

EDUCATION AT A GLANCE

OECD INDICATORS 2005

ANNEX 3: SOURCES, METHODS AND TECHNICAL NOTES

Chapter A: The output of educational institutions and the impact of learning

TABLE OF CONTENTS

<u>INDICATOR A1: EDUCATIONAL ATTAINMENT OF THE ADULT POPULATION</u>	3
■ <u>Table A1.1a, A1.1.b (web), A1.1.c (web), A.1.2a, A1.2.b (web), A1.2.c (web), A1.3a A1.3.b (web), A1.3.c (web)</u>	3
■ <u>Table A1.4</u>	7
<u>INDICATOR A2: CURRENT UPPER SECONDARY GRADUATION RATES</u>	8
■ <u>Table A2.1. Upper secondary graduation rates</u>	8
■ <u>Table A2.2. Post-secondary non-tertiary graduation rates</u>	9
<u>INDICATOR A3: CURRENT TERTIARY GRADUATION RATES</u>	9
■ <u>Table A3.1. Tertiary graduation rates</u>	9
■ <u>Classification of tertiary programmes: Australia</u>	11
■ <u>Classification of tertiary programmes: Austria</u>	11
■ <u>Classification of tertiary programmes: Czech Republic</u>	12
■ <u>Classification of tertiary programmes: Denmark</u>	12
■ <u>Classification of tertiary programmes: Finland</u>	13
■ <u>Classification of tertiary programmes: France</u>	13
■ <u>Classification of tertiary programmes: Germany</u>	14
■ <u>Classification of tertiary programmes: Iceland</u>	14
■ <u>Classification of tertiary programmes: Ireland</u>	15
■ <u>Classification of tertiary programmes: Israel</u>	15
■ <u>Classification of tertiary programmes: Italy</u>	16
■ <u>Classification of tertiary programmes: Japan</u>	16
■ <u>Classification of tertiary programmes: New Zealand</u>	17
■ <u>Classification of tertiary programmes: Poland</u>	17
■ <u>Classification of tertiary programmes: Slovak Republic</u>	18
■ <u>Classification of tertiary programmes: Spain</u>	19
■ <u>Classification of tertiary programmes: Sweden</u>	19
■ <u>Classification of tertiary programmes: Switzerland</u>	20
■ <u>Classification of tertiary programmes: United Kingdom</u>	21
■ <u>Table A3.2. Sciences graduates, by gender</u>	21
■ <u>Table A3.3. Motivation in mathematics and tertiary-type A graduates</u>	21
■ <u>Table A3.4. Survival rates in tertiary education (2000)</u>	21
<u>INDICATORS A4-A7: PISA AND TIMSS</u>	22
<u>INDICATOR A8: LABOUR FORCE PARTICIPATION BY LEVEL OF EDUCATIONAL ATTAINMENT</u>	22
■ <u>Table A8.1a, A8.1b (web), A8.2a, A8.2b (web), A.8.3a, A8.3.b (web), A8.3.c (web), A8.4a A8.4.b (web), A8.4.c (web)</u>	22
■ <u>Table A.8.3a, A8.3.b (web), A8.3.c (web)</u>	23
<u>INDICATOR A9: THE RETURNS TO EDUCATION: EDUCATION AND EARNINGS</u>	24
■ <u>Tables A9.1a, A9.1b, A9.2a (web), A9.2b (web), A9.2c (web), A9.3 (web), A9.4a, A9.4b, A9.4c</u>	24
■ <u>Tables A9.5 to A9.10</u>	25

CHAPTER A: THE OUTPUT OF EDUCATIONAL INSTITUTIONS AND THE IMPACT OF LEARNING

INDICATOR A1: Educational attainment of the adult population

- **Table A1.1a, A1.1.b (web), A1.1.c (web), A.1.2a, A1.2.b (web), A1.2.c (web), A1.3a A1.3.b (web), A1.3.c (web).**

Methodology

Data on population and educational attainment are taken from OECD and EUROSTAT databases, which are compiled from National Labour Force Surveys. Tables by gender (b for males and c for females) are available on the web.

The attainment profiles are based on the percentage of the population aged 25 to 64 years that has completed a specified level of education. The International Standard Classification of Education (ISCED-97) is used to define the levels of education.

Table 1: National Sources

	Statistical agency	Source	Reference period	Coverage	Primary sampling unit	Size of the sample	Overall rate of non-response	Remarks
Australia	Australian Bureau of Statistics	Australian Bureau of Statistics, Labour Force Survey	mai-03	Data refer to persons aged 15 to 64.	Respondents within households	43 500	3.0%	Households are selected and all non-visiting adults aged 15-64 are interviewed
Austria	Austrian Central Statistical Office	Quarterly Mikrocensus	The data refer to annual averages of quarterly the Mikrocensus sample survey	Data refer to persons aged 15 and over.				
Belgium	Statistical office	Labour Force Survey	Annual average	Data refer to persons aged 15 and over.	Households	Around 92 500 individuals		
Canada	Statistics Canada	Monthly Labour Force Survey	The annual data are averages of monthly estimates	Data refer to persons aged 15 and over.	Households	Approx 92 500 persons		
Czech Republic	Czech Statistical Office (CSU)	Labour Force Sample Survey	Annual average of quarterly estimates	Data refer to persons aged 15 and over.	Persons	Around 24 000 households, i.e., approx 60 000 persons, ie approx 53 000 persons aged 15 and over.	30%	Classification according to LFS questionnaire until 1997 used.
Denmark	Eurostat	European Labour Force Survey	Spring quarter	Data refer to persons aged 15 to 64.				
Finland	Statistics Finland	Labour Force Survey	First quarter 2003	Data refer to persons over 14 year olds.	Person	12 000 / month	13.5%	
France	INSEE	Labour Force Survey	Annual average of quarterly estimates	Data refer to persons aged 15 and over.	Households	Around 35 000 households, i.e., approx 75 000 persons aged 15 and over		
Germany	Federal Statistical Office	Labour Force Survey (Microcensus)	05 May -11 May 2003	Data refer to persons aged 15 and over.	Households	0.45% of households	4% for Questions on Educational Attainment.	
Greece	National Statistical Services of Greece	Labour Force Survey	2nd quarter	Total population of private households.	Households		5% of the total surveyed households	Households are selected and all non-visiting adults aged 15-64 are interviewed
Hungary	Hungarian Central Statistical Office	Labour Force Survey	Annual averages of quarterly estimates	Data refer to persons aged 15-74.	Households	64 000 persons	20-21%	Armed forces are not included.
Iceland	Statistics Iceland	Icelandic Labour Force Survey	The annual data are averages of bi-annual (April and November) estimates	All resident persons aged 16 to 74 years.	Individuals	4 200	12%	
Ireland	Central Statistics Office	Beginning 4th quarter 1997, a new Quarterly National Household Survey (QNHS) was implemented, replacing the annual Labour Force Survey (LFS)	The QNHS is a continuous survey Results are compiled for seasonal quarters - ie quarter two refers to March, April and May	Data refer to persons aged 15 and over.	Households			
Israel	Israel's Central Bureau of Statistics	Labour Force Survey	Annual average for 2003.	Permanent residents aged 15+.	Households	Approx. 22,500 households.	12%	
Italy	ISTAT	Household Labour Force Survey	The data refers to the 2nd quarter of each year (2nd week of April)	Data refer to persons aged 15 and over.				The mapping has changed in 2001.
Japan	Statistics Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications	The Labour Force Survey detailed tabulation	Average of 2003	Data refer to persons aged 15 and over.	Households			The special Survey of the Labour Force Survey was integrated into the Labour Force Survey in January 2002.
Korea	National Statistical Office	Monthly Economically Active Population Survey	Annual average of monthly estimates	Data refer to persons aged 15 and over.	Households	30,000 households.		Annual report on the Economically Active Population Survey.
Luxembourg	Eurostat	European Labour Force Survey	Annual average	Data refer to persons aged 15 to 64.				

Table 1 (cont'd): National Sources

	Statistical agency	Source	Reference period	Coverage	Primary sampling unit	Size of the sample	Overall rate of non-response	Remarks
Mexico	Secretaría del Trabajo y Previsión Social (STPS)	Encuesta Nacional de Empleo (ENE)	Biennial survey since 1991, yearly since 1995	The survey covers civilian resident population aged 12 years and over excluding armed forces when they are resident.	Households	In odd years the survey is representative for state, what increases the sample significantly.	Around 15%	
Netherlands	Centraal Bureau voor de Statistiek, Statistics Netherlands	Labour Force Survey						
New Zealand	Statistics New Zealand	Household Labour Force Survey	The annual data are averages of quarterly estimates	Data refer to civilian non-institutionalised persons aged 15 and over.	Households	15000 Households per quarter	8.50%	
Norway	Statistik Sentralbyrå	Labour Force Survey	Annual average	Persons 16-74 years	Individuals	24 000 / quarter	10,4%	
Poland	Główny Urząd Statystyczny	Labour Force Survey	The data are averages of published quarterly figures	Data refer to persons aged 15 and over.	Households	24 700 households.	About 19%	Since the 1 quarter of 2003, the results of the LFS have been generalized on the basis of the balance of the population compiled using the results of the National Census of Population 2002, that is why the data are not fully comparable with previous year data.
Portugal	Instituto Nacional de Estatística	Labour Force Survey	Annual average of quarterly estimates	Data refers to persons aged 15 and over	Households (dwellings)	Around 20 000 households / around 50 000 persons	Around 9%	
Slovak Republic	Statistical Office of the Slovak Republic	Labour Force Sample Survey	Annual average of quarterly estimates	Data refer to persons aged 15 and over.	Dwellings	Around 10 250 dwellings per quarter, i.e., approx 28 900 persons, ie approx 24 500 persons aged 15+	7,5%	Classifications according to LFS questionnaire until 1999 and from 2000 used
Spain	Instituto Nacional de Estadística	Active Population Survey (quarterly)	Yearly average	Data refer to persons aged 16 and over.	Enumeration area	64 072 households (average year 2003)	8.6% (average year 2003)	Part of the non-response is treated. Final rate of non-response: 5.0% (average year 2003).
Sweden	Statistiska Centralbyrån	Labour Force Survey	The annual average	Data refer to persons aged 16-64.	Individuals	Based on 212 700 interviews	16,3%	
Switzerland	OFS	Labour Force Survey	The annual data refer to the second quarter (April-June)	Data refer to persons aged 15 and over.	Persons within households	57 000 (of which 15 000 oversampling of foreign nationals)	30%	The reference person within the household is selected randomly. All data refer only to the reference person (no proxy data).
Turkey	State Institute of Statistics (SIS)	Household Labour Force Survey	Semi-annual survey since October 1988. Annual average of April and October	Data refer to persons aged 15 and over.	Households	15 000 Household in each survey.	10% (1 500 Households in each survey)	
United Kingdom	ONS	Labour Force Survey	Spring Labour Force Survey	Data refer to persons aged 16 and over.	Households	60 000	14%	
United States	Census Bureau and Bureau of Labour Statistics	March Current Population Survey (CPS)	Annual data	Data refer to persons aged 15 and over.	Households	78 000 households, 160 00 persons	7,2% based on households.	

Description of ISCED-97 education programmes and attainment levels and their mappings for each country:

Table 2: Standardised ISCED-97 presentation of national codes on attainment in LFS (2003)¹

	Pre-primary and primary education	Lower secondary education	Upper secondary education				Post-secondary non-tertiary education	Tertiary education			Advanced research programmes
	ISCED 0/1	ISCED 2	ISCED 3C Short	ISCED 3C Long	ISCED 3B	ISCED 3A	ISCED 4	ISCED 5B	ISCED 5A	ISCED 5A/6	ISCED 6
Australia		0/1/2, 2B/2C			3B	3A, 3A/4		5B	5A	5A/6	
Austria		0/1/2			3B	3A	4A, 4B	5B	5A		
Belgium	0/1	2		3C		3A	4	5B	5A		6
Canada	0/1	2				3	4	5B		5A/6	
Czech Republic	0/1	2		3CL		3AB/4				5AB/6	
Denmark (ELFS)	0,1	2		3CL		3A	4	5B	5A		6
Finland	0/1	0/1/2				3	4	5B	5A		6
France	0, 1	2A, 2B	3CS	3CL	3B	3A	4A, 4	5B, 5AI	5A	5A/6	
Germany	1	2A			3B	3A	4	5B	5A		6
Greece	0/1	2	3C	3CL	3B	3A	4C	5B	5A		6
Hungary	1	2		3C		3A	4A	5B	5A		6
Iceland	0/1	2A, 2C	3CS			3A	4C	5B	5A		6
Ireland	0, 1	2				3/3A/3C	4C	5B		5A/6	
Italy	0/1	2	3CS	3CL		3A/3B	4C		5A/5B		6
Japan		OECD estim. from 0/1/2/3				OECD estim. from 0/1/2/3		5B		5A/6	
Korea	0/1	2				3		5B		5A/6	
Luxembourg (ELFS)	0/1	2	3CS	3CL		3/3A,3B	4,4A/4B,4C	5B	5A		6
Mexico	0, 1	2, 2/3A		3CL		3A		5B		5A/6	
Netherlands	0, 1, 1A, 1B, 1C	2, 2A, 2B, 2C		3C		3A,3	4A,4B,4C	5B	5, 5A		6
New Zealand		0, 1		3CL		3A	4C	5B	5A	5A/6	
Norway	0, 1A	2A		3C		3A	4A, 4C	5B	5A		6
Poland		1/2	3CS			3A	4C			5B/5A/6	
Portugal	0/1	2				3		5B	5A		6
Slovak Republic	0, 1	2		3C		3A		5B	5A		6
Spain	0, 1	2A, 2C	3C		3B	3A	4C	5B	5A		6
Sweden	1	2				3A, 3		4/5B	5A	5A/6	
Switzerland	1	2	3CS	3CL	3B	3A	4	5B	5A		6
Turkey	0, 1	2			3B	3A				5A/6	
United Kingdom	0/1	2	3, 3CS	3C, 3CL		3A		5B	5A		6
United States	0/1	2				3		5B, 5AI	5A		6
Israël	0	1/2				3A/3C		5B	5A		6

1. The cells of this table indicate, for each country, the national programme categories that are included in the international levels of education indicated by the column headings. The national codes received do not reflect always perfectly all the national educational system possibilities.

Note: ISCED 5AI (tertiary-type A, intermediate degree).

■ Notes on specific countries

France: Concerning, trend on educational attainment variables coded ISCED97, there is a break between 2002 and 2003. Educational variables for 2003 arose from the continuing employment survey which officially replaced, since the first of January 2003, the annual employment survey. This is a new quarterly survey, and the data collection takes place throughout the continuing year. Approximately 35 000 households, *i.e.* 75 000 people aged 15 years or more, participate in the survey each quarter. The annual results are obtained by taking the average of the quarterly results.

The methods used for coding the educational variables were improved. In the employment survey, the investigator coded directly the training whereas now he registers directly the heading of the diploma

and the training level. Thereafter the automatic coding is carried out and the rejections are treated "manually". Information collected is more detailed that allow bringing the "national" variables closer to ISCED97 definition. These changes explain for some variables the breakdown between 2003 and previous data.

Hungary: From 2000 to 2003 data have been revised. Specification of ISCED4 is used and data for 3A and 4 are separately provided. ISCED5B concern a new type of education that could be completed first since 2000.

Israel: Although pre-academic institutions in Israel are classified under ISCED4 in our national mapping of education, this level remains unaccounted for in this report, since the Labor Force Survey does not include a specific answer category for this level, and it is reported under "other" in the LFS questionnaire.

Japan: The Special Survey of the Labour Force Survey, which had been the source of the Questionnaire III, was abolished, and the Labour Force Survey is used as a source of the Questionnaire III from 2002 data.

The questionnaire of the Labour Force Survey asks the people about their education and select appropriate answer from the following.

- Primary school, junior high school or senior high school (ISCED 1/2/3)
- Junior college (ISCED 5B)
- College or university, including graduate school (ISCED 5A)

Therefore, the data are not distributed by ISCED 0/1/2 and 3.

The distribution between the 0/1/2 and 3/4 levels of education for 2003 and 2002 is based on 2001 one.

Luxembourg: The results apply to the population living in Luxembourg who has passed their education in Luxembourg as well as to them who has passed their education in another country than Luxembourg. This means the figures can not be used as a result for analyzing the national educational system.

Mexico: Revised data series.

United Kingdom: Others qualifications which are currently assigned to ISCED3 are assigned as follows 10% to ISCED97 3A (V), 35% to ISCED97 3CL (V 3+), 55% to ISCED97 3CS (V <3 years).

■ Table A1.4

Methodology

The calculation of the average number of years in formal education is based upon the weighted theoretical duration of schooling to achieve a given level of education, according to the current duration of educational programmes as reported in the UOE data collection. Hence, it is more an

estimate of the “replacement value” of the current supply of human capital than an estimate of the average duration of studies effectively attended by the population in the past.

INDICATOR A2: Current upper secondary graduation rates

■ Table A2.1. Upper secondary graduation rates

Methodology

In order to calculate gross graduation rates, countries identified the age at which graduation typically occurs. The graduates themselves, however, could be of any age. To estimate gross graduation rates, the number of graduates is divided by the population at the typical graduation age (Annex 1). In many countries, defining a typical age of graduation is difficult because ages of graduates vary. Typical ages of graduation are shown in Annex 1.

The *unduplicated count of all ISCED 3 graduates* gives the number of persons who graduate in the reference period from any ISCED 3 programme **for the first time**, *i.e.*, students who have not obtained an ISCED 3 (A, B or C) qualification in **previous** reference periods. For example, students who graduated from ISCED 3A programmes in the period of reference but obtained a short ISCED 3C graduation in an earlier year should (correctly) be reported as ISCED 3A graduates, but must be excluded from the unduplicated count of graduates in column 2 of Table C2.2. Similar cases may occur in the reporting of vocational and general programmes.

■ Notes on specific countries

Australia: The growth in the number of foreign students in Australia is definitely a contributing factor in the rise in this indicator over the past few years.

Austria: In the case of Austria graduation rates from programmes designed to prepare students for tertiary-type A education is the sum of graduation rates from ISCED 3A programmes and ISCED 4A programmes. ISCED 4A programmes (“Berufsbildende Höhere Schulen”), span ISCED levels 3A and 4A, and graduates were not counted as ISCED 3A graduates before, double counting is avoided.

Luxembourg: A significant proportion of the youth cohort study in neighbouring countries at the ISCED 3 level.

New Zealand: The large increase from the previous year results from a change in 'methodology'. The numerator in the calculation includes those who:

* Graduate from upper secondary school which is interpreted as ‘leave secondary school having attained sixth form (year 12) certificate or better’ (35895), or

* Successfully complete an ISCED3 programme post secondary school (38520).

The very high ISCED3 graduation reflects a large increase recently in participation in post-secondary courses, many of which are ISCED3 level. This participation has been spread over a wide range of ages and has been particularly noticeable amongst mature age females. When graduates from these programmes are added to those who leave school after having attained sixth form certificate or better,

and compare these with the population of a single age cohort, graduation rates well in excess of 100% result, particularly for females.

In the 2003 collection, the school leavers from ISECD3G graduation calculations were not included, almost half the total.

Spain: Break series in 2003 school year due to the revision of the national population data.

Turkey: Open education is excluded.

■ **Table A2.2. Post-secondary non-tertiary graduation rates**

Methodology

Please see notes of Table A2.1.

INDICATOR A3: Current tertiary graduation rates

■ **Table A3.1. Tertiary graduation rates**

Methodology

- **Calculation of the country mean for medium and long tertiary-type A programmes**

Countries which included the graduates of medium tertiary-type A programmes among the graduates of long programmes (*x*-code for short programmes) are counted as zero in the calculation of the country mean for medium programmes. In a similar manner, the countries using an *x*-code for long programmes, caused by inclusion of long programmes in the category for short programmes, are counted as zero in the country average for long programmes. This is necessary in order to ensure that the country averages for short programmes and long programmes add up to the correct country average for all first-stage university programmes.

- **Duration categories**

Tertiary-type A programmes can be sub-classified by the theoretical cumulative duration of programmes. For initial programmes at tertiary level, the cumulative theoretical duration is simply the theoretical full-time equivalent duration of those programmes from the beginning of Level 5. For second programmes, cumulative duration is calculated by adding the minimum entrance requirements of the programme (*i.e.* full-time equivalent years of prerequisite tertiary education) to the full-time equivalent duration of the programme. For degrees or qualifications where the full-time equivalent duration is unknown (*i.e.* courses of study designed explicitly for flexible or part-time study), cumulative duration is calculated on the basis of the duration of more traditional degree or qualification programmes with a similar level of educational content. The following duration categories are included in ISCED-97:

- Short: 2 to less than 3 years.
- Medium: 3 to less than 5 years.
- Long: 5 to 6 years.
- Very long: more than 6 years.

As “short” programmes would not meet the minimum duration requirement for classification at ISCED 5A, this category is only appropriate for intermediate programmes in the national qualification and degree structure (see below). That is, programmes of less than three years’ duration must be a component or a stage of a longer programme in order to be classified at level 5A. Individuals who complete these short programmes would not be counted as 5A graduates, however.

Typical ages of graduation are shown in Annex 1.

■ Notes on specific countries

Belgium (Flemish community): The second degrees non-university education (ISCED 5A & ISCED 5B second qualification/degree) are not integrated in the data collection. These types of higher education only consider a very small percentage of the total population enrolled in tertiary education which leads to the conclusion that the exclusion of these degrees has only a small impact on this indicator.

Czech Republic: All Bachelor's programmes are now classified as ISCED5A (according to Czech law), hence the increase of ISCED 5A graduates.

Finland: Due to a structural change in tertiary educational system in Finland ISCED 5B programmes (vocational college) are being phased out. At the same time the volume of polytechnic education (ISCED 5A) has been increased, hence the increase of ISCED 5A graduates.

Ireland: The graduation rates at ISCED 5A for Ireland, as published in EAG 2002, included those students with second qualifications at this level (*e.g.* Masters).

Luxembourg: A significant proportion of the youth cohort study in neighbouring countries at the ISCED 5 and 6 levels.

Spain: Break series in 2003 school year due to the revision of the national population data.

Sweden: There are few students and only five kinds of degrees defined as "second degree" in the Swedish tertiary-type A education system, four of which are dominated by female students.

Classification of tertiary programmes: Australia

ISCED5A	
First	"Bachelor's" (Honours) (4yr); Bachelor of Dentistry (5yr); Bachelor of Veterinary Medicine and Surgery (5yr); Bachelor of Medicine and Surgery (7yr)
Second	Graduate Diplomas (1.5yr); Master's Degree (2yr); Doctorate (by course work) (2yr)
ISCED 5B	
First	Vocational Education and Training Institutions - Diplomas, Advanced Diplomas (2yr); Universities – Undergraduate Diplomas (2 yr); Associate Degree (2 yr)
Second	a
ISCED 6	Doctorates (3yr)

■ **Classification of tertiary programmes: Austria**

ISCED 5A	
First	University “Bakkalaureat” (3yr); University “Fachhochschulstudium – Magister (FH)/ Diplomingenieur (FH)“ (4yr); University “Magister/ Diplomingenieur/ Doktor (1 st)” (4-6yr)
Second	University “Magisterstudium – Magister/ Diplomingenieur” (2yr); Post-graduate studies “MBA, MAS” (2yr)
ISCED 5B	
First	Master craftsmen/ foremen courses “Meisterprüfung/ Werkmeisterprüfung” (2yr); Technical and vocational education colleges “Diplomprüfung”(2yr); Post-secondary colleges for teacher training / medical services/ social work “Lehramtsprüfung/ Diplom”(3yr);Vocationally oriented studies at university “Kurzstudium – akademisch geprüfter...” (3yr);
Second	Post-secondary colleges for teacher training “Aufbaustudium – Lehramtsprüfung” (1yr)
ISCED 6	Doctorate “Doktor”(2yr)

■ **Classification of tertiary programmes: Czech Republic**

ISCED 5A	
First	Bachelor University study “bakalář (umění)” (3yr & 3-4yr); Teacher training for primary education Master’s “Magistr” (4yr) University Master of Arts/ Engineering/ Architecture “magistr urmeni/ inženýr (architekt)” (5-6yr); University Master's in (Veterinary) Medicine “doktor (veterinární) medicíny” (6yr)
Second	Post-graduate Pedagogical Certificate “osvědčení” (1yr); Post-graduate Certificate “osvědčení”(2yr); University Master of Arts/ Engineering/ Business “magistr urmeni/ inženýr”(2-3yr)
ISCED 5B	
First	Higher Technical School for technicians, hotel managers, bank clerks, nurses “Vyšší odborná škola” (2-2.5yr and 3-3.5 yr); Performing Arts and Dance Conservatoire Certificate on Maturita or Absolutorium “vysvědčení o maturitní zkoušce”(6 yr & 8 yr)
Second	a
ISCED 6	University Doctoral Study “Doktor” 3yr

■ **Classification of tertiary programmes: Denmark**

ISCED 5A	
First	Tertiary education medium cycle “Diplomingeniør, maskin- mester, sygeplejerske, folke- skolelærer m.fl.” (3-5yr); Bachelor’s Degree (3yr); Tertiary education long cycle, museum conservator, <i>e.g.</i> from Music Academy “Konservator, konservatorieuddannelserne” (5-7yr)
Second	Tertiary education long cycle “Cand. Mag., cand. Scient., cand. Polyt., etc” (2yr)
ISCED 5B	
First	Tertiary education short cycle, including technician qualification “Datamatiker/ byggetekniker/ Maskintekniker” (2-3yr)
Second	a
ISCED 6	Doctoral Programmes “Ph.D.” (3yr); Doctorate “Doktorgrad” (5-10yr)

■ **Classification of tertiary programmes: Finland**

ISCED 5A	
First	Lower University Programmes 3yr; Polytechnic Programmes 3.5-4.5yr; Higher University Programmes 5-6yr
Second	Specialists in Medicine/Dentistry/Veterinary Science 5-6yr
ISCED 5B	
First	Vocational College Programmes 2-3yr
Second	a
ISCED 6	
	Doctorate Programmes – “Licentiate” 2yr; Doctorate Programmes – “Doctor” 4yr

■ **Classification of tertiary programmes: France**

ISCED 5A	
First	First University Diploma (First cycle 2 years “DEUG” + Second cycle 1 year “Licence”) (3yr); Higher engineering school diploma “Diplôme d’ingénieur” (3-4yr) and Higher business school diploma “Diplôme d’ingénieur commercial” (3yr) including ‘ les Classes Préparatoires aux Grandes écoles (CPGE)” (2yr); Specialised Higher Schools diverse professional diplomas including in architecture, veterinary surgery, art etc “Diplômes professionnels divers (notaire, architecte, vétérinaire, journaliste,...)” (3-4yr); University pharmacy diploma “Diplôme de pharmacien” (5yr); University Diploma in Medicine/ Dentistry “Docteur en médecine/ Diplôme de dentiste” (7yr)
Second	University education 2 nd cycle 2 year “Maîtrise” (1yr); Teaching in university institute of training Master (IUFM) “CAPES, Professeur des écoles, etc” (2yr); Special diploma in Health “Diplôme d’études spécialisées” (3yr)
Third	University education 3 rd cycle “Diplôme d’études supérieures spécialisées (DESS) » (1yr)
ISCED 5B	
First	Specific vocational training diploma “Diplôme universitaire de technologie (DUT) » (2yr) ; Specialised higher school short professional diploma <i>e.g.</i> in special education, laboratory technician, social worker “Diplômes professionnels divers (éducateur spécialisé, laborantin, assistante sociale, infirmier-infirmière, etc.) » (2-3yr); High-level technician award (school or school and work-based) “Brevet de technicien supérieur (BTS)” (2yr)
Second	
ISCED 6	
	University education 3 rd cycle 1st year “Diplôme d’études approfondies (DEA)” (1yr);

Doctorate Programmes “Diplôme de docteur” (3yr)

■ **Classification of tertiary programmes: Germany**

ISCED 5A	
First	University “Fachhochschulen” degree “Diplom (FH)” (4yr); University „Universitäten” degree “Diplom oder Staatsprüfung“ (5yr)
Second	a
ISCED 5B	
First	Specialised academies (Bavaria) “Abschluss der Fachakademie/ Fachhochschulreife“ (2yr); Health sector schools for assistants/ nurses “Abschlusszeugnis für medizinische Assistenten, Krankenschwestern/ -pfleger” (3yr); Trade and technical schools “Fachschulabschluss, Meister/Techniker, Erzieher” (2yr & 3-4yr); Colleges of public administration diploma “Diplom (FH)” (3yr);
Second	a
ISCED 6	Doctoral studies “Promotion” (2-5yr)

■ **Classification of tertiary programmes: Iceland**

ISCED 5A	
First	First University Degree “Háskólanám 3ja/ 4ra/ 5/ 6 ára til fyrstu gráðu” (3yr, 4yr, 5yr or 6yr); Tertiary Technical Programmes - First University Degree “Háskólanám í tæknifræði til fyrstu gráðu” (3.5-4yr);
Second	Master’s degree after 3-4yr 1 st degree “Háskólanám, 1,5-2 viðbótarár ofan á 3- 4 ár, tekin viðbótargráða” (1.5-2yr); Master's degree after 5-6yr 1 st degree “Háskólanám, 2 viðbótarár ofan á 5-6 ár, tekin viðbótargráða” (2yr)
ISCED 5B	
First	Tertiary Diploma “Æðra nám í 2 ár án háskólagráðu” (2 yr or 3 yr); Fine and Applied Arts at Tertiary Level “Listnám í æðri skóla, 3ja/ 4ra ára” (3yr or 4yr); Teacher's Qualification (No degree) “Nám til kennsluréttinda án háskólagráðu” (1yr)
Second	a
ISCED 6	Doctoral Programme (Ph.D.) “Doktorsnám” (4yr)

■ **Classification of tertiary programmes: Ireland**

ISCED 5A	
First	Honours Bachelors Degree (3-4yr); Honours Bachelors Degree in (Veterinary) Medicine/ Dental Science/ Architecture (5-6yr)
Second	Post-graduate Diploma (1yr); Masters Degree (taught) (1yr); Masters Degree (by research) (2yr)
ISCED 5B	
First	Higher Certificate (2yr); Ordinary Bachelor Degree (3yr)
Second	Ordinary Bachelor Degree (3yr)
ISCED 6	Doctoral Degree (Ph.D.) (3yr)

■ **Classification of tertiary programmes: Israel**

ISCED 5A	
First	Bachelor's Degree from universities (3yr); Bachelor's Degree from the Open University (6yr); Teacher training colleges – academic track (2-4yr)
Second	University's Second Degree (2yr); University's Post-Graduate Diploma (2yr); Second Degree from academic colleges (2yr); Second Degree from the Open University
ISCED 5B	
First	Post-secondary education (2yr); Teacher training colleges – non-academic track (2yr)
Second	a
ISCED 6	Third Degree (5-6yr)

■ **Classification of tertiary programmes: Italy**

ISCED 5A	
First	University Degree "Diploma di Laurea" (4-6yr); University Degree "Diploma Universitario" (3yr)
Second	Professional Post-graduate Diploma "Diploma di specializzazione" 2-5yrs; Post-graduate Certificate "Attestato di partecipazione al Corso di perfezionamento" (1yr)
ISCED 5B	
First	Diploma from Fine-arts Academy "Diploma di Accademia di Belle Arti" (4yr); Dramatic Art Studies Diploma "Accademia di arte drammatica – Diploma di attore o diploma di regista" (3yr); Higher Artistic Studies Diploma "Diploma di Istituto Superiore Industrie Artistiche" (4yr); Music Conservatory Diploma "Conservatorio musicale (specializzazione di 2 anni)" (2yr); Dance Studies Diploma "Accademia di Danza – Diploma di avviamento e/o perfezionamento" (3yr)
Second	a
ISCED 6	Doctorate "Titolo di Dottore di ricerca" (3yr)

■ **Classification of tertiary programmes: Japan**

ISCED 5A	
First	Bachelor's Degree "Gakushi"(4yr); Bachelor's Degree in Medicine/Dentistry/Veterinary Medicine "Gakushi" (6yr);
Second	Master's Degree "Shushi" (2yr); University Advanced Course Certificate of Completion "Daigaku Senkoka" (1yr+)
ISCED 5B	
First	Specialised Training College Postsecondary Course Technical Associate Qualification "Senmonshi" (1yr+); Junior College Associate Qualification "Jungakushi" (2-3yrs); College of Technology Associate Qualification "Jun-gakushi" (2yr);
Second	Junior College Advanced Qualification "Tanki-daigaku Senkoka" (1+yr); College of Technology Advanced Qualification "Koto-senmon-gakko Senkoka" (1+yr);
ISCED 6	Doctor's Degree "Hakushi" (5yr); Doctor's Degree in Medicine/Dentistry/Veterinary Medicine "Hakushi" (4yr)

■ **Classification of tertiary programmes: New Zealand**

ISCED 5A	
First	Bachelor's Degree "Bachelor, National Diploma (Level 7)" (3yr)
Second	Post-graduate qualification "Master's Degree/ Post-graduate Certificate/ Post-graduate Diploma/ Bachelor's Honours" (1-2yr)
ISCED 5B	
First	Vocational Diploma "National Diplomas (Levels 5 or 6)" (3yr)
Second	a
ISCED 6	Doctorate/ Higher Doctorate (3-5yr)

■ **Classification of tertiary programmes: Poland**

ISCED 5A	
First	Professional degree (Licentiate) "Licencjat" (3yr); Professional Degree (Engineer) "Inzynier" (3.5-4yr); Master's Degree (Art/ Education/ Engineering/ Veterinary Medicine, etc) "Magister" (5-5.5yr); Degree in Medicine or Dental Science "Lekarz (Stomatolog)" (6yr)
Second	Post-licentiate Master's Degree "Magister" (1.5-2yr); Post-graduate Certificate "Studia Podyplomowe" (0.5-2yr)
ISCED 5B	
First	Teacher Training Diploma for pre-school, primary and other educational institutions "Kolegium nauczycielskie" (3yr); Foreign Language Teacher Training Diploma/ Qualification to teach foreign European languages "Nauczycielskie kolegium języków obcych" (3yr)
Second	a
ISCED 6	Scientific Doctorate "Studia Doktoranckie"(4yr)

■ **Classification of tertiary programmes: Slovak Republic**

ISCED 5A	
First	"Bachelor's" Degree 3-4yr; "Master's" Degree 4 yr; "Master's" Degree in Engineering 5-5.5yr; Degree in Engineering/Architecture/Medicine/Veterinary Medicine 6yr
Second	Supplementary Educational Study - "Certificate" 2yr; Teaching an Additional Subject - "Diploma" 2-4yr
ISCED 5B	
First	Post-secondary Specialisation Study - "Graduate's Diploma" 2-3yr; Higher Professional Studies - "Graduate's Diploma" 3yr; Dance Conservatory - "Graduate's Diploma" and "Certificate on Maturita Examination" 8yr; Conservatory and Secondary Schools Specialising in Arts - "Graduate's Diploma" and "Certificate on Maturita Examination" 6yr
Second	
ISCED 6	Examina Rigorosa - "Academic Degree (JUDr., PaedDr., RNDr., PhDr., etc)" usually 1yr; Doctorate Study (Ph.D., ArtD.) 3yr

■ **Classification of tertiary programmes: Spain**

ISCED 5A	
First	Bachelor's Degree "Diplomado Universitario, Arquitecto Técnico e Ingeniero Técnico" (3yr); Conservation and Restoration of Cultural Assets "Conservación y Restauración de Bienes Culturales" (3yr); Military Programme - Medium Grade "Militar de carrera de la escala media (Diplomado Universitario)" (3yr); University Degree - First and Second Cycle "Licenciado, Arquitecto e Ingeniero" (4-6yr); Higher Dramatic Art Studies Degree "Título Superior de Arte Dramático" (4yr); Music Studies Advanced Degree "Titulación Superior por especialidad musical" (4yr); Military Programme - Medium Grade "Militar de carrera de la escala media (Diplomado Universitario)" (3yr); Military Programme - Higher Grade "Militar de carrera de la escala superior (Licenciado universitario)" (5yr)
Second	Master's Degree "Licenciado e Ingeniero" (2yr)
ISCED 5B	
First	Specific Vocational Training of Plastic Arts and Design - Advanced Level Qualification "Técnico Superior - Ciclos Formativos de Artes Plásticas y Diseño de Grado Superior" (2yr); Specific Vocational Training - Advanced Level Qualification "Técnico Superior - Ciclos Formativos de Formación Profesional de Grado Superior" (2yr); Specific Vocational Training - Advanced Level (Distance Learning) "Técnico Superior - Ciclos Formativos de Formación Profesional de Grado Superior (Distancia)" (2yr); Military Programme Basic Grade "Militar de carrera de la escala básica" (2yr);
Second	a
ISCED 6	Doctorate "Doctor" (4-6yr)

■ **Classification of tertiary programmes: Sweden**

ISCED 5A	
First	Diploma (2-4yr); Bachelor's Degree (3yr); Master's Degree (4yr); Bachelor's Degree in Pharmacy/ Horticulture/ Forestry/ Landscape Architecture/ Medicine/ Psychology/ Dentistry/ Veterinary Medicine (5-5.5yr)
Second	Nursing Specialisation Qualification (1-1.25yr); Midwifery/ Psychotherapy/ Special Education (1.5yr)
ISCED 5B	
First	Diploma in Engineering (Lower Level) (2yr); Diploma in Dance and The Arts (2yr); Degree Certificate in Advanced Vocational Education (2-3yr)
Second	
ISCED 6	"Licentiate" 2yr; "Doctorate" 4yr (including "Licentiate")

■ **Classification of tertiary programmes: Switzerland**

ISCED 5A	
First	<p>Pedagogical University Certificate « Pädagogische Hochschule/ Haute École Pédagogique » (3yr);</p> <p>University of Applied Science Diploma “Fachhochschul diplom/ diploma” (3yr);</p> <p>University Diploma and Bachelor's Degree “Hochschulen - Lizentiat, Diplom, Staatsexamen” (4yr)</p>
Second	<p>Postgraduate Degree “Fachhochschul Nachdiplom” (1yr); University Postgraduate Diploma “Nachdiplom/ Diplôme du troisième cycle/ Postgrade” (1yr)</p>
ISCED 5B	
First	<p>Diploma of Higher Vocational Education - Stage I "Berufsprüfung/ Examen professionnel" (1-2yr);</p> <p>Diploma of Technical School "Höhere Fach- und Berufsschule/ École technique" (2yr); Teacher's Certificate - Teacher Training II "Primarlehrerpatent/ Fachlehrerpatent" (3yr);</p> <p>Polytechnic School Diploma from a Higher Vocational College “Höhere Fachschule/ École Professionnelle Supérieure/ Scuola Professionale Superiore” (3yr)</p>
Second	<p>Trade Master's Diploma or equivalent in Higher Vocational Education - Stage II “Höhere Fachprüfung/ Examen Professionnel Supérieur” (1-2yr)</p>
ISCED 6	<p>University Doctorate “Doktorat/ Ph.D.” (2yr)</p>

■ **Classification of tertiary programmes: United Kingdom**

ISCED 5A	
First	Bachelor's Degree "BA, BSc, etc" (3-4yr); Bachelor of Education "BEd" (4yr); Bachelor of Medicine "MB" (5yr+)
Second	Master's Degree taught "MA, MSc, MBA, etc" (1yr); "Postgraduate Diploma/Certificate "PG Dip/PG Cert" (9m); Teaching Qualification - Postgraduate Certificate in Education "PGCE" (1yr); Master's Degree by Research "Mphil, etc" (2yr+)
ISCED 5B	
First	Higher National Certificate "HNC" (1yr); Diploma of Higher Education "DipHE" (2yr); Higher National Diploma "HND" (2yr)
Second	a
ISCED 6	Doctor of Philosophy "Ph.D." (3yr+)

■ **Table A3.2. Sciences graduates, by gender**

Please see notes of tables A3.1 and A3.5.

The labour force data used are taken from the OECD Labour Force database, compiled from National Labour Force Surveys and European Labour Force Surveys.

■ **Table A3.3. Motivation in mathematics and tertiary-type A graduates**

Please see notes of table A3.1 and explanation on PISA of tables A4-A7.

■ **Table A3.4. Survival rates in tertiary education (2000)**

■ **Notes on specific countries**

Australia and the United States: The survival rates calculated using the standard OECD methodology are significantly higher than those calculated in national studies.

Belgium (Flemish Community): Social advancement education is not included.

France: Does not include all tertiary graduates included in Table A3.1, only those where new entrants data are available.

United Kingdom: Excludes foreign students.

Tables A3.5. Tertiary graduates by field of education, and A3.6. Percentage of tertiary qualifications awarded to females

Please see notes of table A3.1.

Classification

The fields of education used follow the revised ISCED classification by field of study. For definitions and instructions refer to the ISCED Classification (UNESCO, 1997). The classification is in accordance with the fields of training defined in the *Fields of Training – Manual* (EUROSTAT, 1999).

■ **Notes on specific countries:**

Sweden: There are few students and only five kinds of degrees defined as "second degree" in the Swedish tertiary-type A education system, four of which are dominated by female students.

INDICATORS A4-A7: PISA and TIMSS

For any needed information, please refer to the website from PISA (www.pisa.oecd.org) and TIMSS (www.timss.org).

INDICATOR A8: Labour force participation by level of educational attainment

- **Table A8.1a, A8.1b (web), A8.2a, A8.2b (web), A.8.3a, A8.3.b (web), A8.3.c (web), A8.4a A8.4.b (web), A8.4.c (web).**

Methodology

Data on population and educational attainment are taken from OECD and EUROSTAT databases, which are compiled from National Labour Force Surveys.

For sources and classification programmes, please see notes of table A1.1a.

Definitions

The labour force participation rate for a particular age group is equal to the percentage of individuals in the population of the same age group who are either employed or unemployed, as defined according to the guidelines of the International Labour Office (ILO). The employment rates used for this indicator are calculated in the same way but for employed only.

The unemployed are defined as individuals who are without work, actively seeking employment and currently available to start work. The employed are defined as those who during the survey reference week: i) work for pay (employees) or profit (self-employed and unpaid family workers) for at least one hour, or ii) have a job but are temporarily not at work (through injury, illness, holiday, strike or lock-

out, educational or training leave, maternity or parental leave, etc.) and have a formal attachment to their job.

■ **Table A.8.3a, A8.3.b (web), A8.3.c (web)**

■ **General notes**

Historical data on educational attainment are only available for the three major levels of education:

Less than upper secondary education -- 0/1/2 (ISCED97 equivalent levels)

Upper secondary and Post-secondary education -- 3/4 (ISCED97 equivalent levels)

Tertiary non-university and university -- 5/6 (5A/5B/6 ISCED97 equivalent levels)

Before 1997, educational attainment levels were coded according to international mapping ISCED 76. The ISCED 76 levels have been allocated to ISCED97 levels.

Sources

National Labour Force Surveys except for Belgium (1997-1999), Denmark (1998-2001); Luxembourg (1998-2001) and the Netherlands (1998-1999) for which data come from European Labour Force Survey.

■ **Notes on specific countries:**

Czech Republic: from 1994 to 1996, distributions are adjusted considering the 1997 distribution.

Denmark: There is a break in the time series between 1994 and 1995. There has been a revision of the Danish ISCED97 implementation. The revision is due to reforms of the education system. As a result of these reforms most medium-cycle higher education programmes (with a duration of at least 3 years) have been moved from ISCED 5B to ISCED 5A. Furthermore, the majority of short-cycle higher education programmes are now classified as ISCED 5B. The ISCED mapping has been revised.

Ireland: Data provided for the period 1999-2002 are revised figures.

Portugal: From 1991 to 1996, the distribution of the “unknown” category has been adjusted on the basis of the known distribution.

Sweden: There is a break in the time series between 2000 and 2001. This is a result of new data sources and improved information about immigrants.

Switzerland: New mapping in 2001.

United States: For 1991, the distribution is adjusted on the basis of the 1992 distribution.

INDICATOR A9: The returns to education: Education and earnings

- **Tables A9.1a, A9.1b, A9.2a (web), A9.2b (web), A9.2c (web), A9.3 (web), A9.4a, A9.4b, A9.4c**

Methods and definitions

The total (M+F) average is NOT the simple average of the Male and Female figures, but rather the average based on earnings of the total population. This overall average weights the average figure separately calculated for men and for women by the share of men and women at different levels of attainments ((and therefore of earnings).

Upper secondary education (=100) is the basis of comparison for figures reported in tables A9.1 while figures reported in Tables A9.2 are compared to upper secondary and post-secondary non tertiary education (=100) for trend data reasons.

■ **Notes on specific countries**

Earnings data for Hungary, Luxembourg and United States exclude part time, part year or seasonal employment. Earnings data for Belgium and Korea exclude bonuses from employers and overtime compensation in the Belgium case.

Earnings are considered before income tax except for Belgium and Korea where data are after income tax.

The length of the reference period is one week for Australia, Ireland, New Zealand and United Kingdom; one month for Belgium, France, Hungary, Germany, and Portugal; the calendar year for Canada, Czech Republic, Denmark, Finland, Italy, Luxembourg, Netherlands, Norway, Spain and Sweden; and other 12-month period for Korea, Switzerland and United States.

Earnings data are expressed in national currencies for Australia, Canada, Czech Republic, Denmark, Italy, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom and United States; and in euros for Belgium, Finland and Germany.

United Kingdom: Previously the earnings for women over the pension age (60+) were derived from women aged 55 to 59, however earnings are collected for women over 60 who are in employment so these figures have been input here. Moreover, previously the category “unknowns” were apportioned to education levels and this change in the methodology caused a significant change over a two year period comparison for table A9.1.

Sources

Australia	: Survey of Education and Training.
Belgium	: Labour Force Survey.
Canada	: Survey of Labour and Income Dynamics (SLID).

Czech Republic	: Microcensus.
Denmark	: a) Income register (end of 2001); b) Register of educational attainment (October 2001).
Finland	: The Register-based Employment Statistics.
France	: French life force survey.
Germany	: German socioeconomic panel study (GSOEP).
Hungary	: Individual Salary and earnings of employee.
Ireland	: Living in Ireland Survey.
Italy	: Bank of Italy Survey on Household Incomes and Wealth.
Korea	: Survey on wage structure.
Luxembourg	: Structure of earnings survey (every four years).
Netherlands	: Structure of Earnings Survey.
New Zealand	: Labour Market Statistics.
Norway	: Income Statistics for Persons and Families.
Portugal	: List of Personnel.
Spain	: European Household Panel, Eight wave.
Sweden	: National income register.
Switzerland	: Labour Force Survey.
United Kingdom	: Labour Force Survey.
United States	: 2003 March Current Population Survey.

■ Tables A9.5 to A9.10

Methodology

Point I deals with a conceptual framework for the evaluation of returns to education. Point II is a technical definition of the rate of return (ROR). Point III presents the costs and benefits used in the model. Point IV addresses data requirements and the assumptions of the model.

I. Introduction

The rate of return represents a measure of the economic benefits obtained, over time, relative to the cost of the obtaining education. Rates of return can be measured from the private individual's point of view or from society's point of view. Private rates of return measure the future net economic payoff to an individual of increasing the amount of education. Social rates of return measure the benefits to society of additional education. The formulae for calculating both types of return are the same, although the costs and benefits included differ between the two.

II. Technical definition of the Internal Rate of Return (IRR)

The internal rate of return (IRR) calculation is based on the actuarial method of calculating *net present value* (NPV) over time of making an investment relative to the benefits that the investment produces. NPV is a traditional criterion for making investment choices, in that provides an estimate of the future value of investments in terms of their economic benefits, after accounting for the costs of the investments. NPV is calculated as follows:

NPV is calculated as follows:

$$NPV = - \sum_{t=0}^{d-1} C_t / (1+i)^t + \sum_{t=d}^{64-a-d} B_t / (1+i)^t$$

where:

- C_t = costs at period t (t ∈ 0, d-1)
 B_t = benefits at period t (t ∈ d, 64-a-d)
 i = the discount rate at which future costs and benefits are valued in the present
 d = the duration of studies (in years)
 a = age at the beginning of education/training
 64 = age at the last year of activity in the labour market.

The IRR is the discount rate at which NPV=0. Given a stream of assumed costs and benefits over time, the IRR represents the rate of return on investment expressed as an interest rate (i) that a given investment produces in terms of assumed benefits. In project evaluation, a key criterion for project approval is to accept the project if the IRR is greater than the (opportunity) cost of capital that could be used in alternative investments (*e.g.* building facilities).

III. The composition of costs and benefits

Framework: for a hypothetical 40-year-old individual who decides to invest in training in order to reach a higher level of education, the cost elements are the following:

1. Foregone earnings during the training period
2. Training costs

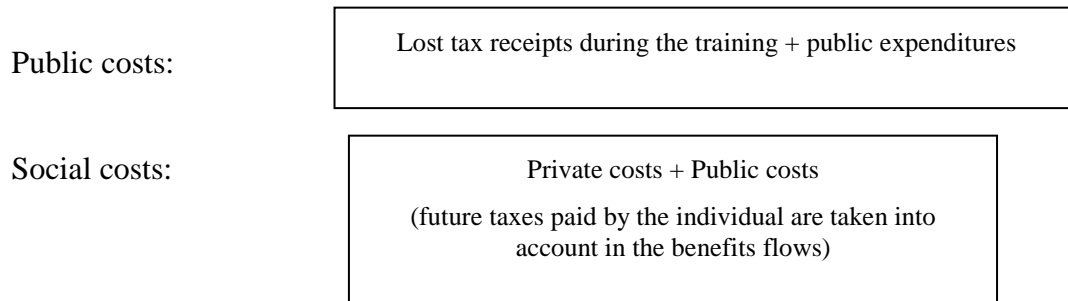
Three forms of educational expenditure are taken into account in the analysis:

- Direct public expenditures on education (for infrastructure, teachers' wages, etc.).
 - Indirect public expenditures (such as subsidies).
 - Direct private expenditures (tuition, other fees, etc.).
3. Additional tax payments resulting from an education-induced increase in taxable income.

These costs can be grouped as follows:

Private costs:

Foregone earnings + direct private expenditures + increased future taxes

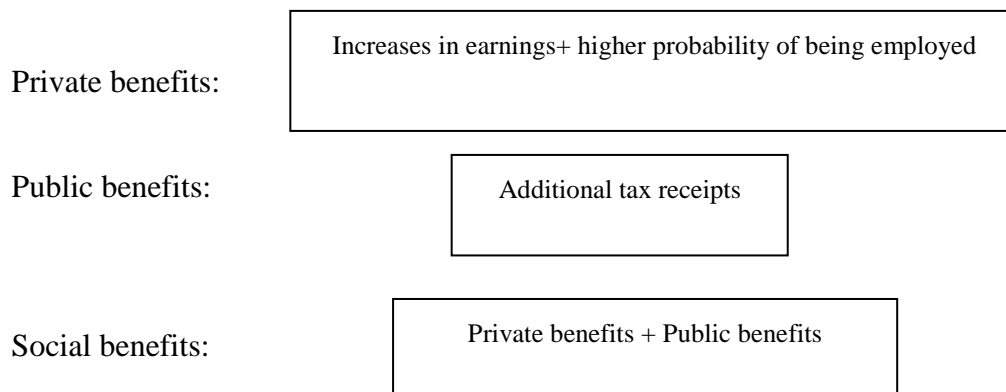


In the calculation of private rates of return, private costs are included; and in the calculation of social rates of return, social costs are included.

The benefits associated with the same hypothetical 40-year-old individual's decision to invest in training are the following:

1. Increased earnings levels arising from a higher level of education
2. Earnings associated with having a higher probability of being employed.
3. For the public sector, additional tax receipts.

These can be grouped as follows:



In calculating the private rates of return, private benefits are included. In calculating the social rates of return, social benefits are included.

IV. Data and model assumptions

This model calculates IRR from the point of view of the individual and society (social returns are the sum of the net individual and public benefits).

Data:

1. Earnings correspond to annual money earnings (direct payment for labour services provided in local currency (before deduction of income taxes or employee social security contributions). They do not include employer social security contributions, government social transfers, investment income, net increases in the value of an owner-operated business or any other income not directly related to work. The source of these data is Statistics Sweden.
2. Tax rates on earnings are taken from the OECD database.
3. Lifetime earnings streams are estimated from cross-section data. That is, the average annual earnings of today's older population cohorts are taken to represent a reasonable estimate of future average annual earnings. In cross-section data the positive earnings differentials between age cohorts reflect productivity growth due to accumulated work experience. A consequence of approximating cross-sectional data to time-series data is that we omit the impact of technological progress on earnings. This could be particularly important if the data were being analysed by industry or occupational category (which is not the case here).

The assumptions of the model

Assumptions are made on the following:

- The typical starting and ending age by level of education.
- The duration of studies.
- The real long-term interest rate. When this rate increases the NPV decreases. The IRR is compared with this discount rate.
- The growth rate of productivity (to reflect the impact of technological progress on average real annual earnings) is fixed at 1 % per year. It is assumed that the growth rate is the same for all levels of education. Each country should choose a growth rate that reflects its reality of labour productivity growth as well as the productivity growth rate for population cohorts with different levels of education.
- How the model handles the problem of unemployment. Specifically, average annual earnings for a given education cohort are weighted by the probability of being employed (1 minus the unemployment rate).
- The earnings of the individual after the training period are assumed to be 10 % more than at the previous level of education. Earnings increase in a linear fashion over 3 years until reaching parity with those of individuals who had already attained the higher level of education.