1. THE PURE PROJECT – EXECUTIVE SUMMARY

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1.1 Introduction

This final report of the project *Public funding and private returns to education – PURE* presents the research undertaken during its two-year duration, starting in November 1, 1998, and ending in October 31, 2000. In particular, this introductory chapter of the final report, which also serves as an executive summary, highlights the objectives and activities of the project as well as draws together the main findings and points to possible policy implications.

The final report of the project is divided into three parts. The first part, covering Chapters 2 to 10, summarises a major part of all the research work done within the project. More precisely, each chapter provides a concise summary of the motivation for the performed analysis, the methodology used, the results obtained, and the conclusions and policy implications that can be drawn based on these results. In each case, more details can be found in the scientific report underlying the summary chapter.

An important feature of these chapters and the reported results is that throughout they cover all or almost all the 15 European countries involved in the project, that is, Austria, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, and Finland as the co-ordinating partner. In other words, these nine chapters provide, on a comparable basis, cross-country evidence *at a European level* on a broad set of policy-relevant issues related to private returns to education.

Chapter 2 summarises and compares the findings on returns to education at the individual level across and within the 15 countries. The impact of investments in education on individuals' lifetime earnings – that is, the interplay between education and work experience – is examined in Chapter 3. Particular emphasis is thereby paid to potential differences between the "baby boom" cohort and other cohorts. The

productivity-enhancing role of education underlying the well-known human capital theory is in Chapter 4 contrasted against the signalling role of education as stated by the so-called screening hypothesis. The interaction between the economic benefit of investment in education and the dispersion in wages (wage inequality) and its development is investigated in Chapters 5 and 6, while Chapter 7 is concerned with the relationship between education and unemployment. The importance of the supply of and the demand for highly educated labour as well as of labour market institutions for the trend in individual returns to education is explored in Chapter 8. Chapter 9, in turn, focuses on the influence of public funding and enrolment into higher education on educational outcomes. Finally, Chapter 10 discusses student loan systems in use in Europe.

Chapters 2 to 10 thus give a comprehensive European picture of private returns to education, factors underlying their levels and trends, and their possible link with wage inequality and unemployment, two topics of considerable importance in today's Europe. As explicitly documented for each chapter, some of the research has already been finalised and the scientific papers underlying the summary chapters are available at the project's web-site www.etla.fi/PURE. Some of the research is still in progress but will be concluded during the next few months.

The second part of the final report presents a few of the large number of country-specific studies that have been undertaken in relation to the PURE project. Most of these concern a single country, but quite a few also compare the situation in two countries. Moreover, these single- and two-country studies complement the multi-country analyses with several highly relevant aspects that, because of the data requirements, can be investigated for a very limited number of countries only.

The third part of the final report highlights the considerable contribution of each partner to the PURE project. It lists the names of all researchers having been involved in the project as well as all the research done and still in progress. Apart from information on country-specific research, these listings also provide information on the on-going cross-country research that is not presented elsewhere in the final report. As is evident from the country-specific contributions, PURE research results have been largely disseminated mainly through presentations at a large number of conferences, seminars and workshops, including the two user-oriented seminars arranged by the project itself.

1.2 Background and objectives

The rationale for the project was outlined in the following way. "While national systems of education are fairly similar across Europe, there are many crucial differences in details. Furthermore, in all European countries the direct outlays on education are mostly financed by the government, although here also, there exist differences not least in the mix of tuition charges, grants and loans given, and fiscal compensation allowed to parents. Moreover, in many countries the share of costs borne by students and/or their parents has shifted over the last decades. Simultaneously there is a political debate on the most desirable system of financing, a debate that bounces between the negative impulse of government deficits and budget cuts and the positive impulse of the increased knowledge-intensity of production and the role of knowledge in maintaining the European competitive edge."

The overarching objective of the PURE project, as stated in the Technical Annex, was to study the impact of different systems of public financial support for school attendance on observed outcomes in the labour market, particularly in terms of the levels and dispersion of private returns to education and education-related inequality in earnings. The project here intended to move into a territory not yet studied from the perspective of optimal investment in human capital, the role of student finance systems, school admission rules (free or selective entry) and school differentiation.

The project was originally divided into several distinct but closely related issues that were to be addressed in detail:

- Analysis and comparison of wage and human capital structures and private returns to education between countries and within countries over time in order to uncover distinct trends as well as similarities and dissimilarities across countries.

- Analysis of the impact on country-specific trends in educational returns of changes over time in underlying market forces (supply-side and demand-side factors).

- Analysis of the impact on country-specific trends in educational returns of carefully differentiated measures of returns by type and level of education in order to highlight and compare national systems of education.

- Analysis of the structure and evolution of the national systems of education, admission rules and systems of financial support for school attendance to be used as input in other parts of the project.

- Analysis of the effects of differing systems of public support for cost of education to individuals and admission rules on the private returns to education and on earnings inequality related to differences in educational attainment.

As is evident from the final report of the project, all these aspects have been addressed. In addition to these stated objectives, the research work of the PURE team expanded to cover other crucial aspects as well, not least the unemployment perspective.

1.3 Activities and dissemination

The activities of the PURE team of researchers have been outlined in detail in the three Progress Reports that have been delivered during the lifetime of the project and are, therefore, not repeated here. This section points to major milestones only.

The principle having guided the research work performed by the PURE team has been active participation – quantitatively as well as qualitatively – of all partners in all research activities undertaken within the project. Apart from having taken responsibility for different sub-projects, all partners have contributed with national data and results to the wide variety of exercises having been conducted. The only limit to partner participation has been the lack of required data. On the other hand, partners have been confronted with this limit only in the case of more specialised and/or sophisticated PURE-relevant analyses. In addition, partners have contributed generously with their specialist knowledge on the different topics analysed within the project. The strong influence of this "working principle" on the research undertaken by the PURE team is also reflected in the outcome of the project – in the multitude of European-level analyses reported in Part I of the final report as well as in the cross-country analyses still in progress (and listed in Part III).

The broad-based objectives set out for the PURE project required frequent project meetings during the first year of the project. In retro-perspective it is, however, obvious that these frequent meetings also greatly stimulated to an enormous number of

complementary analyses, which is highly evident from the three parts of the final report.

The most important cross-country deliverables so far are:

- *Returns to Human Capital in Europe – A Review of the Literature* (ETLA, Series B 156, Helsinki, 1999) edited by Rita Asplund and Pedro Telhado Pereira, a book that reviews country-by-country the current state-of-the-art of the research field covered by the PURE project.

- The forthcoming PURE book *Education and Earnings in Europe: A Cross Country Analysis of the Returns to Education* (Edward Elgar Publishing Ltd., March 2001) edited by Colm Harmon, Ian Walker and Niels Westergaard–Nielsen. The book contains a comprehensive introductory chapter on returns to education written by the three editors, and 15 nation-specific chapters. In other words, the content covers both extensive PURE cross-country comparisons and national chapters giving more details on the various empirical results produced within each partner country. Chapter 2 of the final report gives a summary of the main findings.

Apart from these two PURE books, several working papers have been published in the form of articles in national and international journals, several working papers have been submitted to journals, and several are still in progress. The summary chapters in Part I and Part II of the final report draw together the content of several of these working papers, while PART III provides extensive listings of published and forthcoming reports as well as of reports in progress. There are also preliminary plans for additional PURE books.

The research work of the PURE project has been presented both at national and international conferences, workshops and seminars. (For details, see Part III of the final report.) In addition, the PURE project has arranged two user-oriented seminars where all the cross-country analyses summarised in Chapters 2 to 10 of the final report have been presented and discussed. The first user-oriented seminar was held in Paris in October 1999, and the second in Lisbon in October 2000. The programmes are attached to this executive summary chapter.

The PURE web-site has been a most important dissemination channel. The web-site has continued to report on PURE research results and publications also after the official closing of the project.

1.4 Main results, conclusions and policy implications

This section offers a brief listing of the main findings of the PURE project and also points to possible policy implications of these outcomes. Throughout references are made, in parentheses, to the chapter of the final report that presents and discusses the topic in question in more detail.

- The estimated private *returns to education differ* considerably across Europe. Broadly speaking, the European countries can be classified into three groups: countries with a low average return to education (Scandinavian countries and the Netherlands), countries with a high return to education (Ireland and the UK), and countries that fall in-between these two extremes. (Chapter 2)

- Equally important, there are *no signs of a convergence of returns to education* across the European countries. Some countries show a downward trend in rates of return, others are characterised by an upward trend, while still others display no time trend whatsoever. Furthermore, the trend may differ for men and women within a country. (Chapter 2) One possible consequence in the future of this finding might be higher mobility across national boarders, particularly of highly educated people trying to exploit these cross-country differences in the rewarding of individual investment in education. The rapid expansion of the use of information technologies could be expected to boost such a development, since the possibility of working and living in separate places becomes reality, an aspect pointed to also in the overview of student loan systems in Chapter 10.

- Separate analysis of the wage differentials between college-educated and high-school educated employees, the so-called *college wage gap*, also displays considerable variation across PURE countries. Substantial cross-country differences exist both in the absolute level of the college wage gap and in its development over time and *cohorts*. Specifically, the growth in the college wage gap is shown not to have been restricted to the younger cohorts, as stated in previous studies. On the

contrary, in a number of PURE countries the college wage gap has grown at a faster rate for the older than for the younger cohorts. (Chapter 3)

- Evidence for a limited number of PURE countries indicates that by investing in education individuals not only raise their productivity in working life, as stated by the human capital theory. Investments especially in higher education also seem to provide them with a signal to employers about their innate productive capabilities, as predicted by the so-called screening hypothesis. The productivity-enhancing effect of educational investments still dominates the empirical scene, however. (Chapter 4, also see Chapter 11)

- Throughout Europe social groups that commonly acquire little education face a potentially higher than average return to education. Thus it would be of considerable importance to identify these groups and to provide them with incentives to continue in school. (Chapter 2) The problem of early school leaving has been much debated not least in the UK and is, therefore, one of the special country-specific topics paid attention to in the final report of PURE. (Chapter 13)

- More generally, improving the educational attainment level of the less educated can be expected to reduce *wage inequality*, since education still contributes substantially to the wage differences observed in the European labour markets (Chapter 5). This conclusion is further supported by the finding that a higher education not only secures the individual a higher entry wage, but also guarantees a more advantageous life-cycle wage profile as compared to the less educated. (Chapter 3) There are, however, wage-inequality-related factors that potentially may work in the opposite direction. Among these factors are the concomitant development of within-group wage inequality and the balance between supply and demand.

- Reduced between-educational-level inequality is a necessary but not a sufficient condition for *overall* wage inequality to decline due to more people acquiring a better education. A further condition is that *within-educational-level inequality* decreases with the educational level. In other words, the dispersion in wages would need to be larger among the less educated than among the higher educated. The results for the great majority of PURE countries point in the opposite direction, however; that is, within-educational-levels wage differences tend to be the higher the higher the educational level. (Chapter 6) Put differently, the differences in the return (in terms of wages) that individuals manage to reap from their investment in

education are found to increase rather than decrease when moving up the educational scale. This means that the link between educational expansion and wage inequality is not so straightforward as is often claimed in the political debate. This within-educational-level inequality may seriously mitigate or even outweigh the decline in overall wage inequality that is commonly expected to arise from increased schooling. The interrelation between within- and between-educational-level wage inequality definitely deserves further research.

- Moreover, this European-wide finding of rising wage inequality with the educational level, reveals the presence of a notable *wage risk* associated with further education. The European labour markets are, in other words, characterised by considerable uncertainty with regard to the actual return that individuals can get from their investment in higher education. The obtained results further suggest that returns are riskier (more dispersed) the higher the country's average return to education. Presumably this schooling-level correlated wage risk also affects individuals' incentives and decisions to invest in higher education. (Chapter 6)

- Other aspects of crucial European importance that are likely to influence individual schooling decisions are *employment prospects* (the risk of becoming unemployed) and *unemployment benefits*. Accordingly, attempts should be made to adjust "conventional" rates of return to education for these realities. When such adjustments are undertaken for the PURE countries, the results allow for certain important generalisations to be made. First, what matters is the *difference* in unemployment rates between educational levels rather than the absolute unemployment rate for differently educated employees. Second, the adjustment mostly leads to an *increase* in the rate of return to education, and this effect is in most cases larger for medium-level than for high-level education. In other words, employment expectations affect incentives to invest in further education more at the lower end than higher up the educational scale. Finally, the degree of adjustment in the rate of return to education varies quite substantially between PURE countries. This outcome reflects cross-country differences in the size of the unemployment differentials between educational levels (that is, in employment prospects) but also in the generosity of the unemployment benefit system. A minor difference between adjusted and unadjusted rates of return to education may, in effect, simply be the outcome of the benefit system outweighing the better employment expectations that are usually associated with a higher education. (Chapter 7)

- The enormous expansion in *public funding of higher education*, particularly in the 1990s, resulted in a substantial growth in the supply of highly educated employees. The real value of public expenditure on higher education grew by more than 80% in the PURE countries between 1980 and 1996. Over the same time period the *supply* of employees with a higher (tertiary) education relative to those with a secondary or lower education roughly doubled. Nevertheless the *relative wages* of highly educated employees have displayed an increasing rather than a decreasing trend when aggregating over all 15 PURE countries. The reason for this is obvious: aggregate demand for highly educated labour has expanded at an even faster rate. The reported calculations give a shift of 5.6% per year in aggregate demand for highly educated labour compared to a shift of 4.7% per year in aggregate supply. (Chapter 8)

- Simultaneously, however, the analysis reveals notable variation across PURE countries both in the level and the growth rate of public expenditure on higher education, with countries having started from a lower level showing higher growth rates. This development, in turn, has resulted in a clear convergence in the relative supply of differently educated employees across PURE countries, but nonetheless cross-country differences in the educational composition of the labour force are still substantial. Also the trend in the demand for highly educated labour displays conspicuous variation across countries, albeit demand has risen at least as much as supply in 11 of the 15 PURE countries. These differences in supply and demand, coupled with marked differences in labour market institutions, are without doubt important factors underlying the observed variation in levels and trends of average returns to education across Europe, and consequently also in wage inequality. (Chapter 8) Supply, demand and institutions are shown to have exerted a strong influence on the growth of the college wage gap as well. (Chapter 3)

- A more thorough examination of the link between *public expenditure* on higher education and the supply of highly educated labour – that is, *enrolment into higher education* – provides further support for the finding in Chapter 8 of a strong positive impact of increased public expenditure on higher education on the supply of highly educated labour. In addition to public funding, also entry exams in the high-school system as well as tuition fees are detected to influence enrolment. In contrast, current returns to education and current unemployment rates for younger age groups seem to leave current enrolment into higher education unaffected. (Chapter 9)

- This finding of enrolment into higher education being rather insensitive to the rewarding of education in the labour market as well as to youth unemployment is, moreover, in line with results obtained in other studies of the PURE project. Specifically, Chapter 8 reports no significant effect of relative wages on relative supply when contrasting tertiary education against secondary and lower education. In Chapter 7, in turn, employment expectations are found to play a much less important role in steps from medium to high levels of education than from compulsory to non-compulsory education. Of course, these European-level results may detect even considerable variation across countries. Especially in countries with an extremely low return to education, there is an obvious risk that a growing number of youths decide not to invest in higher education, as speculated in Chapter 2.

- Finally, attempts to explain differences in public expenditure across PURE countries and within countries over time reveal that especially government ideology but also the type of government have played an important role. (Chapter 9)

- The empirical analyses undertaken within the PURE project have throughout been based on national individual data. This approach necessarily raises problems of comparability of data across countries, which may to a varying degree affect the reported results. However, so far Europe can provide sufficient and consistent cross-national data in rare cases only. Increased efforts are needed to produce Trans-European data on individuals and also to make these data easily available to researchers.

- Another serious data shortcoming is the surprisingly scarce and scattered availability of detailed country-specific information on public expenditure on education, not least on higher education and on student support (grants, subsidised loans) in particular. The lack of such data on a comparable basis mitigates any attempt to undertake comprehensive analysis of European educational systems and private and social returns to investment in education. It also prevents private funding aspects to be properly included in the analysis of private returns to education.

APPENDIX: PURE USER-ORIENTED SEMINARS

1st user-oriented seminar – Paris 29.10.1999

Université Panthéon-Assas (Paris 2)
Centre de Vaugirard
391, rue de Vaugirard

8:30 Registration, coffee

9:30 *Returns to education in Europe: What can we learn from PURE results?*
Introduction by Niels Westergaard-Nielsen

11:00 *Schooling, ability and family background: the PURE evidence*
Introduction by Ian Walker

12:30 Lunch

14:00 *Drawing together the evidence on returns to schooling: What do we know?*
Introduction by Colm Harmon?

15:15 The role of schooling: Screening versus human capital
Introduction by Ali Skalli

16:00 Coffee break

16:30 Social returns and private gross/net returns to education
Introduction by Ian Walker

17:30 End of seminar

19:30 Cocktail–dinner

2nd user-oriented seminar – Lisbon 28.10.2000

Universidade Nova de Lisboa

9:00 *Opening session*

Returns to education and public funding in 15 European countries:

9:15 *Returns to education – a cross-country comparison*
presentation by Niels Westergaard-Nielsen

9:40 *Education, earnings growth and cohort effects*
presentation by Simona Comi

9:55 *Education and wage inequality*
presentation by Pedro Martins

10:15 *Education and the income distribution*
presentation by Joop Odink

10:25 *Coffee break*

10:40 *Returns to education and unemployment*
presentation by José Luis Roig

11:00 *The labour market for higher education*
presentation by Erling Barth

11:20 *Public funding and enrolment into higher education*
presentation by Rudolf Winter–Ebmer

11:40 *Special topic 1: The public credit market of education*
presentation by Marianne Guille

11:55 *Special topic II: Early school leaving*
presentation by Ian Walker

12:10 *Lunch*

Discussion of PURE results:

13:30 *Comment by Lord Richard Layard*

14:15 *Panel discussion:* Hilary Steedman, Roberto Carneiro and Simo Juva

15:30 *Coffee break*

15:45 *Open discussion*

16:45 *Closing session*