity and contributes to economic prosperity. However, the causation could also be the other way around, and one could argue that higher-income regions are providing more opportunities for upward mobility, possibly because the economy is giving more opportunities to individuals in general. In the end, it should be recalled that absolute mobility does not take into account the income rank of an individual relative to others in society. The results do not reveal any causality, nor do they show that individuals are better off in richer regions relative to others. What it does show us is that individuals are more likely to experience higher absolute mobility in high-income regions compared to individuals from the same economic background in poorer regions.

When it comes to inequality and mobility, the finding that higher mobility is associated with lower inequality levels is in line with the Great Gatsby Curve and previous studies on other countries and regions (i.e. Corak, 2013; Durlauf and Seshadri, 2017; Torche 2014; Bloome 2015; Torche 2015). However, it goes against the findings of Michelangeli et al (2021), who finds that regions with higher inequality show more mobility. From a theoretical perspective, however, the findings of this study are logical. When inequality structures are carried on over generations because of the absence of equality of opportunity in society, income structures should naturally become more unequal. Similarly, in a highly unequal society, the access to education and occupations vary significantly as stated by Hällsten and Thaning (2018) and Härkönen and Bihage (2011). This reduces equality of opportunity and reproduces income disparities. As with income levels, causality is most likely to go in both directions and cannot be determined by this study.

For relative mobility, the results look quite different. The variables that were strongly correlated with absolute mobility show no association with relative mobility. Instead, education, which was weakly correlated with absolute mobility and the inequality measure P90/P10 show a strong statistically significant correlation. A higher concentration of income in the top 10 per cent of the income distribution is associated with lower relative intergenerational income mobility. Thus,

individuals who grew up in an unequal region where incomes in the top decile are more concentrated relative to other regions will be more unlikely to climb the income ladder in relative terms. However, since relative mobility is looking at the relative change of income ranks, individuals might be doing better than their parents compared to others, but in absolute terms, they might be still be as poor as before. Therefore, relative mobility does not show whether the poor have, in fact, become richer over the generations or if the rich simply earn a bit less. Interestingly, for absolute mobility, the general greater dispersion of incomes is associated with lower mobility, while for relative mobility, the concentration of income among the richest compared to the poorest is more significant. A generally narrower inequality dispersion might give more opportunities to increase incomes in absolute terms, but climbing the income ladder relative to others is significantly more difficult in a society with high income concentration.

Additionally, education levels are strongly correlated with regions with relatively high social capital in the parents' generation, showing lower levels of relative mobility. This could be explained by Hällsten and Thaning's (2018) finding that the choice of educational attainment depends highly on one's social origin. In regions with many highly educated individuals, it may be more difficult to surpass their many highly educated peers and increase income in relative terms. These findings are also not in line with Michelangeli et al. (2021), who found high levels of social capital to be one of the most important associations with high mobility across regions.

Much research needs to be done to fully understand the factors related to intergenerational income mobility. While this study contributes to the existing findings and adds some more factors to the discussion associated with intergenerational income mobility, many factors still impact intergenerational income mobility that have not been covered. The focus should be on studying these relationships with more detailed data showing the regional nuances. Because of the lack of detailed data, especially the results for relative mobility should not be treated as representative. This adds several problems to this study, and the results should be treated carefully. Nevertheless, I decided to use Heidrich's data as there is no other detailed data for intergenerational income mobility across Swedish municipalities. For absolute mobility, the data available was more detailed, and the results should be more reliable. It should be noted that absolute mobility only covers individuals whose families were in the 25th income percentile since Heidrich focuses on

upward mobility. This works very well for the purpose of this study, but the results are not representative of all individuals and will differ when looking at individuals from other income percentiles.

## **8. Conclusion**

This study analyses the relationship between mobility and median incomes across Swedish regions, adding a previously underexplored component to the discussion around intergenerational income mobility in Sweden. Additionally, variables measuring other socioeconomic indicators, such as education or inequality, are added. These factors have been studied before, but this study adds new findings to the discussion on Sweden and gives a nuanced view of the differences between absolute and relative mobility.

The results show that there is a strong association between the median income level and absolute upward mobility across Swedish municipalities. More specifically, this means that children who grew up in the 25<sup>th</sup> percentile are more likely to achieve absolute upward mobility when they grow up in regions with higher median incomes than if they grow up in low-income regions. Inequality also seems to be an important factor in intergenerational mobility. It is found that a lower Gini coefficient is related to higher absolute mobility, while less income concentration at the top is related to higher relative mobility. A high level of education in a region is found to be associated negatively, especially with mobility. Regarding education and inequality, the results of this study are conflicting with the results of similar studies in Sweden.

The results lead to the conclusion that the empirical study can confirm many of the theoretical assumptions around intergenerational income mobility. The results confirm the theory of the Great Gatsby Curve and previous findings on other countries that higher inequality is associated with lower mobility. Furthermore, the theoretical assumption that a society with higher equality of opportunity is also a more productive and efficient society is supported by the higher median income rates in regions with higher intergenerational absolute mobility. However, one must be cautious when deriving direct causalities from the study, as it is likely that both variables are interdependent. Additionally, the results on relative mobility show that individuals in regions with high mobility may be given more chances to increase their incomes compared to their parents'

incomes. However, their movement in the income distribution does not seem to differ much from poorer regions.

This study contributes to a more holistic understanding of intergenerational income mobility across Swedish regions. Increasing equality of opportunity is difficult as it involves social and structural policies that are often only indirectly linked to increasing equality or take many years or decades to bear fruits. Identifying which factors are associated with higher equality of opportunity is a first step in examining the underlying reasons for these correlations and why some regions use their human resources more efficiently than others. The findings show that weaker regions can gain a lot from investment inequality of opportunity. There is much research to be done to understand the mechanisms behind equality of opportunity fully but with widening socioeconomic gaps and rising political polarisation in Sweden and across Europe, equality of opportunity should be a priority.

## 9. References

Atkinson, A. B., Piketty, T., Saez, E. (2011). Top Incomes in the Long Run of History, *Journal of Economic Literature*, vol. 49, no. 1, <https://www.aeaweb.org/articles?id=10.1257/jel.49.1.3>

Atkinson, A. B., Piketty, T. (2007). Top Incomes over the Twentieth Century: A Contrast Between European and English-Speaking Countries, *Oxford University Press*, <http://piketty.pse.ens.fr/files/AtkinsonPiketty2007.pdf>

Atkinson, A. B., Piketty, T. (2010). Top Incomes A Global Perspective, *Oxford University Press*, <http://piketty.pse.ens.fr/files/AtkinsonPiketty2010.pdf>

Bénabou, R., Ok, E. A. (2001). Social Mobility and the Demand for Redistribution: The Poup Hypothesis, *The Quarterly Journal of Economics*, vol. 116, no. 2, pp. 447–487, <https://academic.oup.com/qje/article-abstract/116/2/447/1904170>

Bethhäuser, B. (2017). Fostering Equality of Opportunity? Compulsory Schooling Reform and Social Mobility in Germany, *European Sociological Review*, vol. 33, no. 5, pp. 633–644, <https://doi.org/10.1093/esr/jcx066>

Björklund, A., Jäntti, M., Roemer, J. E. (2011). Equality of Opportunity and the Distribution of Long-Run Income in Sweden, *Institute for the Study of Labor (IZA), Discussion Paper*, no. 5466, <https://docs.iza.org/dp5466.pdf>

Björklund, A., Roine, J., Waldenström, D. (2012). Intergenerational top income mobility in Sweden: Capitalist dynasties in the land of equal opportunity? *Journal of Public Economics*, vol. 96, no. 5–6, pp. 474–484, <https://doi.org/10.1016/j.jpubeco.2012.02.003>

- Björklund, A., Jäntti, M. (2020). Intergenerational mobility, intergenerational effects, sibling correlations, and equality of opportunity: A comparison of four approaches, *Research in Social Stratification and Mobility*, vol. 70, <https://doi.org/10.1016/j.rssm.2019.100455>
- Bloome, D. (2015). Income Inequality and Intergenerational Income Mobility in the United States, *Social Forces*, vol. 93, no. 3, pp. 1047–1080, <https://doi.org/10.1093/sf/sou092>
- Bradbury, K., Triest, R. K. (2016). Inequality of Opportunity and Aggregate Economic Performance, *The Russell Sage Foundation Journal of the Social Sciences*, vol. 2, no. 2, Opportunity, Mobility, and Increased Inequality, pp. 178-201, <https://www.jstor.org/stable/10.7758/rsf.2016.2.2.08>
- Caroll, D. R., Chen, A. (2016). Income Inequality Matters, but Mobility Is Just as Important, *Economic Commentary*, n. 2016-06, <https://www.clevelandfed.org/publications/economic-commentary/2016/ec-201606-income-inequality-and-mobility>
- Chetty, R., Hendren, N., Kline, P., Saez, E. (2014). Where is the land of Opportunity? The Geography of Intergenerational Mobility in the United States, *The Quarterly Journal of Economics*, vol. 129, no. 4, pp. 1553–1623, <https://doi.org/10.1093/qje/qju022>
- Chusseau, N., Hellier, J. (2012). Educational Systems, Intergenerational Mobility and Social Segmentation, *European Journal of Comparative Economics*, vol. 8, no. 2, pp. 255-286, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1607661](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1607661)
- Corak, M. (2013). Income Inequality, Equality of Opportunity, and Intergenerational Mobility, *The Journal of Economic Perspectives*, vol. 27, no. 3, pp. 79-102, <https://www.jstor.org/stable/41955546>
- Dunnzlaff, L., Neumann, D., Niehues, J., Peichl, A. (2010). Equality of Opportunity and Redistribution in Europe, *Institute for the Study of Labor (IZA) Discussion Paper*, no. 5375, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1728332](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1728332)
- Durlauf, S. N., Seshadri, A. (2017). Understanding the Great Gatsby Curve, *NBER Macroeconomics Annual*, vol. 32, <https://www.journals.uchicago.edu/doi/10.1086/696058>
- Fields, G. S. (2010). Does Income Mobility Equalize Longer-Term Incomes? New Measures of an Old Concept, *The Journal of Economic Inequality*, vol. 8, no. 4, DOI:10.1007/s10888-009-9115-6
- Fields, G. S., Hernández, R. D., Freije, S., Sánchez Puerta, M. L., Arias, O., Assunção, J. (2007). Intragenerational Income Mobility in Latin America [with Comments], *Economía*, vol. 7, no. 2, pp. 101-154, <https://www.jstor.org/stable/20060493>
- Hällsten, M., Thaning, M (2018). Multiple Dimensions of Social Background and Horizontal Educational Attainment in Sweden, *Research in Social Stratification and Mobility*, vol. 56, pp. 40-52, <https://doi.org/10.1016/j.rssm.2018.06.005>
- Härkönen, J., Bihage, E. (2011). Occupational attainment and career progression in Sweden, *European Societies*, vol. 13, no. 3, <https://doi.org/10.1080/14616696.2011.568261>
- Haveman, R., Smeeding, T. (2006). The Role of Higher Education in Social Mobility, *The Future of Children*, vol. 16, no. 2, pp. 125-150, <https://www.jstor.org/stable/3844794>

- Heidrich, S. (2017). Intergenerational mobility in Sweden: a regional perspective, *Journal of Population Economics*, vol. 30, pp. 1241–1280, <https://link.springer.com/article/10.1007/s00148-017-0648-x#Sec10>
- Jansson, B. (2021). Income inequality and intragenerational income mobility in Sweden from 1983 to 2010: Following two birth cohorts, *Social Indicators Research*, vol. 158, p. 751–773, <https://link.springer.com/article/10.1007/s11205-021-02694-8?fromPaywallRec=false>
- Jarvis, B. F., Song, X. (2017). Rising Intragenerational Occupational Mobility in the United States, 1969 to 2011, *American Sociological Review*, <https://journals.sagepub.com/home/ASR>
- Jäntti, M., Røed, K., Naylor, R., Björklund, A., Bratsberg, B., Raaum, O., Österbacka, E., Eriksson, T. (2006). American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States, *Institute for the Study of Labor (IZA) Discussion Paper*, no. 1938, <https://docs.iza.org/dp1938.pdf>
- Kuznets, S. (1955). Economic Growth and Income Inequality, *The American Economic Review*, vol. 45, <http://piketty.pse.ens.fr/files/Kuznets1955.pdf>
- Liss, E., Korpi, M., Wennberg, K. (2023). Absolute income mobility and the effect of parent generation inequality: An extended decomposition approach, *European Economic Review*, vol. 152, <https://doi.org/10.1016/j.euroecorev.2022.104359>
- Mazumder (2005). Fortunate Sons: New Estimates of Intergenerational Mobility in the United States Using Social Security Earnings Data, *The Review of Economics and Statistics*, vol. 87, no. 2, pp. 235-255, <https://www.jstor.org/stable/40042900>
- Michelangeli, A., Östh, J., Türk, U. (2023). Intergenerational income mobility in Sweden: A look at the spatial disparities across municipalities, *Regional Science Policy & Practice*, vol. 14, pp. 981–1004, Available online: <https://onlinelibrary.wiley.com/doi/full/10.1111/rsp3.12452>
- Mitnik, P. A., Bryant, V., Weber, M., Grusky, D. B. (2015). New Estimates of Intergenerational Mobility Using Administrative Data, *Stanford Center on Poverty and Inequality*, <https://inequality.stanford.edu/publications/media/details/new-estimates-intergenerational-economic-mobility-using-administrative>
- OECD (2011). Divided We Stand: Why Inequality Keeps Rising, *OECD 50*, <https://www.oecd.org/els/soc/49170768.pdf>
- André, C., Beom, J. Pak, P., Purwin, A. (2021). Keeping Regional Inequality In Check in Sweden, *OECD Economic Department Working Papers*, no. 1689, [https://one.oecd.org/document/ECO/WKP\(2021\)40/en/pdf](https://one.oecd.org/document/ECO/WKP(2021)40/en/pdf)
- Piketty (2011). On the long run evolution of inheritance, France 1820-2050, *The Quarterly Journal of Economics*, vol. 126, no. 3, pp. 1071-1131, <https://www.jstor.org/stable/23015697>
- Piketty (2014). *Capital in the Twenty-First Century*. Cambridge Massachusetts: The Belknap Press of Harvard University Press

Piketty and Zucman (2015). Piketty, T., Zucman, G. (2015). Chapter 15 - Wealth and Inheritance in the Long Run, *Handbook of Income Distribution*, vol. 2, pp. 1303-1368, <https://doi.org/10.1016/B978-0-444-59429-7.00016-9>

Raaum, O., Bratsberg, B., Roed, K., Osterbacka, E., Eriksson, T., Jantti, M., Naylor, R. (2007). Marital Sorting, Household Labor Supply, and Intergenerational Earnings Mobility across Countries, *Institute of Labor Economics (IZA) Discussion Paper*, no. 3037, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1020578](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1020578)

Rawls, J (1958). A Theory of Justice Revised Edition, *The Belknap Press of Harvard University Press Cambridge, Massachusetts*, <https://giuseppicapograssi.files.wordpress.com/2014/08/rawls99.pdf>

Rawls, J. (1971). Justice as Fairness, *The Philosophical Review*, vol. 67, no. 2, pp. 164-194, <https://www.jstor.org/stable/2182612>

Roemer, J. E., Trannoy, A. (2016). Equality of Opportunity: Theory and Measurement, *Journal of Economic Literature*, vol. 54, no. 4, pp. 1288-1332, <https://www.jstor.org/stable/26303161>

A

SCB (2023). Disponibel inkomst för hushåll efter region, hushållstyp och ålder. År 2011 - 2022, *Sveriges officiella statistik*, [https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START\\_\\_HE\\_\\_HE0110\\_\\_HE0110G/TabVX4bDispInkN/](https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__HE__HE0110__HE0110G/TabVX4bDispInkN/)

SCB (2023a). Bruttoregionprodukt (BRP), (ENS2010) efter region (kommun). År 2012 - 2021, *Sveriges officiella statistik*, [https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START\\_\\_NR\\_\\_NR0105\\_\\_NR0105A/NR0105ENS2010T06A/](https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__NR__NR0105__NR0105A/NR0105ENS2010T06A/)

SCB (2023b). Population 16-74 years of age by region, highest level of education, age and sex. Year 1985 - 2022, *Sveriges officiella statistik*, [https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START\\_\\_UF\\_\\_UF0506\\_\\_UF0506B/Utbildning/](https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__UF__UF0506__UF0506B/Utbildning/)

SCB (2023c). Income inequality indicators by region. Year 2011 - 2022, *Sveriges officiella statistik*, [https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START\\_\\_HE\\_\\_HE0110\\_\\_HE0110F/TabVX1DispInkN/](https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__HE__HE0110__HE0110F/TabVX1DispInkN/)

Schinke, 2023 Inheritance in Germany 1911 to 2009: A Mortality Multiplier Approach, *CESifo (Center for Economic Studies and Ifo Institute) - SOEPpaper*, no. 462, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2131208](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2131208)

Shorrocks, A. F. (1978). The Measurement of Mobility, *Econometrica*, vol. 46, no. 5, pp. 1013-1024, Available online: <https://www.jstor.org/stable/1911433>

Solon (2004). A Model of Intergenerational Mobility Variation over Time and Place. *Generational Income Mobility in North America and Europe*, vol. 7, no. 5, pp. 38-47. <http://dx.doi.org/10.1017/CBO9780511492549.003>

Steele, L. G. (2015). Income Inequality, Equal Opportunity, and Attitudes About Redistribution, *Social Science Quarterly*, vol. 96, no. 2, p. 444-464, Available online: <https://doi.org/10.1111/ssqu.12145>

Stockhausen, M. (2021). Like father, like son? A comparison of absolute and relative intergenerational labour income mobility in Germany and the US, *The Journal of Economic Inequality*, vol. 19. Pp. 667-683, Available online: <https://link.springer.com/article/10.1007/s10888-021-09483-w>

Bj

Torche, F. (2014). Intergenerational Mobility and Inequality: The Latin American Case, *the Annual Review of Sociology*, <https://www.annualreviews.org/docserver/fulltext/soc/40/1/annurev-soc-071811-145521.pdf?expires=1711960258&id=id&accname=guest&checksum=F518D83754F749CC253AF5B7252F4F4E>

Torche, F. (2015). Analyses of Intergenerational Mobility: An Interdisciplinary Review, *The Annals of the American Academy of Political and Social Science*, vol. 657, Monitoring Social Mobility in the Twenty-First Century, pp. 37-62, Available online: <https://www.jstor.org/stable/24541791>

Voitchovsky, S. (2009). Does the Profile of Income Inequality Matter for Economic Growth?: Distinguishing between the Effects of Inequality in Different Parts of the Income Distribution, *Journal of Economic Growth*, vol. 10, no. 3, pp. 273-296, Available online: <https://www.jstor.org/stable/40216078>

Waldenström, D. (2017). Wealth-Income Ratios in a Small, Developing Economy: Sweden, 1810–2014, *The Journal of Economic History*, vol. 77, no. 1, Available online: <https://www.jstor.org/stable/26348411>

World Economic Forum (2020) *The Global Social Mobility Report 2020 Equality, Opportunity and a New Economic Imperative*, Available online: [https://www3.weforum.org/docs/Global\\_Social\\_Mobility\\_Report.pdf](https://www3.weforum.org/docs/Global_Social_Mobility_Report.pdf) [Accessed 25 April 2023]

Van der Weide, R., Lakner, C., Mahler, D. G., Narayan, A. (2021). Intergenerational Mobility Around the World, *SSRN Electronic Journal*, Available online: [https://www.researchgate.net/publication/356956992\\_Intergenerational\\_Mobility\\_Around\\_the\\_World](https://www.researchgate.net/publication/356956992_Intergenerational_Mobility_Around_the_World)



## 10. Appendix

Table 1: Sample summary

Region	Median Income	Absolute mobility	Relative mobility
1 Älmhult	435.1	47.37	18.16
2 Ånge	354.2	44.88	18.16
3 Arboga	373.4	44.88	18.16
4 Årjäng	396.8	40.9	18.16
5 Arjeplog	360.2	44.88	18.16
6 Arvidsjaur	350.5	44.88	18.16
7 Arvika	366.9	44.88	18.16
8 Åsele	328.9	44.88	18.16
9 Avesta	370.2	47.33	18.16
10 Bengtsfors	355.7	44.88	18.16
11 Bollnäs	351.4	43.53	18.16
12 Borås	401.0	46.66	18.16
13 Dorotea	317.2	44.88	18.16
14 Eksjö	392.2	44.88	18.16
15 Emmaboda	367.8	47.24	18.16
16 Eskilstuna	373.9	43.81	20.55
17 Fagersta	372.7	47.2	18.16
18 Falkenberg	431.5	46.24	18.16
19 Falun	410.1	44.88	18.16
20 Filipstad	319.8	44.88	18.16
21 Gällivare	421.9	44.88	18.16
22 Gävle	380.6	45.93	18.16
23 Gislaved	426.4	47.09	18.16
24 Gnosjö	461.4	48.06	18.16
25 Göteborg	407.3	45.83	19.23
26 Gotland	385.0	41.65	18.16
27 Hagfors	346.9	44.88	18.16
28 Hällefors	327.4	42.59	18.16
29 Halmstad	405.8	44.88	18.16
30 Haparanda	332.8	44.88	18.16
31 Härjedalen	361.0	44.88	18.16
32 Härnösand	361.2	44.88	18.16
33 Hässleholm	382.6	44.88	18.16
34 Hedemora	357.8	44.88	18.16
35 Helsingborg	408.0	44.88	18.16
36 Hofors	370.8	48.08	18.16
37 Höör	469.7	44.88	18.16
38 Hudiksvall	380.2	43.33	18.16
39 Hulthsfred	356.2	44.88	18.16
40 Hylte	402.1	48.43	18.16
41 Jokkmokk	369.3	41.67	18.16
42 Jönköping	419.1	46.41	18.16
43 Kalix	375.9	44.88	18.16
44 Kalmar	389.0	44.88	18.16
45 Karlshamn	376.1	44.88	18.16
46 Karlskoga	374.6	44.88	18.16
47 Karlskrona	394.8	44.88	18.16
48 Karlstad	376.4	43.55	20.54
49 Katrineholm	366.1	44.88	18.16
50 Kiruna	436.7	44.88	18.16
51 Köping	375.8	44.88	18.16
52 Kramfors	342.0	44.88	18.16
53 Kristianstac	398.0	46.03	18.16
54 Kristinehar	352.6	44.88	18.16
55 Laxå	358.3	44.88	18.16
56 Lidköping	409.2	46.31	18.16
57 Linköping	397.6	44.4	20.38
58 Ljungby	394.7	48.22	18.16
59 Ljusdal	360.5	44.88	18.16
60 Ludvika	356.3	44.88	18.16
61 Luleå	392.0	42.94	18.16
62 Lycksele	365.6	44.88	18.16
63 Lysekil	400.9	44.88	18.16
64 Malmö	381.9	43.41	18.16
65 Malung	384.0	40.97	18.16
66 Mariestad	387.6	44.88	18.16
67 Markaryd	375.3	44.88	18.16
68 Mora	387.9	42.42	18.16
69 Munkfors	329.6	44.88	18.16
70 Nässjö	397.6	46.92	18.16
71 Norrköping	390.1	43.43	18.16
72 Nyköping	407.7	47.71	18.16
73 Olofström	372.9	47.61	18.16
74 Örebro	376.9	45.3	19.87
75 Örnsköldsvik	412.5	47.37	18.16
76 Oskarshamn	396.6	46.83	18.16
77 Östersund	370.1	43	18.16
78 Överkalix	334.2	44.88	18.16
79 Övertorneå	357.7	44.88	18.16
80 Pajala	348.7	44.88	18.16
81 Perstorp	355.2	47.35	18.16
82 Säffle	361.6	44.88	18.16
83 Sävsjö	408.8	44.88	18.16
84 Simrishamn	382.0	42.94	18.16
85 Skellefteå	411.7	44.88	18.16
86 Skövde	408.0	46.85	16.55
87 Söderhamn	360.1	42.4	18.16
88 Sollefteå	337.6	44.88	18.16
89 Sorsele	344.9	44.88	18.16
90 Stockholm	475.9	45.89	22.2
91 Storuman	351.8	44.88	18.16
92 Strömstad	437.0	44.88	18.16
93 Strömsund	333.6	42.9	18.16
94 Sundsvall	397.6	44.88	18.16
95 Sunne	386.9	42.13	18.16
96 Tidaholm	378.4	44.88	18.16
97 Torsby	352.9	40.96	18.16
98 Tranås	369.7	44.88	18.16
99 Trollhättan	395.5	45.92	18.16
100 Uddevalla	397.4	44.88	18.16
101 Umeå	391.2	44.88	18.16
102 Uppsala	409.3	45.86	18.16
103 Vansbro	345.5	41.65	18.16
104 Vara	390.8	47.64	18.16
105 Varberg	460.4	46.56	15.58
106 Värnamo	442.3	48.61	18.16
107 Västerås	424.0	45.38	20.17
108 Västervik	362.9	44.88	18.16
109 Växjö	407.0	47.19	16.18
110 Vetlanda	395.1	46.87	18.16
111 Vilhelmina	343.0	41.91	18.16
112 Vimmerby	386.1	44.88	18.16

Median income for 2022

Regions: Swedish municipalities for which income mobility data is available

Table 2: Sample Summary Relative and Absolute mobility

Absolute mobility outliers (mobility ≠ 44.88)

Region	Median Income	Absolute mobility	Region	Median Income	Absolute mobility
1 Älmhult	435.1	47.37	29 Mora	387.9	42.42
2 Årjäng	396.8	40.9	30 Nässjö	397.6	46.92
3 Avesta	370.2	47.33	31 Norrköping	390.1	43.43
4 Bollnäs	351.4	43.53	32 Nyköping	407.7	47.71
5 Borås	401.0	46.66	33 Olofström	372.9	47.61
6 Emmaboda	367.8	47.24	34 Örebro	376.9	45.3
7 Eskilstuna	373.9	43.81	35 Örnköldsvik	412.5	47.37
8 Fagersta	372.7	47.2	36 Oskarshamn	396.6	46.83
9 Falkenberg	431.5	46.24	37 Östersund	370.1	43
10 Gävle	380.6	45.93	38 Perstorp	355.2	47.35
11 Gislaved	426.4	47.09	39 Simrishamn	382.0	42.94
12 Gnosjö	461.4	48.06	40 Skövde	408.0	46.85
13 Göteborg	407.3	45.83	41 Söderhamn	360.1	42.4
14 Gotland	385.0	41.65	42 Stockholm	475.9	45.89
15 Hällefors	327.4	42.59	43 Strömsund	351.8	42.9
16 Hofors	370.8	48.08	44 Sunne	386.9	42.13
17 Hudiksvall	380.2	43.33	45 Torsby	352.9	40.96
18 Hylte	402.1	48.43	46 Trollhättan	395.5	45.92
19 Jokkmokk	369.3	41.67	47 Uppsala	409.3	45.86
20 Jönköping	419.1	46.41	48 Vansbro	345.5	41.65
21 Karlstad	376.4	43.55	49 Vara	390.8	47.64
22 Kristianstad	398.0	46.03	50 Varberg	460.4	46.56
23 Lidköping	409.2	46.31	51 Värnamo	442.3	48.61
24 Linköping	397.6	44.4	52 Västerås	424.0	45.38
25 Ljungby	394.7	48.22	53 Växjö	407.0	47.19
26 Luleå	392.0	42.94	54 Vetlanda	395.1	46.87
27 Malmö	381.9	43.41	55 Vilhelmina	343.0	41.91
28 Malung	384.0	40.97			

Higher than 44.88 = green

Lower than 44.88 = red

Relative mobility outliers (mobility ≠ 18.16)

Region	Median Income	Relative mobility
1 Eskilstuna	373.9	20.55
2 Göteborg	407.3	19.23
3 Karlstad	376.4	20.54
4 Linköping	397.6	20.38
5 Örebro	376.9	19.87
6 Skövde	408.0	16.55
7 Stockholm	475.9	22.2
8 Varberg	460.4	15.58
9 Västerås	424.0	20.17
10 Växjö	407.0	16.18

Higher than 18.16 = green

Lower than 18.16 = red