Schooling as a Risky Investment: A Survey of Theory and Evidence

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Joop Hartog

Universiteit van Amsterdam
The Netherlands
j.hartog@uva.nl

Luis Diaz-Serrano

CREIP- Universitat Rovira i Virgili
Spain

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Schooling as a Risky Investment:
A Survey of Theory and Evidence[*]

Joop Hartog[1] and Luis Diaz-Serrano[2]

[1] *Universiteit van Amsterdam, The Netherlands, j.hartog@uva.nl*
[2] *CREIP- Universitat Rovira i Virgili, Spain*

Abstract

The survey primarily seeks to expose the literature, presumably in a
well-organized framework. There is no attempt to present any new analyses; only the chapter that lays out the potential scope for the presence
of risk in schooling decisions contains some data specifically collected
and organized for this survey. In presenting the models, emphasis is
on exposing assumptions and results, and leaving intermediate algebraic manipulations mostly to the original sources. The survey will
reveal a rather rugged terrain. It is not so difficult to expose ex post
variability in outcomes, but much harder to indicate how much of this
variability measures ex ante risk. We have theories and models, but not
a commonly applied and generally accepted standard model. Empirical evidence is often conflicting, mostly incomplete and in many cases
sparse and singular. Only on a few issues can we draw firm conclusions and consider the case closed. On most issues we can only call for

more research. It is, indeed, a challenging field worthy of much more attention than so far has been devoted. We need more theoretical effort to develop a work-horse analytical model and more empirical work to measure the risk that is associated with alternative schooling options and to estimate its effect on schooling choices. In particular the many policy choices on design of school systems (such as curriculum design, tracking, financial support for students) should be based on more robust empirical evidence.

Contents

1

Introduction

In an oft quoted metaphor, Adam Smith likened investment in education to erecting a machine. The student expects that the benefits of his training will replace him "the whole expense of his education, with at least the ordinary profits of an equally valuable capital" (Smith, 1776/1976, pp. 203–204). In the half century since the rediscovery of this insight, testing the statement and calculating the rate of return has become something of a subfield in labor economics. But Smith, laying out his five principal circumstances which explain wage differences, also pointed to the "constancy or inconstancy of employment" and to "the probability or improbability of success" in different employments. His argument is too convincing and too eloquently put to ignore. "In the greater part of mechanic trades, success is almost certain; but very uncertain in the liberal professions. Put your son apprentice to a shoemaker, there is little doubt of his learning to make a pair of shoes; but send him to study the law, it is at least twenty to one if ever he makes such proficiency as will enable him to live by the business. In a perfectly fair lottery, those who draw the prizes ought to gain all that is lost by those who draw the blanks. In a profession where twenty fail

for one that succeeds, that one ought to gain all that should have been gained by the unsuccessful twenty." Smith in fact claims that risk is not adequately compensated: "The lottery of the law, therefore, is very far from being a perfectly fair lottery; and that, as well as many other liberal and honourable professions, are, in point of pecuniary gain, evidently under-recompensed." That supply is nevertheless forthcoming is due to the high status of the professions ("the desire of the reputation, which attends upon superior excellence in any of them") and "the natural confidence which every man has more or less, not only in his own abilities, but in his own good fortune" (o.c., pp. 208–209).

These considerations of uncertain benefits from education have received far less attention than the rate of return as compensation for postponing earnings. In the advanced labor economics text by Cahuc and Zylberberg (1994), risk only refers to the employer's risk of imperfect observability of worker performance as emphasised in contract theory. Hamermesh and Rees (1993) refer to occupational health risk and to uncertainty in working hours and a wage premium for unemployment risk, but not to risk associated with investing in education. Willis' section in the *Handbook of Labor Economics* on the human capital earnings function (Willis, 1986b) has no attention for risk. Only Weiss' section on lifecycle earnings (Weiss, 1987), has a section on uncertainty, but with little follow-up.

Obviously, in educational choice, risk is everywhere. Every parent, potential student, teacher and school admissions officer is aware that there is large variation among individuals in school performance and the effects of their schooling. Tastes, abilities, requirements of school and work, graduation, the effect of graduation on employment, type of job, labor market success, all these variables are imperfectly known or foreseen when the individual has the age to decide on schooling. It is actually quite surprising that modern theory, after self-evident reference to the risk of investing in an education by the old masters, has waited so long to face the issues. Surely, the lead by Smith was picked up by Kuznets and Friedman (1954, Chapter 7), who pay attention to the transitory component in professionals' income and by Becker (1993, pp. 195–204), but only followed up in modern formal language by Levhari and Weiss in 1974, and then mostly left to rest. Only recently

has there been growing attention, no doubt stimulated by the general information/uncertainty revolution in economics.

This survey focusses squarely (and exclusively) on the risk that is associated with investing in education. Following Frank Knight it is common to use the term "risk" to refer to measurable uncertainty and "uncertainty" to unmeasurable uncertainty. In the case of risk, "the distribution of the outcome in a group of instances is known," while in the case of uncertainty this is not so (Knight, 1921, p. 233). All the theories in this book refer to measurable uncertainty and we will use the terms risk and uncertainty interchangeably, as confusion can be ruled out. We will survey the modest literature, identify dark corners in our knowledge and reflect on policy issues. We will start, in the next section, with some data on ex post variation in outcomes, like probability to graduate, probability to be employed, earnings dispersion and the like, to indicate at least the potential scope for risk, but also some indicators of ex ante risk. Econometric decomposition of variance into risk and heterogeneity is postponed to Section 5. Section 3 presents theoretical modeling of educational choice under uncertainty, Section 4 presents empirical evidence. Section 6 considers methods to cope with risk like hedging human capital risk by proper composition of a financial investment portfolio and self-insurance through consumption smoothing. Section 7 considers compensation in wages for the risk associated with schooling investment, thus following up on Adam Smith's claim that in his days risk was not sufficiently compensated. Section 8 considers policy issues; policies to promote accessibility of higher education are often motivated by reference to the risk that would prevent youth from the poorer segment of the population to engage in advanced studies. Finally, Section 9 concludes, by summarizing what we know, identify interesting research issues and considering whether taking risk into account makes a difference at all, and if so, on what questions.

The survey primarily seeks to expose the literature, presumably in a well-organized framework. There is no attempt to present any new analyses; only Section 2 contains some data specifically collected and organized for this survey. In presenting the models, emphasis is on exposing assumptions and results, and leaving intermediate algebraic manipulations mostly to the original sources.

4   *Introduction*

The survey will reveal a rather rugged terrain. It is not so difficult to expose ex post variability in outcomes, but much harder to indicate how much of this variability measures ex ante risk. We have theories and models, but not a commonly applied and generally accepted standard model. Empirical evidence is often conflicting, mostly incomplete and in many cases sparse and singular. Only on a few issues can we draw firm conclusions and consider the case closed. On most issues we can only call for more research. It is, indeed, a challenging field worthy of much more attention than so far has been devoted.

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