6. SCHOOLING, WAGE RISK AND INEQUALITY[1]

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6.1 Motivation

The scarce evidence available suggests that both income and wage inequality have been on the rise in the Western world since the 1980s. This result is particularly clear for the United States and the poorer European Union member states, but applies also to the other Western Europe countries.

The main explanation for this phenomenon lies on globalisation. Either through the increase of trade, namely with less developed countries, or through a faster spread of technology, globalisation is likely to have had impacted on the premium of skills in Western countries.

The role of the distribution of skills is in fact crucial as the less skilled are precisely those who have lost the most in wage terms since the early 1980s. Given that employers may transfer their production to countries where wages for non-skilled work is much lower, the less-skilled workers from the Western world see the demand for their labour fall. On top of that, the technological advances require skilled, rather than unskilled, individuals, which leads to a further decrease in the demand for the latter workers.

Given this background, policy-makers have argued that schooling is the best weapon to erode the rising wage inequality. For instance, the recent Lisbon EU Summit placed a great amount of emphasis on training, so that the new internet-related technologies could be spread more fairly across the people in order to eradicate the "info-exclusion" process.

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[1] For extended and more technical versions of this summary chapter, see the papers *Does Education Reduce Wage Inequality? Quantile Regressions Evidence From Fifteen European Countries* and *Schooling, Wage Risk and Inequality*, both available at the PURE web-site www.etla.fi/PURE and at the authors' web-sites www.fe.unl.pt/~psmart and www.fe.unl.pt/~ppereira.

On a more general note, investments in schooling are perceived to be a relatively non-distortionary way to influence the wage distribution. This contrasts with changes in the tax system, namely those meant to make it more progressive, which may entail substantial labour supply disincentive effects. It is thus understandable that policy-makers have turned to schooling provision as a better way to achieve efficiency-equity fine-tunings.

However, the scope of schooling to cut wage inequality is overall an issue poorly researched so far. Although one may assume that a more balanced distribution of schooling will result in a more balanced distribution of earnings, the truth is that the characteristics of both education systems and labour markets and their interactions may prevent that from happening. In this chapter we endeavour to shed some light on this issue, by analysing specific results from PURE countries (plus the US case).

Another related issue that we address in this chapter is wage risk. We define this as the unpredictability which further schooling may entail in terms of its earnings impact. This is a matter of concern, because so far it has been assumed in the traditional methodologies (described below) that there is no risk in this relationship. Undoubtedly this assumption is a gross simplification, as the schooling investment is liable on many factors that may make what initially seems to be a sound investment into a not so profitable one. Following a similar approach to the one we use for the wage inequality case, we present some evidence also for this matter.

6.2 Methodology

The traditional tool to assess the impact of schooling on earnings has been the Mincer equation. This framework, which has been used extensively in the PURE project (see Chapter 2 of this volume), posits that the earnings of individuals depend on some of their observable characteristics, such as their schooling attainment and their degree of labour-market experience, plus some unobservable features. Moreover, the usual estimation procedure (ordinary least squares regression, OLS) considers the impact of such characteristics “on the average”. It allows one to say that, “on the average”, schooling is associated with, say, a 6% increase in earnings. This average concerns all individuals having attained a given level of schooling, regardless of their precise amount of earnings.

Here we adopt a different estimation approach, *quantile regressions (QR)*. This technique allows us to assess the impact of schooling at different points of the distribution of the dependent variable. In particular, this means that we assess the earnings-enhancing scope of schooling both for those individuals who receive high earnings given their schooling and for those who earn low wages, also given their schooling. When using the OLS estimation method, these differences – between those who did better and worse given their schooling level – are not taken into account as they are amalgamated into a single group. With this new methodology, we explicitly focus on these differences and assess the contribution of schooling upon the different types of individuals (that is, those who do better and worse given their schooling attainment).

We thus evaluate the contribution of schooling to inequality by comparing the returns at the bottom and the top of the wage distribution. A necessary result of the view that schooling decreases (within-levels) inequality would be that the return to schooling for individuals who do worse in the labour market, given their schooling level, is higher than for those who do better.

Wage risk, in turn, is measured by the difference in returns at the top and the bottom of the wage distribution. The rationale for this approach is that if this difference is small, then the amount of within-educational-levels wage inequality is small, implying that one's education investment is not liable to uncertainty in terms of whether it will pay off much better or much worse than on average.

6.3 Data

We draw on the PURE micro data sets and on comparable information from the USA. All results refer to the mid-90s and to the case of men. Descriptive statistics on average schooling attainment and wage inequality levels (which also include information for the early 1980s) indicate that both measures have increased during the period covered. However, they reveal significant differences between countries as well. In terms of schooling, Southern European countries have particularly lower levels (Figure 6.1).

With respect to wage inequality, the Cohesion Fund EU countries (Portugal, Spain, Ireland and Greece) exhibit the higher values (Figure 6.2). This phenomenon may be related to the so-called Kuznets curve. This theoretical relationship argues that as countries experience economic development, inequality will initially rise (when the

country is very poor and there is little scope for differentiation) and will then fall (when the country becomes richer and there is, once again, little scope for differentiation).

Figure 6.1. Schooling levels of the work force, 1980 and 1995

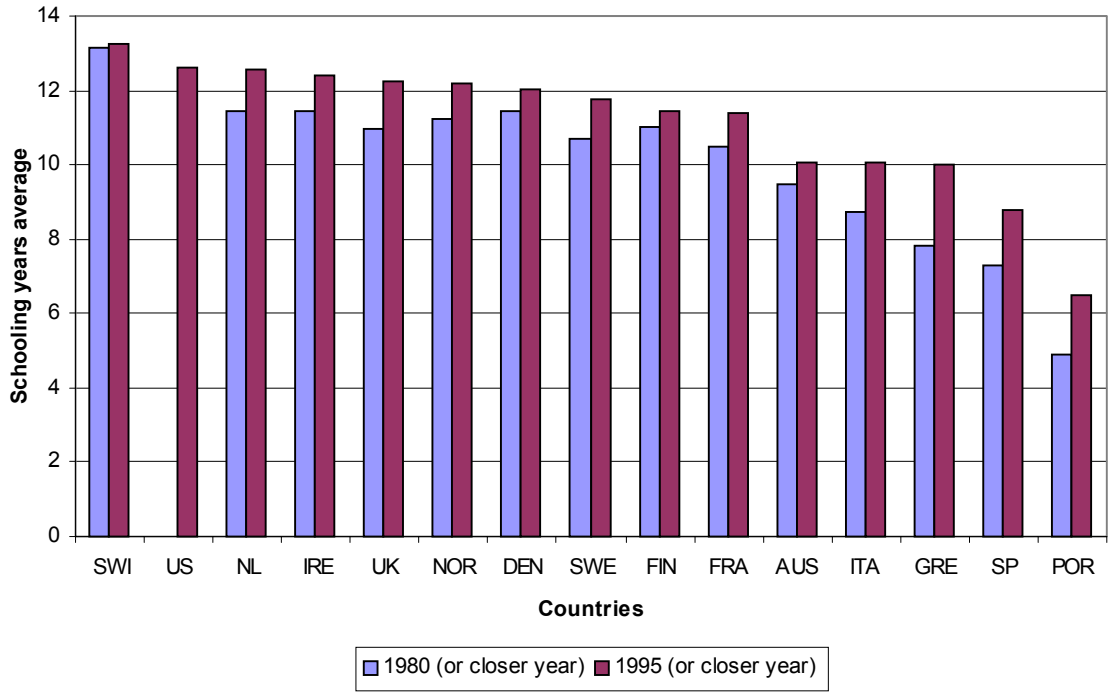
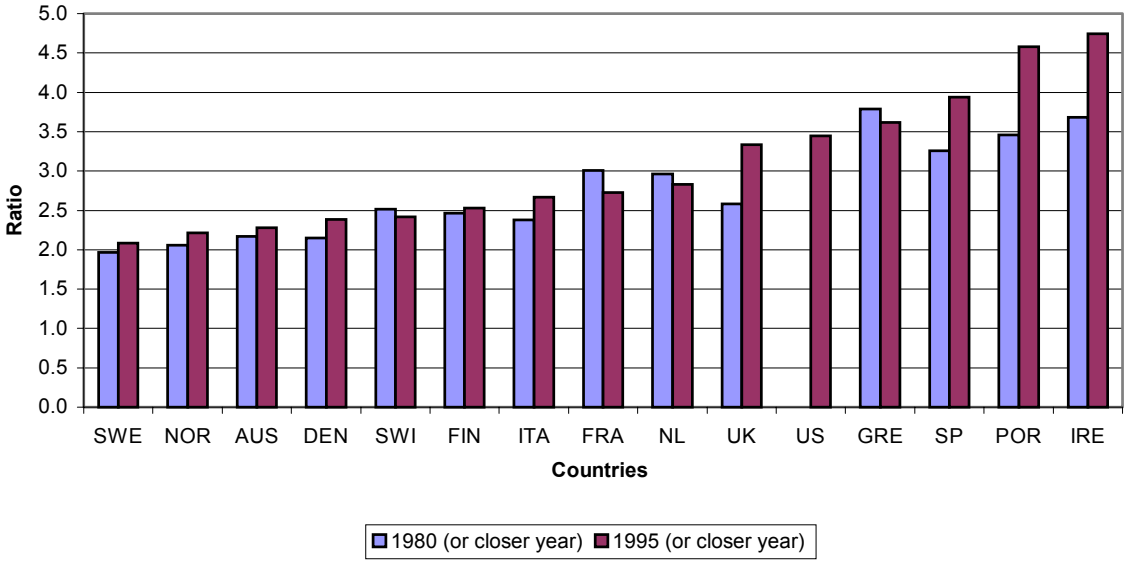


Figure 6.2. Wage inequality, 1980 and 1995, measured as the ratio between the 9th and the 1st decile (gross hourly wages)

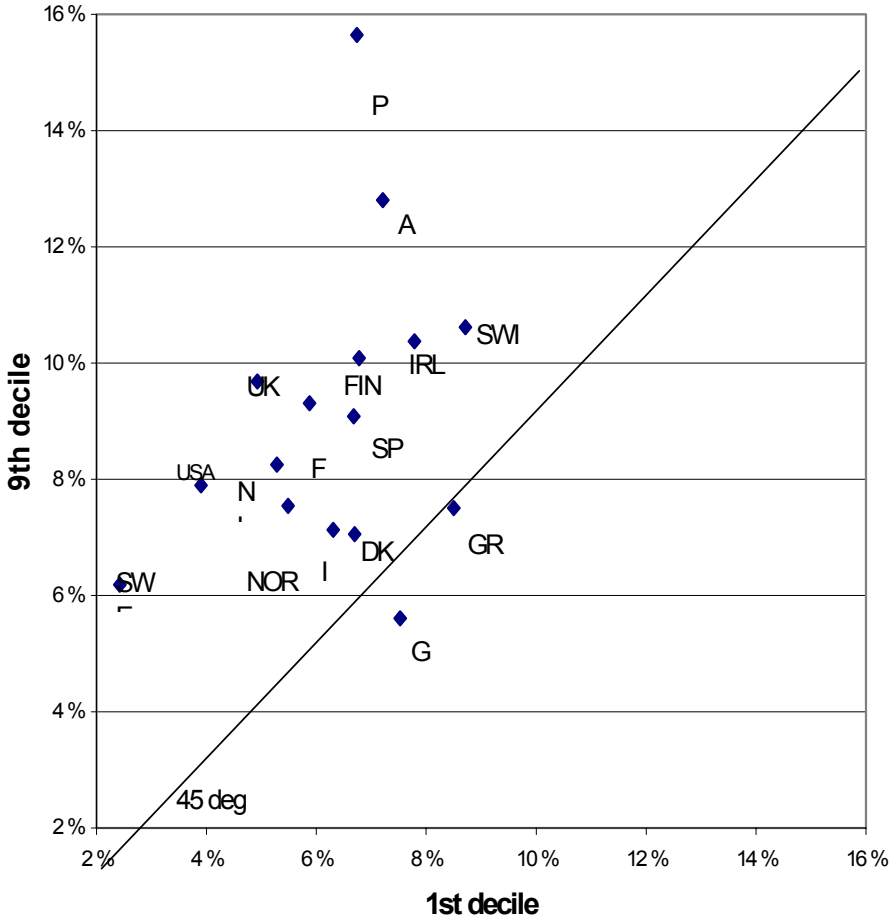


6.4 Results

One may have expected that the heterogeneity across the countries surveyed, in terms both of their schooling systems and labour-market institutions, would be translated into heterogeneous results. However, we found a very similar result across the countries, so similar that one may refer to it as a stylised fact: Returns to schooling turned out to be consistently higher for those individuals who earn more given their schooling levels.

As can be seen from Figure 6.3, which depicts the return to schooling at the top against that at the bottom of the wage distribution, most countries are placed in the upper, left-hand-side triangle. This result means that within-educational-levels pay differences increase with the educational level.

Figure 6.3. Returns to education, quantile regression



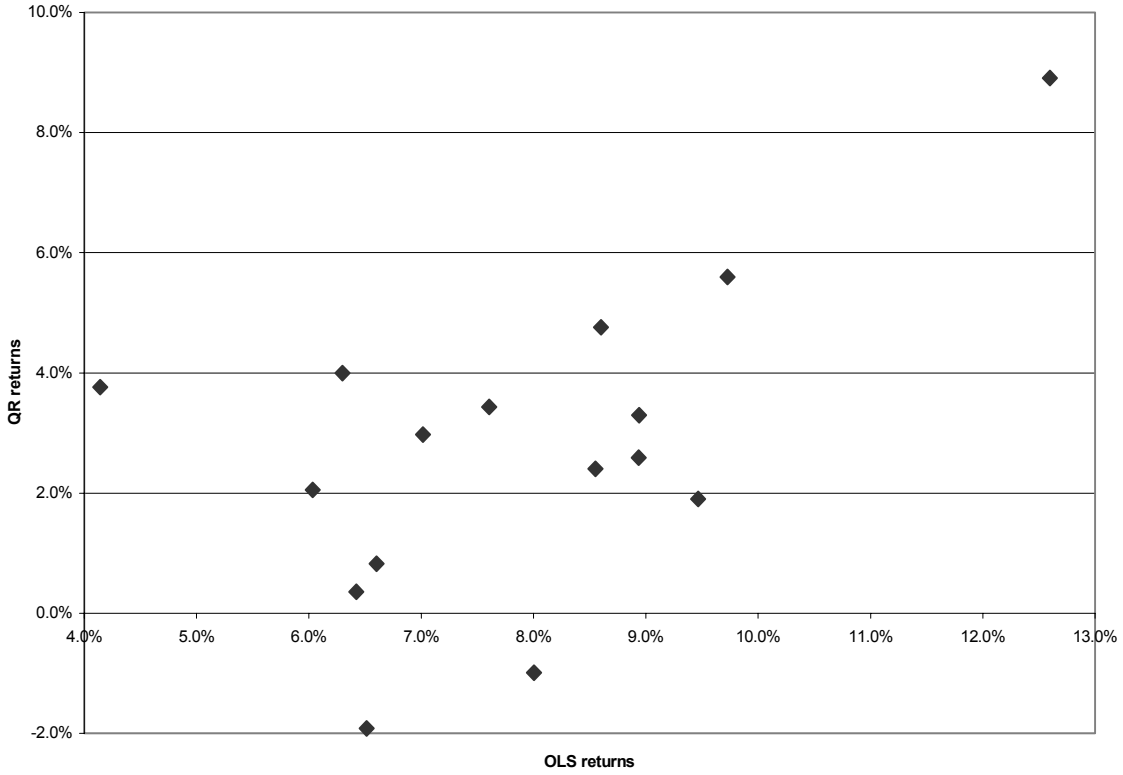
The single exception to this pattern is Germany (the results for Greece should be disregarded as they are not fully comparable with those of the remaining countries, given that this country's results are based on net wages, rather than gross wages). Unlike for the other countries, the returns obtained for Germany are approximately the same for "richer" and "poorer" individuals.

With respect to the wage risk dimension, we thus also find high degrees of uncertainty in the European labour markets. An additional finding is obtained by considering simultaneously the wage-risk measure (the difference between returns at the top and the bottom of the wage distribution) and the average return to education (the one resulting from OLS estimation) – see Figure 6.4.

This analysis reveals a strong positive correlation between the two measures (with a correlation coefficient of 0.6). This means that, in international terms, higher average

returns are associated with riskier returns; countries which boast higher returns to education have generally also more dispersed returns to education and vice versa.

Figure 6.4. Spread in QR returns and OLS returns to education


10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
QR returns
4.0%
5.0%
6.0%
7.0%
8.0%
9.0%
10.0%
11.0%
12.0%
13.0%
OLS returns

6.5 Discussion

One may outline a few explanations which are consistent with the pattern we have uncovered: higher returns to education to individuals who do better in the labour market (i.e., that given their observable characteristics, they end up with higher earnings than those other individuals apparently similar to them).

A first explanation relates to over-education, which occurs when highly educated individuals take jobs that could be performed by workers with lower qualifications. (Over-education may be an important problem if the individuals affected by it perceived their schooling as an investment (rather than consumption) and had high expectations towards the return on that investment.) If this argument holds, then one would in fact witness a lower return to schooling for those workers who do worse in the labour market, given their educational attainment – as we do in our data.

A second explanation concerns a possible interaction between ability and schooling, thus amplifying the impact of ability upon earnings. (By ability we mean the set of the individuals' characteristics which make them particularly suitable for some job and which are likely to be rewarded financially, given that their productivity is higher.) This is an argument along the lines of the nature-rather-than-nurture line of thought, which would require factors that are difficult to influence in school to have a strong impact on the individual's socio-economic performance.

A third and last explanation regards school quality differences. The approach adopted in this study implicitly assumed all schooling to be the same, as it only acknowledged school quantity variation. It may, however, be the case that individuals who do worse at the labour market (given their schooling attainment) are precisely the same who have received lower-quality schooling. If this were the case, we would indeed expect the returns to be lower for individuals who interacted with lower-quality schooling.

We find these explanations particularly convincing as they fit into the exception of Germany. In fact, this country's educational system is characterised by a good matching between labour market needs and skills supplied (e.g. apprenticeships) which, together with the relatively low number of undergraduate students, may erode the scope for over-education to rear its ugly head. Moreover, Germany has been characterised by a strong ability tracking system. This means that the ability spread within each educational level is small, thus preventing the hypothesised schooling-ability interaction from influencing

the country's results. Finally, Germany has also been characterised by strong uniformity in terms of school quality.

All in all, our findings suggest that the link between schooling and inequality is definitely not a straightforward one. Broadly speaking, higher schooling levels are characterised by more dispersed distributions of earnings.

An overall and definitive analysis of the link between schooling and inequality would, of course, also have to account for issues concerning between-educational-level inequality. Educational expansion may entail higher inequality because of more individuals shifting into within-inequality-prone schooling levels. But at the same time this might be more than compensated for by having more individuals in *on the average* better paying schooling attainment levels. However, with the approach adopted here, our work inevitably casts some doubts on the inequality-reducing properties commonly attributed to schooling.

With respect to the wage risk concept and the evidence we provide on it, we believe this is an important dimension of the returns to education literature, which has been overlooked so far. It may not be enough to outline the size of returns without mentioning their spread. Our evidence furthermore suggests that countries where the average returns to education are higher, are also characterised by a riskier relationship between schooling and earnings.