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Human Capital, Inequality and Growth

Torben M. Andersen

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Abstract

Income inequality is increasing in most countries at the same time as traditional redistribution policies are under pressure, not least due to strained public finances. What are the underlying causes, and what is the scope to turn the trend? This is discussed from the perspective of the link between inequality and growth running via education and human capital formation. It is argued that imperfections arising from both capital market imperfections and social barriers imply that inequality may be a barrier to education, which in turn makes inequality persistent and reduces growth. In discussing redistribution it is thus important to distinguish between the traditional passive means of redistribution via taxes and transfers to repair on the distribution of market incomes, and active means which affect the distribution of market incomes. The latter may both lead to more income equality and efficiency improvements reflected in higher incomes or income growth. Policy options to improve educational outcomes and their distribution are discussed.

JEL Classification: I24, E02.

Keywords: income inequality, countries, redistribution policies, public finances, growth, human capital, capital market, social barriers.

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Contact: Torben M. Andersen, Department of Economics and Business Economics, Aarhus University (tandersen@econ.au.dk), CEPR, CESifo and IZA.

CONTENTS

"The income distribution may then be derived from the distribution of qualifications required and qualifications available. Income could become almost equal if there is no tension between the two distributions. People would not need to be of equal productive quality in order to attain this near-equality of incomes", Tinbergen (1972, page 256).

1. INTRODUCTION

Inequality has displayed a trend increase in many countries for some decades. Not only has the distribution widened, but some groups have even experienced declining real incomes. Gains from growth have become more unequally distributed in the period prior to the financial crisis, and the crisis has in a number of countries further increased inequality. These developments raise numerous questions both on the causes and the policy implications.

Globalization and technological changes are frequently given as reasons for the trend increase in inequality. While both are usually associated with aggregate gains, the development clearly demonstrates that there are both winners and losers. In a forward perspective it is crucial to consider the scope for a more equitable distribution of the net gains.

The developments raise questions on policy also. Have policies become less redistributive in recent years, implying that the difference between the gainers and losers has widened? Structural reforms to improve the incentive structure and deregulation to strengthen competition have been in much focus. But has there been a bias in this process disregarding the implications in the equity dimension, or has the political weighting of equity relative to efficiency changed? It is also possible that policy outcomes have changed because the costs of redistributive policies have increased. This has ties to globalization, which is often taken to make it more difficult and costly to maintain tax financed activities, in particular traditional redistribution policies. The constrained fiscal space (high debt and looming sustainability problems) is a further restraint in many countries.

These trends have raised concerns (see e.g. World Economic Forum, OECD, IMF, EU Commission) that the social balance may be affected adversely with both political and economic consequences. In a forward perspective the question is what policy makers can do to turn the trend, especially if public finances are strained. This paper discusses factors determining the income distribution and considers policy options to counteract the tendency towards increasing inequality and their link to economic growth.

Much of the traditional policy discussion focuses on how to repair on an unjust distribution of market incomes via taxes and transfers (passive redistribution). While important, this perspective is too narrow. First, countries which have low levels of inequality in disposable incomes also have low inequality in market incomes. Although they also redistribute, this is quantitatively not more important than the more equal distribution of market income in accounting for their low inequality. This points to the importance of considering which factors frame the distribution of market incomes and thus how it can be affected (active redistribution). Second, given strained public finances and the potential disincentive effects of passive forms of redistribution, there is a need to consider redistribution policies in a broader perspective. Finally, market inefficiencies should be considered carefully. It is a standard view that redistribution comes at the costs of distorted incentives having efficiency costs, thus implying a trade-off between efficiency and equity. In the presence of market imperfections, these issues become more nuanced since there may be efficiency arguments for policies which also can be justified on equity grounds. It thus becomes important to consider market imperfections and their policy implications carefully.

This paper focuses primarily on the distribution of labour income, and not on the functional distribution between labour and capital[1], with a primary focus on the lower end of the income distribution, and what can be done to

[1] This discussion has been revived, see Piketty (2014). It is beyond the scope of this paper to discuss the functional distribution of income. It should be noted, though, that the present paper discusses human capital and its distribution, a form of capital which is important in accounting for wealth and its distribution, and which is not featured in the discussion raised by Piketty (2014)

improve the position for this group. The paper thus takes a labour market perspective. The trends driven by globalization and technological changes may be interpreted as affecting both the level and composition of labour demand. For given labour supply, this inevitably shows up in wages and employment, the exact division depending on labour market institutions. It follows that the consequences of these changes to labour demand can be counteracted by changes in labour supply. This is precisely the essence of the quote by Tinbergen given above. Labour supply depends on many factors among which human capital, and thus education, is crucial. This brings forth that questions of inequality and policies to reduce it are not only a question of traditional redistribution policies (passive redistribution) but also involve education and labour market policies determining the level and distribution of qualifications and skills (active redistribution). The distinction between passive vs. active distribution policies is at the centre of the following discussion.

The paper is organized as follows. Section 2 presents a very stylized framework useful for a discussion of some key issues related to inequality and its driving forces. This framework provides a starting point for a brief overview of some of the important recent trends. Section 3 provides a critical discussion of the empirical evidence on inequality and growth, and the possible causal links between the two. The subsequent discussion focuses on mechanisms through which inequality can influence growth due to market imperfections. Section 4 considers the role of capital market imperfections and social barriers for educational choices and outcomes. This leads to a discussion in Section 5 of some policy options on how to ensure more equality in a way which is detrimental to economic development.

2. A SIMPLE FRAMEWORK/DECOMPOSITION

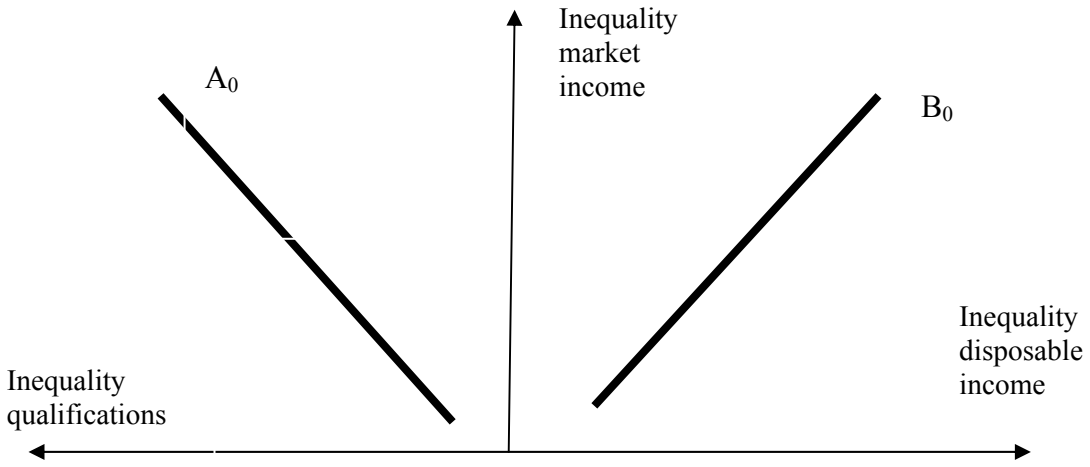
There is a large empirical literature documenting the developments in inequality both for single countries and in a comparative perspective; see e.g. Atkinson et al. (2011), OECD (2012), Roine and Waldenström (2015). It is beyond the scope of this paper to present all this evidence, and instead some key stylized facts of importance for the following discussion are presented.

To organize the discussion it is useful to think of a trinity linking the distribution of[2]

- Qualifications
- Market incomes
- Disposable income

The distribution of qualifications is an important factor in determining the distribution of market incomes. The wage distribution is formed via the interaction between labour demand and supply.

Figure 1: Linkage between the distribution of human capital, market incomes and disposable incomes



All theories of the wage distribution attribute a role to relative supplies and demands[3]. If labour demand increases (decreases) for a particular type of labour, its relative position will improve (deteriorate). For a given structure of labour demand, a more unequal distribution of qualifications will under general conditions lead to a

[2] Consider the following very stylized way of thinking of the problem. Disposable income for household i is given as $y_i^d = \big(1 - \tau(y_i)\big)y_i \equiv d(y_i)$, where $\tau(y_i)$ is the net tax payment made given market income y_i, $1 > \tau' > 0, \tau'' \geq 0$. Disposable income is given by $d(y_i)$ where $0<d'=1-\tau-\tau' y_i<1$, and $d''=-2\tau'-\tau'' y_i<0$. Let market income be given as $y_i = w(h_i)$, where h_i denotes human capital by type i and $w(h_i)$ gives the wage as a function of human capital, $w'>0$. It follows that

$$Var(y^d) \cong (d')^2 Var(y)$$
$$Var(y) \cong (w')^2 Var(h)$$

i.e. the dispersion in market income depends on the dispersion in human capital/qualification weighted by the sensitivity of wages to human capital. Likewise the dispersion of disposable income depends on the dispersion of market income weighted by the sensitivity of disposable income to the market income.

[3] It is also deeply ingrained in trade theory; cf. e.g. the Stolper-Samuelson theorem.

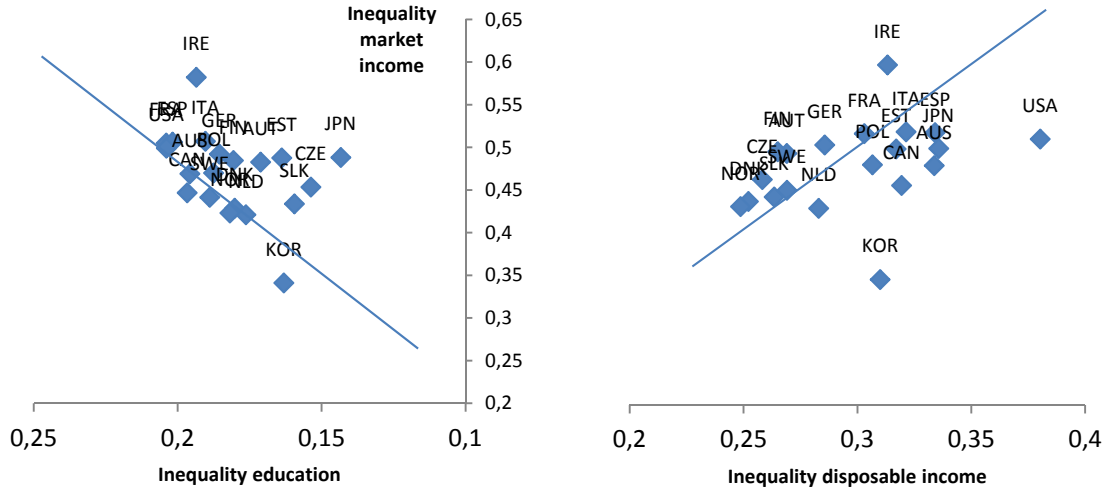
more unequal distribution of market incomes (cf. the labour market line A_0 in Figure 1.). Clearly the precise relation depends on labour market institutions, and there are other reasons for wage differences than differences in qualifications, which are neglected here to simplify.

Disposable incomes are given as market incomes less taxes and plus transfers. For a given tax-transfer scheme, it thus follows that a more unequal distribution of market incomes will lead to a more unequal distribution of disposable incomes, cf. the redistribution line B_0 in Figure 1. The more extensive the redistribution, the further to the right the redistribution line will be positioned.

Relations like the ones depicted in Figure 1 may be expected to hold for a given country; that is, for given structures, institutions, and policies. Interestingly, considering cross-country evidence as done in Figure 2, these patterns reveal themselves. The countries having the most equal distribution of qualifications tend to have the most equal distribution of market incomes, and the countries with the most equal distribution of market incomes tend to have the most equal distribution of disposable incomes.

This is particularly noteworthy since egalitarian outcomes in e.g. the Nordic countries are usually attributed to more redistribution via taxes and transfers. However, as is seen from the figure, the basis for an egalitarian distribution of disposable incomes is founded in an egalitarian distribution of market incomes. As shall be argued below, the latter is as important as redistribution in accounting for the position of the Nordic countries.

Figure 2: Inequality – education, market incomes and disposable incomes, OECD countries.



Note: Inequality in disposable income and market income measured by the Gini-coefficient. Inequality in education measured by the coefficient of variation for test of literacy and numeracy 2012 based on data from www.oecd-ilibrary.org and http://piaacdataexplorer.oecd.org

The key issues can now be illustrated in Figure 3 capturing the stylized facts given in Figure 2. The positive association between inequality in education and inequality in market income is given by relation A_0, and the one between inequality in market income and disposable income by relation B_0 (the redistribution line). With an initial distribution of qualifications $I_q(0)$, the distribution of disposable income becomes $I_d(0)$. Consider now changes in the labour market tending to produce

Figure 3: Changes in labour markets and redistribution

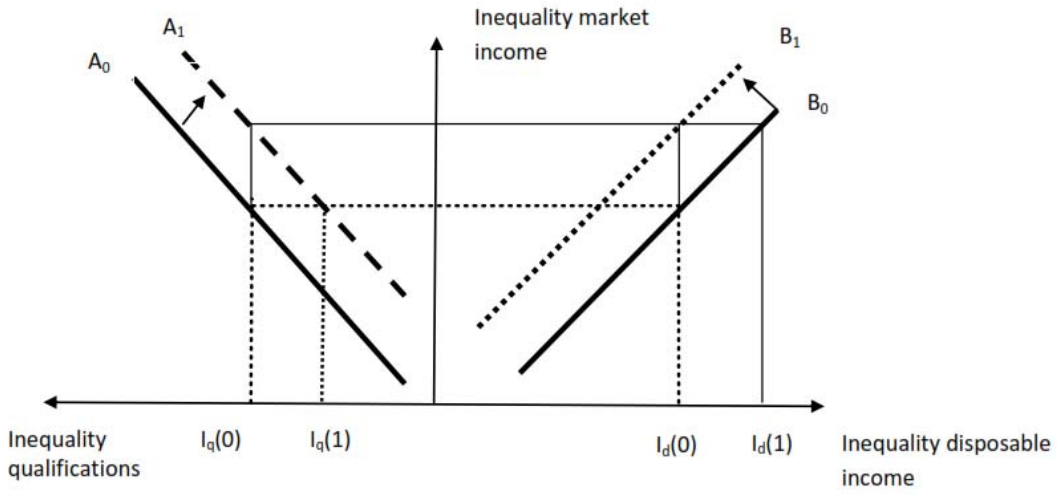
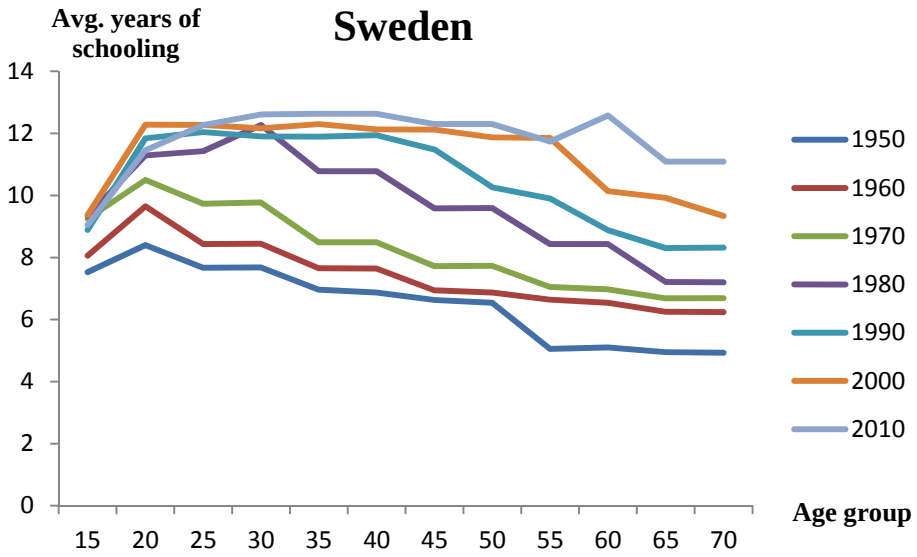


Figure 4: Average years of education across cohorts and age groups



Note: Shows data for five year age-groups, e.g. 15-19 years, etc.
Source: Barro-Lee data set on educational attainment, http://www.barrolee.com/data. See also Barro and Lee (2010).

more inequality; the A_0 locus shifts to A_1. For an unchanged distribution of qualifications ($I_q(0)$) and redistribution mechanisms (B_0), the inequality in disposable income increases to $I_d(1)$. To restore the level of inequality in disposable income to its original level ($I_d(0)$), one would have either to make the system more redistributive (shifting the redistribution line from B_0 to B_1 entailing more passive redistribution) or change the distribution of qualifications to $I_q(1)$, i.e. more active distribution. Both active and passive redistribution[4] have to be financed via taxes, which in turn affects both the level and distribution of market incomes. This raises

[4] In the presence of risk, ex post redistribution also performs an ex ante role of providing insurance, which may have both a direct welfare effect and affect labour market performance, For a discussion see Andersen (2015b).

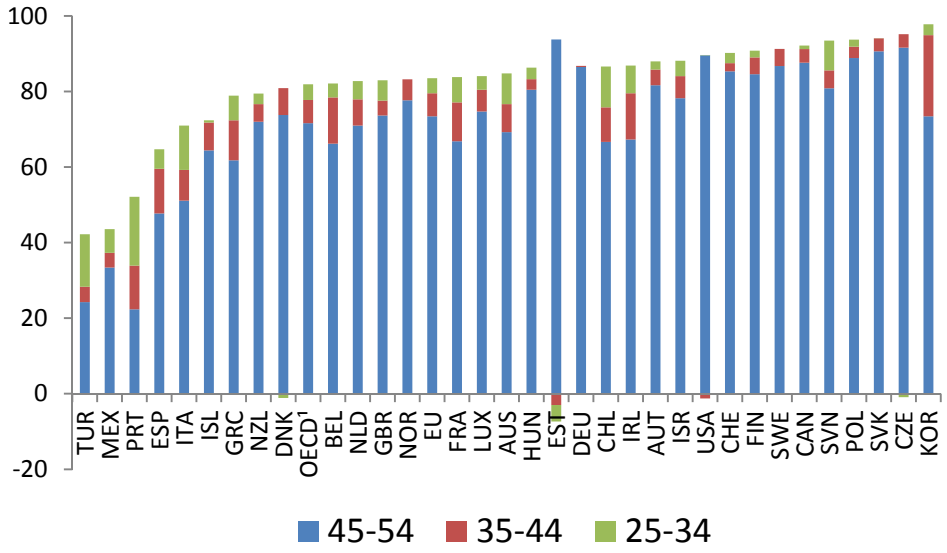
questions on the relation between active and passive redistribution and the optimal use of the two instruments; see below.

Before turning to this discussion, we first briefly review the empirical evidence on the three elements in the reasoning above: qualifications, market incomes and redistribution

2.1. WIDER DISPERSION IN QUALIFICATIONS

During the 20th century education levels increased tremendously in all OECD countries. Schooling was expanded, and a larger and larger share of the population obtained education. The development path is illustrated in Figure 4 using Sweden as an example. Education is here measured by the average years of schooling. The figure shows a huge expansion in education between 1950 and 1980 in terms of lengthening education which roughly amounts to a doubling of schooling measured by years of education. This is mirrored in a larger share obtaining secondary and tertiary levels of education. In short, the average level of education expanded. The figure also brings out that changes in educational policies have a long gestation period. Although young cohorts already in the 1970s and 1980s had 10-11 years of schooling, it is not until around 2010 that this level applies to the entire work force. New cohorts entering the labour market have systematically been better educated than those leaving. This growth factor is now levelling off. This brings out the important point that changes on the demand side have impact much faster than changes on the supply side which have to

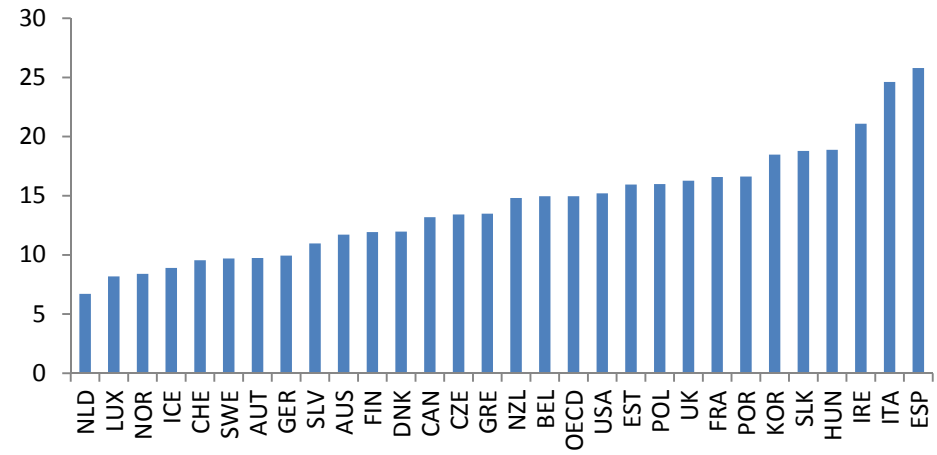
Figure 5: Educational attainment, population share with at least upper secondary education for different age groups, OECD countries, 2010



Note: For Estonia younger cohorts have a lower population share than older cohorts, hence the particular appearance.
Source: OECD, Education at a Glance 2014.

work their way through different cohorts. A fact which also implies that the short and long run effects may differ as changes on the supply side unfold over time.

Figure 6: Youth neither in employment, education or training , 2012



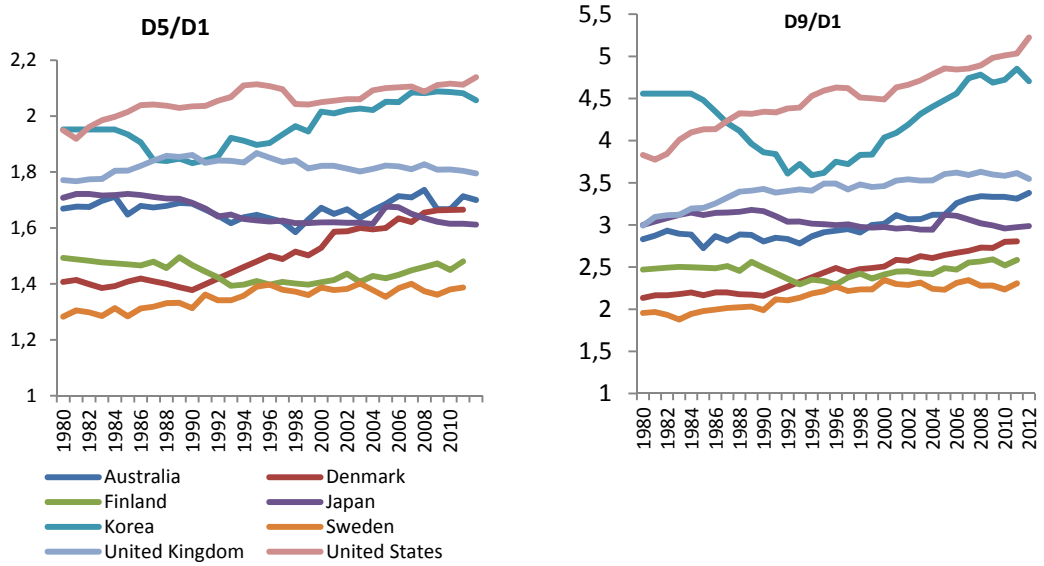
Note: Aamong 15-29 year-old.
Source: OECD, Education at a Glance 2014

In this context the so-called educational residual group is problematic; that is, despite the general increase in education there still remains a significant part of young cohorts not reaching upper secondary or higher levels of education, cf. Figure 5. While educational levels have increased for other groups, there remains a serious problem in a large educational "residual" group in many countries. This is related to a large fraction of youth neither being in education nor in employment, cf. Figure 6. Other aspects in relation to education and human capital accumulation, including late start, drop-out rates etc., are further discussed in Section 5.

2.2. HIGHER SKILL PREMIA

Market incomes depend on wages and working hours over the year. Various studies (see e.g. OECD (2012), Atkinson et al. (2011)) have documented a trend tendency towards wider wage inequality. Figure 7 illustrates the trends by decile ratios capturing both developments at the bottom and top of the wage distribution. While there are country differences, it is seen that there is a trend increase in the D5/D1 and the D9/D1 ratios. The lower end of the wage distribution is losing ground to the middle, and the middle is losing ground to the top.

Figure 7: Wage inequalities, D5/D1 and D9/D1, selected OECD countries, 1980-2011



Note: Gross earnings decile ratios.
Source: www.oecd-ilibrary.org

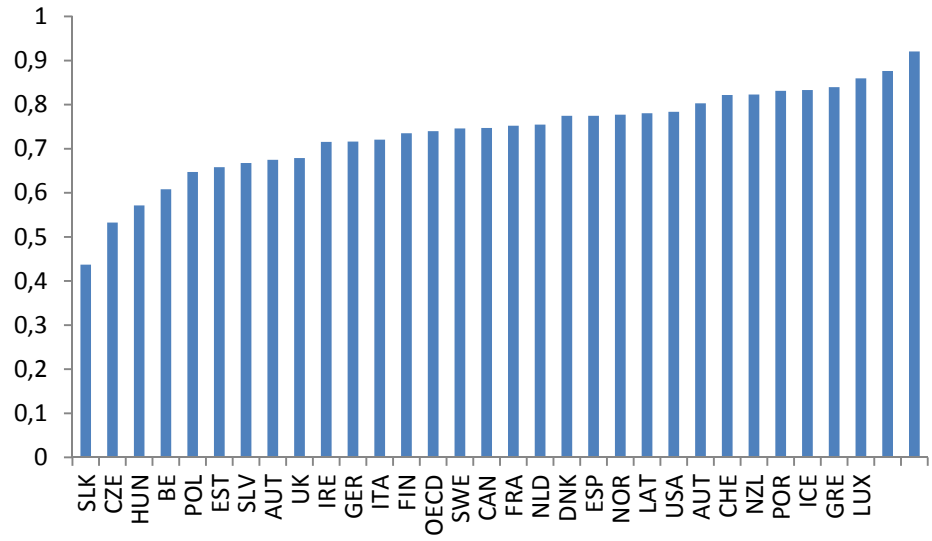
It is widely agreed that both new technologies and globalization tend to induce a skill bias in labour demand; that is, job creation tends to be concentrated at the top of the qualification distribution, while job destruction is concentrated at the lower end. Demand for unskilled jobs falling either due to new technologies or competition from low wage countries (classical Stolper-Samuelson theorem in trade theory) implies that the wage distribution shifts in favour of the more skilled at the cost of less skilled. The split of these changes between wages and employment depends critically on labour market structures and institutions. While there has been some controversy over the role of technology and globalization[5] – and the two are clearly interrelated - it is less important in the present context to separate the two since it is the net consequences which matter from a distributional perspective.

This debate on skill-bias is still ongoing and has recently been amended by the discussion of tasks and its implications for labour demand; see e.g. Autor and Acemoglu (2010). Lower transaction and information costs, seen most clearly for services which can be delivered electronically, lead to foreign competition in areas which earlier have been considered as "non-tradeables" and which often have a high intensity of "medium" educated workers. The importance of globalization in terms of winners and losers need thus not to be monotonously related to the position in the qualification distribution. On the other hand, it may be argued that an ageing population may increase labour demand in this medium educational segment via demand for care and services.

That labour market options are closely related to education is well-documented; see e.g. OECD (2014). Low education is associated with lower employment rates – see Figure 8 – more frequent and longer unemployment spells, and lower wages.

[5] See e.g. Goldin and Katz (2009) and Jaumotte, Lall and Papageorgiou (2013).

Figure 8: Employment gap: employment for low education relative to medium education



Note: Employment rate for those having education below upper secondary level relative to the employment rate for those with upper secondary or post-secondary non-tertiary education.
Source: OECD (2014).

A number of empirical studies show that the educational expansion during the 1950s and 1970s had an important effect on the wage distributions. Despite a change in the composition of labour demand, there was a general increase in human capital and a larger supply of skilled and highly skilled labour. Following Tinbergen (1972) it may be interpreted in the way that the distribution of qualifications kept up with changes in the distribution of demanded qualifications, implying that the wage distribution was not much affected. As to the observed widening of wage inequality, Goldin and Katz (2009, p. 291) conclude in a recent book that the "lion's share of rising wage inequality can be traced to an increasing educational wage differential". OECD (2011) also present some empirical evidence showing that widening earnings inequality is driven by technological changes, but also deregulation and less generous social transfers (see also Jaumotte, Lall and Papageorgiou (2013)).

Note that education is also associated with better health, longer longevity, social outcomes, participation in social and political activities etc. It is conceptually difficult to separate the causal links here, and there may be severe selection problems underlying the observed correlations. However, some studies do find a causal link between education and health; see Conti, Heckman and Urzua (2010). Heckman and Kautz (2013) find that cognitive and socio-emotional skills are explaining labour market and social outcomes.

The evidence thus clearly points to the role of the distribution of qualifications or human capital for the distribution of market incomes.

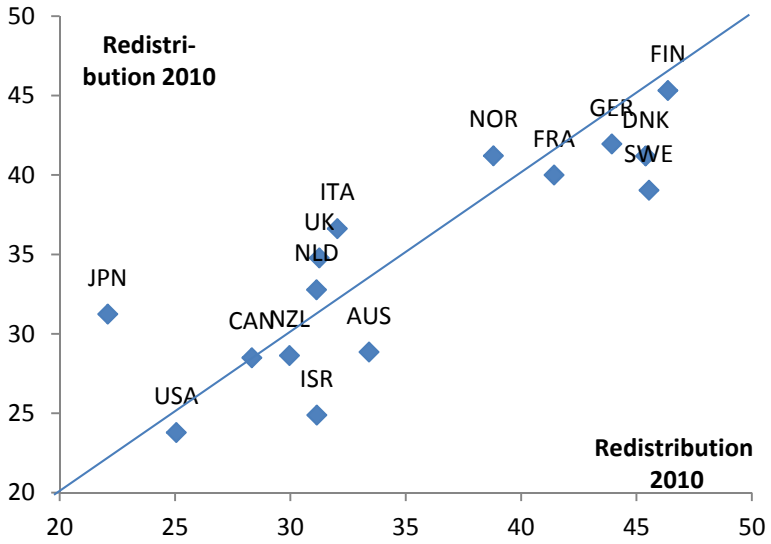
2.3. CHANGED REDISTRIBUTION

Finally, there is the question whether policies have become less redistributive in recent years. First a remark on conventional measures of inequality like the Gini coefficient. Income distributions are compared on the basis of equivalized household incomes. That is, the income for the entire household is taken into account and adjusted for the size and composition of the household[6]. Both the income concept and the equivalence scale are thus of importance. On the income side it is particularly important whether imputed rents for owner-occupied housing are included since these rents tend to follow house prices and thus the business cycle. Changes in the family

[6] The OECD equivalence scale gives the equivalence factor as the square root of the number of family members. The equivalized income is the total household income divided by the equivalence factor.

structure also matter. Changes in marriage pattern and assortative matching are of importance; see Atkinson (IZA) and Salverda (2015). Many countries experience a trend increase in the number of single households both because more young live as singles and due to an ageing population. This tends, other things being equal, to make the income distribution more unequal. Likewise can an increase in student enrolment in the short run lead to more inequality. In short, inequality can be significantly affected by various factors on top of the direct effects of labour market conditions and public redistribution policies.

Figure 9: Redistribution in 2000 and 2010, OECD countries



Note: Redistribution measured as the percentage difference between Gini defined over market incomes and disposable income. Defined as in Figure 2.
Source: Own calculations based on data from www.ilibrary-oecd.org.

Here the key question is whether governments redistribute more or less than in the past. Obviously, severe measurement problems are involved, and the issue is considered by a very summary measure, namely the ratio of the Gini for disposable income to the Gini for market income. This metric measures the percentage change in inequality attained via taxes and transfers[7]. It is widely perceived that redistribution has been curtailed in recent times, but the evidence leaves a more blurred picture. Figure 9 gives this measure of redistribution for 2000 and 2010 for a number of OECD countries. As is seen, some countries are redistributing more and some less. Note that this is in accordance with more detailed country studies; see e.g. Bargain et al. (2013).

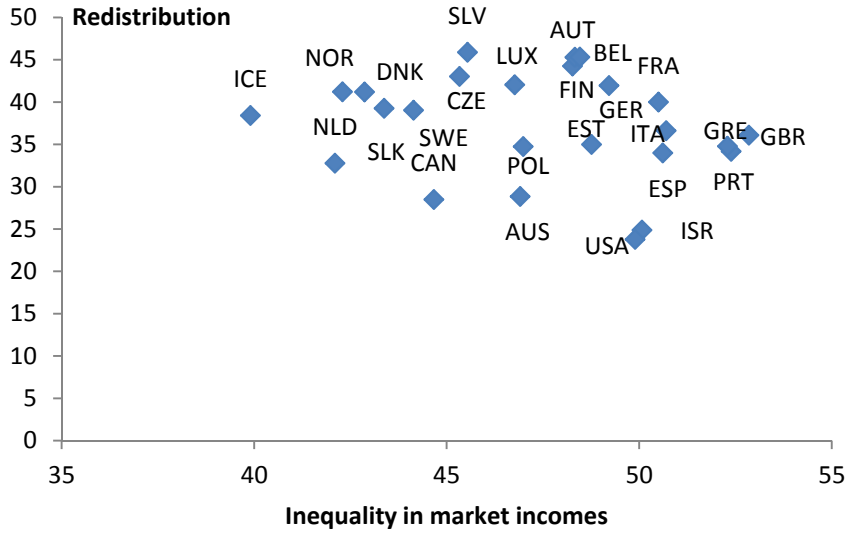
Policy reforms in a number of countries have had a primary focus on incentive effects, which in turn may lead to less redistribution; see e.g. Knieser and Ziliak (2002). This trend may reflect that incentive effects have been underestimated in the past or higher efficiency costs from redistribution due to globalization. On the other hand, it may be argued that recent policy reforms have focused mostly on the incentive effects, paying little attention to the implications for insurance and redistribution.

In the wake of increasing inequality in market incomes, increasing support for more redistribution should be expected. According to the well-known political-economy model of Meltzer and Richard (1981) a more unequal distribution of incomes (measured by the ratio of mean income to median income) should increase the political support for more redistribution. Despite this it is not clear that the political equilibrium in most countries is shifting in the direction of support for more redistribution. This points to the weak empirical support for the abovementioned political-economy model of redistribution illustrated by Figure 9 showing that countries with

[7] A relative measure is better than the absolute difference between the Gini for market incomes and disposable income since the latter is not independent of the level of inequality. That is, the absolute difference can be small either because of much redistribution or because of a high level of inequality in market incomes.

more unequal distribution of market incomes tend to have more redistribution (actually the correlation is negative in the figure).

Figure 10: Inequality in market incomes and redistribution, OECD countries



Note: Redistribution measured as the percentage difference in Gini coefficient defined over market incomes and disposable income, cf. Figure 9.
Source: Own calculations based on data from www.oecd-ilibrary.org

3. INEQUALITY AND GROWTH

Empirical studies – both in the time and the cross-country dimension – have extensively explored the relation between income levels or growth and inequality. Typically, per capita income (GDP) and the GINI coefficient defined over equivalent household income are the measures used. Some studies focus on how inequality affects growth, while others consider the link from growth to inequality.

In a recent survey of some 20 studies[8] Neves and Silva (2014, p. 13)[9] conclude: "To sum up, from all the studies reviewed we reach the conclusion that inequality is most likely to affect growth negatively in some cases and positively in others, depending on the specification for the growth regression, the initial level of inequality, the whole shape of the income distribution and the development level". In short, the empirical evidence do not leave clear-cut conclusions. However, the evidence point in the direction that inequality is found to have a negative effect on growth in cross-section studies for low-income countries and when inequality is measured over some wealth variable.

For a number of reasons it is unclear what to conclude from the finding of either a positive, negative or an ambiguous relationship between income/income growth and inequality.

First, a number of theories imply a non-linear relationship in the time domain. Most well-known is the Kuznets-curve, cf. Kuznets (1955). In the time dimension Kuznets predicted a non-linear relationship where growth at first is associated with increasing and later with decreasing inequality[10]. The explanation was a changing sector composition of the economy (agriculture/industry; rural/urban; unskilled/skilled). Up to the 1970s there is empirical support for the Kuznets-curve, but the relation explains only a small part of the variations in inequality across countries and time; see e.g. Barro (2000). Including more recent years makes the empirical support less clear (see e.g. Aghion, Caroli and García-Peñalosa (1999)).

Second, both growth and inequality are endogenous variables depending on policies, institutions and economic conditions. Theoretically it is thus possible that changes in economic conditions may be associated with both a positive and a negative correlation between the two, cf. below. This implies that it is not obvious what to conclude in terms of policy implications from any correlation between the two variables. This may be driven by particular changes in economic conditions (shocks), institutions or policies. Moreover, higher growth may lead to higher demand for welfare services and redistribution, implying that there are serious problems of reverse causality. This also applies to various controls since the same factors which explain e.g. low inequality may be driving higher growth. This also includes factors like changes in demographics, age structure etc.

Finally, the policy implications are unclear. Consider findings showing that countries with less/more inequality have higher/lower growth. Does it follow from such findings that a traditional redistribution policy lowering inequality would lead to higher growth? It may or may not. This question is particularly pertinent since cross-country studies rather than panel studies tend to find a negative relation between inequality and growth; see Neves and Silva (2014). It is thus possible that some countries may have high inequality and low growth due to very inefficient policies and institutions. In this setting more redistribution is not automatically ensuring higher growth. Public choice stresses political imperfections associated with rent seeking behaviour of various forms (see e.g. Buchanan (1987)). Such imperfections may imply that countries for a given level of taxes may have both lower income and more inequality. Another variant of this is political institutions which preserve inefficient policies and where reform proposals are blocked.

Before turning to a discussion of specific cases where inequality may be an impediment to growth, it is useful to clarify the notion of inequality underlying these analyses.

[8] A number of studies find that more inequality is associated with a lower growth rate (see e.g. Persson and Tabellini (1994) and Alesina and Rodrik (1994), and more recently Ostroy (2014) and Cingano (2014). Studies using panel methods and improved data sets (Li and Zou (1998) and Forbes (2000)) find oppositely that inequality is associated with more growth.

[9] See also the up-date and results in Cingano (2014).

[10] Brückner et al. (2014) consider how a higher income level affects inequality for a sample consisting of 154 countries for the period 1960 to 2007. They estimate a panel model in which country-specific income is instrumented by oil prices and foreign demand. They find that higher income has a significant moderating effect on income inequality.

3.1. ON THE NOTION OF INEQUALITY

The concept of inequality used in these analyses and its interpretation are not trivial. Inequality is often measured by the Gini coefficient defined over equivalized household incomes. The attraction of this measure is that it has a straightforward interpretation (the share of income to be redistributed to achieve a completely equal distribution of income). However, the way the income distribution is summarized in the Gini-coefficient can be contested and various other measures exist; see Salverda, Nolan and Smeeding (2009) for a discussion and references. The following addresses some principle questions in relation to inequality of importance for the discussion of the nexus between inequality and growth.

Conceptually two issues should be mentioned since they are particularly important in relation to education. One issue is process versus end-result, and the other the relevant time horizon or period within which to measure inequality.

Standard economic analyses tend to focus on end-results, and the position of individuals is assessed in terms of the ability to fulfil needs or in terms of utility (or income). The consequences rather than the process matter. This is most clear in the case of utilitarianism where the social welfare function is defined as the sum of individual utilities. But also egalitarians are focused on the end-result in terms of ability to fulfil various needs; see e.g. Konow (2003).

Other theories of justice focus on processes, emphasizing desert and thus proportionality and individual responsibilities. Justice is associated with the choices and efforts of the individual, and therefore the process is important. Procedural justice is ensured if everybody has equal opportunities in the choices they can make (Konow (2003)). Since various individuals will make different choices, the end results may differ, but this is not in itself posing a problem provided that all have had the same opportunities. If so, differences are caused by different choices and efforts and therefore under the control of the individual, and it follows that these differences are not necessarily a concern for policies (redistribution).

Equal opportunities are an ethical value with wide support. It has both a de jure and a de facto side. The former refers to whether individuals have the same formal options and rights, and the latter to the extent to which individuals in reality have the same possibilities. The latter becomes important when social factors affect the choice space such that actual options differ across individuals although formal options do not. This line of thinking brings out that the possibilities and outcomes for the individual are not independent of the context in which the individual is situated. Theories emphasizing social inclusion can be seen as belonging to the class of theories. A prominent scholar in this area is Sen (1983, 2009), who emphasized functionings and capabilities. Functionings are the ability to satisfy needs in a given social context, and capabilities refer to the extent to which the individual can realize these functions. For Sen both the process and the end result are of importance.

In the present context of human capital, it may thus on ethical grounds be argued that equal opportunities (in the de facto sense) for education are an objective in itself. However, education also has fundamental implications for labour market options (and many other aspects including health, social activities etc.) and thus end-results. As we shall argue, both from an equal opportunity perspective and a consequentialistic viewpoint it may thus be possible to argue in favour of the same policies.

Education is an investment. Time and resource are spent (mainly as young), and the return is reaped later in life as labour market options in terms of job characteristics and incomes. Usually inequality discussions run in terms of annual income. This leads to the paradoxical result that policies which are effective in terms of increasing education, e.g. by lowering the number of unskilled, on impact may lead to a higher measured inequality (students usually have low disposable income), although it over time leads to a larger share of the population having higher income, and for the individuals higher life-time income. For the same reason support to students (further discussed in section 5) will lead to less inequality when measured on the basis of annual incomes, although it is a regressive policy instrument providing support to individuals tending to have high life time incomes.

4. INEQUALITY AND HUMAN CAPITAL

Next we turn to the mechanisms through which inequality may have a causal effect on growth; that is, can specific channels through which inequality affects growth be identified and what are the policy implications? This leads to a consideration of various forms of imperfections through which this linkage may run[11] [12] [13].

An important channel through which inequality may matter for growth is via initial conditions or stocks. That is, accumulation of various forms of capital constitutes the initial conditions which may differ across individuals and have implications for growth.

There is a fundamental difference between accumulation of real capital and human capital. While there may be diminishing returns to both forms of capital accumulation, for capital accumulation it applies at the firm or aggregate level, while for human capital it applies at the individual level since human capital is embodied in humans. Even though abilities matter and differ, diminishing returns to education imply that the distribution of human capital /education matters for the overall level of human capital. The social gains from human capital investments are larger if these investments are distributed across individual[14]. The same does Keynes not apply to real capital. Diminishing returns do not apply at the individual level, and therefore the social gains from investments in real capital do not directly depend on the distribution across individuals. For real capital it has been argued that inequality may strengthen capital accumulation and thus growth (per capita income). This is so if savings is increasing in income; cf. e.g. Lewis (1954) and Kaldor (1957). This suggests that inequality is good for capital accumulation, and bad for human capital accumulation.

The role of human capital for growth is well established. A rather large literature has explored the importance of education for productivity increases; see e.g. de la Fuente (2011) and Hanushek and Woessmann (2011). The early empirical studies measured education in the quantitative dimension as e.g. the share of the population having reached education measured in years of study. These analyses tended to find a positive but not very large effect of education on productivity. More recent studies include both quantitative and qualitative measures of education, and education is generally found to have a significant importance for productivity growth. Education in the qualitative dimension (measured by various proficiency tests) is at least as important as education along the quantitative dimension (years of education/level of education). It is also found that the quality of education for broad groups in the labour market is at least as important as for education for the elite; see Hanushek and Woessmann (2011).

Another strand of empirical work has analysed the role of the public sector (size and composition) for growth. The studies show that various government expenditures have different implications for growth; for an overview and discussion see Andersen (2015b). The composition of expenditures matters, and so-called productive or active spending like education has positive effects on growth. In this sense the balanced budget multiplier over the medium or long-run run is different for different types of expenditures.

The reasoning above strongly suggests that acquisition of human capital is an area where equity and efficiency are intimately related. Below we turn to explanations stressing the effects running from inequality to growth via human capital accumulation. This points to the scope for what has been termed active redistribution policies which via education affect both the level and distribution of income. Before proceeding in that direction, it should be noted that one strand of literature has explored how passive redistribution may affect educational

[11] A possible link between inequality and growth arises in a political-economy model. In a more unequal society, there is larger support for redistributive policies, which in turn leads to higher taxation and regulation harmful for economic growth; see e.g. Barro (1990), Persson and Tabellini (1994) and Alesina and Rodrik (1994). This explanation is up against the pure predictive power of the political-economy model of redistribution, cf. Section 2, and also disregards market imperfections.

[12] Alesina and Perotti (1996) present empirical evidence that inequality is associated with social discontent and socio-political instability which reduces investment incentives; see also Venieris and Gupta (1996).

[13] Inequality may also be a source of crises and thus macroeconomic stability. Discussion has been prompted by the increase in inequality (in particular at the top) prior to the financial crisis, and the rising debt levels (see e.g. van Treeck and Sturn (2012) for a survey). One argument is that in particular low income groups have increased borrowing to compensate for lagging income development (keeping up with the Joneses effect). An alternative argument is that the increasing debt has been driven by financial deregulation. Atkinson and Morelli (2011) do not find empirical evidence in support of increasing inequality leading to financial crises. Coibion et al. (2014) do not find support in US data that low-income households accumulated more debt than high-income households.

[14] Let human capital be given as $h(a_i, e_i)$, where a_i is ability, and e_i educational input. Assume that $h_a(.)>0$ and $h_e(.)>0$, $h_{ee}(.)<0$ and $h_e \to \infty$ for $e \to 0$. If a given educational input $\Sigma e_i = e$ is to be allocated to maximize total human capital, the optimum would have $h_e(a_i, e_i) = h_e(a_j, e_j)$ for all i,j. Hence, $e_i>0$ for all i. If abilities and education are complements, $h_{ea}(.)>0$, it follows that $e_i>e_j$ if $a_i>a_j$, i.e. there is a regressive bias, cf. Arrow (1971).

incentives. This literature primarily considers educational choices along the intensive margin in a setting where agents differ in abilities. Arrow (1971) pointed to a regressive bias in the allocation of educational resources. If a given amount of educational resources are to be allocated across agents with different abilities, human capital production is maximized by allocating according to abilities, under the assumption that the marginal human capital effect of a given educational input is increasing with abilities. From a human capital perspective, resources should be devoted to the more able, and passive redistribution should address the distributional aims (see also Hare and Ulph (1979)). Allowing for private education choices, Bovenberg and Jacobs (2005) and Jacobs (2012)) argue that a government wanting to redistribute should also subsidize education. The argument being that the income tax financing redistribution distorts educational choices, and this can be circumvented by educational subsidies[15]. While these are important findings, they do not directly address the issues raised here since they only focus on education along the intensive margin. The distributional issue pertains mainly to education along the extensive margin, that is, to an increase the number of skilled/educated workers. Historically it has been a great achievement to increase the share of educated, but as discussed above significant problems remain.

Finally, note that if initial conditions matter, it is also a source of persistency in inequality. In a seminal paper Becker and Tomes (1979) consider sources of persistence in human capital and income/wealth. The setting is one where parents invest in the education of their children along the intensive margin, and also bequeath their children, i.e. there is parental altruism towards children. There are no capital market imperfections. Endowments (abilities, social capital etc.) are exogenously given and display persistence but do not affect the marginal return to educational investments. Richer families tend to invest more in education and to bequeath more than less rich families. Under plausible assumptions there is mean reversion; that is, in the long run income in a family is independent of the initial position in the income distribution. An interesting finding of the paper is the intra-generational link in education, income and wealth arising from the endogenous family decisions on education and bequests. This shows the possible strong path dependence running over several generations when initial conditions matter. In the following the implications hereof are considered in the presence of market imperfections, namely capital market imperfections and social barriers in education.

4.1. CAPITAL MARKET IMPERFECTIONS

In presence of capital market imperfections, the initial distribution of wealth may have a critical importance for accumulation of human capital and therefore be a source of both inequality and persistence across generations. If families are not able to self-finance education for their children, the chosen level of education will in general be lower. This implies a locking-in of talent in the sense that the level of education chosen for given abilities etc. is lower than in a situation with a perfect capital market (Becker and Tomes (1979)).

The implications of capital market imperfections for the interaction between income/wealth inequality and human capital accumulation are worked out in an important contribution by Galor and Zeira (1993). Becoming educated requires a fixed investment (extensive margin). They consider a setting where all have the same abilities, but families differ in initial wealth. Parents are altruistic and bequeath their children. The capital market is imperfect in the sense that the borrowing rate exceeds the lending rate, which in turn implies that the opportunity costs of education depend on the ability to self-finance education. As a consequence, some young receive so low a bequest that they abstain from education, implying that their own children also get a small bequest and refrain from investing in education. Galor and Zeira (1993) show how this in an environment were all have the same abilities may result in a stationary equilibrium with non-educated low income families and educated high income families. In this situation there is complete persistence (hysteresis) in the position in the income distribution. It is an implication that the stationary equilibrium depends on the initial distribution of wealth and that there may be multiple equilibria. If it has a large share of families with low wealth who abstain from education, the steady state equilibrium will also have a high share of non-educated and in this sense an unequal distribution of income/wealth and a lower level of capital.

The important insight is that the distribution of income/wealth matters for educational choice, and thus the total human capital stock. Inequality is an impediment to education, human capital and thus potentially growth. A more equal distribution of income/wealth may thus be associated with more education and thus higher human

[15] These studies assume that the government can commit. If the government has a commitment problem, it will ex post tax the return to education excessively, and this motivates educational subsidies; see e.g. Andersson and Konrad (2003).

capital and growth. In short, equity and efficiency are not in conflict. Equality alleviates the consequences of capital market imperfections.

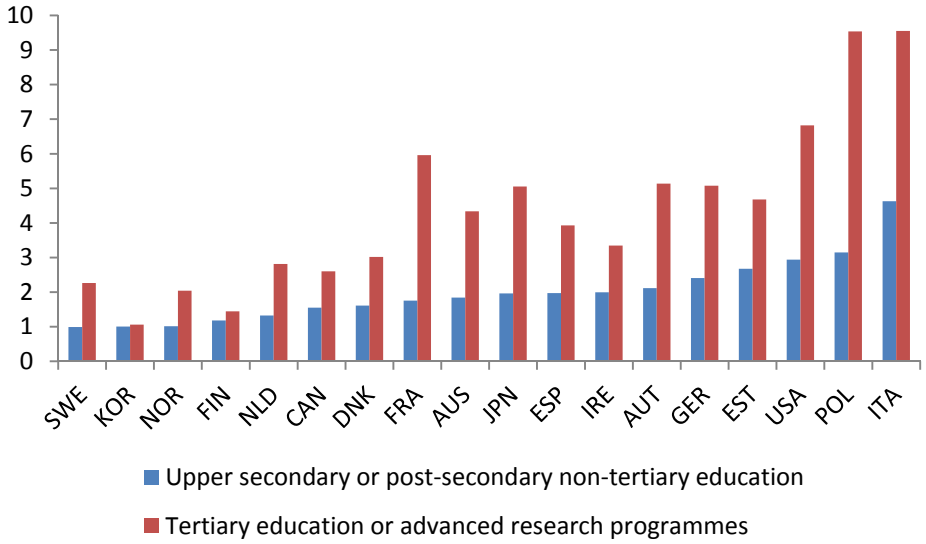
Galor and Moav (2004) develop an explanation why inequality in early phases of development may be conducive for growth, and oppositely at later stages of development. The analysis combines the savings and the imperfect capital market arguments. At low income levels, capital accumulation is more important than human capital, and inequality induces a higher level of capital accumulation when savings rates are increasing in income/wealth. At later stages, human capital becomes more important, and capital market imperfections imply that inequality may be lowering capital accumulation and thus growth. Stated differently, the relation between inequality is non-linear, depending on the level of economic development.

Observe that in models stressing the importance of capital market imperfections the issue of active and passive redistribution does not arise. A traditional redistribution policy will lead to more wealth for low income families, increasing the likelihood that their children get education. There is no immediate conflict between traditional redistribution policies and the aim of boosting educational investments. The arguments here relied on parental altruism; in its absence more targeted measures may be called for to ensure that educational choices are affected.

4.2. SOCIAL BARRIERS

The role of social gradients in educational options and choices is of a particular policy concern since it questions equality of opportunity in pursuing abilities and developing interests and motivations; an ethical value with wide support. Equality of opportunity concerns both the formal access and entry possibilities into the educational system as well as the outcomes. When social and cultural capital matter a removal of economic and formal barriers to entry into the educational system is not sufficient to create equal opportunities in outcome possibilities for given talent and abilities. From an efficiency point of view it implies that the human capital potential in the population is not exploited as best as possible, or phrased by Halsey (1961) that there is an unused "pool of ability".

Figure 11: Odds ratio to access tertiary education by parents' educational attainment



Note: The "odds ratio" reflects the relative likelihood of participating in tertiary education of individuals whose parents have upper secondary or are participating in upper secondary education if parents do not have this level of education, i.e. the latter is the reference group.
Source: OECD 2014).

The social gradient in education is strong. While the precise mechanisms are debated there is ample empirical evidence that the social background of children and youth affect their educational attainment (entry and performance). To list a few key findings of importance for the following discussion: [16][17]

- The odds that young people will attend higher education are low if neither of the parents has completed higher education, and much higher if one of the parents has a higher education, OECD (2012).

- The barrier is not only economic, but cultural and social capital matters critically (Holm and Jæger (2007)). Even for children with comparable performance in primary and lower-secondary school in terms of grades, there is a social gradient in educational choices (OECD (2012)).

- Literacy and numeracy proficiency depend positively on parents' levels of education (OECD (2014)).

- Previous schooling has a substantially larger impact on preparing students from less-educated families to enter higher education. There is a link between inequalities in early schooling and students from families with low levels of education enrolling in higher education; see Heckman and Mosso (2014).

- The advantage of having highly educated parents is smaller in countries with high educational levels, high overall quality of overall schooling, and large public involvement in education (smaller private costs); see OECD (2012).

- Social mobility is lower in countries with higher income inequality, cf. Björklund and Jäntti (2009) and Corak (2013).

These findings suggest that it is not only a question of economic barriers (credit constraints) but that there are further constraints, which may be addressed by public intervention in education. The following considers this issue in some detail. To clarify, the mechanisms focus solely on social barriers to education. Clearly, personal characteristics and in particular abilities matter as well, but these aspects are disregarded to focus on the role of social barriers. The following is based on Andersen (2015a).

Consider a basic overlapping generations setting where individuals live for two periods. As young educational efforts are made to acquire education and become skilled as old. Individuals succeed education and become skilled with a probability depending on both their educational input and their social background. Children with skilled parents have a higher chance of becoming skilled for a given educational input than children with unskilled parents. This captures key elements of the social factors outlined above. As young, agents can spend time studying or working as unskilled, and as old they work as skilled if succeeding education and unskilled if non-educated. Education thus has an opportunity cost in terms of foregone income as young[18] [19]. Since children with skilled parents, other things being equal, have a better chance of succeeding in education, they invest more in education, and this tends to reinforce their chance of succeeding in the educational system and become skilled. Similarly, children with unskilled parents are less inclined to pursue and less likely to succeed education.

In equilibrium there is social mobility, but social status is reproduced in the sense that children with skilled parents are more likely to become skilled than children with unskilled parents and vice versa. There is a dynamic effect of a change in the share of skilled. If more education inputs are invested, more will become skilled, which in turn affects future educational choices and thus the share of skilled. In this sense education produces education.

This raises questions on the rationale and form of public intervention. Assume for the sake of argument that the public sector can offer educational inputs which are perfect substitutes to private education; i.e. the public sector does not have any options which are not available in the market. In the same vein it is assumed that public education is general and accessible to all at the same terms (i.e. it is not targeted specific groups). To a first

[16] See e.g. Holmlund et al. (2011) for an overview and discussion of various methods to separate the two. Among other things it is concluded that "...we think that all these twin, adoption, and IV finding suggest that schooling is in part responsible for the intergenerational schooling link: more educated parents get more educated children because of more education" (page 626).

[17] Heckman has in a number of studies analysed the role of (early) intervention in overcoming social barriers to education; see e.g. Heckman and Mosso (2014) for an overview and references.

[18] Hence, there is no up-front financing requirement to start education, and hence the capital market plays no role.

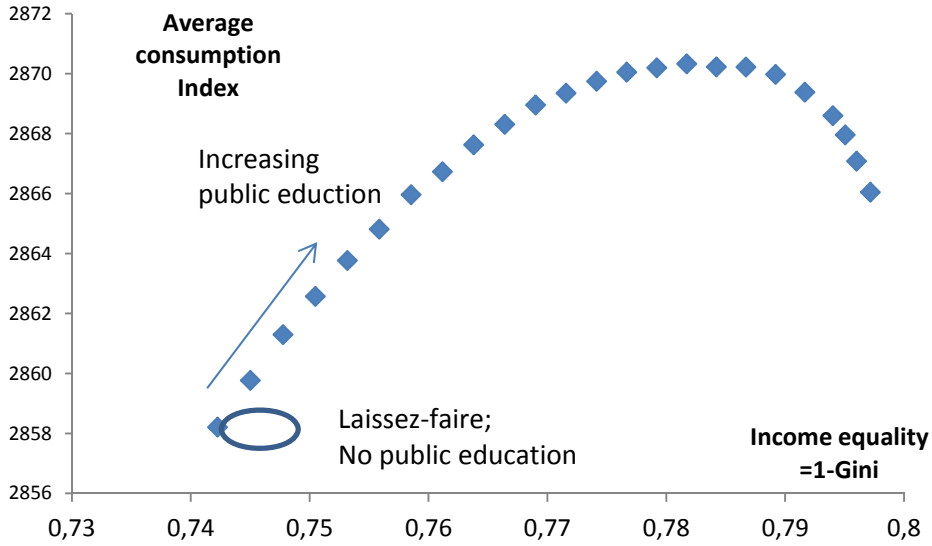
[19] Note that the educational decision is entirely driven by economic conditions, the choice sets are the same for all youth, but the "productivity" of their educational effort differs due to social factors.

approximation, this may be said to characterize general public schooling, and serves the purpose of not biasing the analysis towards a favourable role for public education. Under these assumptions public education will crowd out private education; however, crowding out is in general less than complete. Educational inputs will therefore in net terms increase. The reason for less than complete crowding out is that more public education releases an income effect for the young, which in turn lowers their marginal utility of consumption and thus the opportunity costs of private education.

Any suboptimal educational choices are in this setting caused by social barriers. There are no differences in abilities or capital market imperfections or the like impeding education. This suggests a possibility that the pool of abilities in the population is not efficiently used. Is it possible that public intervention in a setting with social barriers to education can be Pareto-improving? In Andersen (2015a) it is shown that public intervention can be Pareto-improving. The condition is that public education increases total consumption possibilities in society. If this is the case, the gainers are able to compensate the losers. On pure efficiency grounds there may thus be an argument for public intervention. Social barriers are a market failure on par with capital market imperfections.

In Figure 12 the effect of an increase in public education is illustrated. The figure shows the effects on efficiency measured by aggregate living standards (consumption) and equity by its distribution for various levels of public education. An increase in public education traces out a hump-shaped pattern in the efficiency-equity space. Starting from the laissez-faire situation, an increase in public consumption increases aggregate living standards and reduces inequality, but at some point living standards start declining while inequality keeps declining. The hump shape is interesting since it shows that public intervention over some interval does not raise a conflict between efficiency and equity. Keeping increasing public education would imply that a turning point is reached, and a conflict or trade-off between income and inequality arises. Note also that if social preferences are increasing in living standards and equality, it is optimal to be on the segment of the locus which displays a trade-off.

Figure 12: Income-equality locus – public investments in education

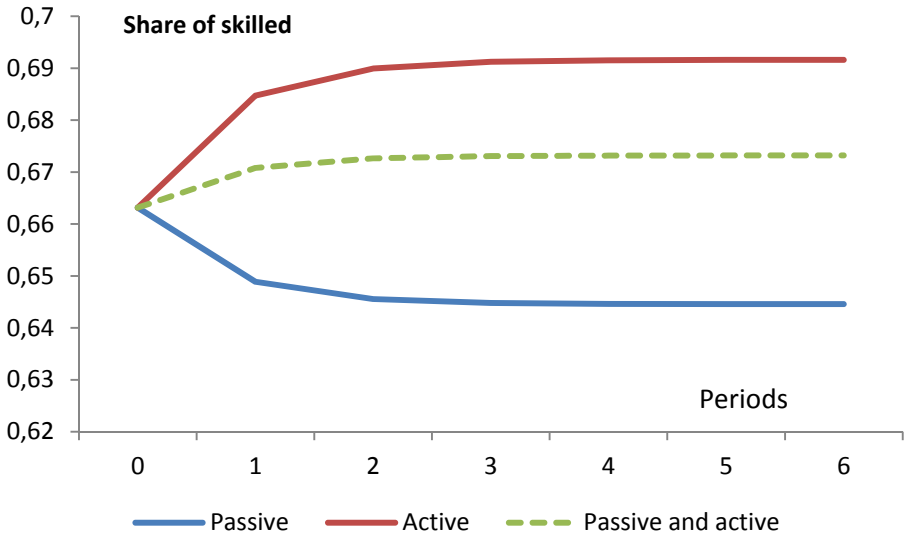


Note: Income inequality is measured as 1- Gini
Source: Results from simulation reported in Andersen (2015a).

Inequality in consumption possibilities creates a motive for redistribution. Skilled (old) will have higher income than unskilled (old). Consider a transfer scheme which provides income support to the unskilled old which is financed by a tax on the skilled. Compare the passive scheme to an active scheme providing education to the

young, and also financed by a tax on the skilled (old). The two forms of redistribution affect education differently. The active scheme increases education, while the passive scheme reduces education. On impact the passive scheme benefits the unskilled old, but over time it implies that the number of unskilled increases. The passive scheme distorts educational choices by lowering the gain from education. Oppositely, the active scheme does not on impact benefit the unskilled, but it reduces the share of unskilled over time[20]. These different dynamic implications are illustrated in Figure 13, which considers three different policy scenarios all starting from an initial situation without any public intervention (laissez-faire): passive redistribution, active redistribution and combining passive and active redistribution. It is seen that the share of skilled develops differently. Active redistribution has a tail wind by increasing the share of skilled by improving the social background of children which further increases the number of skilled and reduces taxes, while passive transfers work in the opposite direction.

Figure 13: Dynamic adjustment of the share of skilled, active vs. passive redistribution

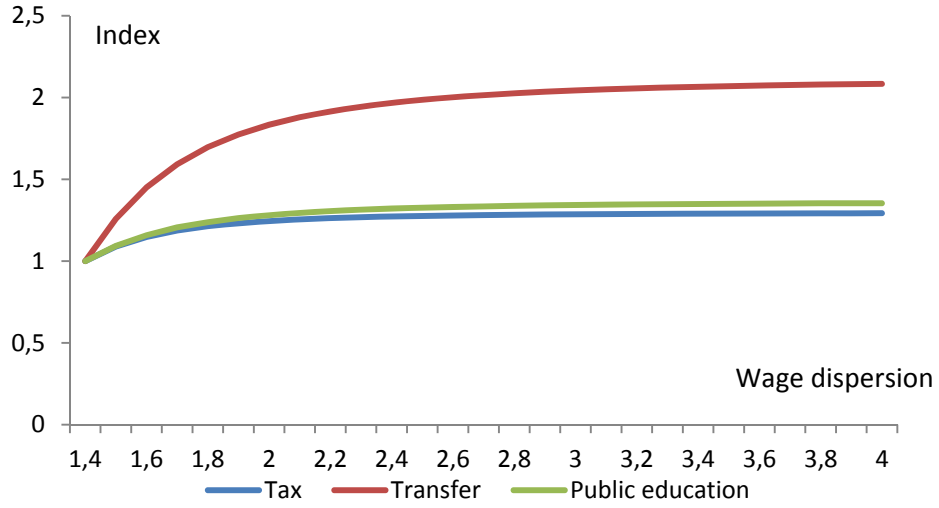


Source: Results from simulation reported in Andersen (2015a).

If market forces increase wage dispersion, there is both a stronger incentive to educate but also a potentially greater need for passive redistribution. How should optimal policies respond to such a change? Clearly this depends on the social welfare function. To work out the response, the following assumes a utilitarian social welfare function and considers welfare in steady state. This particular social welfare function can be contested, but it is widely used in the literature, and hence it is a useful starting point by which to discuss how policies may respond to changes in market conditions. Both active and passive redistribution expand when wage dispersion widens, and in this sense the public sector takes on a more active role. Several effects are at play. First, private incentives to educate increase since the wage gains become larger. Second, for the same reason the social gain to public education increases, and since private choices are suboptimal, it is optimal to increase public education. Finally, the widening wage dispersion increases the gain from passive redistribution. Specifically the marginal utility for the skilled declines (they get a higher wage and thus consumption) relative to the marginal utility for the unskilled, and this increases the gains from passive redistribution. Figure 14 illustrates the adjustment of transfers, public education and taxes under the optimal policy to widening wage dispersion between skilled and unskilled.

[20] The present case assumes constant wages. If wages are endogenous, there is the additional effect that more skilled will tend to reduce the wages of skilled and increase the wages of unskilled, and therefore further reduce wage inequality.

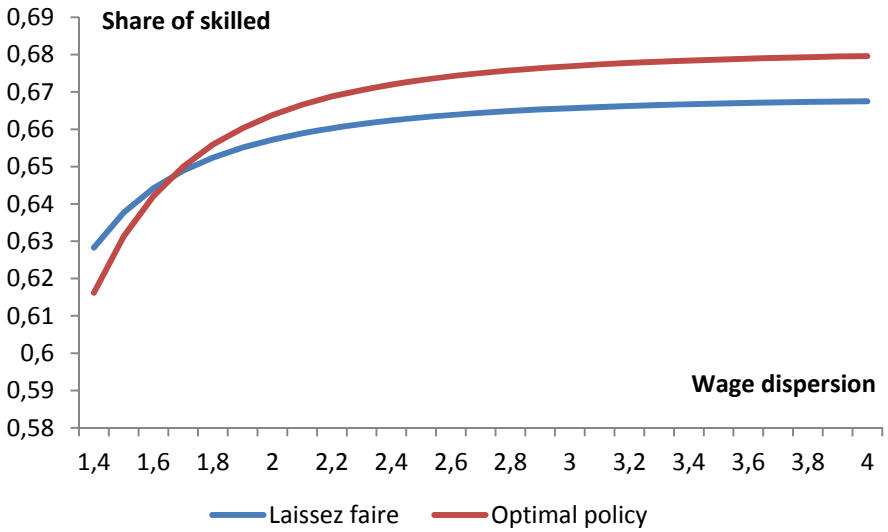
Figure 14: Optimal policy response to widening wage dispersion



Note: Policies compared to policies for low wage dispersion, i.e. index =1 corresponds to policies for wage dispersion =1.4. Wage dispersion is givens as the ratio of wages for skilled to unskilled.
Source: Results from simulation reported in Andersen (2015a).

As noted, the two policies have different implications for the share of skilled. Figure 15 shows how the share of skilled evolves in the laissez-faire case and under the optimal policy. Interestingly, the share of skilled under the optimal policy may be smaller than in the laissez-faire case for low levels of wage dispersion. The reason is the effect of the passive transfer lowering educational incentives.

Figure 15: Share of skilled under laissez-faire and optimal policy

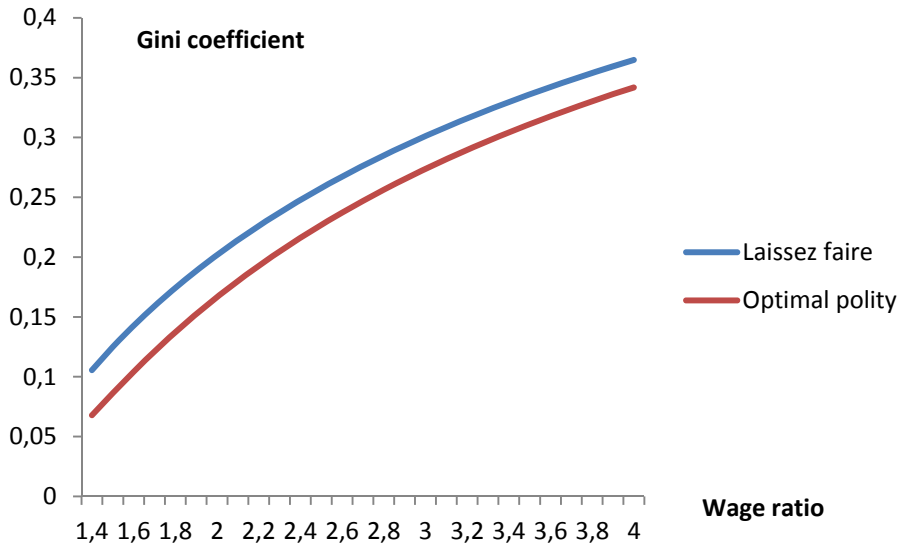


Source: Results from simulation reported in Andersen (2015a).

Finally, although the planner engages both in more passive and active redistribution it is seen from Figure 16 that the net effect is an increase in inequality. Hence, the optimal policy response does not fully neutralize the effect on inequality from widening wage dispersion. This points to two general observations. First, neither

active nor passive redistribution is costless; hence the larger need has to be weighted against the larger costs. The effect of the exogenous shift in wage dispersion on inequality is mitigated but not neutralized. Secondly, the precise response obviously depends on the social welfare function and how it trades off efficiency against equity.

Figure 16: Inequality and wage dispersion: Laissez-faire and optimal policy



Source: Results from simulation reported in Andersen (2015a).

5. POLICY IMPLICATIONS

A higher level and more equal distribution of human capital are associated with more growth and a more equal distribution of incomes. Human capital growth has ceased in a number of countries, and inequality in education remains substantial. This leaves scope for policies which can both boost growth and ensure more equality.

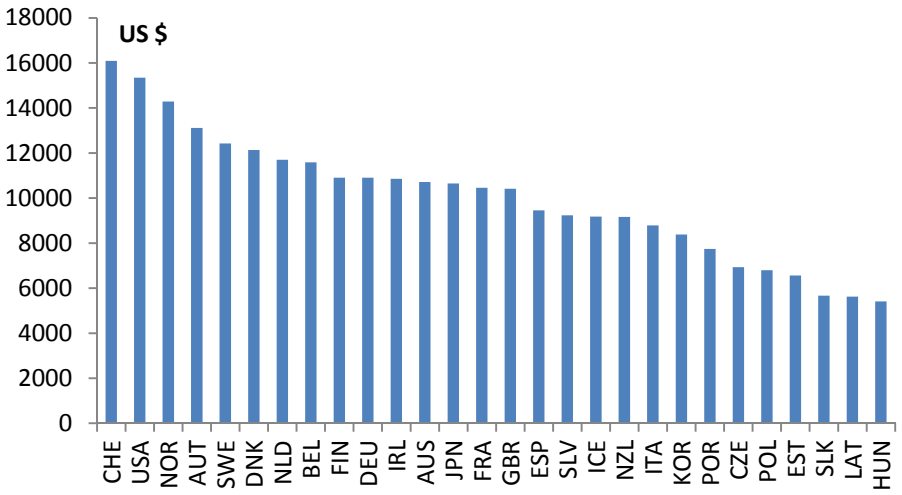
As a starting observation it is worth remarking that the boundaries for the level and distribution of human capital have not been reached. This is seen from wide country differences in human capital acquisition measured both quantitatively and qualitatively, and the fact that social barriers matter for educational choices and outcomes, cf. evidence discussed above.

What are the policy options for improving human capital accumulation along both the quantitative and qualitative dimensions? Where are the most binding barriers?

The present situation leaves an education paradox. Labour market developments have clearly increased the premium to qualifications and thus education, and yet a large educational gap remains. In particular, a large share – about 1 in 5 on average across OECD countries – of each cohort does not obtain a market relevant education. If the gains from education are so large, why don't more young people obtain education? Part of the explanation may be myopia and underestimation of the gains from education. This can, however, not be the sole explanation. Most young people do start on some education, but high drop-out rates keep educational achievements down. This strongly suggests that the binding constraint is not the supply capacity in the educational system, but rather factors related to social barriers, motivation, learning capabilities, teaching methods and approaches etc. which are influential in creating the foundation and motivation for education.

Public involvement in education is large in all countries, but there are some variations both in the level and split between private and public financing. Figure 17 gives annual expenditures per student. In a situation with strained public finances, it is worth stressing that educational expenditures have important short- and long-term effects, and thus should be prioritized. Cross-country evidence does not point to a clear relation between resource use and educational outcomes, OECD (2014). This suggests that financial factors are not necessarily the most binding constraint for the education system in most countries, which stresses the importance of organization and design of education. However, the allocation of resources within the educational system may be an issue, especially whether sufficient resources are spent on primary education and early intervention to ensure equal opportunities in educational possibilities; see e.g. Corak (2013) and OECD (2014).

Figure 17: Annual expenditure per student by educational institutions, 2011



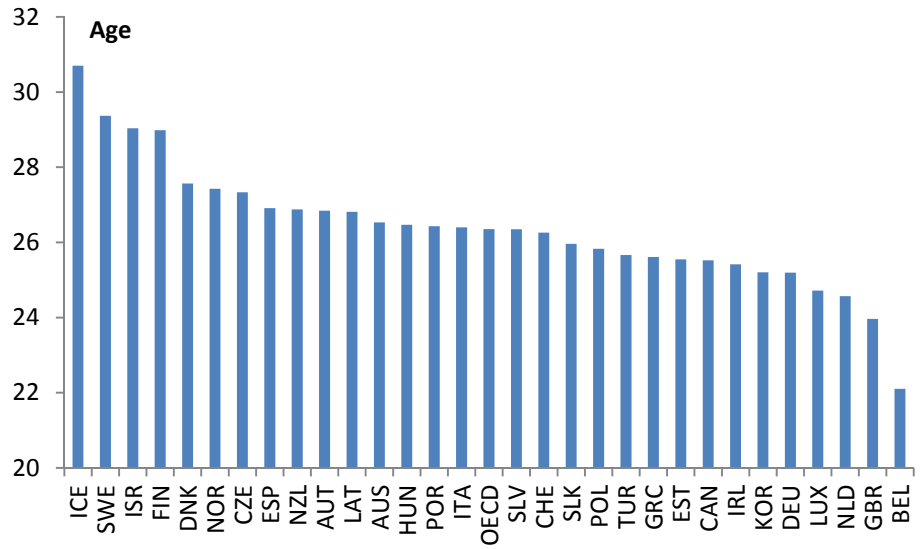
Note: USD, converted by PPP exchange rates. Based on full-time equivalents for primary through tertiary education. Source: OECD, Education at a Glance 2014.

This raises questions on both productivity and efficiency in the educational sector. Productivity in the sense of whether given tasks are solved in the most cost-effective way, and efficiency in the sense of whether the right tasks are pursued. In both respects there seems to be room for improvements in a number of countries, and the following highlights a few important possibilities.

The role of social barriers has already been discussed in Section 4.2. There is a large literature documenting the importance of early intervention to overcome social barriers. It is an implication of these studies that early intervention also is more cost effective than later interventions coping with the consequences of low education and social problems.

There has been a trend increase in both entry into and exit ages from especially tertiary education. Cross-country evidence shows that this is a particular problem in a number of countries, cf. Figure 18 .This is problematic for two reasons. First, during these "delay" periods a large share of youth works in unskilled jobs. In this way the supply of unskilled labour is expanded by individuals having the potential of becoming highly educated and who later do get an education. This imposes a negative externality on the group who has a harder time acquiring education and for whom these jobs are their realistic labour market opportunity. Second, both the private and social return from education are reduced by late start and completion of education. It is thus important to ensure a more expedite transition into tertiary education.

Figure 18: Average age – tertiary education, 2012



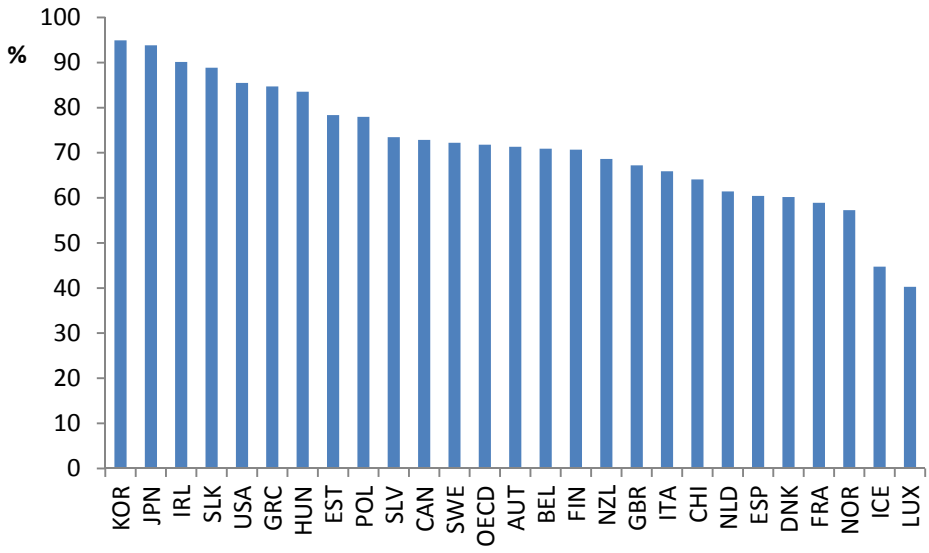
Note: Average age of graduates at ISCED 5A level.
Source: OECD, Education at a Glance 2014.

In many countries there are high drop-out rates and a high level of churning with multiple starts on education, cf. Figure 19 showing an indicator for delay in upper secondary programmes. While some drop-out and change of educational plans should be allowed for, the level is in some countries high and very resource demanding.

There are also important issues concerning the structure of educations along both the horizontal and vertical dimension. In the vertical dimension, there has been much focus on tertiary education under the heading of the "knowledge society". While there is substantial evidence in support of skill-bias in labour demand it is questionable whether it has been translated too rigidly into requirements in terms of (higher) education. Hanuschek and Woessmann (2011) document the importance of education along the qualitative dimension, but also the importance of the composition. They find that the quality of education (measured by performance tests) matters for productivity growth, and also that the composition of education matters. In particular, the

importance of having high quality vocational training and the effect hereof for productivity growth may be larger than the effects of educations at the top.

Figure 19: Successful completion within stipulated duration of upper secondary programmes

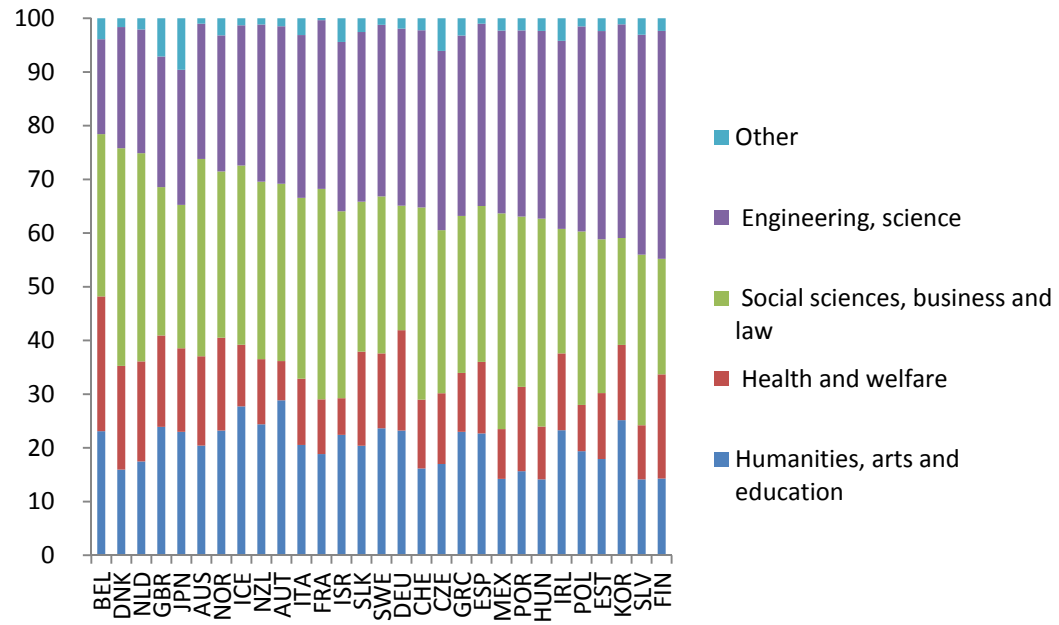


Note: Successful completion within stipulated duration of upper secondary programmes.
Source: OECD, Education at a Glance 2014.

Along the horizontal dimension, there is also a question of field or specialization. This is related to the question of over-education in the sense that more are educated with particular specializations than is demanded. In this context there is an issue of the consumption (nice to know) vs. investment or labour market (need to know) value of education. This is particularly an issue in countries where education is almost entirely publicly financed and with unrestricted access creating an environment where educational choices may be affected more by their "consumption" than their "investment" value. This may lead to "over-supply" for certain educations. It also raises a question of who should carry the costs of "wrong" choices. If education is basically free (besides the opportunity cost) and there are no entry constraints, how far should the "insurance" go in terms of income support if no job can be found? Is there an implicit guarantee that education relevant jobs should be available, or should the individuals search more widely for jobs, possibly for jobs for which they are "over-educated"?

Discussions of over-education are difficult, and there are inherent measurement problems in trying to empirically measure the prevalence of over-education. The question of over-education is also related to various adjustment mechanisms, which involve both pros and cons. In principle, wages should adjust to ensure a balance between supply and demand. Hence, if some educations are in excess supply, the implications should be a market adjustment resulting in lower wages (alternatively higher unemployment) for these educational groups. If educational choices respond to this, the problem should disappear in the medium/long-run. If "overeducated" search for jobs with lower qualification requirements, there is a trickle-down effect and possible inefficiencies in the sense that they could have qualified for the job in a more straightforward and less costly way. Even if these individuals have higher productivity in such a job, it is not obvious that this makes the extra education worthwhile. On the other hand, it may be argued that there is an important buffer role in a risky and changing labour market. Given the difficulties of predicting future labour demand, some "overeducation" may be justified under the plausible assumption that it is easier to adjust "downwards" than "upwards". This applies both along the vertical and horizontal dimension.

Figure 20: Distribution of tertiary new entrants, by field of education (2012)



Note: Distribution of tertiary new entrants, by field of education.
Source: OECD, Education at a Glance 2014

Finally, there is an issue of student grants/subsidies. For individuals obtaining higher education, educational subsidies tend to be regressive in a life time perspective (see e.g. Velfærdskommissionen (2006)), but why make transfers to individuals who likely end up in the upper end of the income distribution? Especially if tax progression is declining, possibly under the pressure from globalization. In such a situation, it may from a distributional point of view be logical to reduce student support for high income groups, i.e. tertiary education. The counter-argument is that financing may be a barrier to education. This may apply even if these grants are loans; cf. the discussion above on social barriers. However, for tertiary education, and in particular the transition from the bachelor level into the masters level, the role of social barriers is washed out, and some student fees, which can be in the form of debt to be repaid upon graduation, are unlikely to be a significant deterrent for educational choices and may also strengthen the focus on the "investment" value of educations.

6. CONCLUSION

Inequality is on the rise at the same time as the scope for traditional distribution policies via taxes and transfers are constrained by lack of fiscal space. Moreover, the distortionary effects and thus societal cost of redistribution may be increasing due to globalization. This depicts a gloomy picture, but the traditional discussion on redistribution overlooks the basic fact that the foundation for an equal distribution is created in the labour market. Ensuring a more equal distribution of education would thus lead to a more equal distribution of income. This points to the importance of an active distribution policy via education (level and distribution) which also requires more focus on ensuring de facto equal opportunities in educational choices and options – an ethical value which is widely supported.

Importantly, there is scope for improvements given the resources already allocated to education. More resources may be called for, but in the first place it is an important policy challenge to exploit the room for improvements given the resources already provided. The most binding constraint for educational performance and achievement does not seem to be educational supply capacity in the quantitative dimension. Most young start on some post-secondary education, the problem is that a large share never complete. The reasons for this are numerous, including insufficient proficiency and motivation as well as social background factors which impede educational performance. There is thus an urgent need for improvements in education in both the quantitative and qualitative dimension to ensure that education is not lagging too much behind in the race against technology.

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