On the uncertain nature of human capital investments
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Chapter 6

Conclusion

This thesis consists of four essays all discussing different, but intervened, implications of uncertainty on investments in education.

In Chapter 2 we exploit an original internet collected dataset of Dutch high school student for answering some basic questions on the informational set that individuals own when taking choices about their investment in human capital. The direct survey method points to wide dispersion of expected median earnings among individuals, but few systematic influences can be pinpointed. The same holds for variance and skewness. Students allow for wide dispersion in the wage distributions associated with a particular education scenario and dispersions vary strongly between individuals. But again, there are very few systematic patterns that can explain the differences between individuals. In particular, the absence of influence of family background and ability indicators is at variance with what self-selection models based on private information would lead one to anticipate. Surprisingly enough, respondents do not seem to demand any type of compensation for this risk.

A most remarkable result in our analysis is the systematic lower wage expectations that females have for themselves. However, this is a systematic effect in all expectations and by consequence, anticipated rates of return to education do not vary by gender. Anticipated rates of return differ by education but not monotonically with education level. Some of our evidence is in line with self-selection models as the perceived probabilities to complete an extended education increase the perceived rate of return, for VMBO and VWO students, but not for HAVO students. Furthermore, secondary school students that do not intend to continue to university foresee a lower return to university
training than students that do intend to continue. Anyhow, it has to be said that in expected earnings levels we do not see patterns in line with self-selection; among VMBO students and among HAVO students, wage expectations do not differ by intention to continue or not.

Since this study is the first in this field dealing with an internet based survey, we dedicate some attention to examine whether such a new methodology is suitable for our intentions and for other researchers willing to exploit the potentiality of the medium. We do not find compelling evidence that our survey is evidently biased, e.g.: towards abler or more interested students. The number of erroneous answers – as violations of probability theory – is comparable with earlier, laboratory led, experiments, but by omitting feedback on the errors we lose a large number of observations. Mostly, the survey is afflicted by a high number of early quitters. This problem would, presumably, afflict every internet based survey addressed to such a young population and it is not specific to the method of obtaining information on wage expectations. Probably a more accurate design, length and phrasing could contribute in minimizing the number of early quitters. In all, we think the method of Dominitz and Manski can certainly be applied in open internet surveys. Nonetheless, much more work is needed in order to unravel the precise nature of wage expectations.

Variation in observed wages within educational cells has often been taken as an indication of risk that education bears (Díaz-Serrano, 2005; Bonin et al., 2007; Hartog, 2011). Yet, it may be conceived as a resultant of components that are foreseeable and components that are unforeseeable by the potential student when deciding on schooling. In a recent study Chen (2008) addresses these concerns by distinguishing observed and potential inequality and decomposing potential wage inequality into uncertainty and unobservable heterogeneity, allowing, at the same time, for self-selection and truncation biases. Chapter 3 replicates this study on the same sample and on three additional samples of American women, British men and German men.

The results of the replication on the same dataset are mixed as we are able to reproduce the original results only partially. We find that potential inequality is smaller, instead of larger than observed inequality as Chen finds. The transitory component in observed inequality is not equal to the permanent component, but only one third to one half of it. Observed and potential inequalities are only constant for high school graduates and beyond: high school drop-outs have higher values. We agree firmly only on the ratio between un-
certainty and unobserved heterogeneity as the former strongly dominates the latter. However, it is not highest for the lowest level of education but for the highest.

As for the result for US women, they are closer to our results for men than to Chen’s results. Potential inequality is again smaller than observed inequality, the transitory component is very small and much smaller than the permanent component, observed and potential inequality are increasing in education, the correlation coefficients are small, one of them is negative while the other three are positive and as for men in our estimates, uncertainty dominates over negligible heterogeneity and is increasing in education.

For the UK we find that potential inequality is greater than observed inequality in half the cases and smaller in the other half, both are declining in level of education, the transitory component is only a fraction of the permanent component, the correlation coefficient is not negligible, twice it is negative and in four cases it is positive, uncertainty dominates over heterogeneity with one exception and is declining in education.

In the German case, potential inequality is much larger than observed inequality, neither of them is monotonic in education, the transitory component is negligible and hence much smaller than the permanent component. The most remarkable outcome is correlation coefficients close to or even larger than 1. This leads to the impossible result of negative uncertainty.

Our replication of Chen’s results shows, at the very least, that differences in sample composition and instrumental variable choice give rise to very different results. This does not build confidence in the robustness or general validity of the outcomes. The results for Germany, with correlation coefficients above 1, raise even more doubts.

In Chapter 4, concentrating my attention on type of College major choice, I exploit recent advancements in the literature for semiparametric estimators in the case of polychotomous choice models, to test the often made assumption of endogenous schooling selection when future outcomes are uncertain. I also provide estimates for the effect that differences in personal risk level have for those choices. The main finding exposed in this Chapter is that concerns about risk significantly biases observed wages and observed wage variances for every one of the four College major category - Humanities, Sciences, Social Sciences and Health and Education - that I partition my sample into. The test of the Roy model for educational choices support the role of comparative
advantages in schooling decisions for three out of the four College major categories the only exception being Humanities. I advance the hypothesis that the almost absence of risk aversion for the Humanities graduates group could be a resultant of the particularly favorable family background that this group enjoys. I also find that OLS estimation severely underestimates returns to education up to more than 100%. Additional results, contributing to the growing literature of causal effects of schooling on risk, show how some types of education protect against macroeconomics shocks better than others, how Scientific and Social Sciences type of degrees entail less risk compared to Humanities and Health and Education type of educations and confirms the long-running growth of transitory volatility for college graduates earnings in the US for the past twenty years.

Chapter 5 responds to the skepticism surrounding parametric methods by developing a semiparametric alternative to Chen’s estimation strategy. The main advantage of using a semiparametric instead of a parametric method is the limited dependence on distributional assumptions for producing consistent estimates. The results shown there do not confirm most of the previous parametric estimates. In fact, all decompositions of wage dispersion (observed, potential and the transitory component) are maximum for high school and college drop outs; holding a degree, either from high school or college, is found to decrease wage variability by half; unobserved heterogeneity severely impacts wage variability; within educational wage variability for college graduates, once self-selection biases are controlled for, would be reduced, in a world where selection into education was not permitted, compared to the status quo.

What is clear from our analysis is that investing in education has a significant impact on risk of future wages and this is especially true for college education if not finished. If compensation for risk exists in the labor market (see, for example, Moretti, 2000; Hartog, 2011) and if this compensation works via higher wages for riskier occupations, our findings might contribute to explain the increase of educational level inequality observed in the U.S. and other advanced economies in the past 30 years.

A second general result emerging from the present analysis regards the roles that risk and private information respectively play in the formation of expectations and schooling choices. It is clear from the empirical evidence put forward in this thesis that even if private information exists and should be accounted for, uncertainty dominates it and heavily affects schooling choices.
Choice makers, in the forms of students, do have a certain amount of superior knowledge about their tastes and inclinations, but not enough to rule out risk and as the results of Chapters 2 and 4 testify, they are well aware of it.