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"Income inequality and intergenerational transmission of wealth."

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Firma dello studente

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Introduction

Greater intergenerational mobility matters not just because it's fair and provides equal chances for everyone, but it's also good for the economy. It suggests that people get jobs based on their skills and not just because their parents were well-off. This means that people's abilities are put to better use, so they work in roles that benefit society, making society more productive and efficient overall. (Krogh, 2022) It was found that different countries have a link between intergenerational mobility and income inequality. In places with more income inequality, there tends to be lower intergenerational mobility. (Corak, 2013)

This thesis aims to show the relationship between income inequality and education and how it affects intergenerational mobility based on the Global Database on Intergenerational Mobility (GDIM). Intergenerational income mobility is closely connected to educational disparities based on one's family background, as research by (Solon, 2004) and (Blanden et al., 2007). When family background significantly influences educational attainment, leading to greater educational inequality, there is a higher likelihood that an individual's adult earnings are linked to their family's income during childhood. This observation is supported by Blanden (2007), who found that 85% of the decline in mobility between the 1958 and 1970 cohorts can be attributed to an increase in educational inequality. In the 1970 cohort, children from wealthier families achieved significantly more in education compared to those from less affluent backgrounds.

One can predict potential future trends in intergenerational mobility by examining current trends in educational inequality, as educational disparities play a significant role in perpetuating inequalities across generations, as suggested by (Blanden J et al., 2010)

This paper delves into the dynamic nature of income inequality and its evolving trends over time, alongside the intricate relationship between intergenerational mobility and various influencing factors, with a particular focus on the role of education. The ensuing chapter, Chapter 2, critically examines a multitude of

scholarly works and research studies dedicated to analyzing the impact of education on intergenerational mobility. The subsequent Chapter 3 employs specific models to discern how family background and income exert their influence on educational attainment and the subsequent implications for intergenerational mobility.

1.1 Income inequality

Research on economic inequality mainly concentrates on monetary inequality. The two types of inequality are monetary and nonmonetary, according to economists. The economic activities of a person or a household, such as their earnings, income, spending, and wealth, are all covered by the concept of monetary inequality. Contrarily, nonmonetary inequality covers a wider range of economic factors, such as capability or well-being. The significance of economic inequality lies in its inherent violation of principles related to social justice (Atkinson & Bourguignon, 2015). The field of sociology places its emphasis on studying unequal social relationships when investigating inequality, whereas economists direct their attention to the uneven distribution of economic resources. More specifically, the sociological examination of inequality centers around analyzing social class and status. (Goldthorpe & McKnight, 2006)

Expanding further on Historical research, the allocation of economic resources centers on the study of how top income and wealth shares have evolved (Alvarado et al., 2018; Atkinson et al., 2011; Stephens, 2016). When examining how satisfied the population is overall, the distribution of income is looked at because it is thought of as a stand-in for well-being. The issue of income inequality has received significant attention in economic literature. There are numerous justifications for measuring inequality. First, it is connected to economic expansion, cyclical patterns, and total consumption. Second, regardless of how inequality affects other factors, there is a normative reason to look into it as a social problem. As a result, determining income distribution is essential for informing policy choices (Decancq et al., 2014). Moreover, the extent of economic inequality within a society can result in unfavorable effects, which encompass heightened crime rates, health issues, mental illness, diminished educational accomplishments, reduced social cohesion, and lower life expectancy (Myles, 2014).

Moving forward, Income inequality has experienced a significant rise in recent decades (Heathcote et al., 2010). Economic and income disparity has been the subject of in-depth research, which has examined several potential contributing variables as well as possible outcomes. Because rising levels of inequality have both benefits and

drawbacks, the impacts of this upward trend in inequality have received a lot of attention in studies. Income inequality may encourage people to work hard and pursue entrepreneurial endeavors, according to research, which implies that it stimulates Gross Domestic Product (GDP) development (Naguib, 2017). Conversely, increased inequality has been associated with a decline in the additional satisfaction gained from additional income and an increase in social problems or unrest. (Peterson, 2017)

For more information on this subject, consider the various tools available for assessing income distribution. Comparing the distribution's average and median values is one straightforward measurement. The Lorenz curve, the Gini coefficient, the Theil index, and the Atkinson index are other well-known measures of income inequality. The income quantile share ratio, which splits the population into quantiles and evaluates the allocation of resources within each group over time, is another often-used approach. In particular research projects, Yitzhaki (1979), Income inequality is measured using a variety of metrics. To measure relative deprivation, this includes computing the Gini coefficient and mean income as a product. (Stiglitz et al., 2009).

The World Bank (2005) outlined six requirements that need to be met for an accurate gauge of income disparity:

1. Independence from the mean: the indicator should remain the same even if all incomes double.
2. Unaffected by population size: the size of the population should not affect the inequality measurement.
3. Invariance to income exchange: swapping incomes should not alter the inequality measure.
4. Sensitivity to Pigou-Dalton Transfer: this implies that if wealth is reallocated from the wealthy to the less affluent, the inequality index should decrease.
5. Segment ability: this principle suggests that the inequality metric can be divided into different aspects, such as population segments or income sources.
6. Testability of the statistics: changes in the index over time should be statistically verifiable.

Building upon this concept, the Lorenz curve presents a visual representation of income inequality. The population must be sorted by the magnitude of their incomes to plot its trajectory. To draw the curve, the percentage of total income earned by the various demographic segments is taken into account (Bierwag & Grove, 1966). The Lorenz curve is used to calculate inequality metrics like the Gini coefficient as well as the size of the income distribution.

The most used measure of income disparity is the Gini coefficient. Given that it is based on individuals' income levels, it is an effective way to gather data on the various income discrepancies. This index is defined by the area between the Lorenz curve and the 45-degree line representing perfect equality. Since there is no space between the two curves when the Lorenz curve lies on the 45-degree line, perfect income equality is indicated. On the other hand, the Gini coefficient rises when the two curves diverge from one another. When the Gini index is 1, it means that there is perfect income inequality, meaning that one person owns all of the money.

1.1.2 Income Inequality Factors

The phenomenon of increasing income inequality is commonly ascribed to either structural or institutional factors. Historically, economists have predominantly emphasized structural factors as the primary catalysts for this upward trend, specifically citing globalization and technological advancements. In recent times, there has been a notable trend toward recognizing the impact of institutional political factors, specifically the adoption of neoliberal policies characterized by privatization, deregulation, and reductions in taxation and social welfare, which commenced during the early 1980s. The policies under consideration, initially advocated and strictly implemented by the United Kingdom and the United States before gaining worldwide acceptance, have been acknowledged as major contributors to income inequality. (Atkinson et al., 2011; J. E. Stiglitz, 2009)

- **Globalization**

The impact of globalization is highlighted in an early and significant explanation of the rise in economic disparity (Borjas, Freeman, and Katz 1991; Revenga 1992).

The globalization phenomenon has contributed to the outsourcing of many goods and services that were previously produced domestically in Western countries, which hurts the wages of lower-skilled labor. The "market forces hypothesis" contends that as trade and mobility obstacles have been lowered, globalization and technological innovation have been accelerated, leading to an increase in the demand for highly qualified employees.

- **Technology**

A related argument explaining the growth in inequality emphasizes how technology, particularly the advent of the digital era, has had an impact. As a result of allowing robots to take over routine employment, the digital era has increased the value of abilities needed for non-routine work while decreasing the value of lower-skilled, routine tasks. These job structures have undergone significant changes as a result of the theory known as Skill-biased Technological Change (SBTC). Because of this, many traditional full-time jobs with benefits have been replaced by flexible part-time jobs without the same privileges. These jobs frequently consist of short-term "gigs" like driving or delivering meals. For instance, starting in the 1990s, over 60% of all new employment was non-standard, influenced by technology changes, and individuals in such jobs have a higher likelihood of being destitute, according to a 2015 assessment by the Organisation for Economic Co-operation and Development (OECD). (Brown 2017)

Technology has also been cited as a justification for inequality because it has a significant role in how productive certain skills are and because SBTC has increased production. It is highly challenging to separate any one person's contribution to society from that of others because even the most successful businessperson depends on the rule of law, sound infrastructure, and a workforce with a university education. (J. Stiglitz, 2013)

- **Tax policy**

The main source of revenue that governments use for redistribution, a crucial step in lowering economic disparity, is typically taxes. Economic theories favor redistribution since it is implied that the poor benefit significantly more from additional money than the wealthy because the added value of income decreases as income levels rise. However, since the late 1970s, there has been a major shift in how people view redistributive programs. The theory of 'trickle-down economics', which proposes that tax relief for the rich will in the end be advantageous for everyone, was consequently promoted by policymakers in the United States and the United Kingdom. However, later expert evaluations have found that tax cuts do not accelerate economic development. (CBPP, 2017)

- **Executive pay**

(Patnaik, 2014) The main source of revenue that governments use for redistribution, a crucial step in lowering economic disparity, is typically taxes. Economic theories favor redistribution since it is implied that the poor benefit significantly more from additional money than the wealthy because the added value of income decreases as income levels rise. However, since the late 1970s, there has been a major shift in how people view redistributive programs. (Gabaix & Landier, 2008)

- **Union decline**

The broad consensus is that trade unions play a substantial role in reducing economic inequality. They "promote wage consistency by preventing wage reduction among low-income earners" and "reduce wage spikes among high earners" (Visser & Checchi, 2011). Because companies frequently agree to salary requests to prevent unionization, the mere existence of unions can also increase the compensation of non-union employees in related industries. Additionally, research has shown a strong link between union density and increasing redistribution, both directly and through its influence on left-leaning political regimes. (Haddow et al., 2013)

1.1.2 Income Inequality's Effects

Numerous unfavorable effects have been linked to the rise in income inequality. In terms of the economy, income inequality has been shown to stifle growth,

investment, and innovation in addition to the obvious cases of poverty and material scarcity frequently associated with low incomes. socially speaking. They found that societies with greater social inequality generally experience worse social outcomes than societies with greater equality. (Wilkinson & Pickett's, 2009)

- **Economic**

The main focus of income inequality is economics. It makes sense that it could lead to widespread economic outcomes. It has been associated with less growth, investment, and innovation, especially economically. When income inequality in a nation reaches a certain point, growth is reduced. While the greater equality of the other countries included in the study helped to increase their growth rates, the income inequality in these countries would have been one-fifth higher if it had not increased. (Cingano, 2014)

- **Health**

(Wilkinson & Pickett's, 2009) discovered significant relationships between income inequality and both physical and mental health. For instance, they found that the difference between the least and most equitable wealthy countries in terms of life expectancy is typically more than four years. With rank, health steadily gets better, and lifestyle factors like drinking and smoking have little of an impact on this correlation. However, job stress and a person's sense of control over their work, including the variety of work and the use and development of skills, appear to make the biggest difference in ill health.(Schrecker & Bambra, 2015)

- **social**

Violent crime rates are lower in nations with greater equality (Hsieh & Pugh, 1993). This is partly because more equal societies experience less poverty, which in turn results in fewer people feeling hopeless about their circumstances. Lower-income persons have also been found to be more likely to commit crimes. Additionally, strain theory asserts that countries with greater social inequality place a larger social priority on economic success while offering fewer resources to do so. (Merton, 1938)

1.2 Trends In Income Inequality

Worldwide inequality has been rapidly declining since the 1990s. Global inequality saw a rapid rise during the nineteenth and the majority of the twentieth centuries, with growing gaps in per capita income between nations as wealthier economies prospered relative to the rest of the world. However, a time of growth and progress was marked by the revival of international economic cooperation in the middle of the 20th century. Since GDP growth rates per person soared in developing nations, particularly in Asia, this led to an alignment of income levels between countries (Bourguignon, Bourguignon, and Scott-Railton 2015). So many homes experienced a poverty reduction. Thus, over the past thirty years, the inequality in worldwide incomes has first leveled out and then begun to significantly decline. The fact that not all parts of the world have seen this income convergence with more industrialized nations is significant. For instance, Sub-Saharan Africa's income growth has frequently lagged behind that of Asia. Additionally, some of the gains made in lowering global inequality may be undone as a result of the COVID-19 dilemma. Global inequality is likely to increase because wealthy economies often have more resources to deal with the effects of the epidemic and the subsequent recovery efforts.

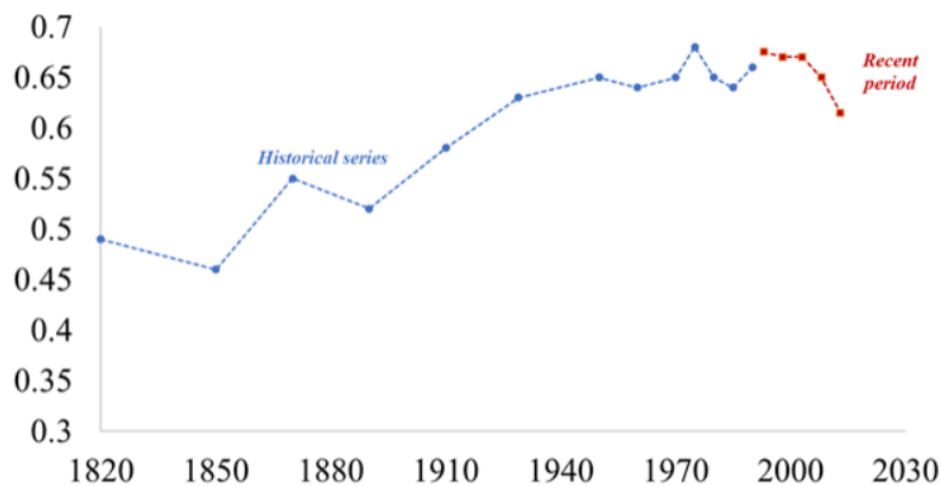


Figure 1.1. Global Income Inequality (Gini Coefficient) (Lakner & Milanovic, 2013)

Between-country inequality signifies the disparity in average earnings across various nations. This type of inequality constitutes two-thirds of worldwide income inequality. In the years leading up to the COVID-19 pandemic, between-country income inequality was reduced, as countries previously characterized by low-income and large populations, such as China and India, grew faster than high-income countries. The Gini coefficient is a significant indicator of inequality, measuring the distribution of income, consumption, or wealth. A Gini coefficient of 0 symbolizes perfect equality, while a value of 100 implies absolute inequality. (Deborah Hardoon, 2022)

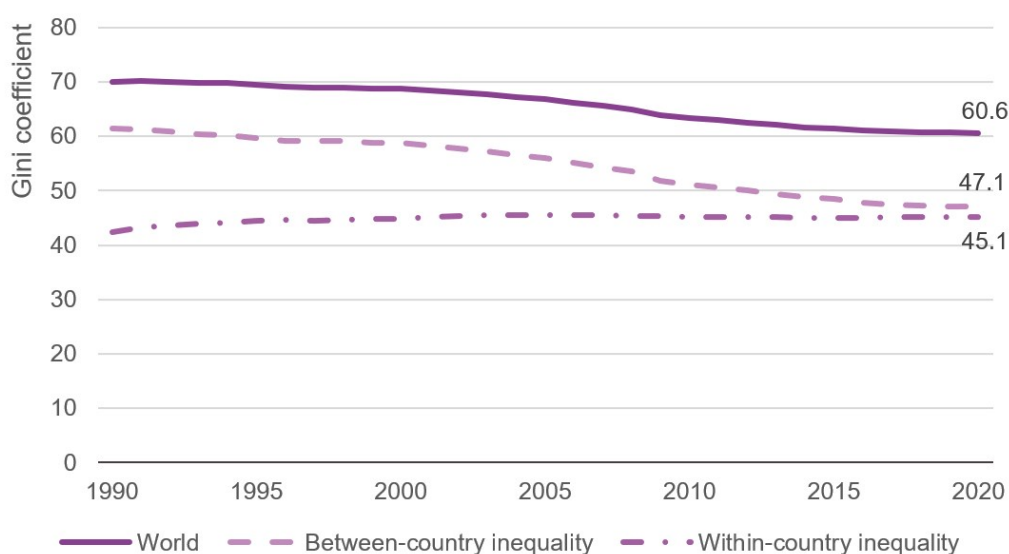


Figure 1.2 Development Initiatives based on (UNU-WIDER, 2022)

Figure 1.2 displays due to a decline in between-country inequality, the worldwide Gini coefficient dropped by 0.1 points (from 60.7 to 60.6) between 2019 and 2020, while the Gini coefficient between countries remained steady. What happened to global inequality in 2020 is depicted differently in several estimates. (UNU-WIDER, 2022)

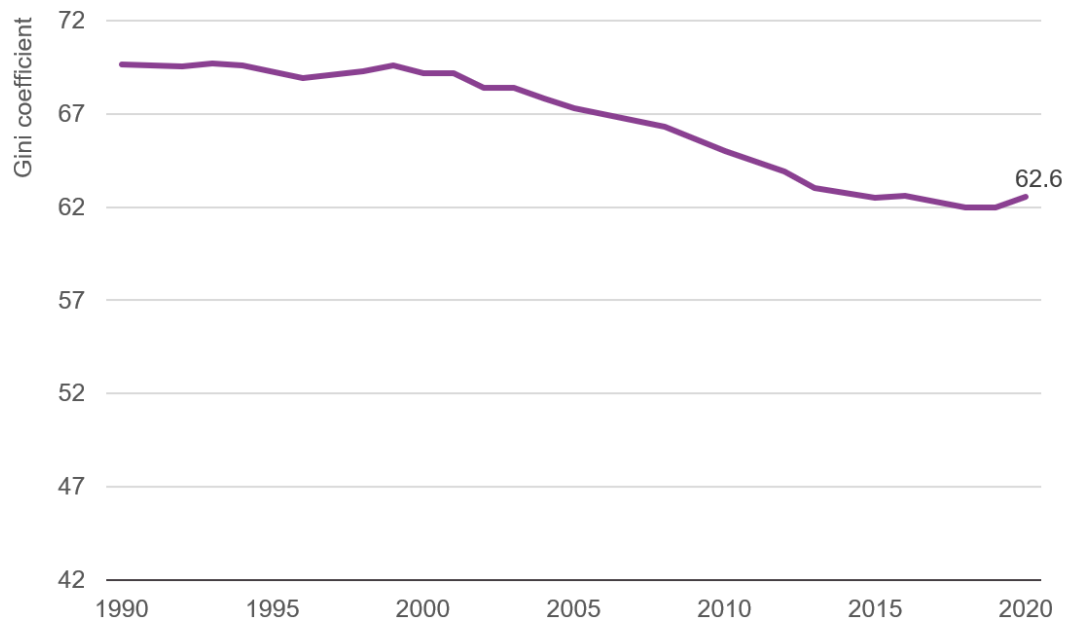


Figure 1.3 *Development Initiatives* (Lakner et al., 2022)

However, figure 1.3 indicates that based on many high-frequency mobile surveys carried out in 2020 and 2021, (Lakner et al., 2022) produced estimations. According to these projections, the worldwide Gini index will have its largest yearly growth in 2020 (a 0.7-point increase from anticipated trends). The COVID-19 pandemic's greater impact on low-income countries (LICs) resulted in a substantial increase in inter-country inequality, accounting for almost all of this. Within-country inequality was rather stable during this time, on average, with significant variation between nations.

As a consequence, one approach to comprehending these inequalities involves directing attention towards the disparity between the net wealth of governments and the net wealth of the private sector. In the preceding four decades, nations have experienced a notable increase in wealth, while concurrently witnessing a considerable decline in the financial resources of their respective governments. In affluent nations, the proportion of wealth owned by public entities is negligible or even in deficit, indicating that the entirety of wealth is predominantly concentrated in private ownership. The Covid crisis has significantly amplified this phenomenon, wherein governments have borrowed approximately 10-20% of the Gross Domestic Product (GDP) primarily from the private

sector. The present scarcity of financial resources within governments holds significant implications for their ability to address future inequality and tackle pressing challenges of the 21st century, such as climate change.

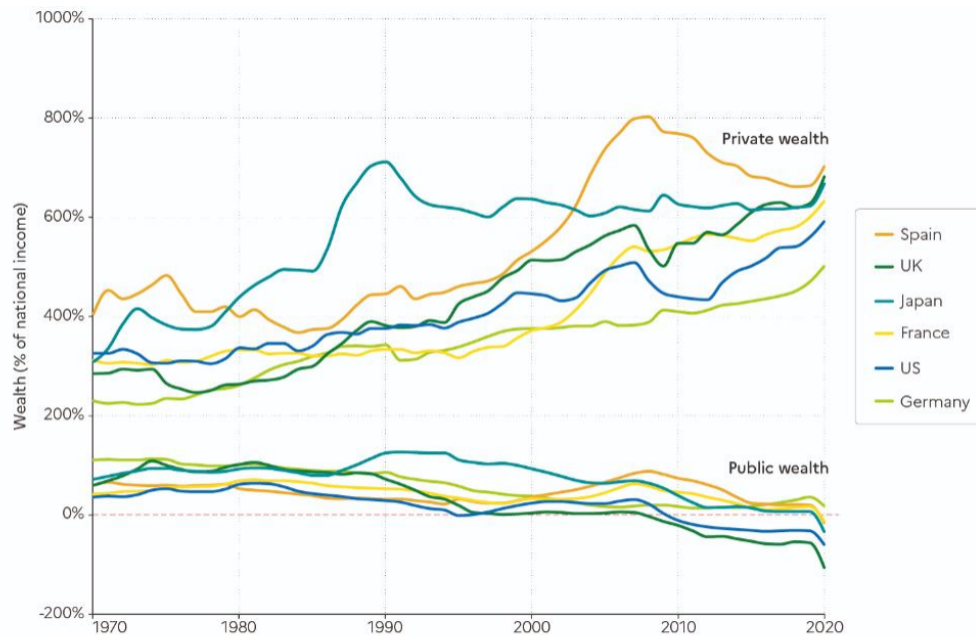


Figure 1.4 Public wealth (WIR 2022)

However, it is essential to point out that, In the United Kingdom, there has been a significant decline in public wealth, which has decreased from 60% to 106% of the national income over the period spanning from 1970 to 2020. Public wealth is the total value of all governmental entities' possessions, including both financial and non-financial assets, less any outstanding obligations. (Bajard et al., 2021)

1.3 Intergenerational mobility:

Economic mobility refers to how a person's income varies throughout their lifetime to the distribution of incomes obtained in the economy. How and how much an individual's income increases (decreases) about the distribution of incomes generated in the economy is referred to as their upward or downward mobility. In general, intergenerational economic mobility—what economists refer to as the "American Dream"—is necessary for realizing the oft-mentioned American Dream.

Intergenerational economic mobility is more specifically the chance for a person to rise to a position in the income distribution that is distinct from the position that their parents held when they were children. (Santos J, 2020)

Additionally, it is essential to mention Intergenerational mobility has long piqued the interest of economists and sociologists, who are now concentrating on describing the mechanisms driving the occupational persistence of parents and children. Social mobility has a component called "intergenerational mobility" that deals with the degree to which a person's social status differs from that of his parents, either up or down the socioeconomic ladder. To put it another way, this kind of mobility examines generational transitions and focuses on the connection between parents' socioeconomic level and the status their children would eventually achieve as adults. (OECD, 2010)

Moreover, we should also consider that A nation with perfect intergenerational social mobility is one where everyone has an equal chance of obtaining a certain vocational position, regardless of their familial background. This emphasizes that personal contentment is dependent on one's abilities and efforts. In contrast, there is a strong association between parents and children's employment positions in a culture with minimal mobility. As a result, intergenerational mobility is also an important factor when analyzing career mobility. The nature of their first employment may change if the socioeconomic background of their family and their father's profession have a significant impact on the career performance of their children. This may then have a long-term impact on their future job path. (G. Ballarino & P. Barbieri, 2012)

A result of intergenerational mobility might be either absolute or relative, according to economists. Relative intergenerational economic mobility assesses a person's position in income distribution in comparison to other people in their generation. Absolute intergenerational economic mobility compares an adult child's salary to what their parents made when they were that adult child's age. A common gauge of relative mobility is called intergenerational elasticity (IGE). IGE defines persistence over generations as the degree to which a parent's position in the income distribution affects their adult child's position in the income distribution of the child's generation.(Pablo A. Mitnik & David B. Grusky, 2020)

Every person, regardless of their family history, has an equal probability of landing a specific vocational post in a country with complete intergenerational social mobility. This emphasizes how one's skills and efforts determine their level of personal contentment. In contrast, in a culture where there is little mobility, there is a substantial correlation between parents and their children's employment statuses. Intergenerational mobility is therefore a key consideration when examining job mobility. If an adult child's career success is largely determined by their family's socioeconomic status and their father's profession, it will influence the son's first job. This, in turn, can significantly impact his future career path.

Furthermore, the examination of inequality and intergenerational economic mobility was initially conducted through a framework proposed by Becker and Tomes in 1979. They suggested that parents should invest in their children's human and non-human capital to optimize utility. Endowments and human and non-human capital investments combined define the child's future earnings. Parents invest more in their children, with wealthy parents having the ability to invest the most, because high levels of societal inequality result in large investment returns. Consequently, there exists an inverse relationship between intergenerational income persistence and inequality, as suggested by Solon (2004). An expansion on Becker and Tomes' model was carried out, which included an analysis of public contributions to human capital. It was posited that increased returns on education and less equitable public investments in human capital correspond to decreased income mobility and heightened cross-sectional income inequality. This correlation between high-income inequality (as indicated by the Gini coefficient) and low intergenerational income mobility was named The Great Gatsby Curve. (Hall & Krueger, 2012)

The majority of research on the geography of intergenerational economic mobility around the world has been done in North American and European nations, particularly the United States. (Barry J. Zimmerman, 1992; Bhattacharya & Mazumder, 2011; Chetty, Hendren, Kline, Saez, et al., 2014; Solon, 1992) Sweden (Anders Björklund et al., 2003;

Anders Björklund & Markus Jäntti, 1997), the United Kingdom (Dearden et al., 2009), and Canada (Aydemir & Icelli, 2013; Miles Corak & Andrew Heisz, 1999).

According to existing IGE estimates in these areas, Scandinavian countries have the highest levels of intergenerational earnings or economic mobility, whilst the United States and the United Kingdom have the lowest levels (Anders Björklund & Markus Jäntti, 1997; Chadwick & Solon, 2002; Corak, n.d.). Existing research indicates that there are different IGE estimates among countries, or even within one when it comes to the degree of IGE estimates. The main causes for this are observed to be diverse rules of sample construction and various estimation methodologies.

1.4 Great Gatsby Curve

The relationship between intergenerational mobility and economic inequality is depicted by the Great Gatsby Curve. It was initially employed to demonstrate this negative link between various nations. Higher intergenerational mobility is associated with lower inequality, whereas lower intergenerational mobility is associated with higher inequality in countries. (Corak, 2013b)

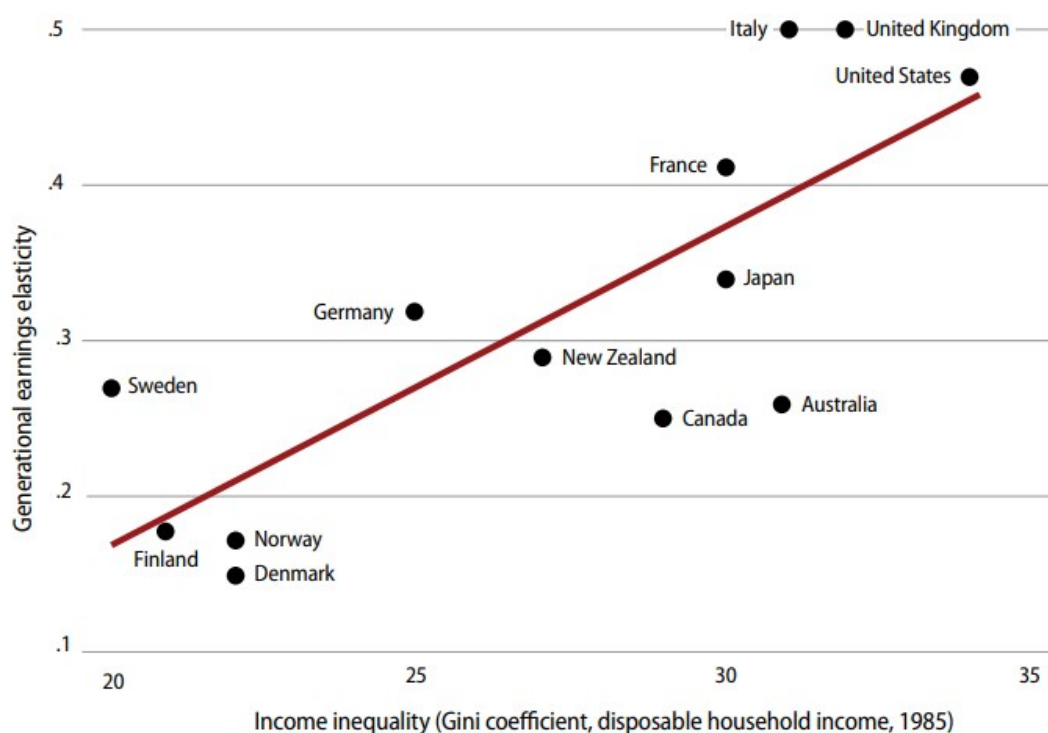


Figure 1.5 Great Gatsby Curve (Corak, 2013b)

Along two dimensions, this curve ranks the nations. Finland, Sweden, Norway, and Denmark are the nations with the lowest levels of inequality, while the United Kingdom and the United States have the highest levels. Transitioning from left to right indicates a shift from minimal to substantial inequality. Ascending vertically from the bottom to the top symbolizes a shift from high generational economic mobility to reduced generational economic mobility. The correlation between a parent's economic standing and their children's future economic outcomes is relatively weak in countries like Finland, Norway, and Denmark, where a son is likely to inherit less than a fifth of his father's economic benefits or setbacks. On the other hand, in Italy, the United Kingdom, and the United States, the next generation stands to inherit approximately half of their parents' economic gains or losses. For instance, in Denmark, a father earning twice the average wage would predict his son to earn only about 15% more than the average, while in the U.S., the expected increment would be nearly 50%. (Corak, 2013b)

In other words, an increased transference of economic status across generations is associated with heightened inequality within a particular timeframe. In societies characterized by high levels of inequality, the affluent are more likely to see their offspring maintain high economic standing, while the underprivileged are more prone to witness their children perpetuating the cycle of poverty.

The relationship between income inequality and mobility is examined (Corak, 2013b). The 'Great Gatsby curve' is how Alan Krueger refers to this relationship. The Gini coefficient, which is evaluated on the horizontal axis, captures income inequality. The intergenerational income elasticity metrics, which are shown on the vertical axis, capture income mobility. The range of a Gini coefficient is 0 to 100, with zero denoting complete income equality and 100 denoting total income inequality. The endurance of income across generations is quantified by the intergenerational income elasticity, a measure of income persistence, or. That is, the income distribution, assesses the likelihood of a person following in the footsteps of their parents. A lower value denotes lesser earnings permanence and larger income mobility, respectively. The upward trend of the Great Gatsby curve demonstrates the inverse relationship between income

inequality and income mobility; countries exhibiting higher income inequality tend to have greater continuity of earnings across generations and reduced income mobility.

The GGC has led to a lot of research. In terms of theory, the pursuit of underlying mechanisms to elucidate the curve has centered on determining what kind of socioeconomic conditions could yield a GGC over time within a specific country. The persistence of socioeconomic status has commonly been perceived in theoretical models as connected to the extent of inequality in a given society. It's reasonable to contend that numerous hypotheses proposed to clarify the GGC often rely on previous models of intergenerational mobility where such a relationship was apparent but not explicitly acknowledged. However, the empirical aspect of the research has lacked concentration. While some studies have aimed to gather evidence supporting the mechanisms proposed by various hypotheses, others have endeavored to pinpoint GGC-like trends across diverse spatial and temporal contexts.(Steven N. Durlauf et al., 2022)

Moreover, it is crucial to consider The Great Gatsby curve makes several suggestions for public policy. It is advised to implement policies for more equal societies alongside those for higher social mobility if the relationship between inequality and mobility is such that the larger the disparity in a nation, the lower the mobility. A policy suggestion (OECD, 2010), indicates that social transfer programs and progressive tax systems should increase social equality as well as people's possibilities for social and economic success. Alternative explanations for reductions in income mobility include economic restrictions and ineffectual government. (BOUDREAUX, 2014a)

1.5 Education

According to The European Commission (2014), Training people for life and instilling in them a feeling of democratic citizenship are the goals of education. Regardless of a learner's socioeconomic status or culture, this should be done. A productive and creative workforce is produced as a result of producing great education, and this produces sustainable growth patterns. One of the eight essential aspects of well-being is education. In reality, according to economic studies, one of the factors influencing

economic output and living quality is the population's level of ability. (J. E. Stiglitz, 2009)

Additionally, both economic development and income distribution are impacted by the distribution of education. In reality, if coupled with bad redistributive policies, restricted chances to invest in education, gaps in school quality, or differences in educational attainment, may result in growing wealth inequality. (Almas Heshmati, 2014)

However, it is essential to point out that, Education is one of the primary pathways to upward social mobility, unequal access to and quality of education may inhibit such mobility by ensuring that the wealthy remain wealthy and the poor remain poor. According to research by (Jerrim & Macmillan, 2015). Nations with high levels of inequality make more private investments in education and make fewer public ones. Therefore, having more money contributes more to the transfer of advantage and consequently wealth to subsequent generations in regions where inequality is higher.

Additional research has demonstrated a connection between schooling and The Great Gatsby Curve. Sweden, (Brandén, 2019) investigated a few potential causes of The Great Gatsby Curve. In Sweden, he discovered that educational attainment and cognitive and non-cognitive skills are the main determinants of inequality and mobility. He also discovered that an individual's educational attainment significantly influences their level of mobility or immobility. Moreover, Government spending has been found to increase mobility because it increases the likelihood that less fortunate kids will receive more investments in their education and overall social welfare or human capital. Education is a driving force behind the Great Gatsby Curve. (Mayer & Lopoo, 2008)

There are several theories explaining the process generating this, even if the curve itself does not indicate a causal connection. The idea that education is a powerful causal mechanism is one of the most prevalent and pertinent theories to this inquiry. Higher levels of income disparity are likely to result in people at the top of the income distribution receiving better educations or at least devoting more time to their education than those at the bottom of the income distribution. (Jerrim & Macmillan, 2015). Also

(Sakamoto et al., 2014) elaborate on this concept, "Their results imply that the stress generated by poverty diminishes the chances for low-income adolescents to be competitive in school attainment hence increasing their chances of inheriting their low-income status.

While the connection within the Great Gatsby Curve is generally thought to be influenced by education, prior investigations into public education funding have shown conflicting outcomes. In his study on the effects of institutional measures on mobility while adjusting for inequality, (BOUDREAUX, 2014b) concluded that government spending on education was not statistically significant.

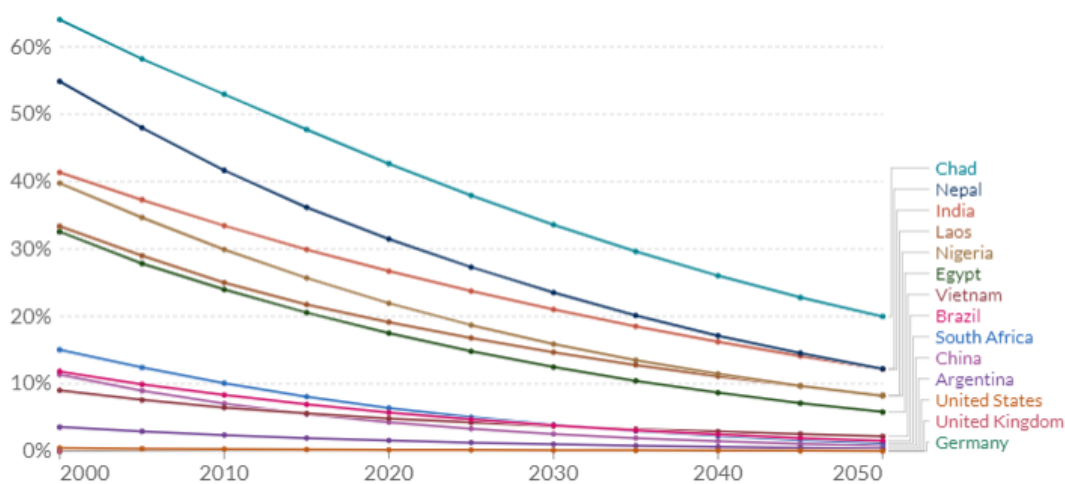


Figure 1.6 Share of the population with no formal education, (IIASA, n.d.)

The given image highlights persistent problems in several developing nations, even in the face of unprecedented literacy rates. Nonetheless, when scrutinizing literacy data based on age groups, substantial generational discrepancies become evident in most countries, and almost universally so in emerging nations. Younger cohorts progressively outpace older ones in terms of education. This trend points towards a continuous upsurge in the average literacy rate across these countries' populations. The visual representation presents estimates and forecasts related to the global proportion of individuals lacking formal education.

The visualization displays the estimations and projections of the proportion of people worldwide who lack formal education. According to data from The International Institute for Applied Systems Analysis (IIASA), rates of education should rise as the world develops. By 2050, only five countries—Burkina Faso, Ethiopia, Guinea, Mali, and Niger—are likely to have rates of no education above 20%.

Despite numerous assumptions inherent in these predictions, it seems plausible that by 2050, most literacy discrepancies across various countries might be largely addressed. This discussion delves into the variances across the global spread of educational years in finer detail. The chart from Lee and Lee (2016) illustrates the distribution of total years of schooling amongst the adult population for selected years.

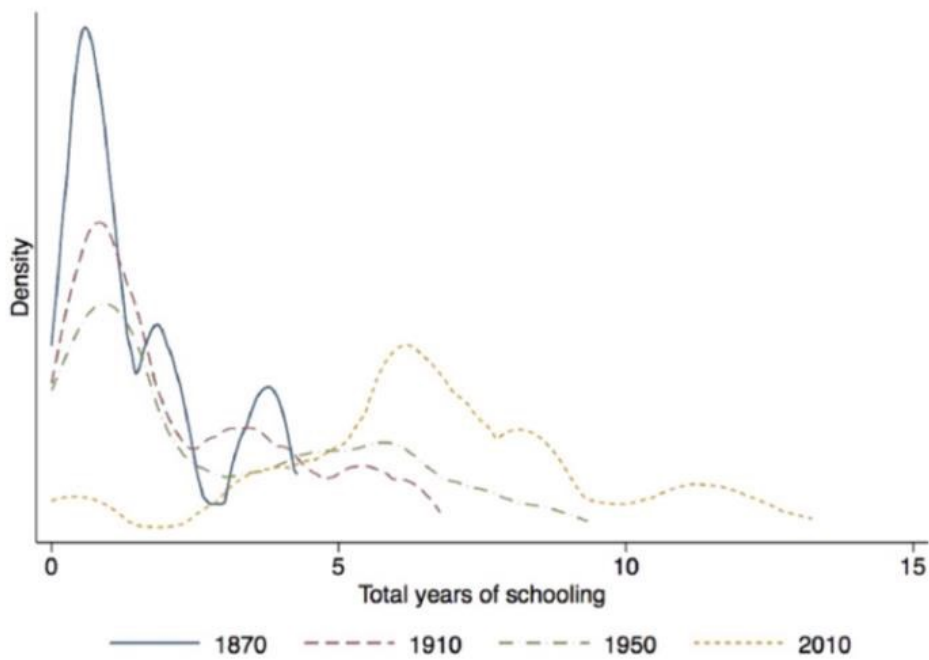


Figure 1.7 World distribution of years of schooling for selected years (Lee & Lee, 2016)

This chart can be interpreted as a "smooth histogram," serving as an approximation of the proportion of the world's population that has reached a certain educational level. The horizontal axis represents various durations of education, and each individual's years of education are taken into account.

The chart indicates that in 1870, a significant portion of the populace had between 0 and 3 years of formal education, with the distribution leaning heavily towards the left. By 2010, the distribution had notably shifted towards the right. This consistent rightward shift over time suggests a steady increase in education levels as the percentage of the population without a high school diploma has declined, thereby reducing the concentration of those at lower education levels. This change indicates a steady worldwide increase in the average number of years spent in school.

The extended tails of the distributions can be linked to differing paces of educational expansion among countries. Over an extended period, the dispersion of years of schooling has widened significantly, largely due to international discrepancies as some nations embarked on extensive education much later than others, and some are still trailing behind. Interestingly, although educational inequality increased from 1870 to 1950, it started to gradually diminish thereafter, as illustrated by the denser middle portion of the 2010 distribution compared to that of 1950. More specific instances of the decline in educational inequality since 1950 are provided later on.

The narrative takes a different turn when examining the last two decades' educational inequalities. The graphical representation showcases the fluctuations in the Gini coefficient of the distribution of years of schooling across several world regions, highlighting recent evolutions in disparities in educational attainment.

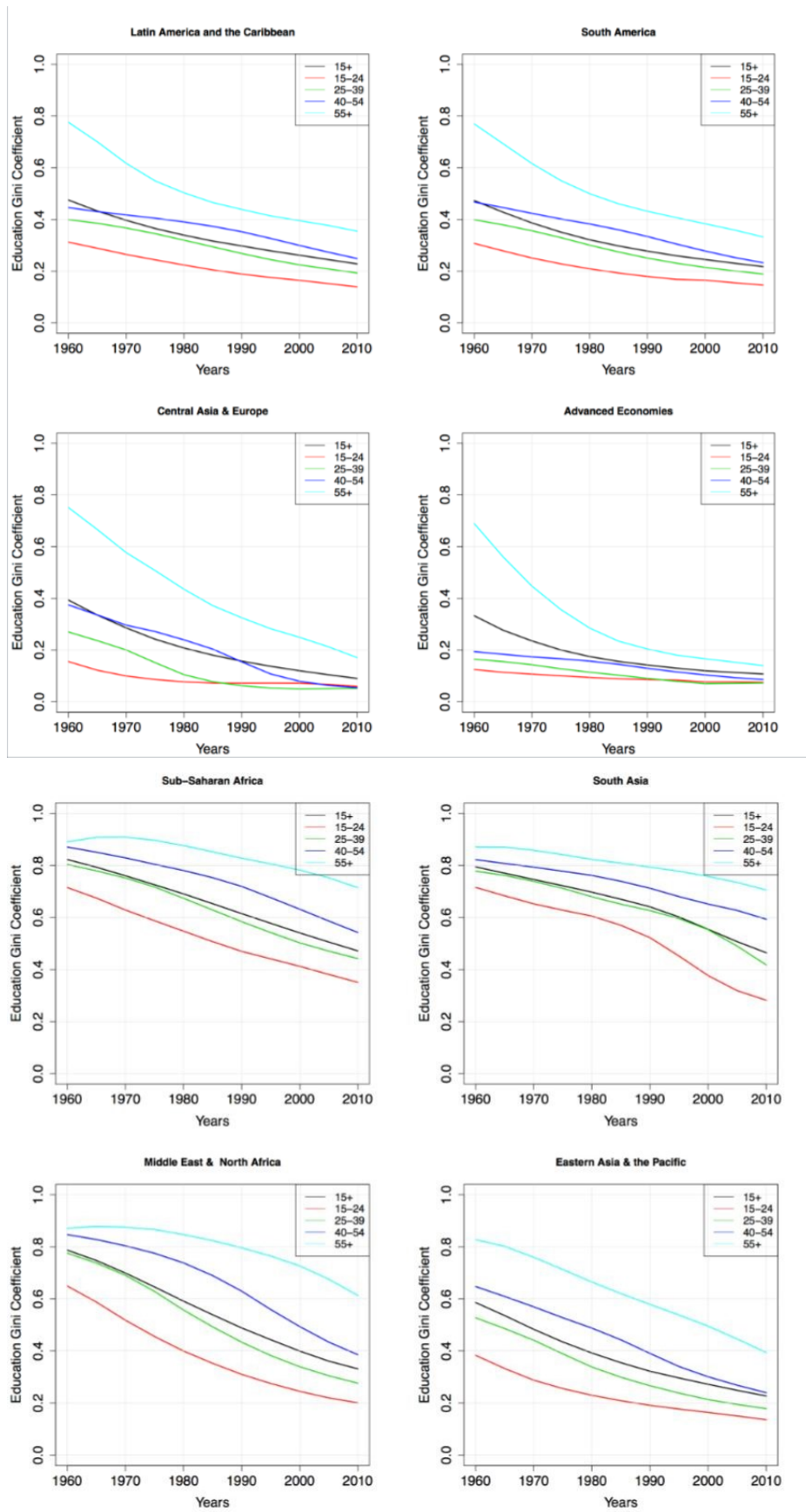


Figure 1.8

Education Gini coefficients by world region for selected age groups, 1960- 2010 (Cuaresma C, 2013)

Greater values of the Gini coefficient, a measure of inequality, signify higher levels of inequality. For a more detailed understanding of the Gini coefficient's definition and measurement, refer to our section on income inequality. The time-series graph depicts inequality across different ages. With inequality decreasing over time, it's clear that older generations faced more inequality than their younger counterparts. Furthermore, it's notable that from 1960 to 2010, educational inequality experienced a yearly decrease across all age groups and geographical locations.

The age-based analysis offers a peek into the future. Considering that inequality is lesser among today's younger generations, we can expect a continuing decrease in the forthcoming years. Therefore, we can still anticipate further reductions in educational disparity within developing nations. If global education continues to progress, we can expedite this vital process of global convergence

Chapter 2

2.1 Theoretical literature

As the United States grapples with increasing levels of inequality, the higher education sector faces a critical decision – whether to perpetuate this widening wealth gap or actively combat it. In this research, conduct an in-depth exploration of how educational institutions influence intergenerational mobility. These findings highlight a clear connection between the pursuit of institutional prestige and associated behaviors, and a decrease in mobility and socioeconomic stability, both at the institutional and individual levels. Should leaders of educational institutions and policymakers aspire to address the mounting inequality crisis through higher education, they have a unique opportunity to reconcile the paradox of promoting college as a pathway to mobility while simultaneously reinforcing socioeconomic disparities and inequality. (Simpfenderfer Amanda Davis, 2021)

Moreover, (Coady & Dizioli, 2017) presented that Over the past fifteen years, the overall outcome of expanding education has been a reduction in income inequality, particularly in emerging and developing economies. While the extent of this impact on income inequality varies among these economies, it consistently leans towards reducing inequality. This decrease primarily results from a decline in educational disparities, although it is partially counterbalanced by the inequality-inducing consequences of higher education levels. In advanced economies, the expansion of education is linked to a net increase in income inequality. This is due to the relatively minor reduction in educational disparities, especially at the lower end of the education spectrum in advanced economies, which is outweighed by the income-inequality raising effect of higher education levels. This pattern aligns with the idea of constant or increasing returns associated with additional years of education.

The significant shift occurring in the worldwide labor market, marked by the increasing proportion of educated workers in Emerging Market and Developing Economies (EMDEs), is poised to elevate global potential economic growth. This transformation is expected to coincide with a further reduction in global income inequality. This decline will primarily stem from a decrease in inequality among nations, driven largely by EMDEs narrowing the per capita income gap with advanced economies as productivity disparities diminish. On a global scale, the significance of inequality within individual countries would progressively rise. Nevertheless, in most cases, this educational wave would decrease inequality specific to each country. The population-weighted average of the Gini difference between scenarios with and without the educational wave would decrease across all regions among EMDEs, but not for Advanced Economies (AEs) as a collective entity. However, it's important to consider some caveats. Factors such as biased technological advancements, the global spread of new technologies, and shifts in the substitutability between factors of production could potentially alter these outcomes. (Bank & Prospects Group, 2018)

However, the challenge of enhancing educational mobility in Denmark, despite the availability of extensive social services, is likely rooted in the country's welfare state. The findings suggest that factors such as wage compression and the presence of more generous welfare benefits may unintentionally dampen the motivation for individuals to pursue higher education. The relatively limited economic returns on education in Denmark shed light on the discrepancy between the nation's egalitarian childhood policies and the relatively similar levels of educational mobility observed in Denmark and the United States. Furthermore, the clustering of families into neighborhoods and schools based on parental advantages is a probable contributor to this issue. While the Danish welfare system does contribute to alleviating some childhood inequalities, it falls short in addressing significant disparities in skill attainment. (Landersø & James J. Heckman, 2017)

Moving forward, Krogh adds that Education stands as a fundamental means through which wealth is passed down from one generation to the next. Therefore, in principle, increased public investment in education should enhance educational access and quality

for all, not just those hailing from affluent backgrounds. While this research couldn't establish a direct cause-and-effect relationship, it did reveal a significant correlation between higher public spending on education and increased social mobility, even when accounting for income inequality. Specifically, greater expenditures on primary and secondary education were notably linked to heightened mobility, both at the school district and commuting zone levels. In contrast, public spending on higher education and financial aid for higher education did not exhibit a similar significant correlation with enhanced mobility, as observed with public primary and secondary education spending. (Krogh, 2022)

Furthermore, Christopher Rauh fine-tunes a model that displays a dynamic complementarity between primary and higher education about the American economy. Within this model, households have a say in determining the level and distribution of spending on education at the non-tertiary and tertiary levels, as well as on public pension and wealth redistribution. The model effectively replicates various aspects of the US economy, such as income inequality, intergenerational mobility, the proportion of GDP allocated to early education, and the rate at which the public pension is replaced. (Rauh, 2017)

Examination of the evolution of educational disparities among recent generations of young individuals and discusses the potential implications for future intergenerational mobility. Notably, there have been significant advancements in educational attainment, reducing disparities tied to family backgrounds, coinciding with increased public educational investments and a focus on standards and performance metrics since the mid-1990s. While this progress is promising for improving children's life prospects and mobility, it has not notably reduced inequality at the highest levels of education. This suggests that a standards-driven approach alone may not suffice to promote mobility, particularly if the most lucrative labor market opportunities are tied to the highest qualifications. The paper suggests that more ambitious targets and consistent guidance in schools, along with potentially radical solutions like expanding the Pupil Premium, may be necessary to address persistent educational inequalities and enhance social mobility, especially for disadvantaged students. (Blanden & Macmillan, 2014)

Moreover, disparities in educational opportunities and outcomes significantly contribute to income inequality across generations, reinforcing the notion presented by the 'Great Gatsby Curve.' The study underscores that educational policies aimed at providing equal access to quality education, particularly for disadvantaged individuals, are essential for breaking the cycle of intergenerational income inequality. By shedding light on the pivotal role of education, the paper serves as a crucial resource for policymakers and stakeholders in addressing this critical issue and fostering greater economic equity.

Based on the latest research findings, it appears that education may not serve as a remedy for social inequality. It seems that the education system has exacerbated the problem of social inequality. Educational inequality stems from factors like family background and the varying levels of educational attainment and institutions. Furthermore, research findings revealed a general alignment between public perception and the actual state of educational inequality and social mobility. (Wing Tung SZETO, 2017)

The education system's design, coupled with insufficient public assistance for disadvantaged families, hindered the development of early childhood skills in children and lacked inclusivity in producing graduates. This contrasted with the situation in other countries, where this issue didn't manifest to the same extent. Additionally, these factors likely played a role in altering family dynamics. On one hand, this led to increased stress and difficulties for some families, while, conversely, it bolstered the income potential of two-parent households where both partners possessed relatively high levels of education. (Corak M, 2012)

James Heckman and Rasmus Landersø, illuminate the pivotal role of education in addressing inequality and fostering social mobility. The paper underscores that Denmark's successful model of reduced income inequality and enhanced social mobility is intrinsically tied to its robust investment in early childhood education and comprehensive, high-quality education systems. The study demonstrates that

educational interventions, particularly in the early years, can break the cycle of disadvantage and provide individuals with opportunities to overcome socioeconomic barriers. Furthermore, it underscores the importance of equitable access to education as a means to bridge income gaps and enhance upward mobility, offering valuable insights for American policymakers seeking to reduce inequality and promote social mobility.(Heckman & Landersø, 2022)

Moving forward, disparities in educational opportunities and outcomes significantly contribute to income inequality across generations, reinforcing the notion presented by the 'Great Gatsby Curve.' The study underscores that educational policies aimed at providing equal access to quality education, particularly for disadvantaged individuals, are essential for breaking the cycle of intergenerational income inequality. By shedding light on the pivotal role of education, the paper serves as a crucial resource for policymakers and stakeholders in addressing this critical issue and fostering greater economic equity.(Blanden et al., 2022)

Understanding the inverse link between mobility and educational disparities poses challenges due to the limited availability of causative evidence. There is no causal link present. Therefore, we are unable to It can be argued that the presence of academic inequalities has a detrimental effect on social well-being. The topic of discussion pertains to the concept of mobility within educational institutions. What can be inferred is School systems are characterized by low educational inequity Quality is frequently characterized by a higher degree of The topic of discussion pertains to the concept of social mobility inside educational institutions.(Gaudin & Hindriks, 2018)

Table 2.1: Synthesis of theoretical literature

<i>Authors</i>	<i>Topics</i>	<i>Conclusions</i>
Amanda Davis Simpfenderfer (2021)	The Role Of Higher Education In Intergenerational Mobility	Both the institutional level and individual level create lower levels of mobility and socioeconomic security.
David Coady and Allan Dizioli (2017)	Income Inequality and Education Revisited	Expanding education in the past fifteen years has served to diminish income inequality.
Bank W, Prospects Group D (2018)	Education Demographics and Global Inequality	The educational wave would decrease inequality.
Pin Rasmus Landersø, James J. Heckman (2017)	The Scandinavian Fantasy	The research shows that Denmark's welfare system, along with wage compression, may hinder educational mobility.
Isabel Krogh (2022)	From American Dr om American Dream to American Reality	Boosting public funding for primary and secondary education is linked to greater social mobility.
Christopher Rauh (2017)	Voting, education, and the Great Gatsby Curve(2017)	Good performance on inequality and intergenerational mobility.
Jo Blanden, Lindsey Macmillan (2014)	Education and Intergenerational Mobility: Help or Hindrance?	standards-driven approach alone may not suffice to promote mobility.
Wing Tung (2017)	Is education a solution to inequality?	It appears that the education system has worsened the issue of social inequality.
Corak M (2012)	How to Slide Down the ‘Great Gatsby Curve	It seems higher education has a positive effect on social mobility.

Heckman and Landersø (2022)	Lessons for Americans from Denmark about inequality and social mobility	that educational interventions, particularly in the early years, can break the cycle of disadvantage.
Blanden J, Doepke M, Stuhler J (2022)	Educational Inequality	The government can have a positive on education equality which addresses social mobility.
Gaudin M, Hindriks J (2018)	An international comparison of school systems based on social mobility.	Low education inequality is characterized by greater social mobility.

2.2 Empirical literature

The expansion of higher education in Britain has had a significant impact on intergenerational mobility. (J. Blanden & A. Goodman, 2002) Discover that the growth of higher education has disproportionately favored individuals from affluent backgrounds over those from less privileged families, leading to a reinforcement of the connection between an individual's income and that of their parents. The research also presents findings indicating that variations in educational achievements contribute to the transformation in the relationship between parental income and their children's earnings. In summary, the study underscores the vital role of education in intergenerational mobility and suggests that policies aimed at enhancing educational access for marginalized groups could be instrumental in mitigating disparities in opportunities within the UK.

Recent years have witnessed a surge in research examining the relationship between parents and children's economic and social statuses. This growth is largely attributed to the availability of robust longitudinal data. However, most of these studies have not thoroughly explored changes in intergenerational mobility. Typically, these studies use a common approach, which involves estimating log-linear regressions to investigate how a child's economic status relates to that of their parents. This is represented as:

$$\ln Y_i^{\text{CHILD}} = \alpha + \beta Y_i^{\text{PARENTS}} + \varepsilon_i$$

In this equation, "Y" represents economic status (often measured as labor market earnings), and "e" is the error term. The coefficient "b" is a key measure that indicates the strength of the relationship between a child's status and their parents' economic situation. A "b" value of zero suggests complete intergenerational mobility, meaning that a child's economic status is independent of their parents, while a "b" value of one suggests complete immobility, indicating that a child's economic status is entirely determined by their parents. The primary focus of this research is to estimate the "b" value while addressing the challenges related to measuring economic status (Y) and various statistical complexities.

Politics affects income inequality through market dynamics in addition to state-driven redistribution. According to (Morgan & Kelly, 2013), governments can influence income inequality by enacting redistributive tax and transfer laws as well as "market conditioning," a theory in which the government influences people's behavior. This mechanism becomes more important, particularly in developing countries. The authors' model looks at how governments use policies to shape markets and, as a result, have an impact on income inequality. They examine information from 19 LAC (Latin American and Caribbean) nations that was collected between 1980 and 2000. Ordinary least squares (OLS) and robust-cluster standard errors, as proposed by Rogers (1994), are used in the model's estimation. The results suggest that investments in human capital have an equalizing effect and that political power has a more significant impact on market inequality than redistribution. Therefore, social spending should be a top priority for nations trying to combat inequality.

However, (Reardon, 2011) presents evidence indicating a shift in the influence of education on intergenerational mobility over time. While parental education used to be a significant factor in explaining income disparities in earlier generations, its importance has diminished in more recent ones. This suggests that factors like family income may now have a more substantial impact on children's academic success and future economic prospects. However, the interplay between family income, educational achievements, and cognitive abilities has created a feedback loop that could potentially reduce intergenerational mobility, resulting in a more unequal and economically divided society. Therefore, further research is needed to comprehend the reasons behind these trends and their consequences, as well as to devise effective interventions to address this issue.

Intergenerational mobility in the United States reveals that the role of education in shaping mobility prospects is intricately linked to geographic location. (Chetty, Hendren, Kline, & Saez, 2014) Highlighted significant regional disparities in opportunities for upward mobility and underscored the critical influence of education on these disparities. While education remains a key factor, its impact varies across regions, with access to quality education playing a pivotal role in determining the extent to which children can

overcome their parents' economic circumstances. They emphasize the need for a nuanced policy approach that addresses these regional differences in educational access and mobility to reduce disparities in intergenerational mobility throughout the country.

Moreover, (Haveman & Smeeding, 2006) underscores the significance of advanced education in fostering upward social mobility and diminishing disparities in achievement linked to income. The argument put forth emphasizes the necessity of implementing policies that guarantee equitable access to higher education for all students, thus enabling it to catalyze enhancing social mobility and improving the prospects of underprivileged youth. This approach can ensure that American higher education institutions fulfill their role in advancing social mobility and extending opportunities to all.

Moving forward, During the nineteenth and early twentieth centuries, intergenerational mobility in the United States exceeded that in Britain. However, in more recent decades, it has become relatively similar between the two countries. Certain groups, notably African Americans in the U.S. South, faced exclusion for a significant period. Nevertheless, they gained access to improved education in the mid-twentieth century and transitioned into higher-paying occupations during the 1960s. Hence, education has played a role in advancing intergenerational mobility, yet other factors such as race and regional disparities in educational resources and economic outcomes also influence this mobility.(Goldin C & F. Katz, 2009)

The return on educational investment is more significant for kids from wealthier families than for those from less affluent backgrounds. This discrepancy arises because educational achievement tends to persist within families, granting a dual advantage to children of well-educated parents, ultimately leading to higher educational attainment and increased earnings in adulthood. In comparison to other prosperous democratic nations, the United States experiences the lowest levels of economic mobility and the highest levels of inequality. Additionally, countries where education yields substantial returns tend to exhibit lower levels of economic mobility. While education can be a

potent force for leveling the playing field, the increasing income inequality might undermine opportunities for upward mobility. (Autor, 2014)

Lastly, Leone's study presents empirical findings derived from the Global Database on Intergenerational Mobility (GDIM) and explores the global disparities in intergenerational mobility within the realm of education. The primary discovery is that high-income countries typically exhibit significantly greater intergenerational mobility compared to their developing counterparts. Moreover, this disparity between these two groups of countries has been steadily widening over the past four decades. Developing nations have struggled to enhance opportunities for upward mobility in education for their populations. The likelihood of attaining intergenerational (upward) mobility in education varies greatly across the globe, with percentages ranging from 11 percent in South Sudan to 92 percent in Taiwan for individuals born in the 1980s. Leone also highlights a positive correlation between mobility and income levels, indicating that the chances of advancing on the educational ladder are, on average, twice as high in high- and upper-middle-income countries as opposed to low-income nations. (Leone, 2019)

Table 2.2: *Synthesis of the empirical literature*

Authors	Topics	Data	Estimation	Conclusions
J. Blanden and A. Goodman (2002)	Changes in Intergenerational Mobility in Britain	UK	OLS	Enhancing educational accessibility for underprivileged populations has the potential to diminish disparities in opportunities.
Morgan J and Kelly N (2013)	Market Inequality and Redistribution in Latin America and the Caribbean	LAC countries	OLS	Political influence has a greater impact on economic inequality within markets compared to redistribution efforts, while investments in human capital serve to diminish inequality.
Reardon S (2011)	The Widening Academic Achievement Gap Between the Rich and the Poor:	USA	OLS	Family income could now exert a more significant influence on the academic achievements of children and their future economic opportunities.
Chetty R, Hendren N (2014)	Where is the land of opportunity?	USA	OLS	Education in different geographic locations in America has a different outcome.
Haveman R, Smeeding T (2006)	The Role of Higher Education in Social Mobility	USA	Descriptive statistics	policies should be implemented to ensure equal opportunities for all students in higher education to enhance social mobility
Goldin C and F. Katz (2009)	The Race between Education and Technology	USA	OLS	Getting higher-paying occupations by improving Education.

Autor D (2014)	Skills, education, and the rise of earnings inequality among the “other 99 percent”	Europe, USA	OLS	Nations where education offers significant advantages typically have reduced levels of economic mobility.
Leone T (2019)	Intergenerational Mobility in Education: Estimates of the Worldwide	Worldwide	OLS	expanding access to education and improving the quality of education, particularly for disadvantaged groups, as a means of promoting intergenerational mobility and reducing inequality.

Chapter 3

3.1 The Global Database on Intergenerational Mobility:

The Global Database on Intergenerational Mobility (GDIM) contains estimates of intergenerational mobility (IGM) in education by 10-year cohorts, covering people born from 1940 to 1989, intergenerational mobility (IGM) refers to the degree to which a generation's economic well-being surpasses that of their parents or how an individual's socioeconomic status is unrelated to that of their parents.

The Global Database on Intergenerational Mobility (GDIM) includes assessments of intergenerational mobility in the realm of education. This emphasis on education can be attributed to several factors. To start with, human capital holds a central position in determining one's economic well-being. Additionally, data regarding intergenerational educational outcomes are more readily accessible compared to income-related data. Moreover, estimating educational mobility poses fewer methodological complexities. Unlike income, an individual's level of education, once attained, remains constant throughout their life. Furthermore, individuals can provide highly accurate information about their parent's educational background, which is not the case for income, allowing for the examination of educational mobility even without panel data.

3.2 Global Coverage

In total, the GDIM provides assessments of both absolute and relative intergenerational mobility for 153 countries, which represent approximately 97% of the global population born in the 1980s (as indicated in Table 2). For 114 countries, covering around 87% of the world's population, these mobility estimates extend across four decades, spanning from individuals born in the 1950s to those born in the 1980s. Except for the Middle East and North Africa, where the coverage is 83%, all other regions exhibit a population coverage exceeding 90%.

Table 3.1: Coverage of the Global Database on Intergenerational Mobility (GDIM)

Income group/region	Number of countries covered		Number of population covered	
	With retrospective data	Total	With retrospective data	Total
High-income countries	38	38	93%	93%
Developing countries	76	115	86%	98%
East Asia and the Pacific	8	18	92%	99%
Europe and Central Asia	20	20	99%	99%
Latin America and the Caribbean	15	16	95%	97%
Middle East and North Africa	6	10	51%	83%
South Asia	5	8	89%	100%
Sub-Saharan Africa	22	43	72%	97%
world	114	153	87%	97%

Note: The table displays the count of nations covered in our database and the proportion of the global population that these countries represent.

3.3 Characteristics featured in the GDIM dataset:

The existing body of literature presents various approaches to measuring intergenerational mobility (IGM). These mobility metrics can be categorized into two main groups based on how they handle the outcome variable, which can be treated as either a continuous or categorical parameter. Additionally, mobility measures are often derived by organizing individuals into quantiles based on the outcome variable. The resultant transition probabilities, such as the likelihood of an individual with parents in a lower educational quintile or quartile achieving a higher educational quintile or quartile compared to their peers in the same generation, serve as inherent indicators of mobility.

The existing body of literature presents various approaches to measuring intergenerational mobility (IGM). These mobility metrics can be categorized into two main groups based on how they handle the outcome variable, which can be treated as either a continuous or categorical parameter. Additionally, mobility measures are often derived by organizing individuals into quantiles based on the outcome variable. The resultant transition probabilities, such as the likelihood of an individual with parents in a lower educational quintile or quartile achieving a higher educational quintile or quartile compared to their peers in the same generation, serve as inherent indicators of mobility.

Table 3.2 presents the elements incorporated in the GDIM dataset. The initial 11 variables within GDIM serve as metadata, offering descriptions of countries and surveys. Variables 9 to 11 are designed to establish distinct rows for each country, ensuring that each row features a unique combination of code, cohort, parent, and child. Finally, variables 12 to 23 furnish descriptive statistics about the education variables.

Variables 24-32 encompass a range of metrics for assessing intergenerational mobility, all of which are anchored in either year of schooling or educational categories. When considering educational categories, individuals and their parents are categorized based on their highest educational attainment, grouped into five categories as outlined in Section 4: (i) less than primary, (ii) primary, (iii) lower-secondary, (iv) upper-secondary, or (v) tertiary.

Variables 24-32 contain various iterations of the probability of children surpassing their parents' educational achievements. These metrics differ in their utilization of either year of schooling or educational categories and in how they handle parents with tertiary education.

Variable 32 represents (one minus) the correlation coefficient obtained from regressing the years of education of children on their parents' education levels, commonly referred to as COR. A higher value of the correlation coefficient signifies greater intergenerational persistence and, consequently, reduced mobility.

Table 3.2: Variables in the GDIM

NO.	Variables Name	Definitions
<i>Metadata</i>		
1	country	Name of country
3	region	Region (with high-income as a separate category)
4	region_noHICgroup	Region (with high-income economies among the regions)
5	incgroup2	Income groups (2 categories) as of July 1, 2020
6	incgroup3	Income groups (3 categories) as of July 1, 2020
7	incgroup4	Income groups (4 categories) as of July 1, 2020
8	status	Retrospective / Co-residents / Mix
9	cohort	Cohort (which decade individuals are born in)
10	parent	Mothers/Fathers/Max/Average
11	child	Sons/Daughters/Al
<i>Descriptive statistics</i>		
12	P1	Share of parents with ISCED0 (less than primary)
13	P2	Share of parents with ISCED1 (primary)
14	P3	Share of parents with ISCED2 (lower secondary)
15	P4	Share of parents with ISCED3-4 (upper secondary)
16	P5	Share of parents with ISCED5-8 (tertiary)
17	C1	Share of children with ISCED0 (less than primary)
18	C2	Share of children with ISCED1 (primary)
19	C3	Share of children with ISCED2 (lower secondary)
20	C4	Share of children with ISCED3-4 (upper secondary)
21	C5	Share of children with ISCED5-8 (tertiary)

22	MEAN _p	Mean of parents' years of schooling
23	MEAN _c	Mean of children's years of schooling

Mobility measures based on educational categories or years of schooling

24	CAT	Pr child surpasses parent's years of school
25	DIF	Mean change in years of schooling conditional on parent not having tertiary
26	MIX	Pr child surpasses parent's educational category (counting children with tertiary as mobile)
27	CAT_ISCED0	Pr child surpasses parent's educational category when parents have ISCED0
28	CAT_ISCED1	Pr child surpasses parent's educational category when parents have ISCED1
29	CAT_ISCED2	Pr child surpasses parent's educational category when parents have ISCED2
30	CAT_ISCED34	Pr child surpasses parent's educational category when parents have ISCED3-4
31	CAT_ISCED5678	Pr child surpasses parent's educational category when parents have ISCED5-8
32	COR	The correlation coefficient between children's and parents' years of schooling

3.4 Empirical approaches

As an empirical approach, we conducted a series of linear regression analysis to assess the impact of income groups (incgroup3) on parents' education levels within each ISCED category. The income groups examined were Low-income and Middle-income, with High-income as the reference group. Key parameters in our analysis included coefficients, residual standard error, multiple R-squared, and F-statistics, all of which are crucial for evaluating the relationship between income and parents' education levels.

The regression equation which predicts variable "P_i" based on the independent variable "incgroup3" can be written as follows:

$$P_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i \quad i = 1, \dots, 5$$

Certainly, the regression equation describes a model used to predict the dependent variable "P_i" based on the independent variable "incgroup3," which represents different income groups. In this multiple linear regression model, "P_i" is the outcome we seek to understand, while "β₀" serves as the intercept, representing the value of "P_i" when all income categories are zero. The coefficients "β₁," "β₂," and "β₃" quantify the impact of "Low income," "Middle income," and "High income" categories, respectively, on "P_i." The independent variables "X_{1i}," "X_{2i}," and "X_{3i}" are indicator variables corresponding to each income group for each observation, with "X_{3i}" serving as the reference category. The error term "ε_i" accounts for unexplained variability and follows a normal distribution assumption. This equation provides a structured framework for analyzing the relationships between income groups and the outcome of interest, controlling for other factors, and helping us gain insights into the effects of income disparities on "P_i."

In our analysis of parents' education levels across various ISCED categories, we found a consistent pattern regarding the influence of income groups (incgroup3). For parents with ISCED0 (less than primary)

$$P1=0.102154+0.702685 \times \text{Low income}+0.320290 \times \text{Middle income},$$

This equation indicates that for every unit increase in the "Low income" category, P1 is expected to increase by approximately 0.702685 units, while for the "Middle income" category, it's expected to increase by approximately 0.320290 units. The overall model is highly significant ($p < 0.001$) and explains 44.2% of the variance in parents' educational attainment in this category. Similarly, for parents with ISCED1 (primary), illustrates that the "Low income" category is associated with a decrease of approximately 0.146816 units in P2, while the "Middle income" category is associated with a smaller decrease of approximately 0.024571 units. The model is highly significant ($p < 0.001$) but explains a smaller portion of the variance in P2, approximately 9.1%.

This trend persisted across other ISCED categories. Parents with ISCED2 (lower secondary) in Low-income 0.157875 and Middle-income 0.072397 groups exhibited lower educational attainment compared to their High-income counterparts, with p-values below $2e-16$. The model elucidated 16.15% of the variance in parents' lower secondary education levels. For parents with ISCED3-4 (upper secondary), the "Low income" category is linked to a decrease of approximately 0.259293 units in P4, and the "Middle income" category is associated with a smaller decrease of about 0.138101 units. The model is highly significant ($p < 0.001$) and explains roughly 23.5% of the variance in P4. Lastly, parents with ISCED5-8 (lower tertiary) showed a similar pattern, the "Low income" category is linked to a decrease of approximately 0.138700 units in P5, while the "Middle income" category is associated with a smaller decrease of about 0.085222 units. The model is highly significant ($p < 0.001$) and explains approximately 19.3% of the variance in parents' tertiary education levels. These findings underscore the persistent impact of income disparities on parents' educational attainment.

In the context of children's education levels, our linear regression analyses revealed distinct patterns between income groups and children's education levels across various

ISCED categories (C1 to C5) underscoring the profound influence of income disparities on educational outcomes. For children with less than primary education (ISCED0),

$$C_1 = 0.017661 + 0.619202 * \text{Low income} + 0.228409 * \text{Middle income} + \varepsilon_1$$

Both low-income and Middle-income groups exhibit significantly lower educational levels compared to High-income income, with p-values below $2e-16$. The model explains an impressive 46.26% of the variance in early childhood education, emphasizing the substantial impact of income on this critical stage.

This trend persists in primary education (ISCED1), where Low-income and Middle-income groups show significantly higher shares of children with ISCED1 compared to High-income, although the model explains 5.41% of the variance in primary education. Lower secondary education (ISCED2) introduces nuance, with Low income significantly affecting education levels, but Middle income not differing significantly from High income. The model explains 4.57% of the variance, highlighting the complexity of this relationship. For upper secondary education (ISCED3-4), both Low-income and Middle-income groups attain significantly lower levels, with the model explaining 27.66% of the variance. In tertiary education (ISCED5-8), Low-income and Middle-income groups achieve significantly lower education levels compared to High income, with the model explaining approximately 35.42% of the variance.

Comparing parent's and children's education, the persistence of income-related disparities is evident across both generations, irrespective of ISCED categories. Lower-income groups consistently achieve lower education levels than their higher-income counterparts, highlighting the enduring influence of income on educational outcomes for parents and their children.

In our pursuit of understanding the intricate relationship between education attainment and income inequality, we turn to ANOVA, a robust statistical tool. ANOVA allows us to explore how income groups, represented by Incgroup3, impact parents' educational levels across different ISCED categories

3.3 ANOVA Analysis based on the GDIM for parents.

Educational level	Degree of freedom (Df)	Sum of Squares (Sum Sq)	Mean Square (Mean Sq)	F Value	P-Value (Pr(>F))	
P1	incgroup3	2	371.5	185.76	2663	<2e-16 ***
	Residuals	6722	468.9	0.07		
P2	incgroup3	2	16.5	8.249	336.4	<2e-16 ***
	Residuals	6722	164.8	0.025		
P3	incgroup3	2	18.78	9.392	647.3	<2e-16 ***
	Residuals	6722	97.54	0.015		
P4	incgroup3	2	53.53	26.763	1031	<2e-16 ***
	Residuals	6722	174.43	0.026		
P5	incgroup3	2	16.63	8.315	802.9	<2e-16 ***
	Residuals	6722	69.62	0.010		

Our ANOVA analysis reveals a profound and consistent influence of income groups—categorized as Low-income, Middle-income, and High-income—on educational attainment across various ISCED categories. The remarkably low p-values in each case underscore that the observed disparities in educational achievement among these income groups are not mere happenstance but statistically significant.

This relationship between income and education attainment remains robust and unwavering across all ISCED categories. It consistently demonstrates that individuals belonging to lower-income strata tend to attain lower educational levels compared to their counterparts from higher-income brackets. This observation illuminates the pivotal role of income disparities in shaping educational outcomes.

The implications are substantial: individuals hailing from less privileged backgrounds often encounter impediments to accessing high-quality education, thereby achieving lower levels of educational attainment. Conversely, those within the higher-income brackets are more likely to attain advanced levels of education.

This resounding association between income and education underscores the profound impact of socioeconomic factors on educational trajectories. It compels us to recognize the importance of addressing income disparities to ensure equitable access to quality education and, subsequently, to break the cycle of inequality in our society.

3.4 ANOVA Analysis based on the GDIM for children.

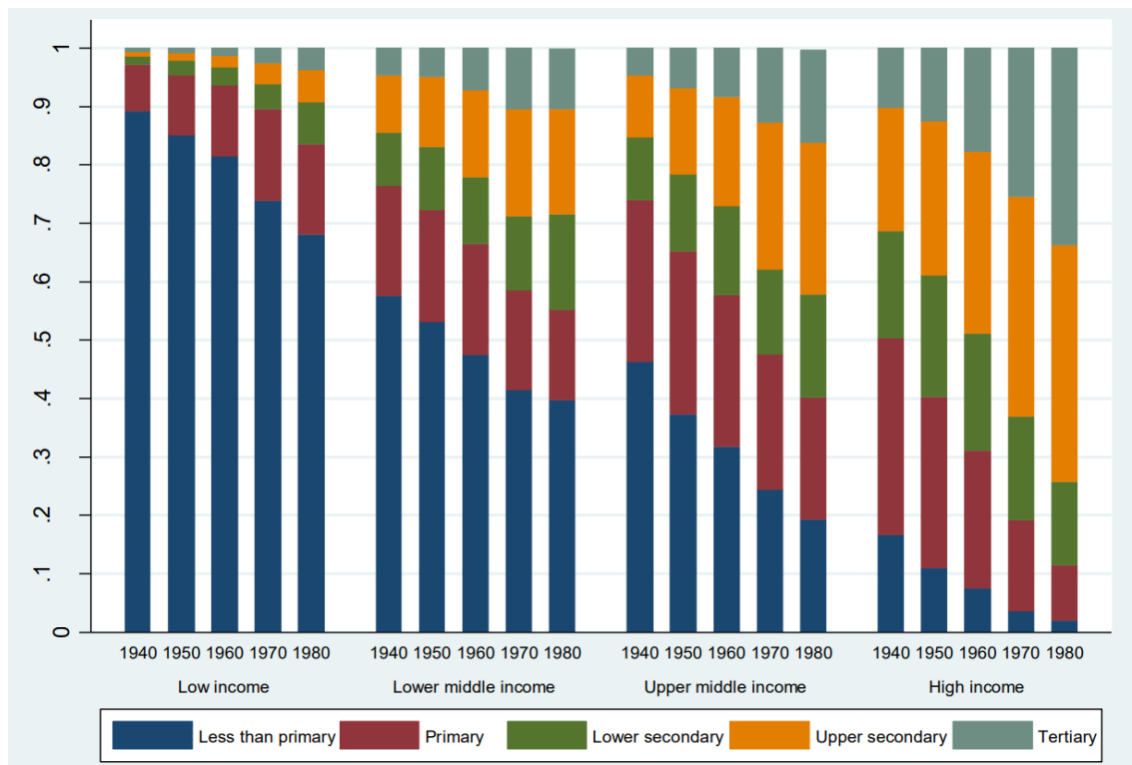
Educational level	Degree of freedom (Df)	Sum of Squares (Sum Sq)	Mean Square (Mean Sq)	F Value	P-Value (Pr(>F))
C1	incgroup3	278.7	139.35	2893	<2e-16 ***
	Residuals	6722	323.8	0.05	
C2	incgroup3	5.35	2.6760	192.3	<2e-16 ***
	Residuals	6722	93.54	0.0139	
C3	incgroup3	3.66	1.8277	161	<2e-16 ***
	Residuals	6722	76.31	0.0114	
C4	incgroup3	76.59	38.30	1285	<2e-16 ***
	Residuals	6722	200.33	0.03	
C5	incgroup3	67.43	33.71	1845	<2e-16 ***
	Residuals	6722	122.85	0.02	

Our ANOVA analysis for children's educational attainment (C1 to C5) reveals a parallel trend. Income groups exert a substantial influence on the educational levels of children, with consistently low p-values, all falling below $2e-16$. Much like their parents, children also exhibit a consistent relationship between income and education across all ISCED categories. Lower-income children are more likely to attain lower educational levels in comparison to their peers from higher-income backgrounds. This consistency in the impact of income on education attainment for both parents and their children underscores the enduring role of socioeconomic factors in shaping educational outcomes.

3.5 Empirical Outcomes

In this research, we provide summary statistics regarding educational levels, as defined by the ISCED classification outlined earlier, to offer a detailed depiction of the distribution of educational outcomes in four income categories (Incgroup4). we consider (Incgroup4) for better illustration of educational mobility.

Figure 3.1 Parents' Educational Level Based on GDIM

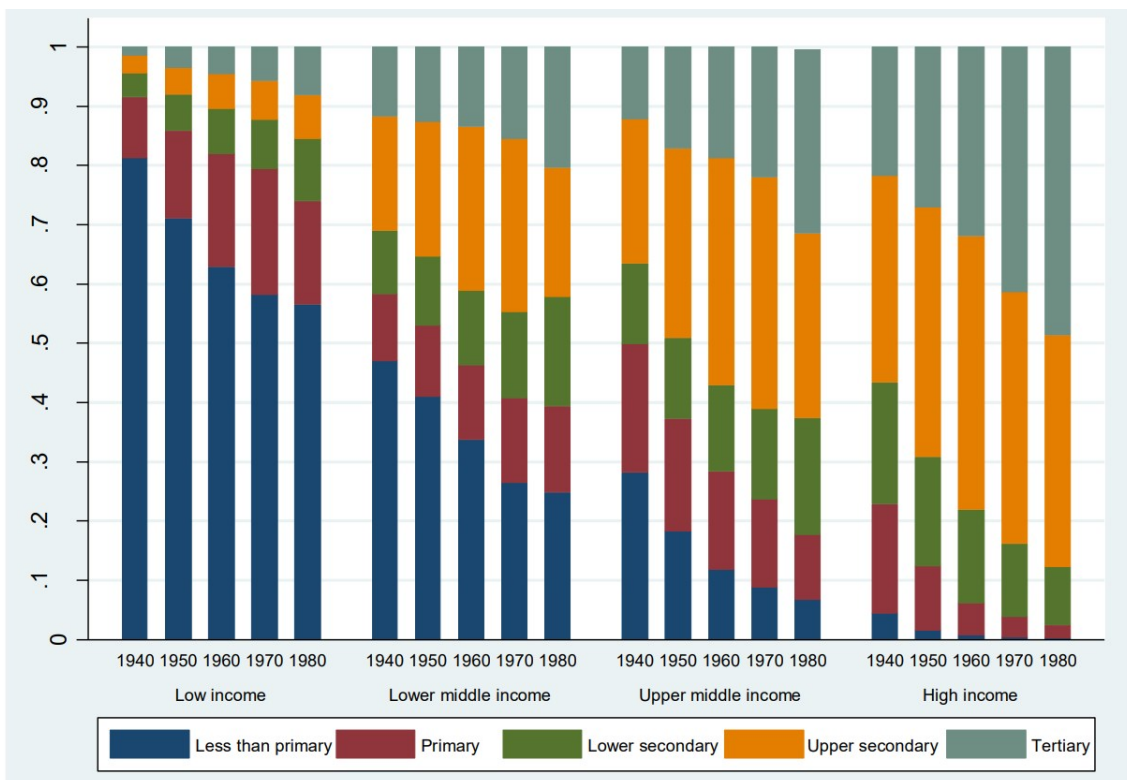


Certainly, utilizing the ISCED classification system, let's delve into the detailed landscape of educational outcomes. In a broad sense, there's a positive trend: the number of people who haven't completed full primary education is declining, while education at more advanced levels, particularly upper secondary and tertiary education, is on the rise.

Nonetheless, a significant educational divide persists between economically prosperous and disadvantaged nations. Consider this striking fact: the likelihood of a child born in a high-income country during the 1980s and 1989 achieving a tertiary education degree is approximately six times greater than their counterparts in low-income countries. This gap remains substantial when comparing high-income nations to lower middle-income countries, where the chances are approximately 2.5 times higher. Even when compared

to upper middle-income countries, the odds are around 1.5 times higher. This stark discrepancy highlights the persistent global disparities in educational opportunities. Furthermore, it's noteworthy that in high-income countries, the percentage of individuals lacking primary education falls below for those born after the 1960s. In stark contrast, this figure exceeds more than 60 percent for children hailing from low-income countries. This underlines the significant educational challenges faced by individuals from economically disadvantaged backgrounds.

Figure 3.2 Children's Educational Level Based on GDIM

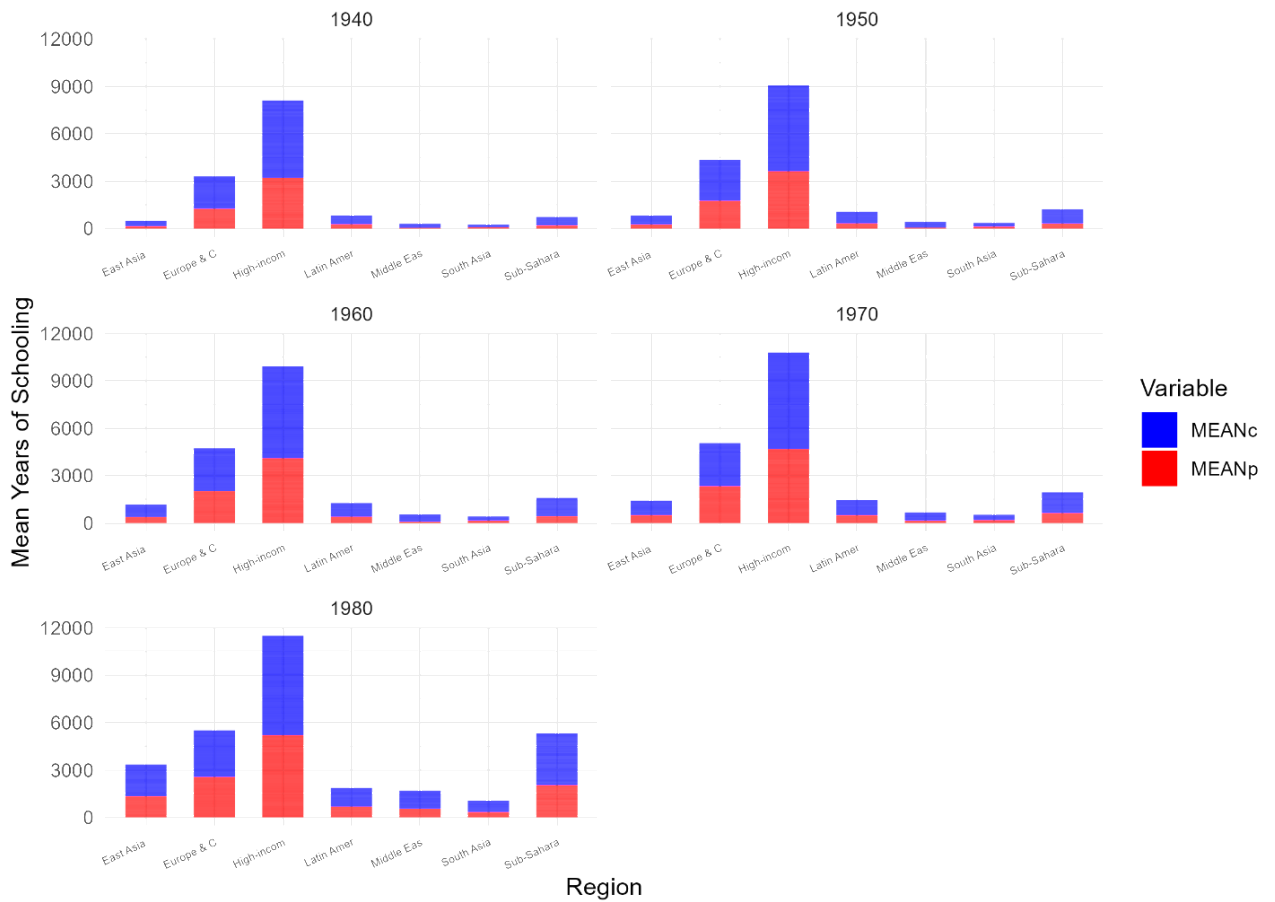


The severe inequality in educational outcomes persists even when we consider the previous generation as depicted in Figure 2. Within this generation, we observe a substantial disparity in educational attainment across the various countries we examined.

Specifically, for children born in low-income countries between 1940 and 1949, a staggering around 90 percent of their parents had not obtained a primary education diploma. In stark contrast, in high-income countries, only around 20 percent of parents in the same generation lacked a primary education diploma.

This stark contrast underscores the persistent and wide-reaching gap in educational achievements between low-income and high-income countries, not only in the current generation but also across previous generations.

Figure 3.3 Average years of schooling based on GDIM

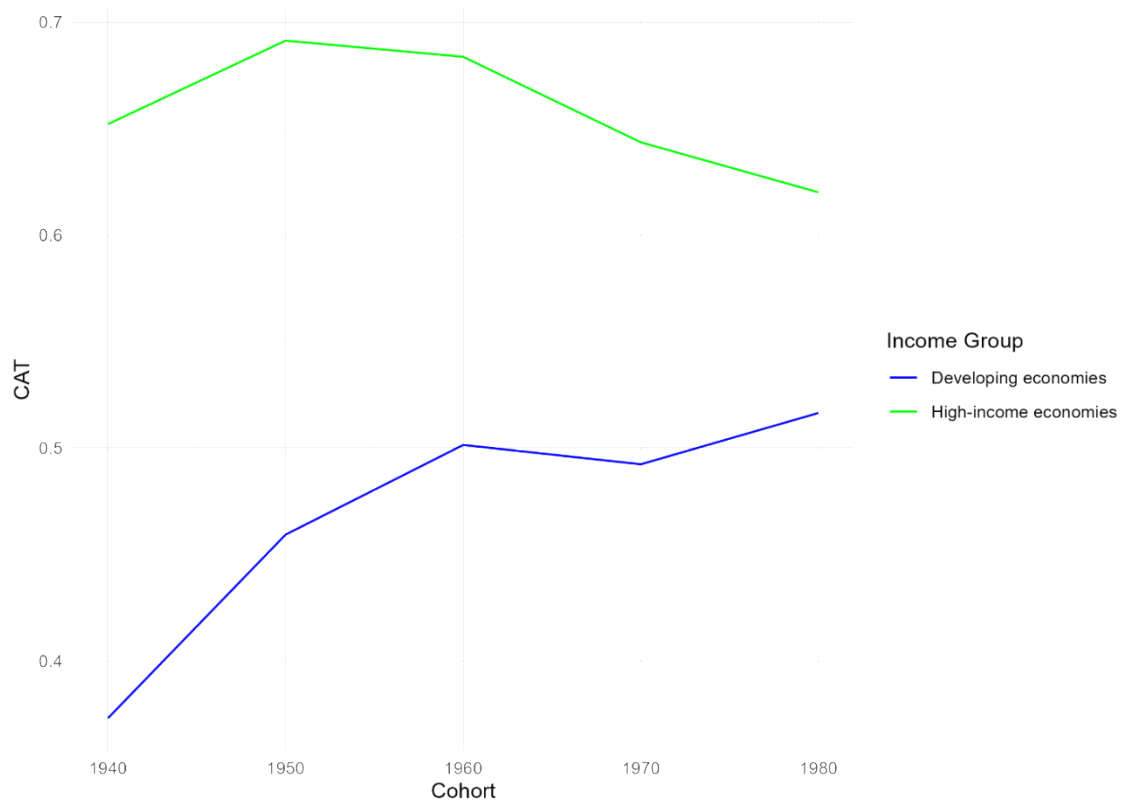


In light of the data presented in Figure 3.11, it is evident that, on average, successive generations tend to achieve higher levels of education compared to their parents. Moreover, the graph demonstrates a notable increase in the average years of schooling for both generations as time progresses. This discernible trend is most pronounced in East and South Asia, as well as in sub-Saharan Africa.

However, it is crucial to note that despite experiencing substantial growth in educational attainment, South Asian and sub-Saharan African countries continue to exhibit significantly lower levels of education compared to more economically developed

regions. This persistence of educational disparities underscores the importance of further examination and intervention in these regions to promote equitable educational progress.

Figure 3.4 Mobility 1940s-1980s based on GDIM (CAT)



Note: The chart illustrates unweighted averages of intergenerational mobility estimations, and this mobility assessment relies on these same five educational attainment categories, Pr child surpasses parent's educational category (conditional on parent not having tertiary) (CAT).

The fact that average mobility has been decreasing in wealthy countries isn't surprising. As people in these countries achieve higher education, it becomes harder for each new generation to surpass the education level of their parents. What's more surprising is that in less wealthy countries, mobility remains much lower and hasn't improved in the average low-income country in the past. This is surprising because there is more potential for people in these countries to achieve more education than their parents.

For example, the percentage of people with advanced education among parents in developing countries from the 1980s is similar to what it was among parents in wealthy countries back in the 1940s.

In our analysis, we rely on the Global Database on Intergenerational Mobility (GDIM), which features two distinct variables representing different facets of mobility: the Mean Change in Years of Schooling Conditional on Parents Not Having Tertiary Education (DIF) and the Correlation Coefficient between Children's and Parents' Years of Schooling (COR). These variables provide insightful definitions of absolute and relative mobility, offering nuanced insights into intergenerational mobility trends.

Absolute mobility, as gauged by DIF, quantifies the degree to which the living standards of a particular generation surpass those of their parents. It serves as a metric for understanding the extent to which educational attainment has improved over generations. Conversely, relative mobility, as encapsulated by COR, delves into the degree to which an individual's educational standing within the attainment distribution remains unaffected by the position of their parents. It reveals whether one's educational success is independent of their parents' educational achievements.

Our study endeavors to provide a comprehensive analysis of intergenerational mobility spanning from the 1940s to the 1980s cohorts, while also considering gender differentials. This in-depth exploration allows us to gain a nuanced understanding of the evolving landscape of mobility over time and across gender lines.

Figure 3.5 Mobility from 1940s to 1980s cohort by gender.

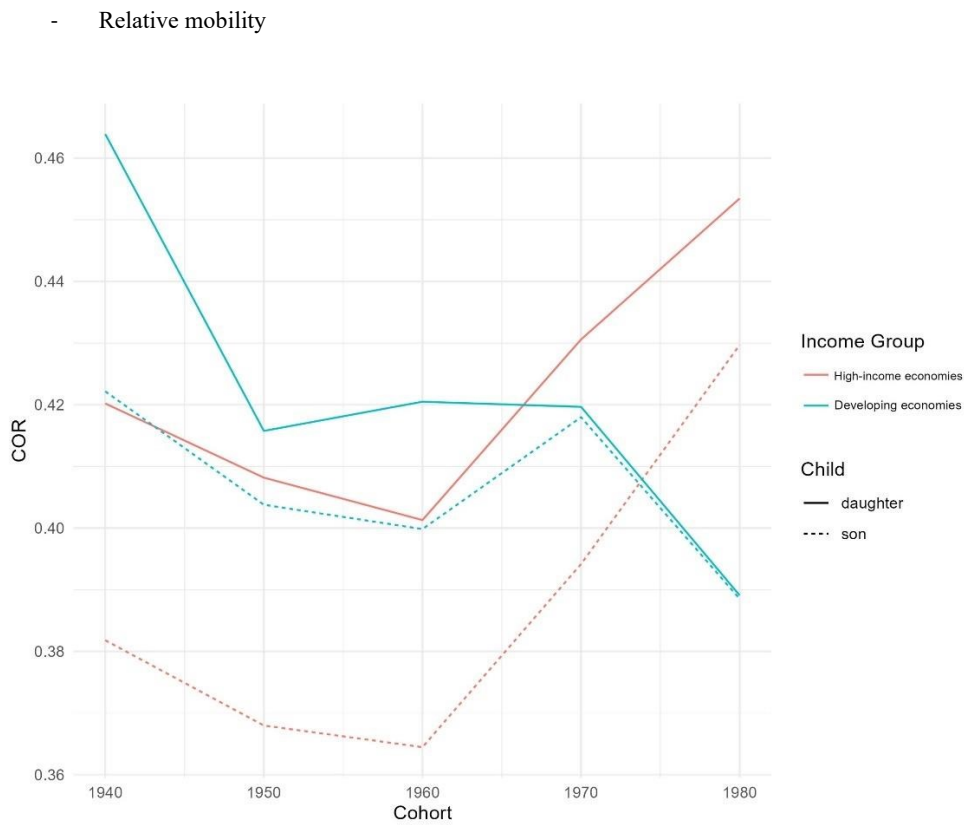
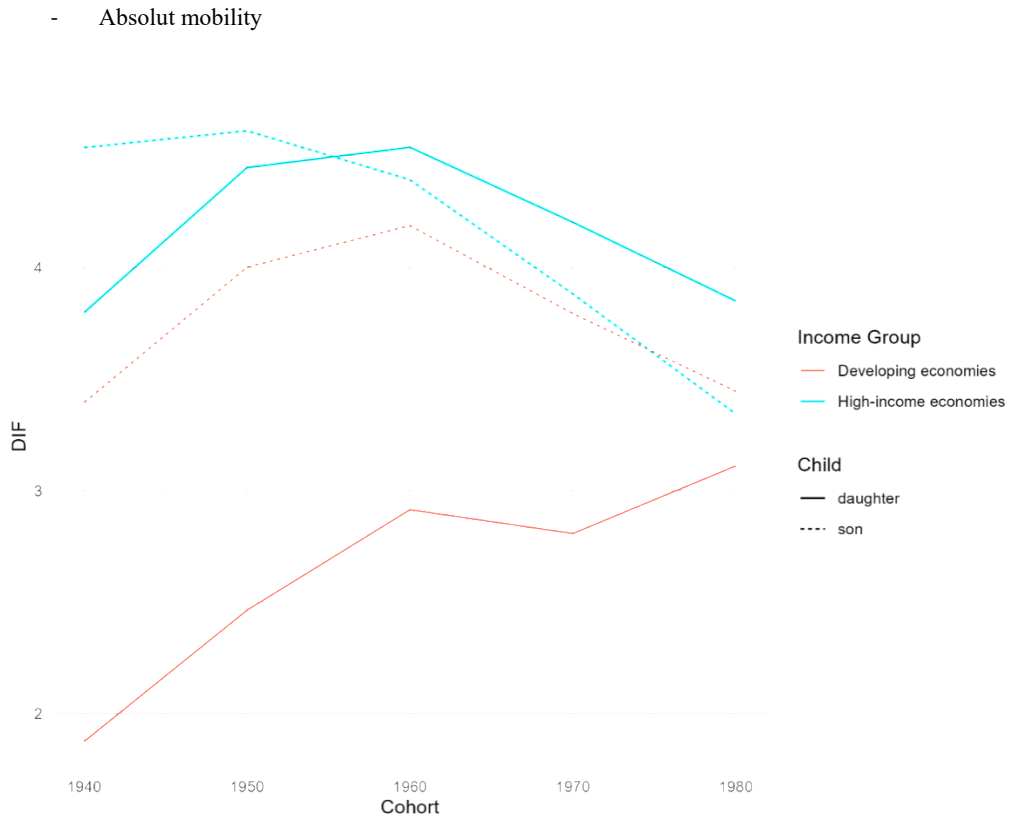


Figure 3.5 provides a detailed analysis of intergenerational mobility over time, taking into account gender disparities. When it comes to absolute mobility, a notable shift in trends becomes evident. For individuals born in the 1940s in high-income countries, boys had a higher likelihood of exceeding their parents' educational attainment levels compared to girls. However, over time, this pattern has reversed, with girls now having a greater probability of surpassing both parents.

In contrast, the situation in the developing world is distinct. While the gender gap has gradually narrowed, boys in the average developing country still maintain a greater likelihood of surpassing their parents compared to girls. This intriguing observation implies that, unlike their counterparts in high-income countries, girls in the developing world face significantly different odds of achieving higher education levels than their parents. If current trends persist, it suggests that girls in the developing world are set to outperform boys in terms of absolute mobility in the upcoming decade(s).

Turning to relative mobility, we note that there are no marked differences between boys and girls in developing countries (as depicted in Figure 3.5). In these countries, gender does not seem to play a significant role in determining relative mobility. In contrast, the situation in the average high-income country tells a different story. The initially high levels of relative mobility appear to be primarily driven by boys, and this trend has persisted over the years. There is no indication that the gender gap in relative mobility observed in the developing world is diminishing.

Conclusion

Income inequality is a multifaceted issue with far-reaching implications for both individuals and society as a whole. The study of income inequality encompasses monetary and nonmonetary aspects, reflecting its profound impact on economic well-being and social justice. Income inequality has been on the rise in recent decades, driven by a combination of structural factors like globalization and technological advancements, as well as institutional factors such as tax policies and the decline of labor unions. The consequences of increasing income inequality are far from trivial, affecting economic growth, health outcomes, crime rates, and social cohesion. Addressing this complex problem requires a comprehensive approach that considers both economic and social aspects while implementing policies that promote a fairer distribution of resources and opportunities.

Conversely, intergenerational economic mobility, often referred to as the embodiment of the "American Dream," examines the prospects of individuals to transcend their parents' socioeconomic status. It plays a crucial role in determining the equality of opportunity within a society (Santos J, 2020). As research has shown, the level of intergenerational mobility is intricately linked with income inequality, with higher inequality associated with lower mobility. Notably, the Great Gatsby Curve reveals that the Scandinavian countries exhibit the highest levels of intergenerational economic mobility, while the United States and the United Kingdom have among the lowest levels.

Moving forward, education plays a critical role in both promoting social mobility and influencing income inequality. Ensuring equitable access to quality education is crucial for breaking the cycle of wealth disparity and enabling individuals from diverse backgrounds to realize their full potential. The concept of the Great Gatsby Curve highlights the complex relationship between income inequality and education, indicating that where inequality is high, educational opportunities and investments often follow wealth lines, perpetuating economic disparities across generations. While theories suggest that education is a powerful mechanism for disrupting this cycle, the precise causal links remain intricate and debated. Nonetheless, it is evident that investing in education, particularly through public policies that promote equal access, holds the key to fostering a more inclusive and prosperous society where economic opportunities are not determined by one's socioeconomic background.

The recent release of the Global Database of Intergenerational Mobility (GDIM) has presented an unprecedented opportunity to comprehensively assess intergenerational educational mobility on a global scale. This study adopted a worldwide perspective, utilizing both ANOVA model results and intergenerational regression models to gauge

the continuity of education from one generation to the next across diverse nations. Over the past several decades, spanning from the 1940s to the 1980s, a consistent upward trajectory in mean years of education has been observed across all regions. However, a significant educational divide persists, with low-income countries primarily lacking primary education while high-income countries exhibit higher educational attainment, especially in primary education. A generational trend reveals that those born between 1980 and 1989 are pursuing higher education levels, but access to tertiary education remains substantially unequal between high-income and low-income nations. These findings underscore the ongoing challenge of addressing global and national educational inequalities, emphasizing the urgent need for targeted efforts to ensure equitable access to advanced education.

However, wealthy countries experience a decline in absolute mobility which can be attributed to the increasing difficulty for each new generation to surpass their parents' education levels. Surprisingly, low-income countries have shown limited improvement in mobility despite having more potential for educational advancement. Moving forward, considering trends in intergenerational mobility with gender disparities. In high-income countries, a shift in absolute mobility shows girls are now more likely to surpass their parents' education levels, unlike in the 1940s when boys had the advantage. In developing countries, the gender gap is narrowing, but boys still hold a greater likelihood of exceeding their parents. This suggests that girls in developing countries are on track to outperform boys in absolute mobility. Relative mobility shows no significant gender differences in developing countries, while in high-income countries, it remains primarily driven by boys, with no apparent narrowing of the gender gap.

The role of income in educational attainment can create a cycle that affects social mobility. When individuals from lower-income groups face challenges in accessing quality education, they are more likely to experience limited economic opportunities, potentially perpetuating income inequality across generations. Conversely, individuals from higher-income backgrounds have greater access to educational resources, which can enhance their upward mobility. A key insight here is that reducing income inequality plays a vital role in increasing educational attainment, which in turn significantly enhances intergenerational mobility.

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