Main Results

Growing dissatisfaction with education systems in developed countries has led economists to focus on the private returns on education. This makes it possible to quantitatively measure the efficiency and equity of systems, but also to compare them from one country to another. As can be seen from the descriptive statistics, the number of students with long studies has been growing steadily over the last few decades. It is therefore important to be able to measure the return on investment of these future workers. The first model estimated is the one proposed by Mincer (1974), which is fairly simple but explains well the effect of education on wages. Our estimate of Mincer's model explains about 20% of wage dispersion by the dispersion of education and experience. In the literature, we generally find about 30%. Its advantage is therefore its simplicity of interpretation and its universally verified explanatory power, which is rare in economics.

The second model consists of Mincer's equation supplemented by the gender of the individual. The results are very close to those estimated with the Mincer equation: private returns equal to 9% per additional year of study. Moreover, the "gender" variable highlights a 30% wage gap between men and women, which is observed empirically.

Nevertheless, the counterpart of the simplicity of Mincer's equation is its limitations. Education, for example, is a highly endogenous variable. There is, the talent bias, which comes from unobservable factors correlated with education and wages, resulting in an overestimation of the return to education. Several methods can be used to deal with the problem, such as using primary differences in the case of panel data. However, economists Angrist and Krueger instrument the time spent in school by the quarter of birth, because of laws that prohibit leaving school before the sixteenth birthday. A person born at the end of the year is therefore likely to stay in school longer. Other instrumental variables can also be used, such as the distance of the household from the nearest university.

In fact, economists have found that the results obtained with Mincer's simple equation do not differ greatly from the results that are instrumented. Guille and Skalli (1999) found that the positive talent bias was offset by the negative measurement error bias in the surveys.

Finally, the most important limitation of Mincer's approach is that it imposes a marginal return to education that is common to all individuals and constant across all levels of education.

A second, much more comprehensive method for estimating returns to education is based on human capital theory. Education is seen as an investment that generates costs and benefits. The aim is then to estimate the net returns to an individual's educational investment, rather than the causal effect of education on the salary.

In the second part, we wish to measure the social returns on education. In the first model, social returns on education are simply estimated by OLS, taking into account the socio-demographic characteristics of the individual and the characteristics specific to the

department. Private returns are differentiated according to the type of diploma, using categorical variables. However, there is always a problem of endogeneity which leads to a positive bias in social returns. Once again, there are characteristics specific to the department and unobserved, linked to the attractiveness of the department. These variables are positively correlated to the proportion of employees with higher education qualifications, as an attractive department will tend to attract large companies and qualified individuals.

To try to solve the problems of endogeneities, we have estimated this model in first differences using the panel aspect of the data. In addition, we have instrumented the change in the proportion of university graduates by the creation of universities in the department in year N-5. The aim was to estimate social returns using a 2SlS. We were confronted with a weak instrument and a difficulty to correctly estimate the first step of the 2SlS. This leads to an inconclusive second step.

Finally, in a last model we have carried out an instrumentation of the individual and general level of diploma. The individual level is instrumented by the socio-professional category of the father and the general level by the number of institutions of higher education at year N-5 in the department. Compared to the model in question 7, we see that the social returns are lower. This confirms our hypothesis of positive bias.

Estimating the social returns to education is also important because governments have the necessary levers to raise the average level of education of the population. The question is therefore whether the education received by the individual increases his or her productivity and usefulness to community life. Private returns cannot be used as a basis for political decision-making. Indeed, wages are not only due to productivity, but also to negotiation, the presence of a dual labour market, etc... Moreover, signal theory effectively admits a framework where the increasing relationship between wages and education is compatible with the absence of an effect of education on productivity, because of information asymmetry. Social returns suggest that there is a positive externality, where the education of skilled workers has a beneficial effect on the welfare of others.