Introduction

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The objective of this book is to synthesize a wide range of research findings from a European research project 'Schooling, Training and Transitions (STT)',¹ organized and funded within the Targeted Socio-Economic Research Programme of the European Union.

At the Lisbon Summit in 2000, the European Council defined an ambitious ten-year strategy to make the European Union 'the most competitive and dynamic knowledge based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion'.² Subsequent monitoring has revealed only limited success in implementing certain key elements within this strategy, particularly in the sphere of lifelong learning. The process of equipping all of Europe's potential workforce with the skills, knowledge and expertise to enable them to contribute to economic growth and combat social exclusion represents a key area where substantial progress remains to be achieved.

A major reason for this disappointing progress lies in our limited knowledge of the nature and diversity of the education and training systems within the European Union and their interactions with the economies of the member states. To improve our understanding of the way these systems operate, a group of economists was constituted to conduct comparative research on the processes of human capital formation in the European education and training area and to study the interactions between these processes and the labour market. This group, of which I was the coordinator, worked together from 1997 to the end of 1999 to explore these issues. Adopting a lifecycle perspective, the group took advantage wherever possible of the range of research resources now available for analytical research on education, employment and training. Facilitated and funded by the European Commission under its programme of Targeted Socio-economic Research, the group prepared over 60 working papers.³ These have been published in the STT project Working

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Paper Series. The main results have now been gathered together and are presented here in nine chapters.

‘Transitions’ serve as a useful unifying theme for this research project, as they link successive individual states over time: through school, from school to work, and between jobs. As the project gathered momentum, it became apparent that another common feature of the research is the links between the processes of human capital formation, obtained at any point in life, subsequent transitions and the present or future work career of individuals. We reflect this in the title of this book: *Human Capital Over the Life Cycle: A European Perspective*.

The objective of the project was to improve our knowledge about the factors underlying inequalities in education and the labour market. It seems to us that one of the most important challenges in Europe is to understand the link between education and training on the one hand and economic and social inequality on the other. The more we understand these links, the better placed we will be to tackle issues of inequality via the education and training system. We are aware that inequalities become apparent as individuals move through the schooling system, that they may develop further during an individual’s career, and can take an extreme form with the phenomenon of poverty and exclusion in both childhood and adulthood. Three aspects deserve particular attention:

EDUCATIONAL INEQUALITY

Different individuals or different groups, within the same educational system, have varying chances of access to, or experience different outcomes from, the schooling system. Some of them experience various forms of ‘wastage’ in the education process, in that they choose to drop out or fail to engage with the process of education. Why do such outcomes arise? When does this situation begin? Are some characteristics of schooling systems more positive or some government incentives more effective in terms of reducing these inequalities or of limiting wastage?

DIFFERENCES IN ACCESS TO LABOUR MARKETS

The transition from school to work has increasingly become recognized as an important step in an individual’s career development. Two reasons explain this widening interest. First, the transition process has become longer in many countries, which has implications for the inequalities in outcomes that become apparent around this time. While some young people find a job immediately after leaving school, others may experience a long and difficult transition

before getting a steady job. The other reason is that this transition is suspected of having long-lasting effects upon the whole work career. Exploring the links between education and transition from school to work, which implies disentangling the effects of education from those other individual characteristics and experiences, is thus of substantial interest in its own right.

DIFFERENCES IN LIFELONG EARNINGS AND TRAINING

Finally, how can we understand differences in earnings over the life cycle? As there are an increasing number of panel data sets available in European countries, much can be said about the relationship between careers and earnings. Questions such as the links between initial education and training, the choice and characteristics of trainees, male/female differentials, or atypical employment and contracts can now be studied in a degree of detail and over time periods which permit us to probe these questions in depth.

We hope that this book will help to shed some light upon these issues. It may well be the case that we simply end up by posing more questions than we started with, but we hope that such questions will be based more firmly upon the up-to-date evidence provided in this publication. It is also worth stressing that, although the book appears to be an edited collection of readings, we have taken considerable care to integrate our work and to develop each chapter along common lines. In particular, we wanted the perspective to be systematically comparative. While our approach is essentially quantitative and theoretically rigorous, the value of good comparative research lies in the differences it reveals between countries. Through the variations that we observe, we gain a better understanding both of the limits of our theories and, more importantly, about the broader workings of the socio-economic system. However, big differences sometimes appear in the results for different countries, from similar models and using similar methods. These differences tell us many important things about the true scope of our theoretical models and, by deduction, about the influence of variations in the institutional context in our European countries. We inject a note of caution at times. Our work with data from different countries has taught us to question their comparability, and has given us strong incentives to increase pressure for the production of better quality data for European comparison purpose in the future. This being said, we did our best to provide systematically international comparisons in each chapter, with these comparisons being either the core of the chapter, or resulting from the confrontation of the results obtained from one or a few countries with those provided by an international review of existing papers on the same topics.

Another common link is the over-arching questions we have addressed.

Each chapter deals with optimal human capital investments and career choices at a specific point in the life cycle, from an individual or from a social point of view. Thus, we kept in mind the same general questions whatever the narrower issues considered in each chapter. What trends do we identify? How well do systems deliver? What are the labour market impacts of different choices in educational systems or among educational tracks? What do we learn from international comparisons? Are some results robust to the diversity of their institutional context? Where we find similarities or differences between countries, what do these imply in terms of policy implications and recommendations?

As economists, we focus particularly on optimal human capital investments and career choices. From a theoretical perspective, this means that we use as 'inputs' in our models variables like relative prices, costs and opportunities, and consider the relative efficiency of attaining a particular goal. This theoretical approach and the associated econometric 'tools' are useful when trying to derive broad comparative lines in the links between educational systems and the labour market. However, of course, they are much more limited if the objective was to explore in detail either the existing educational systems in the European countries, or the institutional aspects of their labour markets. This was not the case here. Similarly, social interactions in the shaping of 'preferences' for a particular educational track (for example in the choice of apprenticeship versus vocational school or gender differences in the choice of some particular jobs) are outwith our scope. From an empirical perspective, the different chapters in the book most often adopt a methodology that involves hypothesis formulation and testing. Individual level data (generally from large and rich data sets, facilitating the use of econometric methods) are used to test different theoretical hypotheses or questions raised in the particular phenomenon at stake: for example, several theoretical assumptions can be made about the relationship between the beginning of the work career and outcomes later in life. One can think of accumulation/disaccumulation of human capital, predictions based upon signalling theory and so on. Choosing between these different explanations, or refuting some of them, is a matter of empirical evidence. We follow this general approach throughout the book.

Finally, the book does not aim to cover all the aspects of the links between education and employment in every European country. This would have been ambitious in a book of 250 pages, and is certainly beyond the resources that were available to use as we undertook this task. The perspective adopted in the book is thus more limited. Though almost all the stages in the life cycle in relation to education are tackled, from early childhood to stages late in the work career, only some aspects are considered in detail here. These relate to three stages in the life cycle: first, the characteristics and effects of schooling systems, then transitions from school to work, and, finally, human capital and the work career.

SCHOOLING SYSTEMS

Differences in lifelong earnings may originate from an early point in an individual's life. The first chapter of this book deals with early childhood. Wim Groot, Henriëtte Maassen van den Brink, Simone Dobbelsteen and Noortje van Mierlo address the transfer of skills and competencies in the pre-school period. The authors suggest three reasons for an increased interest in early childhood education. The first reason is that nowadays in most European countries early childhood education services are widely accepted as an important stage in the education and social development of children. The second reason is the growing concern about the well-being and future of children from disadvantaged families. It is generally acknowledged that children from disadvantaged families face a restricted set of opportunities later in their lives. Thirdly, the increased interest in early childhood educational arrangements derives also from the increase in the labour force participation of women with young children, which in turn has led to a growing interest in the effects of women's employment in the pre-school years on outcomes for children. The aim of the chapter is to provide a survey of the research that has been carried out on the costs, benefits and returns of pre-school educational arrangements and to analyse their effectiveness. Two general conclusions emerge. The first is that one can find only few robust econometric results on the effects of early childhood education, although a fair amount of research has been done on this subject (both intervention programmes and childcare) on child development and on the effects of childcare on female labour supply. Moreover, little work has been done on the effects of childcare on firms and on the social costs and benefits of early childhood education. However, and this is the second general conclusion that they draw, the available research does seem to indicate that good quality care and good quality intervention programs can have substantial positive effects on the children who participate in these programmes.

Is expenditure on schooling causally and positively related to student educational and labour market outcomes? This is the question asked in Chapter 2 by Peter Dolton, Ros Levacic and Anna Vignoles. The research evidence for this is still under debate. For example, Hanushek et al. (1996)⁴ find that in the US there is 'no strong or consistent relationship between school resources and student performance'. Others disagree, and find, also from the US, that school inputs⁵ are positively related to outcomes, especially subsequent earnings (Card and Krueger, 1992).⁶ A fair number of reasons might explain this mixed evidence on the effects of school quality. This chapter discusses these reasons from a methodological point of view and tackles the difficulties associated with the use of production function analysis. It then reviews and highlights the significant findings from the US

and European literature on this issue. The authors also acknowledge the importance of school effectiveness. Mainly centred on class size, this body of research has largely neglected other school resources as explanatory factors for student attainment. Conversely, research using education production functions has systematically focused on the study of a causal relationship from school resources to student outcomes, but has paid little attention to the school process itself. The authors find that recent studies utilizing student level data, together with school and school district level resource input data, have found some school resource effects. Using a larger range of control variables, the authors are now also able to make progress in reducing omitted variables and endogeneity bias. These studies have produced some evidence that school quality variables exert a positive influence upon non-exam outcomes. However, a fair amount of work still needs to be done to improve the measures of school output. It also is necessary to overcome the problems of limited data on school resources, on the one hand, and to find reliable instruments to correct for endogeneity bias, on the other hand. Good quality studies that use individual level data tend to use panel data, and thus mostly relate to the performance of school systems that have now undergone significant changes. Therefore, their relevance for showing evidence of relationships between resources and pupils' examination attainment in the current system is questionable. There is no alternative to longitudinal data, though, if one wants to analyse the longer-term impact of the quality of schooling on earnings.

The aim of Chapter 3 is to provide a theory and description of schooling systems. Louis Lévy-Garboua, Nathalie Damoiselet, Gérard Lassibille and Lucia Navarro-Gomez provide a theory that distinguishes between education and training, in which these may be combined in varying proportions by schooling systems for the production of differentiated skills. The authors use data from 16 industrialized countries and the responses given by education experts to a questionnaire that they developed specifically for this study. They postulate a theoretical model in which a basic distinction is made between general education and vocational training. In this model they assume that education contributes to the production of the learning skill, which is considered a general investment for producing many other kinds of occupation-specific skills in combination with specific training. They propose a test for this model and then show that the diversity of marketable skills introduces a policy trade-off for schooling systems between education and non-learning skills. Students should be given a chance to receive further general education before they engage in vocational training. In the same way, they should be sorted in the different tracks according to some combination of their cognitive ability and occupation-specific talents. The authors conclude that early differentiation is good for education but not for the

production of skills. They advocate a late horizontal differentiation of schooling systems, which, they argue, would induce a high demand for both education and training.

TRANSITIONS FROM SCHOOL TO WORK

In Chapter 4, María Jesús San Segundo and Barbara Petrongolo investigate the main determinants of the decision to stay on at school at age 16, relating this decision to local labour market conditions. It can be argued that high unemployment rates cause young people to postpone their labour market entrance, because of the resulting decrease in the expected gains from job search and, therefore, the opportunity cost of education. This results in a positive correlation between current youth unemployment and the probability of staying on at school. Conversely, higher youth unemployment, combined with higher adult unemployment, may imply tighter budget constraints for families, which could operate to discourage enrolment in secondary education. In their analysis, the authors identify these two contrasting effects of unemployment on the demand for post-compulsory education in Spain and the UK. Enrolment rates at age 16 are related to both the unemployment rate of youths who have not completed upper-secondary education and the general unemployment rate. They use two cross-sections of youths, interviewed in the Spanish Labour Force Survey (EPA) and the British Labour Force Survey, both in the second quarter of 1991. The use of both controls produces quite clear-cut results: staying-on rates are correlated positively with youth unemployment but negatively with adult unemployment for both males and females. However, the variable that plays the prominent role in the decision to stay on at school is the parents' level of education. These results argue in favour of policies aimed at improving the academic achievement of students from disadvantaged families, as developed in several European countries.

Chapter 5 relates early career experiences with later career success. David Margolis, Erik Plug, Véronique Simonnet and Lars Vilhuber provide an original comparative attempt to analyse the influence of early career experiences of young people in the labour market upon their labour market success or failure later in life. The subject of early-career experiences, in terms of access to a first job, or of the job mobility of young people, is already well developed in the literature. Very little attention, though, has been given to the effects of these experiences in the longer term (that is, more than five years after school leaving). This topic is approached from different perspectives. The authors undertake an econometric estimation using several measures of early career experiences with the aim of controlling for the omitted variable bias, and also considering a variety of different measures of later career success. They use

long panel data sets from the United States, France, Germany and the Netherlands. As educational and labour market institutions vary widely from one country to another, they can test if workers with similar early career experiences experience similar career success in the different countries. They note that several different theories link early career variables to later career outcomes and show that there seem to be no 'general principles' that govern similarly the four labour markets considered. This implies that the role played by institutions and their inclusion in theoretical models should be an important topic for future research.

In Chapter 6, Sylvie Mendès and Catherine Sofer compare the access to the first job of apprentices and, more generally, the performances along the work career of ex-apprentices to those of workers who attended vocational school. Do firms value the skills resulting from in-firm training more than those acquired at school? The question then arises whether this specific type of learning facilitates transitions from school to work, as some of the German evidence, especially the low rate of youth unemployment, seems to indicate. However, other explanations are possible, such as demographic specificities, institutional arrangements that raise the returns to specific human capital for firms, or more generally the benefits from youth employment. From a theoretical point of view, the chapter first asks whether apprentices benefit mainly from firm-specific human capital or from positive selection mechanisms. The second question relates to a possible selection effect in the educational system: young people choosing apprenticeship over vocational school may well possess some characteristic that is correlated with the rate at which they obtain their first job. The authors find that apprenticeship seems to be an effective tool in the fight against youth unemployment. Correcting for the endogenous choice of education generally strengthens the results in favour of apprenticeship. Access to the first job appears to be easier for apprentices in every country analysed. In addition, and more generally, the quality of this first job is higher, where 'quality' is measured in terms of the permanence of the job. These are short-term findings, however. Over the longer run, the advantages of apprenticeship seem weaker, and are even found to disappear entirely in some of the research evidence considered in this chapter. One interpretation is that general human capital is of less value to firms at the beginning of the work career, but becomes more valuable over time as it facilitates adaptation to new types of work over the life cycle.

HUMAN CAPITAL AND THE WORK CAREER

In Chapter 7, Peter Elias and Rhys Davies provide an overview of the theoretical and empirical literature relating to employer-provided training and they

consider the involvement of employers in skill formation across Europe. They stress that access to vocational training whilst in employment is regarded as a means of enhancing the flexibility of labour by increasing the productivity and employability of workers. This chapter considers the role of employers in the process of skill formation within the European Union. They use information from the Continuing Vocational Training Surveys, and show that there is considerable variation in the incidence of employer provided training within Europe. Especially, there is a significant divergence between the north and south of Europe. Differences in the industrial composition of employment between countries largely explain variations in training participation. However, the content of employer provided training is also shaped by the relationship between the structure of workforce skills delivered by national systems of initial vocational training and the associated production process used by employers. This implies that qualitative differences in employer provided training across countries must be studied alongside simple quantitative comparisons. The authors point towards the potential gains to be made from policy interventions, which would encourage the effective utilization of skills by employers and reduce their incentive to follow retrogressive forms of competition.

Chapter 8 moves on to labour contracts. Juan Cañada-Vicinay and Michel Sollogoub look at institutional regulation of the labour markets, and, more precisely, at the links between labour contracts and economic performance. They compare Spain and France, which both stand at the higher end of the labour standard index describing the strength of the legislation governing a number of aspects of the labour markets. At the same time, these two countries perform differently relative to the European average, with France having similar outcomes to the EU-15, while Spain is an extreme case of poor performance, especially regarding unemployment. The authors analyse how firms use two types of contracts, fixed-term and open-ended labour contracts, in the two countries. They pay special attention to the influence of education on the probability of obtaining permanent employment. They show from the Spanish example, where there was a change in the legislation in the 1990s, that the inflow into permanent contracts is driven more by the individual human capital endowment and business cycle variables than by legal changes. For France, on the one hand fixed-term contracts are found to facilitate integration into the labour market, and even sometimes provide a matching process leading to an open-ended contract but, on the other hand, they are found also to create inefficient working conditions in which employers and employees are insufficiently committed. These results raise the question of the effectiveness of government programmes aimed at integrating youths into the workforce (youth-employment contracts), which are generally based on fixed-term contracts. The limited duration of the contract may produce a risk of opportunistic behaviour by employers. The

authors conclude that, to avoid this risk, government programmes should attempt to increase the employers' level of commitment to the employment relationship. Especially, their gain from a greater ease of firing might be compensated by an obligation to provide training, as in training-oriented contracts for example.

Finally, in Chapter 9, Kjell Salvanes looks at labour mobility. The author first presents the aggregate worker and job flows for Norway and compares the results with those from other European countries and the US. He then studies in detail the employment management policies for heterogeneous workers, using a panel data set for Norway for the 1986–94 period, matching workers and plants. The focus of the chapter is to analyse worker and job flows by education level. Two hypotheses can be made: high job creation/destruction rates and 'churning' rates may be due to job creation for highly educated workers and job destruction for low-educated workers and vice versa for replacements, or may result from high hiring separation rates for all skill levels. Distinguishing between education categories of workers allows the author to test these assumptions. He finds that re-employment separations are procyclical, which suggests that this process consists mainly of quits, and that job destruction is counter-cyclical, which implies that it is mainly an employer-initiated phenomenon. Furthermore, these two processes also show different patterns with the educational level of workers. Re-employment separation rates do not vary monotonically with education level, while job destruction is declining in education level. The author also finds differences by education levels, cohorts and gender, in the level of job creation and job destruction rates, as well as in the level of re-employment rates. Another striking finding is that net job creation for highly-educated women is much higher than that for highly-educated men.

While the goals of the Lisbon Summit might appear now to be bold and ambitious, the very fact that we can undertake such productive and collaborative research to understand better the workings of our different educational systems and their longer-term impacts – making good use of data resources, many of which have been produced in a co-ordinated manner for the European Union – is testimony to the growing importance of our European identity. We hope that the results of the work presented here will be of interest to a fairly wide audience. While the general focus of our work lies within the disciplinary boundaries of comparative economic studies, we have written in a style that makes this work accessible to a wider audience, including policy makers, academics and others who have an interest in the ways in which the different educational systems across the European Union impart knowledge, foster citizenship and promote economic growth.

NOTES

1. The STT final report is available on the web site of the European Commission: <http://improving-ser.sti.jrc.it/default/>
2. Presidency Conclusions, Lisbon European Council, 23–24 March 2000.
3. Published in STT Working Papers Series, web site: <http://www.univ-orleans.fr/DEG/LEO/TSER>
4. Hanushek, E., S.G. Rivkin and L.L. Taylor (1996), 'Aggregation and the estimated effects of school success', *The Review of Economics and Statistics*, 78, 611–27.
5. School inputs include financial resources (such as expenditure per pupil) and real resources (such as pupil–teacher ratios or various measures of teacher education and experience).
6. Card, D. and A. Krueger (1992), 'Does school quality matter? Returns to education and the characteristics of public schools in the US', *Journal of Political Economy*, 100, 1–40.