INDICATOR A9

WHAT ARE THE ECONOMIC BENEFITS OF EDUCATION?

This indicator examines the relative earnings of workers with different levels of educational attainment of 25 OECD countries and the partner economy Israel. This indicator also presents data that describe the distribution of pre-tax earnings (see Annex 3 for notes) within five ISCED levels of educational attainment to help show how returns to education vary within countries among individuals with comparable levels of educational attainment. The financial returns to educational attainment are calculated for investments undertaken as a part of initial education, as well as for the case of a hypothetical 40-year-old who decides to return to education in mid-career. For the first time, this indicator presents new estimates of the rate of return for an individual investing in upper secondary education instead of working for the minimum wage with a lower secondary level of education.

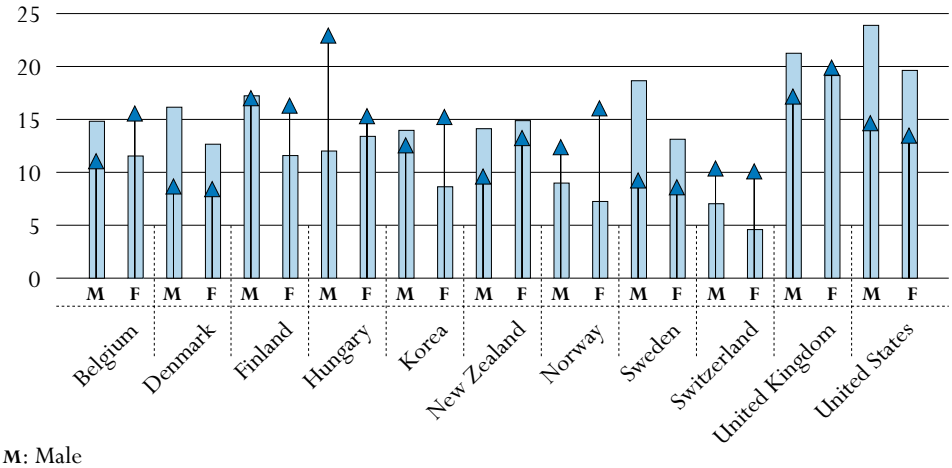
Key results

Chart A9.1. Private internal rates of return for an individual obtaining an upper secondary or post-secondary non-tertiary education, ISCED 3/4 and for an individual obtaining a university-level degree, ISCED 5/6 (2003)

Private internal rates of return for an individual immediately acuiring the next level of education: an upper secondary or post-secondary non-tertiary education, ISCED 3/4

Private internal rates of return for an individual immediately acuiring the next level of education: a tertiary level degree, ISCED 5/6

In all countries, for males and females, private internal rates of return exceed 4.5% on an investment in upper secondary education (completed immediately following initial education). Private internal rates of return are, on average, higher for investment in upper secondary or post-secondary non-tertiary education than for tertiary education. Attaining higher levels of education can be viewed as an economic investment in which there are costs paid by the individual (including reductions in earnings while receiving education) that typically result in higher earnings over the individual's lifetime. In this context, the investment in obtaining a tertiary degree, when undertaken as part of initial education, can produce private annual returns as high as 22.6%, with all countries showing a rate of return above 8%.



M: Male
F: Female
Source: OECD. Tables A9.5 and A9.6. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).
StatLink http://dx.doi.org/10.1787/068170623457

Other highlights of this indicator

- Earnings increase with each level of education. Those who have attained upper secondary, post-secondary non-tertiary or tertiary education enjoy substantial earnings advantages compared with those of the same gender who have not completed upper secondary education. Across all countries, individuals with tertiary-type A and advanced research education had earnings that were at least 50% higher than individuals whose highest level of educational attainment was below upper secondary level of education (Chart A9.4).

- In all countries, females earn less than males with similar levels of educational attainment (Table A9.3). For a given level of educational attainment, they typically earn between 50 and 80% of what males earn.

- Countries differ significantly in the dispersion of earnings among individuals with similar levels of educational attainment. Although individuals with higher levels of education are more likely to be in the highest earnings group, this is not always the case. The proportion of individuals with the highest educational attainment (tertiary-type A and advanced research programmes) in the lowest earning category (at or below half of the median) vary from 0 to 19.6%, in Portugal and Canada, respectively. Countries also differ in the relative share of men and women in the upper and lower categories of earnings.

- In all countries, it is profitable for a 40-year-old to return to education mid-career and obtain a tertiary degree. This applies to both males and females. The rate of return when the individual, at age 40, begins the next level of higher education in full-time university studies varies between 6.5% for males in New Zealand and 28.2% for females in Belgium.

A9

Policy context

One way in which markets provide incentives for individuals to develop and maintain appropriate skills is through wage differentials – in particular through the enhanced earnings awarded to persons with higher levels of education. At the same time, education involves costs that must be balanced against these higher earnings. This indicator examines relative earnings associated with different levels of education, the variation in these earnings and the estimated rates of return to individuals making investments to obtain higher levels of education.

The dispersion of earnings is also relevant for policies that support attainment of higher levels of education. Evidence suggests that some individuals may be receiving relatively low returns to investments in education, that is, they earn relatively low wages even though they have relatively high levels of educational attainment. Policy makers may wish to examine characteristics of the education programmes which appear to have low rates of return for some people or to examine the characteristics of the individuals in these programmes, such as their gender or occupation.

Evidence and explanations

Education and earnings

Earnings differentials according to educational attainment

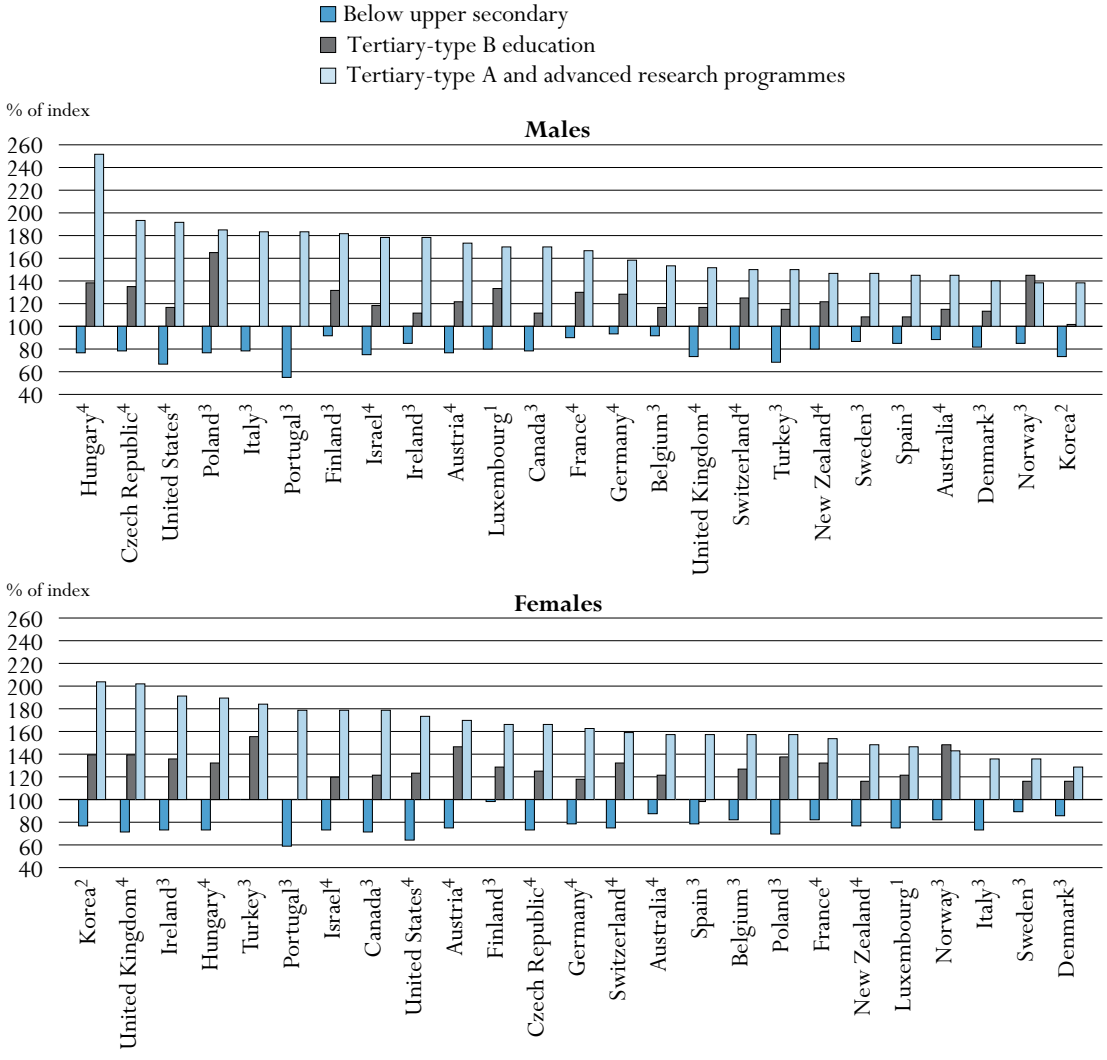
A key measure of the financial incentive available for an individual to invest in further education, earnings differentials may also reflect differences in the supply of educational programmes at different levels (or barriers to access to those programmes). The earnings benefit of completing tertiary education can be seen by comparing the average annual earnings of those who graduate from tertiary education with the average annual earnings of upper secondary or post-secondary non-tertiary graduates. The earnings disadvantage from not completing upper secondary education is apparent from a similar comparison of average earnings. Variations in relative earnings (before taxes) among countries reflect a number of factors, including the demand for skills in the labour market, minimum wage legislation, the strength of unions, the coverage of collective bargaining agreements, the supply of workers at the various levels of educational attainment, the range of work experience of workers with high and low levels of educational attainment, the distribution of employment among occupations and, last but not least, the relative incidence of part-time and seasonal work.

Chart A9.2 shows a strong positive relationship between educational attainment and average earnings. In all countries, graduates of tertiary-level education earn substantially more than upper secondary and post-secondary non-tertiary graduates. Earnings differentials between those who have tertiary education – especially those with a tertiary-type A level of attainment – and those who have upper secondary education are generally more pronounced than the differentials between upper secondary and lower secondary or below, suggesting that in many countries upper secondary (and, with a small number of exceptions, post-secondary non-tertiary) education forms a break-point beyond which additional education attracts a particularly high premium. Table A9.1a shows that the earnings premium for 25-to-64-year-olds with tertiary-level education, relative to upper secondary education, ranges from 26% in Denmark (2004) to 115% in Hungary (2005).

The earnings data shown in this indicator differ across countries in a number of ways. The results should therefore be interpreted with caution. In particular, in countries reporting annual earnings, differences in the incidence of seasonal work among individuals with different levels of educational attainment will have an effect on relative earnings that is not reflected in the data for countries reporting weekly or monthly earnings (see the Definitions and methodologies section below).

Chart A9.2. Relative earnings from employment (2005 or latest available year)

By level of educational attainment and gender for 25-to-64-years-olds (upper secondary and post-secondary non-tertiary education = 100)



1. Year of reference 2002.
2. Year of reference 2003.
3. Year of reference 2004.
4. Year of reference 2005.

Countries are ranked in descending order of the relative earnings of the population with a tertiary-type A level of educational attainment.

Source: OECD. Table A9.1a. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

StatLink http://dx.doi.org/10.1787/068170623457

A9

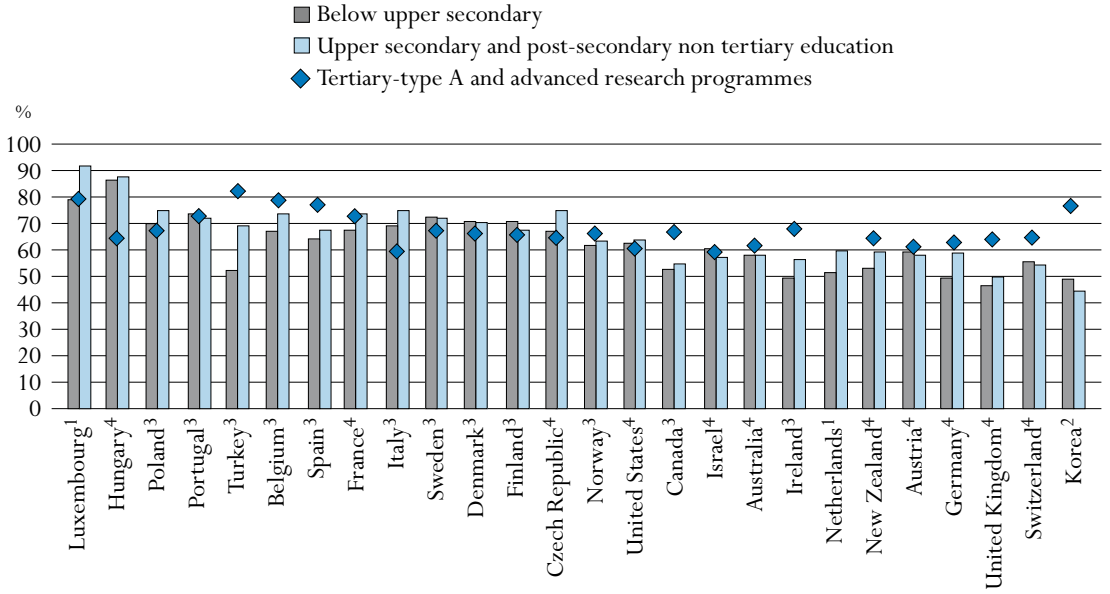
Education and gender disparity in earnings

For 25-to-64-year-olds, financial rewards from tertiary education benefit females more than males in Australia, Austria, Canada, Ireland, Korea, the Netherlands, Norway, Spain, Switzerland, Turkey and the United Kingdom. The reverse is true in the remaining countries, with the exception of Belgium and Germany, where – relative to upper secondary education – the earnings of males and females are equally enhanced by tertiary education (Table A9.1a).

Both males and females with upper secondary, post-secondary non-tertiary or tertiary attainment have substantial earnings advantages (compared with those of the same gender who do not complete upper secondary education), but earnings differentials between males and females with the same educational attainment remain substantial. In all countries, and at all levels of educational attainment, females in the 30-to-44-year-old age group earn less than their male counterparts (Chart A9.3 and Table A9.1b). When all levels of education are taken together (*i.e.* total earnings are divided by the total number of income earners, by gender), average earnings of females between the ages of 30 and 44 range from 51% of those of males, in Korea, to 84% in Luxembourg (Chart A9.3 and Table A9.1b).

Chart A9.3. Differences in earnings between females and males (2005 or latest available year)

Average female earnings as a percentage of male earnings (30-to-44-year-old age group), by level of educational attainment



1. Year of reference 2002.
2. Year of reference 2003.
3. Year of reference 2004.
4. Year of reference 2005.

Notes: Data on earnings for individuals in part-time work are excluded for the Czech Republic, Hungary, Luxembourg and Poland, while data on part-year earnings are excluded for Hungary, Luxembourg and Poland.

Source: OECD. Table A9.1b. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

StatLink http://dx.doi.org/10.1787/068170623457

The relative differential between men and women must be treated with caution, however, since in most countries earnings data include part-time work. Part-time work is often a major characteristic of women's employment and its prevalence is likely to vary a lot from one country to another. In Luxembourg, Hungary and Poland, those with part-time work and part-year earnings are excluded from the calculations. Earnings of females between the ages of 30 and 44 reach 84, 83 and 81% of those of males, respectively.

The gap in earnings between males and females presented in Chart A9.3 is explained in part by different choices of career and occupation, differences in the amount of time that males and females spend in the labour force, and the relatively high incidence of part-time work among females.

The distribution of earnings within levels of educational attainment

Data on the distribution of the share of individuals with a given level of educational attainment in different earnings groups can be used to describe how tightly earnings are distributed around the country median.

Tables A9.4a, A9.4b and A9.4c show the distributions of earnings among 25-to-64-year-olds for 25 OECD countries and the partner economy Israel. Distributions are given for the combined male and female populations, as well as for males and females separately. There are five categories of the earnings distribution, ranging from "At or below one-half of the median" to "More than twice the median". For example, in Table A9.4a, for Australia, the figure of 24.3% is found in the row "Below upper secondary" under the column "At or below one-half of the median". This means that 24.3% of Australians who are between the ages of 25 and 64 and whose highest educational attainment is below the upper secondary level have pre-tax earnings at or below one-half of the median earnings of all Australian 25-to-64-year-olds who had earnings from work during the reference period of the national survey. Tables A9.4b and A9.4c also present earnings distributions among males and females relative to the median of the entire adult population with earnings from work.

Indicators based on average earnings do not consider the range of earnings that individuals with a given level of educational attainment experience. Some individuals with high levels of educational attainment may have relatively low levels of earnings and individuals with low levels of education may have high levels of earnings. This variation may reflect differences in the returns to education across individuals and may be of concern to policy makers if they indicate that the labour market signals individuals receive as they consider investment in education are not clear.

The data show that in most countries the share of individuals in the lowest earnings categories falls as the level of educational attainment rises. This result is another way of viewing the well-established positive relationship between earnings and educational attainment. However, it is notable that even at higher levels of education there are individuals in the lower earnings categories, indicating that they have experienced a relatively low rate of return to education.

Still, countries differ significantly in the dispersion of earnings. For instance, Table A9.4a shows that in most countries the largest proportion of the population has earnings above one-half of the median but less than 1.5 times the median. Yet this percentage ranges from less than 45% in

Canada to more than 80% in Belgium. Across all levels of education, countries such as Belgium, the Czech Republic, Luxembourg and Portugal have no or relatively few individuals with earnings either at or below one-half the median. Conversely, while across all countries almost 22%, on average, of individuals between the ages of 25 and 64 have earnings above 1.5 times the median, this population share is as low as 14.1% in Belgium.

Countries also differ significantly in the gender distribution of individuals in the lowest earnings group. For example, taking into account all levels of educational attainment, Hungary is the only country in which the percentage of females in the lowest earnings category is smaller than the percentage of males in the same category. At the opposite end of the spectrum, the percentage of females in the highest earnings category is smaller than that of males in all countries. This is particularly marked in Switzerland, with 13% of males in the highest earnings category versus 2% of females and 4% of males in the lowest earnings category compared to 35% of females (Chart A9.5).

The interpretation of earnings dispersion data

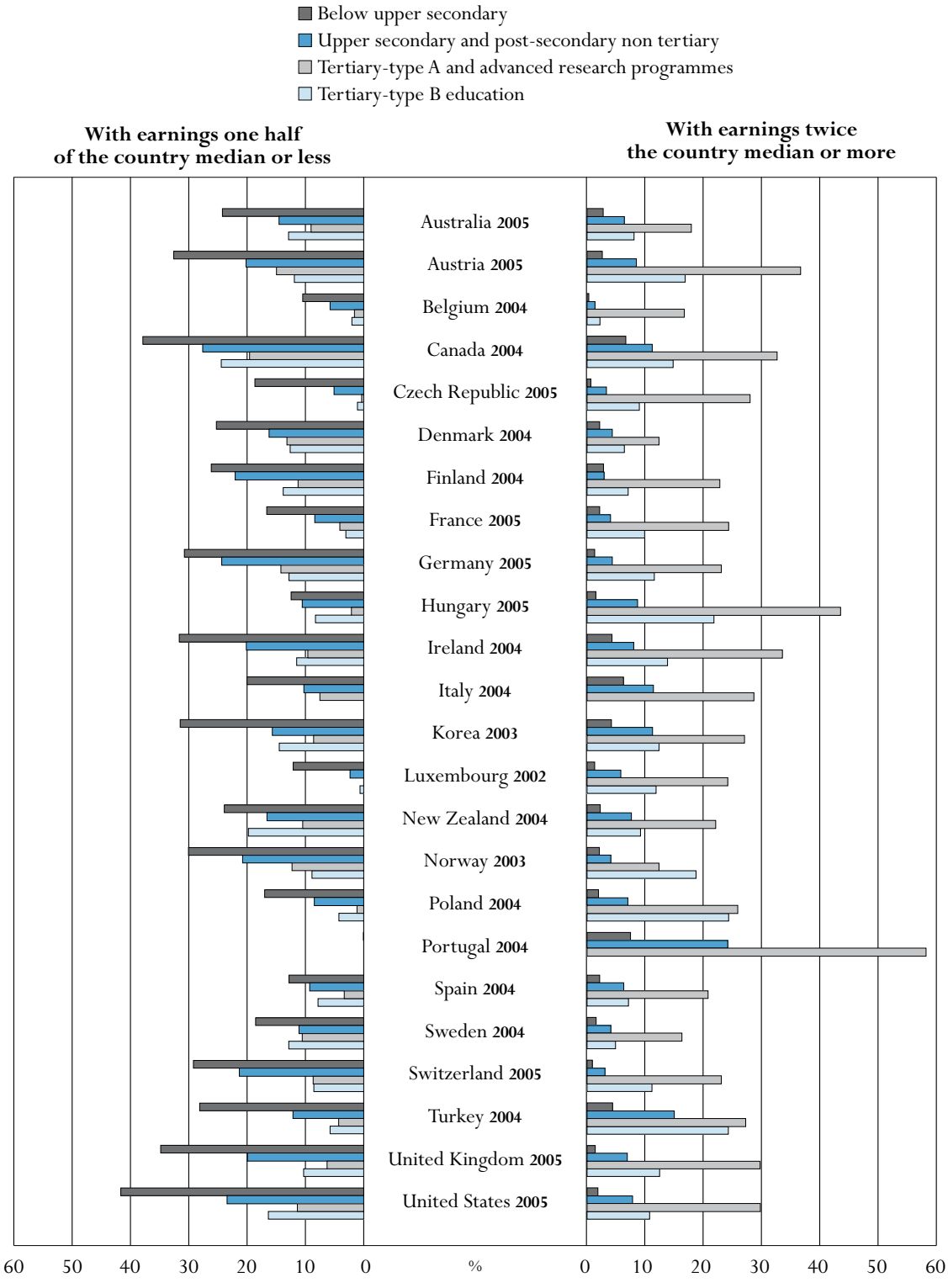
A wide range of factors – from differences in institutional arrangements to variation in individual abilities – is likely to determine the extent of earnings dispersion among individuals of similar educational attainment. At an institutional level, countries in which wage setting is more centralised would tend to see lower earnings dispersion, owing to a degree of convergence between occupational status and educational attainment. More broadly, earnings dispersions also reflect the fact that educational attainment cannot be fully equated with proficiency and skills: skills other than those indicated by educational attainment, as well as experience, are rewarded in the labour market. Differences in the scale and operation of training systems for adult learners also influence national patterns of earnings dispersion, as do non-skills-related recruitment considerations – such as gender, race or age discrimination (and consequently the relative effectiveness of national legislative frameworks in countering such problems). Finally, note that in Belgium earnings are centred on the median; this is probably in part because Belgian earnings data are net of income tax.

However, the data do show that in all countries, earnings dispersion falls as educational attainment rises. This trend has many possible interpretations, including that greater educational attainment could be providing more information on an individual's skills to potential employers, resulting in a closer link between education and wages.

More generally, the data point to gaps in the understanding of earnings determination. Research in the United States has shown that for individuals of the same race and sex, over one-half of the variance in earnings is not explained by quantifiable factors such as a person's years of schooling, age, duration of labour market experience, or indeed the schooling, occupation and income of their parents. Some research on the determinants of earnings has highlighted the importance that employers give to so-called non-cognitive skills – such as persistence, reliability and self-discipline – as well as raising questions for policy-oriented research on the role of education systems, and particularly early childhood education, in developing and signalling such skills (see the Definitions and methodologies section below).

A9

Chart A9.4. Share of 25-to-64-year-olds in earnings categories by level of educational attainment (2005 or latest available year)

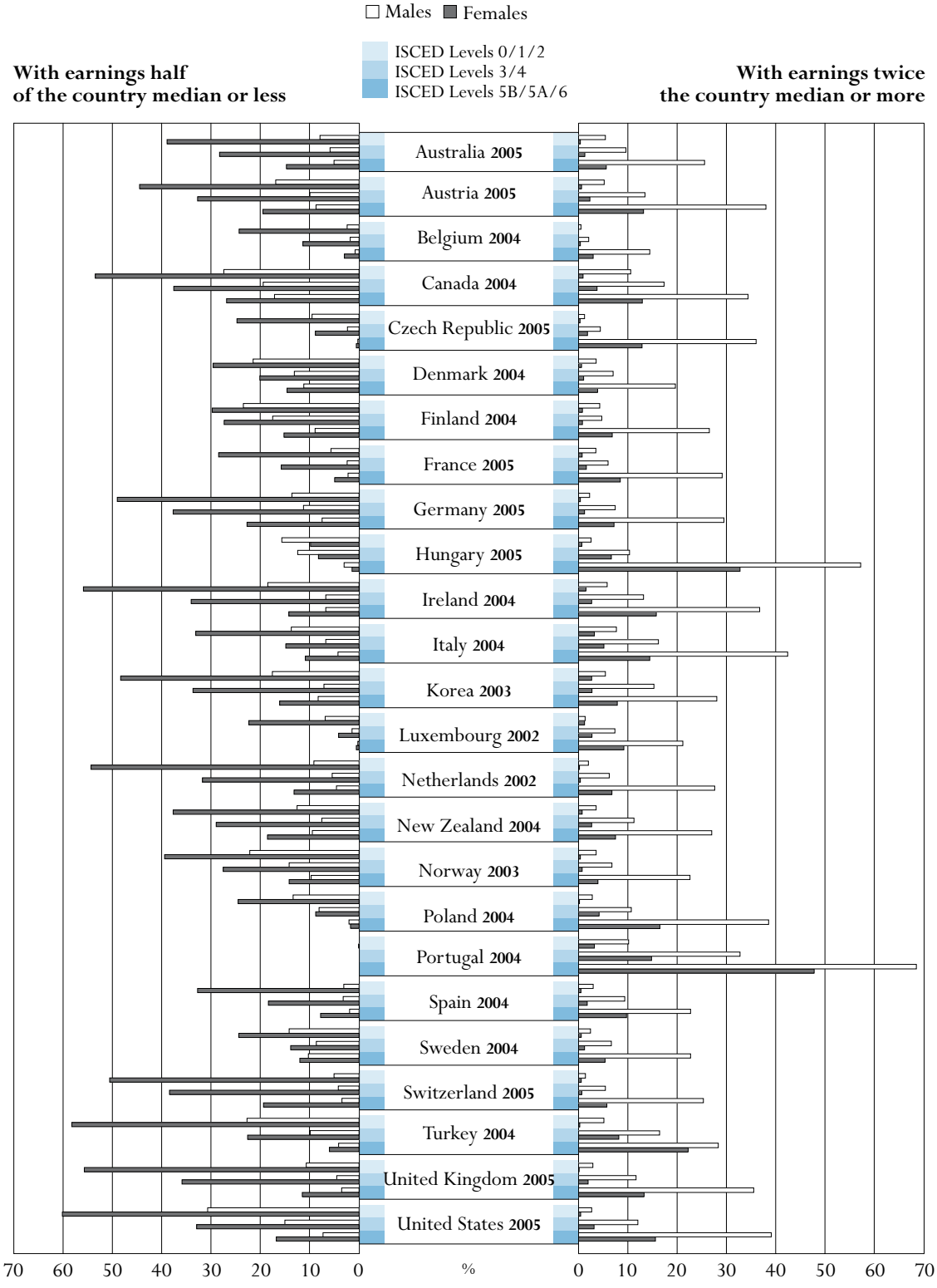


Source: OECD. Table A9.4a. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

StatLink http://dx.doi.org/10.1787/068170623457

A9

Chart A9.5. Share of 25-to-64-year-olds in earnings categories by level of educational attainment and gender (2005 or latest available year)



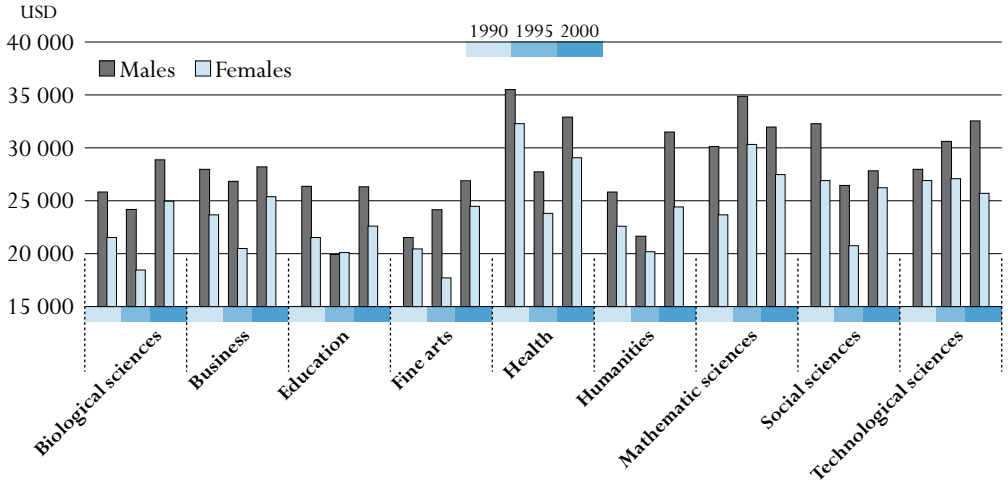
Source: OECD. Table A9.4b, Table A9.4c. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

StatLink http://dx.doi.org/10.1787/068170623457

Box A9.1. Variations in earnings by disciplines – the example of Canada

Though indicators present a single estimate for returns to a particular level of education, the variations and explanations behind such indicators are great. This box explores these variations for Canada. Data from three different cohorts of tertiary-type B graduates (1990, 1995 and 2000, along with earnings two years after graduation) suggest that earnings vary by discipline as well as by gender. The chart below shows that median earnings in 2002 (in 1997 constant Canadian dollars) for graduates from 2000 can be as high as $32 911 for male health graduates and as low $22 604 for women graduates of education. By reviewing the earnings of three different cohorts of graduates, the impact of labour market demands over a ten-year period can be shown. Gains over the period were evident for men and women who were graduates in fine arts, but they had the lowest median earnings. Those with degrees in health fields lost ground, however, although they had higher earnings than most other graduates. In general, women graduates earn slightly less compared to men with degrees in the same discipline.

Median earnings for three cohorts of tertiary-type B male and female graduates by discipline (1990, 1995, 2000)



Source: Drewes, Torben (2006), *Returns to College Education: Evidence from the 1990, 1995, and 2000 National Graduates Surveys*, Learning Research Series, Human Resources and Social Development Canada.

Information on variation in earnings by disciplines is important information for students and other stakeholders, as well as an essential way of analysing how different disciplinary fields contribute to the economy. Similarly, accessing data over time on earnings by levels of education provides further information about the match between supply and demand. In addition, the analytical possibilities and the policy implications that can be drawn from trend data by fields of study are substantial. International comparable data would provide additional analytical potentials by connecting country specific and global trends. The Canadian illustration thus serves as an example to strive for in international data collections.

For more information, see:
http://www.hrsdc.gc.ca/en/cs/sp/hrsdc/lp/publications/sp-654-09-06/SP-654-09-06E.pdf

A9

Rates of return to investment in education

The impact of education on earnings can be evaluated in the framework of investment analysis in which an individual incurs costs of getting an education (direct costs such as tuition while in school and indirect costs such as foregone earnings while in school). The effectiveness of this investment can be assessed by estimating the economic rate of return to the investment, which measures the degree to which the costs of attaining higher levels of education are translated into higher levels of earnings. The measure of return used here is the internal rate of return, which is effectively an interest rate that measures the economic return to an investment. This rate equates the costs required to attain the next highest level of education with the present value of a lifetime stream of additional earnings associated with the higher level of attainment. This indicator is analysed from two different points of view: rates of return to the individual (Tables A9.5 and A9.6), which reflect only the individual's earnings and costs, and rates of return to government (Tables A9.7 and A9.8). The return to government includes higher income tax and social contributions collected, as well as costs borne by the government. These private and public returns are calculated for 11 OECD countries.

Internal rates of return are computed for the attainment of two different levels of education: upper secondary education or post-secondary non-tertiary education, following from a lower secondary level of attainment (Tables A9.5 and A9.7); and tertiary education, following from an upper secondary or post-secondary non-tertiary level of educational attainment (Tables A9.6 and A9.8). Unlike the results presented in *Education at a Glance 2006* (OECD, 2006a), this year this indicator presents internal rates of return for obtaining upper secondary education or post-secondary non-tertiary education, following from a lower secondary level of attainment and based on the assumption that foregone earnings are fixed at the level of the minimum wage (when no national minimum wage was available, the wage was selected among wages determined in collective agreements). This implies that while in school obtaining an upper secondary level of education, the individual receives no earnings, compared with an individual at lower secondary level of education who receives the minimum wage or equivalent.

Internal rates of return are computed for two different periods in the individual's lifetime: immediately following initial education, and at the age of 40. In the latter, forgone earnings depends upon average earnings at the lower level of education and social benefits varying accross countries.

In addition, when calculating the internal rate of return at the age of 40, the analysis explores the impact on rates of return – for individuals and government – of the costs of education.

All results are presented separately for males and females.

Private internal rates of return to investment in education

The private internal rate of return for the individual is estimated on the basis of the additions to after-tax earnings that result from a higher level of educational attainment, net of the additional private costs (private expenditures and foregone earnings) that attaining this higher level of education requires. In general, the living expenses of students (cost of housing, meals, clothing, recreation, etc.) are excluded from these private expenditures.

Estimates of private rates of return for an individual who has invested in obtaining upper secondary or post-secondary non-tertiary education from an original lower secondary level of

education are presented in Table A9.5. Estimates for an individual who has invested in obtaining a tertiary-level education, up to the attainment of an advanced research qualification starting from an upper secondary level of education are presented in Table A9.6.

Private rates of return were calculated for the following two scenarios:

1. The individual has continued directly to the next highest level of education before entering the labour market.
2. Attaining the next highest level of education has been postponed until the age of 40, when education is resumed on a full-time basis. Two cases are examined in this scenario: *i)* the individual bears the direct costs of tuition (as reported by national education authorities) and foregoes earnings (net of taxes) while studying; and *ii)* the individual bears no direct tuition costs, but again bears the cost of foregoing earnings.

The results show that for males, in all countries except Hungary, Norway and Switzerland, the rates of return to the attainment of upper secondary or post-secondary non-tertiary education exceed those for tertiary education.

At the upper secondary level, the private internal rate of return shows greater variability than at tertiary level, while the former varies from 4.6 to 24%, the latter is not below 8% (Table A9.5, A9.6). Private rates of return at the upper secondary level are seen to be higher for females than males in two countries: Hungary and New Zealand, and in five countries at the tertiary level: Belgium, Korea, New Zealand, Norway and the United Kingdom.

The results also show that when an individual attains the next higher level of education at age 40, private rates of return to tertiary education are generally higher than those for the achievement of upper secondary education, except in Denmark, New Zealand and the United States. At the tertiary level, the additional incentive created by eliminating tuition costs tends to be weak. At the upper secondary level, eliminating tuition costs results on average in 0.4 of a percentage point increase in the private rate of return for males and a 1.0 percentage point increase for females. At the tertiary level, eliminating tuition costs increases the private rate of return by 0.9 percentage points for males and 1.7 percentage points for females. Nevertheless, while in countries such as Denmark, Finland and Norway the impact on private rates of return from eliminating the student's tertiary-level tuition costs is small, the impact is significantly larger in Belgium, Hungary, Korea, the United Kingdom and the United States.

Public internal rates of return to investment in education

The public internal rate of return is one way of examining the effect on public-sector accounts of individuals' choices to invest in education and the effect of the different policy settings that affect these investments. For the public sector, the costs of education include direct expenditures on educational institutions (such as direct payment of teachers' salaries, direct payments for the construction of school buildings, and buying textbooks, etc.) and public private transfers (such as public subsidies to households for scholarships and other grants and to other private entities for the provision of training at the workplace, etc.). The public costs of education also include income tax revenues on students' foregone earnings. The benefits include increased revenues from income taxes on higher wages, plus social insurance payments. In practice, the achievement of higher levels of education will give rise to a complex set of fiscal effects on the benefit side, beyond the effects of

wage and government payments-based revenue growth. For instance, better educated individuals generally experience superior health status, lowering public expenditure on the provision of health care. And, for some individuals, achieving higher levels of educational attainment may lower the likelihood of committing certain types of crime (see Indicator A10 in *Education at a Glance 2006*); this in turn reduces public expenditure. However, tax and expenditure data on such indirect effects of education are not readily available for inclusion in these rate-of-return calculations.

Estimates of public rates of return are shown in Tables A9.7 and A9.8. Table A9.7 presents public rates of return for an individual who has invested in obtaining upper secondary or post-secondary non-tertiary education (ISCED level 3/4), from an original lower secondary level of education. This estimate depends on the same assumption made for the private rate of return, *i.e.* an individual with a lower secondary level of education who earns the minimum wage or equivalent. Table A9.8 concerns an individual who has invested in obtaining a tertiary-level education, up to the attainment of an advanced research qualification (ISCED level 5(A, B)/6), starting from an upper secondary or post-secondary non-tertiary level of education (ISCED level 3/4).

As with the estimation of private rates of return, the calculation considered two scenarios:

1. Following initial education, the individual has continued directly to the next highest level of education, before entering the labour market.
2. Attaining the next highest level of education has been postponed until the age of 40, when education is resumed on a full-time basis. Two cases are examined in this scenario: *i)* the individual bears the direct costs of tuition (as reported by national education authorities) and foregoes earnings (net of taxes) while studying; and *ii)* the individual bears no direct tuition costs, but again bears the cost of foregoing earnings.

The results show that, for the achievement of the tertiary level of attainment during initial education, the public rate of return is in all cases lower than the private rate of return (except for Belgium, Korea and, for males, New Zealand). When the individual goes back to full-time education in mid-career, and bears the direct costs of tuition and foregone earnings, public rates of return for completing tertiary education are lower than private rates of return in all countries (Table A9.8). These low rates are driven by a number of factors including the high costs of providing education and high losses in tax receipts (when the individual in study foregoes earnings) relative to tax revenues (when the individual returns to work).

The results show that, for upper secondary education, the effect of the public sector bearing the individual's tuition costs is to lower the public rate of return by an average of 0.2 percentage points for males and 0.3 percentage points for females (Table A9.7). At the tertiary level, the average effect is to lower the public rate of return by about 0.7 of a percentage point for males and 1 percentage point for females. The magnitude of this decline in the public rate of return in the United States is noteworthy – 2.3 percentage points for males and 2.8 percentage points for females (Table A9.8) – which is partially explained by the high private contributions to the costs of tertiary education in the United States.

The interpretation of internal rates of return

For those who acquire upper secondary or tertiary education, high private internal rates of return in most countries (though not in all) indicate that human capital investment appears

to be an attractive way for the average person to build wealth. Furthermore, and with some exceptions, policies that reduce or eliminate the direct costs of education are seen to have only a modest impact on individuals' decisions to invest in mid-career learning.

In many cases, the reported private internal rates of return are above – and in a number of countries significantly above – the risk-free real interest rate, which is typically measured with reference to rates applying on long-term government bonds. However, returns on human capital accumulation are not risk-free, as indicated by the wide distribution of earnings among the better educated. Moreover, not everyone who invests in a course of education actually completes the course. Rates of return will be low, and possibly negative, for individuals who drop out. Therefore, individuals contemplating an investment in education are likely to require a compensating risk premium. However, in a number of countries, the size of the premium of the internal rates of return over the real interest rate is higher than would seem to be warranted by considerations of risk alone. If returns to this form of investment are high, relative to investments of similar risk, there is some obstacle to individuals making the investment. High risk-adjusted private rates of return provide initial grounds for policy intervention to alleviate the relevant constraints.

For one, high rates of return indicate a shortage of better-educated workers, driving up earnings for these workers. Such a situation might be temporary, with high returns to education eventually generating enough supply response to push the rates into line with returns to other productive assets. However, the speed of adjustment would depend largely on the capacity of the education system to respond to the derived increase in demand and the capacity of the labour market to absorb the changing relative supplies of labour. The rebalancing mechanism could be accelerated by making better information about the returns to different courses of study available to students, helping them to make more informed choices.

Part of the high returns may also be compatible with market stability. According to this interpretation, the high internal rates of return would partly reflect economic rents on a scarce resource, namely ability and motivation. If the returns to education at the margin are lower, the case for public intervention to stimulate human capital accumulation is lessened if the quality of the marginal student cannot be improved. However, to the extent that the education system can improve both cognitive and non-cognitive skills of young people, education policy can make a significant contribution to efficiency and equity in the long run. The results from the OECD Programme for International Student Assessment (PISA) suggest that some countries succeed much better than others in securing high and equitable educational performances at the age of 15 years.

Internal rates of return to investment in education can also be viewed from a societal perspective. Such a perspective would combine both the private and public costs and benefits of additional education. For instance, the social cost of education would include foregone production of output during study periods as well as the full cost of providing education, rather than just the cost borne by the individual. A social rate of return should also include a range of possible indirect benefits of education, which also have economic repercussions, such as better health, more social cohesion and more informed and effective citizens. While data on social costs are available for most OECD countries, information on the full range of social benefits is less readily available. Indeed, for a number of possible external factors associated with education, current understanding of the nature and size of the effects is incomplete.

It is important to consider some of the broad conceptual limitations to estimating internal rates of return in the manner done here:

- The data reported are accounting rates of return only. The results would no doubt differ from econometric estimates that would rely, for example, on an earnings function approach, rather than on a lifetime stream of earnings derived from average empirical earnings.
- Estimates relate to levels of formal educational attainment only. They do not reflect the effects of learning outside of formal education.
- The approach used here estimates future earnings for individuals with different levels of educational attainment based on knowledge of how average gross earnings in the present vary by level of attainment and age. However, the relationship between different levels of educational attainment and earnings may not be the same in the future as it is today. Technological, economic and social change could all alter how wage levels relate to the level of educational attainment.
- As with the discussion of the interpretation of earnings dispersion data, differences in internal rates of return across countries in part reflect different institutional and non-market conditions that bear on earnings. Institutional settings that limit flexibility in relative earnings are a case in point.
- Estimates are based on average pre-tax earnings for persons at different levels of educational attainment. However, at a given level of educational attainment, individuals who have chosen different courses of study or who come from different social groups may register different rates of return.
- In estimating benefits, the effect of education in increasing the likelihood of employment is taken into account. However, this also makes the estimate sensitive to the stage in the economic cycle when the data were collected.

The rate-of-return calculations also involve a number of restrictive assumptions necessary for international comparability. In particular, it was not possible to include the effects on public accounts of changes in social transfer payments resulting from changes in wages. This is largely because the rules that govern eligibility for a broad range of social entitlements vary greatly across countries as well as by marital or civic status (and sometimes other criteria). Consequently, to ensure comparability, the rates of return have been calculated on the assumption that the individual in question is single and childless.

The above analyses could be extended in a number of ways, subject to data availability. In particular, more differentiated and comparable data relative to costs per student and a range of social transfer payments would be useful. Estimating changes in value added tax receipts resulting from the increased earnings acquired through obtaining higher levels of education would also contribute to a more complete assessment of impact on public accounts. The calculations do not consider that those with high earnings can often generate higher levels of income after age 64 as a consequence of their having superior pension arrangements.

Definitions and methodologies

Earnings data in Table A9.1a are based on an annual reference period in Austria, Canada, the Czech Republic, Denmark, Finland, Ireland, Italy, Korea, Luxembourg, Norway, Portugal, Spain, Sweden, Turkey and the United States. Earnings are reported weekly in Australia, New Zealand and the United Kingdom, and monthly in Belgium, France, Germany, Hungary, Poland and

Switzerland, and the partner economy Israel. Data on earnings are before income tax, while earnings for Belgium, Korea and Turkey are net of income tax. Data on earnings for individuals in part-time work are excluded for the Czech Republic, Hungary, Luxembourg and Poland, while data on part-year earnings are excluded for Hungary, Luxembourg and Poland.

The research regarding earnings determination in the United States is described in Bowles and Gintis (2000).

Earnings assumptions were made in calculating rates of return.

For the individual who decides to attain upper secondary education as part of his or her original education, the assumptions concerned the estimated level of foregone earnings fixed at the minimum wage (when no national minimum wage was available, the wage has been selected among wages determined in collective agreements). This assumption aims at counterbalancing the excessively low recorded earnings for 15-to-24-year-olds with lower secondary education, which caused excessively high estimates in earlier editions of *Education at a Glance*.

For the individual who decides to return to education in mid-career, the assumptions concerned the immediate earnings increase (10% relative to the level of earnings at the previous level of educational attainment) and the time required for convergence with the average wage of individuals already holding the next highest level of educational qualification (two years). These assumptions are somewhat *ad hoc*. Empirical evidence on the earnings of adults who return to work following part-time or full-time studies is scarce, especially for individuals attaining an upper secondary qualification. However, Canadian data indicate a convergence period of just two years for 30-to-49-year-olds who obtain a university degree, with a still shorter catch-up time for those who obtain a tertiary degree. It should be noted, nevertheless, that the Canadian data are derived from a small sample of individuals and do not control for the fact that those who invested in education may differ in important ways – such as motivation and inherent ability – by comparison with those who did not.

For the methods employed for the calculation of the rates of return in Tables A9.5 to A9.8, see Annex 3 at *www.oecd.org/edu/eag2007*.

Further references

The following additional material relevant to this indicator is available on line at:

StatLink http://dx.doi.org/10.1787/068170623457

- ***Table A9.2b Trends in relative earnings: male population (1997-2005)***
- ***Table A9.2c Trends in relative earnings: female population (1997-2005)***
- ***Table A9.4b Distribution of 25-to-64-year-old males by level of earnings and educational attainment (2005 or latest available year)***
- ***Table A9.4c Distribution of 25-to-64-year-old f*emales *by level of earnings and educational attainment (2005 or latest available year)***

A9

Table A9.1a.

Relative earnings of the population with income from employment (2005 or latest available year)

By level of educational attainment and gender for 25-to-64-year-olds and 30-to-44-year-olds (upper secondary and post-secondary non-tertiary education = 100)

			Below upper secondary education		Post-secondary non-tertiary education		Tertiary-type B education		Tertiary-type A and advanced research programmes		All tertiary education	
			25-64	30-44	25-64	30-44	25-64	30-44	25-64	30-44	25-64	30-44
OECD countries												
Australia	2005	Men	86	88	105	111	115	117	143	150	136	141
		Women	86	88	104	103	120	128	156	156	146	149
		M+W	81	83	96	99	110	113	139	141	131	134
Austria	2005	Men	76	73	131	136	122	119	173	164	149	144
		Women	74	75	122	119	145	132	168	170	156	151
		M+W	71	69	121	122	129	123	174	170	152	148
Belgium	2004	Men	91	93	100	103	117	120	153	151	137	137
		Women	82	84	106	110	127	127	155	160	137	139
		M+W	90	92	102	104	116	118	155	154	134	134
Canada	2004	Men	79	78	103	105	111	107	169	157	140	132
		Women	70	74	96	98	120	125	176	186	146	155
		M+W	78	78	102	104	110	108	168	161	138	134
Czech Republic	2005	Men	79	82	m	m	135	148	193	201	190	199
		Women	72	74	m	m	125	136	165	171	161	169
		M+W	72	76	m	m	125	139	185	194	181	191
Denmark	2004	Men	82	79	97	92	113	112	141	134	133	128
		Women	85	80	96	96	115	115	128	124	126	123
		M+W	82	80	103	98	115	116	129	124	126	122
Finland	2004	Men	91	88	m	m	131	125	180	168	161	150
		Women	97	92	m	m	129	125	165	160	146	141
		M+W	94	91	m	m	123	115	171	159	149	138
France	2005	Men	90	89	m	m	129	134	167	166	152	152
		Women	81	81	m	m	130	134	152	161	142	149
		M+W	86	87	m	m	125	131	157	161	144	148
Germany	2005	Men	93	95	114	117	128	126	159	152	151	144
		Women	77	80	117	117	117	113	161	160	151	149
		M+W	88	86	111	111	132	130	164	157	156	150
Hungary	2005	Men	76	76	127	127	138	144	253	269	253	268
		Women	72	75	117	117	131	134	188	194	188	194
		M+W	73	75	121	120	131	133	216	225	215	225
Ireland	2004	Men	83	87	104	107	111	114	178	167	157	150
		Women	72	76	101	101	134	132	190	199	170	175
		M+W	86	90	104	102	119	119	186	179	164	159
Italy	2004	Men	78	79	m	m	m	m	183	163	183	163
		Women	73	74	m	m	m	m	134	128	134	128
		M+W	79	81	m	m	m	m	160	143	160	143
Korea	2003	Men	73	83	m	m	103	109	138	132	127	125
		Women	75	91	m	m	138	146	201	227	176	195
		M+W	67	77	m	m	111	122	156	161	141	148
Luxembourg	2002	Men	79	78	114	137	132	139	170	176	149	156
		Women	74	67	120	129	120	125	145	150	131	137
		M+W	78	76	117	120	129	136	165	171	145	152
Netherlands	2002	Men	84	84	m	m	m	m	m	m	143	141
		Women	72	72	m	m	m	m	m	m	155	156
		M+W	84	84	m	m	m	m	m	m	148	147

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

Table A9.1a. *(continued)*

Relative earnings of the population with income from employment (2005 or latest available year)

By level of educational attainment and gender for 25-to-64-year-olds and 30-to-44-year-olds (upper secondary and post-secondary non-tertiary education = 100)

				Below upper secondary education		Post-secondary non-tertiary education		Tertiary-type B education		Tertiary-type A and advanced research programmes		All tertiary education	
				25-64	30-44	25-64	30-44	25-64	30-44	25-64	30-44	25-64	30-44
OECD countries	**New Zealand**	2005	Men	79	81	107	109	122	110	146	139	140	133
			Women	77	73	105	103	115	113	147	149	135	137
			M+W	78	79	105	106	108	102	144	141	132	131
	Norway	2004	Men	84	88	118	113	143	143	139	137	140	138
			Women	82	86	121	116	148	151	141	142	142	143
			M+W	84	88	125	120	154	146	135	133	136	134
	Poland	2004	Men	77	76	107	110	164	175	184	186	179	183
			Women	68	71	102	103	136	150	155	164	151	162
			M+W	78	80	99	100	154	166	166	170	163	169
	Portugal	2004	Men	54	60	m	m	m	m	182	180	182	180
			Women	58	61	m	m	m	m	177	180	177	180
			M+W	57	62	m	m	m	m	179	179	179	179
	Spain	2004	Men	84	83	83	87	107	105	144	141	132	128
			Women	78	79	95	62	97	100	156	158	141	144
			M+W	85	84	89	96	104	105	144	141	132	130
	Sweden	2004	Men	85	81	121	124	107	106	145	140	135	132
			Women	87	82	105	107	114	106	133	129	127	122
			M+W	87	82	120	121	105	100	137	131	127	122
	Switzerland	2005	Men	79	79	109	106	123	122	149	145	140	137
			Women	75	81	112	110	131	140	158	170	149	161
			M+W	76	80	109	108	139	142	164	165	156	157
	Turkey	2004	Men	67	64	m	m	115	110	149	145	139	133
			Women	46	48	m	m	154	174	183	169	164	167
			M+W	65	63	m	m	121	119	152	143	141	135
	United Kingdom	2005	Men	72	70	m	m	117	118	152	161	142	148
			Women	70	65	m	m	137	136	200	203	180	181
			M+W	69	71	m	m	123	124	169	177	155	161
	United States	2005	Men	64	65	113	112	117	115	192	193	183	183
			Women	63	63	109	111	122	119	173	180	167	172
			M+W	67	67	110	110	117	114	183	183	175	175
Partner economy	**Israel**	2005	Men	74	62	107	112	119	113	179	185	159	162
			Women	72	66	120	122	119	119	177	188	157	165
			M+W	79	71	104	105	113	109	169	178	151	156

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

A9

Table A9.1b.

Differences in earnings between females and males (2005 or latest available year)

Average annual earnings of females as a percentage of males by level of educational attainment of 30-to-44-year-olds and 55-to-64-year-olds

			Below upper secondary education		Upper secondary and post-secondary non-tertiary education		Tertiary-type B education		Tertiary-type A and advanced research programmes		All levels of education	
			30-44	55-64	30-44	55-64	30-44	55-64	30-44	55-64	30-44	55-64
OECD countries	**Australia**	2005	58	59	58	56	64	62	61	60	62	59
	Austria	2005	59	54	58	55	64	99	60	64	57	53
	Belgium	2004	67	67	74	65	78	79	78	84	76	67
	Canada	2004	53	50	55	56	64	55	65	57	63	54
	Czech Republic	2005	67	78	75	90	69	79	64	74	69	81
	Denmark	2004	71	70	70	72	72	71	65	64	72	69
	Finland	2004	71	78	68	78	67	74	65	71	70	73
	France	2005	67	65	74	71	74	62	72	64	74	62
	Germany	2005	49	50	58	50	52	52	62	62	57	53
	Hungary	2005	87	86	87	102	81	107	63	77	83	84
	Ireland	2004	49	56	56	63	65	57	67	52	62	58
	Italy	2004	69	76	75	70	m	m	59	55	74	70
	Korea	2003	49	45	44	52	59	107	76	62	51	37
	Luxembourg	2002	79	83	92	71	83	105	78	131	84	56
	Netherlands	2002	51	47	60	47	m	m	m	m	62	50
	New Zealand	2005	53	60	59	71	61	54	64	65	61	65
	Norway	2004	61	63	63	65	66	69	65	63	66	63
	Poland	2004	70	72	75	95	64	76	66	74	81	87
	Portugal	2004	73	96	72	130	m	m	72	193	78	114
	Spain	2004	64	57	68	67	64	56	76	74	75	65
	Sweden	2004	73	76	72	73	72	77	66	68	72	74
	Switzerland	2005	55	46	54	52	62	53	64	53	54	47
	Turkey	2004	52	38	69	113	109	m	81	176	78	85
	United Kingdom	2005	47	49	50	56	57	59	63	71	56	54
	United States	2005	62	54	64	62	66	67	60	58	65	58
Partner economy	**Israel**	2005	61	48	57	56	60	51	58	58	62	58

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

A9

Table A9.2a.

Trends in relative earnings: adult population (1997-2005)

By educational attainment, for 25-to-64-year-olds (upper secondary and post-secondary non-tertiary education = 100)

			1997	1998	1999	2000	2001	2002	2003	2004	2005
OECD countries	**Australia**	Below upper secondary	79	m	80	m	77	m	m	m	81
		Tertiary	124	m	134	m	133	m	m	m	131
	Austria	Below upper secondary	m	m	m	m	m	m	m	m	71
		Tertiary	m	m	m	m	m	m	m	m	152
	Belgium	Below upper secondary	m	m	m	92	m	91	89	90	m
		Tertiary	m	m	m	128	m	132	130	134	m
	Canada	Below upper secondary	m	77	79	79	76	77	78	78	m
		Tertiary	m	141	141	145	146	139	140	138	m
	Czech Republic	Below upper secondary	68	68	68	m	m	m	m	73	72
		Tertiary	179	179	179	m	m	m	m	182	181
	Denmark	Below upper secondary	85	86	86	m	87	88	82	82	m
		Tertiary	123	124	124	m	124	124	127	126	m
	Finland	Below upper secondary	97	96	96	m	95	95	94	94	m
		Tertiary	148	148	153	m	150	150	148	149	m
	France	Below upper secondary	84	84	84	m	m	84	84	85	86
		Tertiary	149	150	150	m	m	152	146	147	144
	Germany	Below upper secondary	81	78	79	75	m	77	87	88	88
		Tertiary	133	130	135	143	m	143	153	153	156
	Hungary	Below upper secondary	68	68	70	71	71	74	74	73	73
		Tertiary	179	184	200	194	194	205	219	217	215
	Ireland	Below upper secondary	75	79	m	89	m	76	m	86	m
		Tertiary	146	142	m	153	m	144	m	164	m
	Italy	Below upper secondary	m	58	m	78	m	78	m	79	m
		Tertiary	m	127	m	138	m	153	m	160	m
	Korea	Below upper secondary	m	78	m	m	m	m	67	m	m
		Tertiary	m	135	m	m	m	m	141	m	m
	Luxembourg	Below upper secondary	m	m	m	m	m	78	m	m	m
		Tertiary	m	m	m	m	m	145	m	m	m
	Netherlands	Below upper secondary	83	m	m	m	m	84	m	m	m
		Tertiary	141	m	m	m	m	148	m	m	m
	New Zealand	Below upper secondary	77	76	76	74	74	m	76	75	78
		Tertiary	148	136	139	133	133	m	126	129	132
	Norway	Below upper secondary	85	84	84	m	m	84	80	84	m
		Tertiary	138	132	133	m	m	135	126	136	m
	Poland	Below upper secondary	m	m	m	m	m	m	m	78	m
		Tertiary	m	m	m	m	m	m	m	163	m
	Portugal	Below upper secondary	62	62	62	m	m	m	m	57	m
		Tertiary	176	177	178	m	m	m	m	179	m
	Spain	Below upper secondary	76	80	m	m	78	m	m	85	m
		Tertiary	149	144	m	m	129	m	m	132	m
	Sweden	Below upper secondary	90	89	89	m	86	87	87	87	m
		Tertiary	129	130	131	m	131	130	128	127	m
	Switzerland	Below upper secondary	74	75	76	78		77	75	74	76
		Tertiary	152	153	151	157		156	156	164	156
	Turkey	Below upper secondary	m	m	m	m	m	m	m	65	m
		Tertiary	m	m	m	m	m	m	m	141	m
	United Kingdom	Below upper secondary	64	65	65	67	67	m	69	67	69
		Tertiary	153	157	159	159	159	m	162	158	155
	United States	Below upper secondary	70	67	65	65	m	66	66	65	67
		Tertiary	168	173	166	172	m	172	172	172	175
Partner economy	**Israel**	Below upper secondary	m	m	m	m	m	m	m	m	79
		Tertiary	m	m	m	m	m	m	m	m	151

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

A9

Table A9.3.

Trends in differences in earnings between females and males (1997-2005)

Average annual earnings of females as a percentage of males by level of educational attainment of 25-to-64-year-olds

OECD countries

		1997	1998	1999	2000	2001	2002	2003	2004	2005
Australia	Below upper secondary	60	m	66	m	62	m	m	m	61
	Upper secondary and post-secondary non tertiary	62	m	64	m	62	m	m	m	60
	Tertiary	62	m	67	m	63	m	m	m	65
Austria	Below upper secondary	m	m	m	m	m	m	m	m	57
	Upper secondary and post-secondary non tertiary	m	m	m	m	m	m	m	m	60
	Tertiary	m	m	m	m	m	m	m	m	62
Belgium	Below upper secondary	m	m	m	64	m	65	66	66	m
	Upper secondary and post-secondary non tertiary	m	m	m	72	m	72	74	74	m
	Tertiary	m	m	m	74	m	76	74	74	m
Canada	Below upper secondary	m	52	51	52	51	50	52	52	m
	Upper secondary and post-secondary non tertiary	m	59	60	60	59	61	60	59	m
	Tertiary	m	61	60	58	58	60	61	61	m
Czech Republic	Below upper secondary	66	66	66	m	m	m	m	74	74
	Upper secondary and post-secondary non tertiary	69	69	69	m	m	m	m	80	80
	Tertiary	66	65	65	m	m	m	m	67	68
Denmark	Below upper secondary	73	73	73	m	74	75	73	74	m
	Upper secondary and post-secondary non tertiary	72	71	71	m	71	73	71	71	m
	Tertiary	68	66	66	m	67	68	67	67	m
Finland	Below upper secondary	78	77	77	m	76	76	76	76	m
	Upper secondary and post-secondary non tertiary	74	72	72	m	71	72	72	72	m
	Tertiary	66	65	62	m	63	64	66	65	m
France	Below upper secondary	68	68	68	m	m	68	68	68	68
	Upper secondary and post-secondary non tertiary	75	75	75	m	m	75	75	74	75
	Tertiary	69	69	69	m	m	69	72	70	70
Germany	Below upper secondary	63	74	70	56	m	53	54	54	52
	Upper secondary and post-secondary non tertiary	64	67	68	63	m	61	60	60	62
	Tertiary	63	68	60	61	m	60	58	60	62
Hungary	Below upper secondary	79	80	84	83	83	85	89	89	88
	Upper secondary and post-secondary non tertiary	88	86	89	88	88	93	95	96	93
	Tertiary	64	63	62	62	62	67	71	72	69
Ireland	Below upper secondary	46	48	m	46	m	48	m	49	
	Upper secondary and post-secondary non tertiary	59	63	m	60	m	57	m	56	m
	Tertiary	70	70	m	71	m	62	m	61	m
Italy	Below upper secondary	m	70	m	76	m	70	m	69	m
	Upper secondary and post-secondary non tertiary	m	62	m	65	m	66	m	74	m
	Tertiary	m	52	m	62	m	60	m	54	m
Korea	Below upper secondary	m	56	m	m	m	m	48	m	m
	Upper secondary and post-secondary non tertiary	m	70	m	m	m	m	47	m	m
	Tertiary	m	75	m	m	m	m	65	m	m
Luxembourg	Below upper secondary	m	m	m	m	m	80	m	m	m
	Upper secondary and post-secondary non tertiary	m	m	m	m	m	86	m	m	m
	Tertiary	m	m	m	m	m	75	m	m	m
Netherlands	Below upper secondary	46	m	m	m	m	49	m	m	m
	Upper secondary and post-secondary non tertiary	56	m	m	m	m	58	m	m	m
	Tertiary	57	m	m	m	m	62	m	m	m

Note: Data on earnings for individuals in part-time work are excluded for the Czech Republic, Hungary, Luxembourg, Poland and Portugal, while data on part-year earnings are excluded for Belgium, Hungary, Luxembourg, Poland and Portugal.

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

A9

Table A9.3. *(continued)*

Trends in differences in earnings between females and males (1997-2005)

Average annual earnings of females as a percentage of males by level of educational attainment of 25-to-64-year-olds

			1997	1998	1999	2000	2001	2002	2003	2004	2005
OECD countries	**New Zealand**	Below upper secondary	52	61	65	61	61	m	65	66	61
		Upper secondary and post-secondary non tertiary	62	63	67	64	64	m	63	63	62
		Tertiary	60	59	61	67	67	m	62	62	60
	Norway	Below upper secondary	60	60	61	m	m	61	63	63	m
		Upper secondary and post-secondary non tertiary	61	61	62	m	m	63	66	64	m
		Tertiary	63	62	62	m	m	64	66	65	m
	Poland	Below upper secondary	m	m	m	m	m	m	m	71	m
		Upper secondary and post-secondary non tertiary	m	m	m	m	m	m	m	81	m
		Tertiary	m	m	m	m	m	m	m	68	m
	Portugal	Below upper secondary	72	71	71	m	m	m	m	74	m
		Upper secondary and post-secondary non tertiary	69	69	69	m	m	m	m	69	m
		Tertiary	66	66	65	m	m	m	m	67	m
	Spain	Below upper secondary	60	61	m	m	58	m	m	63	m
		Upper secondary and post-secondary non tertiary	72	76	m	m	71	m	m	68	m
		Tertiary	68	69	m	m	64	m	m	73	m
	Sweden	Below upper secondary	73	74	74	m	74	74	75	75	m
		Upper secondary and post-secondary non tertiary	72	72	73	m	71	72	73	73	m
		Tertiary	67	66	67	m	65	67	68	69	m
	Switzerland	Below upper secondary	51	51	53	51	m	51	52	54	53
		Upper secondary and post-secondary non tertiary	55	57	58	57	m	53	54	52	56
		Tertiary	60	61	62	62	m	59	60	58	60
	Turkey	Below upper secondary	m	m	m	m	m	m	m	52	m
		Upper secondary and post-secondary non tertiary	m	m	m	m	m	m	m	75	m
		Tertiary	m	m	m	m	m	m	m	89	m
	United Kingdom	Below upper secondary	47	50	51	50	50	m	52	52	50
		Upper secondary and post-secondary non tertiary	53	53	53	52	52	m	54	53	52
		Tertiary	60	62	63	64	64	m	64	63	66
	United States	Below upper secondary	53	60	59	59	m	63	67	63	63
		Upper secondary and post-secondary non tertiary	59	62	61	60	m	63	64	63	65
		Tertiary	59	58	59	56	m	58	61	59	59
Partner economy	**Israel**	Below upper secondary	m	m	m	m	m	m	m	m	57
		Upper secondary and post-secondary non tertiary	m	m	m	m	m	m	m	m	59
		Tertiary	m	m	m	m	m	m	m	m	58

Note: Data on earnings for individuals in part-time work are excluded for the Czech Republic, Hungary, Luxembourg, Poland and Portugal, while data on part-year earnings are excluded for Belgium, Hungary, Luxembourg, Poland and Portugal.

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

Table A9.4a.

Distribution of the 25-to-64-year-old population by level of earnings and educational attainment (2005 or latest available year)

			Level of earnings					
			At or below half of the median	More than half the median but at or below the median	More than the median but at or below 1.5 times the median	More than 1.5 times the median but at or below 2.0 times the median	More than 2 times the median	All categories
			%	%	%	%	%	%
OECD countries								
Australia	**2005**	Below upper secondary	24.3	46.3	21.1	5.6	2.8	100
		Upper secondary and post-secondary non-tertiary	14.5	39.2	29.9	10.0	6.4	100
		Tertiary-type B education	12.9	32.6	35.2	11.3	8.0	100
		Tertiary-type A and advanced research programmes	9.1	20.5	33.1	19.5	17.9	100
		All levels of education	15.5	35.1	28.9	11.6	8.9	100
Austria	**2005**	Below upper secondary	32.6	41.0	18.9	4.9	2.6	100
		Upper secondary and post-secondary non-tertiary	20.2	30.6	29.2	11.6	8.5	100
		Tertiary-type B education	11.9	17.1	30.3	23.8	16.8	100
		Tertiary-type A and advanced research programmes	15.0	13.4	15.7	19.3	36.6	100
		All levels of education	20.8	29.2	26.5	12.5	11.1	100
Belgium	**2004**	Below upper secondary	10.5	58.0	27.9	3.3	0.3	100
		Upper secondary and post-secondary non-tertiary	5.8	52.8	33.8	6.3	1.4	100
		Tertiary-type B education	2.1	35.3	48.4	12.0	2.2	100
		Tertiary-type A and advanced research programmes	1.6	17.8	37.3	26.7	16.7	100
		All levels of education	5.5	44.5	35.9	10.2	3.9	100
Canada	**2004**	Below upper secondary	37.9	29.6	16.9	8.9	6.7	100
		Upper secondary and post-secondary non-tertiary	27.6	26.5	23.0	11.6	11.2	100
		Tertiary-type B education	24.4	23.0	23.2	14.6	14.8	100
		Tertiary-type A and advanced research programmes	19.6	14.7	17.2	15.8	32.6	100
		All levels of education	26.5	23.4	20.8	13.0	16.3	100
Czech Republic	**2005**	Below upper secondary	18.7	65.3	13.7	1.7	0.7	100
		Upper secondary and post-secondary non-tertiary	5.1	49.8	34.1	7.7	3.3	100
		Tertiary-type B education	1.1	33.5	43.8	12.7	9.0	100
		Tertiary-type A and advanced research programmes	0.3	10.5	39.2	21.9	28.0	100
		All levels of education	5.4	44.6	33.3	9.6	7.2	100
Denmark	**2004**	Below upper secondary	25.3	41.3	26.9	4.4	2.2	100
		Upper secondary and post-secondary non-tertiary	16.2	35.8	35.8	7.8	4.3	100
		Tertiary-type B education	12.6	23.4	43.5	14.0	6.4	100
		Tertiary-type A and advanced research programmes	13.2	20.3	38.8	15.4	12.3	100
		All levels of education	17.6	32.4	34.8	9.2	5.9	100
Finland	**2004**	Below upper secondary	26.2	36.7	27.4	6.8	2.8	100
		Upper secondary and post-secondary non-tertiary	22.1	36.4	30.9	7.8	2.9	100
		Tertiary-type B education	13.8	27.2	39.6	12.3	7.1	100
		Tertiary-type A and advanced research programmes	11.3	16.4	27.4	22.1	22.8	100
		All levels of education	19.2	30.8	31.1	11.3	7.7	100
France	**2005**	Below upper secondary	16.6	51.8	23.9	5.5	2.2	100
		Upper secondary and post-secondary non-tertiary	8.4	46.1	32.7	8.8	4.0	100
		Tertiary-type B education	3.1	28.8	40.9	17.3	9.9	100
		Tertiary-type A and advanced research programmes	4.1	17.4	33.7	20.5	24.3	100
		All levels of education	9.4	40.9	31.3	10.8	7.5	100
Germany	**2005**	Below upper secondary	30.8	32.7	28.2	7.0	1.3	100
		Upper secondary and post-secondary non-tertiary	24.4	33.9	29.0	8.3	4.3	100
		Tertiary-type B education	12.8	25.4	32.3	18.0	11.5	100
		Tertiary-type A and advanced research programmes	14.2	17.1	24.9	20.7	23.0	100
		All levels of education	21.5	28.5	28.1	12.3	9.6	100

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

A9

Table A9.4a. *(continued-1)*

Distribution of the 25-to-64-year-old population by level of earnings and educational attainment (2005 or latest available year)

				Level of earnings					
				At or below half of the median	More than half the median but at or below the median	More than the median but at or below 1.5 times the median	More than 1.5 times the median but at or below 2.0 times the median	More than 2 times the median	All categories
				%	%	%	%	%	%
OECD countries	**Hungary**	2005	Below upper secondary	12.5	67.0	16.1	3.0	1.5	100
			Upper secondary and post-secondary non-tertiary	10.5	43.8	26.7	10.3	8.7	100
			Tertiary-type B education	8.3	29.4	30.0	10.6	21.8	100
			Tertiary-type A and advanced research programmes	2.1	6.7	23.4	24.4	43.5	100
			All levels of education	9.0	39.6	24.1	12.2	15.2	100
	Ireland	2004	Below upper secondary	31.7	33.9	21.9	8.2	4.3	100
			Upper secondary and post-secondary non-tertiary	20.2	33.7	25.6	12.4	8.0	100
			Tertiary-type B education	11.5	30.1	29.0	15.6	13.8	100
			Tertiary-type A and advanced research programmes	9.6	14.9	19.3	22.7	33.5	100
			All levels of education	20.8	29.2	23.3	13.5	13.1	100
	Italy	2004	Below upper secondary	20.0	44.2	24.0	5.5	6.2	100
			Upper secondary and post-secondary non-tertiary	10.3	33.6	34.1	10.7	11.4	100
			Tertiary-type B education	m	m	m	m	m	m
			Tertiary-type A and advanced research programmes	7.5	17.7	31.0	15.2	28.6	100
			All levels of education	14.0	36.0	29.4	9.1	11.5	100
	Korea	2003	Below upper secondary	31.5	42.8	19.0	2.5	4.2	100
			Upper secondary and post-secondary non-tertiary	15.7	34.9	29.6	8.6	11.2	100
			Tertiary-type B education	14.5	30.8	31.0	11.3	12.4	100
			Tertiary-type A and advanced research programmes	8.6	17.5	29.7	17.1	27.0	100
			All levels of education	17.8	32.1	27.1	9.5	13.5	100
	Luxembourg	2002	Below upper secondary	12.1	60.1	21.6	4.9	1.3	100
			Upper secondary and post-secondary non-tertiary	2.3	52.2	28.0	11.7	5.8	100
			Tertiary-type B education	0.6	28.6	41.7	17.2	11.8	100
			Tertiary-type A and advanced research programmes	0.0	14.4	36.6	24.9	24.1	100
			All levels of education	3.5	45.4	30.0	13.0	8.2	100
	Netherlands	2002	Below upper secondary	26.9	37.9	29.0	5.0	1.3	100
			Upper secondary and post-secondary non-tertiary	17.4	36.5	33.2	9.3	3.6	100
			All tertiary education	8.3	20.8	30.5	21.9	18.6	100
			All levels of education	17.4	32.6	31.3	11.6	7.1	100
	New Zealand	2005	Below upper secondary	22.9	48.4	20.8	5.4	2.5	100
			Upper secondary and post-secondary non-tertiary	17.4	34.1	28.8	11.5	8.2	100
			Tertiary-type B education	16.9	29.3	30.8	11.2	11.7	100
			Tertiary-type A and advanced research programmes	11.5	21.9	26.9	19.4	20.3	100
			All levels of education	17.0	33.5	27.2	12.1	10.2	100
	Norway	2004	Below upper secondary	30.1	37.1	25.5	5.1	2.2	100
			Upper secondary and post-secondary non-tertiary	20.4	35.4	32.2	8.1	4.0	100
			Tertiary-type B education	8.7	15.3	34.7	22.8	18.4	100
			Tertiary-type A and advanced research programmes	12.3	22.0	40.1	13.5	12.1	100
			All levels of education	19.0	31.0	33.7	9.7	6.6	100
	Poland	2004	Below upper secondary	17.0	54.4	21.0	5.7	1.9	100
			Upper secondary and post-secondary non-tertiary	8.5	44.7	29.1	10.7	7.0	100
			Tertiary-type B education	4.2	27.9	28.0	15.6	24.3	100
			Tertiary-type A and advanced research programmes	1.2	16.6	35.6	20.8	25.8	100
			All levels of education	9.6	41.0	27.6	11.4	10.4	100

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

Table A9.4a. *(continued-2)*

Distribution of the 25-to-64-year-old population by level of earnings and educational attainment (2005 or latest available year)

			Level of earnings					
			At or below half of the median	More than half the median but at or below the median	More than the median but at or below 1.5 times the median	More than 1.5 times the median but at or below 2.0 times the median	More than 2 times the median	All categories
			%	%	%	%	%	%
Portugal	**2004**	Below upper secondary	0.0	61.6	23.2	7.7	7.5	100
		Upper secondary and post-secondary non-tertiary	0.0	32.9	27.8	15.1	24.2	100
		Tertiary-type B education	m	m	m	m	m	m
		Tertiary-type A and advanced research programmes	0.0	7.1	16.5	18.3	58.2	100
		All levels of education	0.0	50.0	23.2	10.3	16.5	100
Spain	**2004**	Below upper secondary	12.8	50.8	29.0	5.2	2.2	100
		Upper secondary and post-secondary non-tertiary	9.3	42.6	31.6	10.2	6.3	100
		Tertiary-type B education	7.8	43.8	30.6	10.6	7.1	100
		Tertiary-type A and advanced research programmes	3.3	22.8	33.2	19.9	20.7	100
		All levels of education	9.1	41.0	30.9	10.7	8.4	100
Sweden	**2004**	Below upper secondary	18.6	44.0	31.1	4.8	1.6	100
		Upper secondary and post-secondary non-tertiary	11.1	41.9	34.9	8.0	4.1	100
		Tertiary-type B education	12.9	31.1	39.8	11.4	4.9	100
		Tertiary-type A and advanced research programmes	10.6	21.5	36.4	15.3	16.3	100
		All levels of education	12.8	37.2	34.8	9.1	6.1	100
Switzerland	**2005**	Below upper secondary	29.2	51.7	16.9	1.3	0.9	100
		Upper secondary and post-secondary non-tertiary	21.3	35.4	32.3	7.9	3.1	100
		Tertiary-type B education	8.6	20.5	39.7	20.0	11.2	100
		Tertiary-type A and advanced research programmes	8.7	19.0	25.9	23.4	23.0	100
		All levels of education	18.0	31.8	30.2	12.0	8.1	100
Turkey	**2004**	Below upper secondary	28.2	39.5	20.2	7.7	4.4	100
		Upper secondary and post-secondary non-tertiary	12.1	26.1	29.6	17.1	15.0	100
		Tertiary-type B education	5.8	11.8	25.4	32.8	24.2	100
		Tertiary-type A and advanced research programmes	4.3	9.6	27.8	31.0	27.2	100
United Kingdom	**2005**	Below upper secondary	34.9	46.0	14.3	3.4	1.4	100
		Upper secondary and post-secondary non-tertiary	20.0	38.8	23.9	10.5	6.9	100
		Tertiary-type B education	10.3	28.0	28.8	20.4	12.5	100
		Tertiary-type A and advanced research programmes	6.3	15.4	23.4	25.2	29.7	100
		All levels of education	17.3	33.1	23.3	14.1	12.2	100
United States	**2005**	Below upper secondary	41.7	40.4	12.2	3.9	1.8	100
		Upper secondary and post-secondary non-tertiary	23.5	36.2	21.3	11.3	7.8	100
		Tertiary-type B education	16.4	31.0	25.2	16.7	10.7	100
		Tertiary-type A and advanced research programmes	11.4	19.2	21.4	18.3	29.7	100
		All levels of education	20.3	29.9	20.7	13.5	15.7	100
Partner economy								
Israel	**2005**	Below upper secondary	22.4	54.4	16.4	3.7	3.1	100
		Upper secondary and post-secondary non-tertiary	16.7	43.1	22.6	8.7	9.0	100
		Tertiary-type B education	16.3	36.6	23.0	10.3	13.8	100
		Tertiary-type A and advanced research programmes	10.5	24.9	20.5	13.1	31.1	100
		All levels of education	14.6	35.4	21.4	10.4	18.2	100

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).

Please refer to the Reader's Guide for information concerning the symbols replacing missing data.

StatLink http://dx.doi.org/10.1787/068170623457

Table A9.5.

Private internal rates of return for an individual obtaining an upper secondary or post-secondary non-tertiary education, ISCED 3/4 (2003)

Assuming that all individual after lower secondary level of education will receive the minimum wage

	Rate of return when the individual immediately acquires the next higher level of education		Rate of return when the individual, at age 40, begins the next higher level of education in full time studies, and the individual bears:			
			Direct costs and foregone earnings		No direct costs but foregone earnings	
	Males %	Females %	Males %	Females %	Males %	Females %
OECD countries						
Belgium	14.8	11.6	9.0	24.4	9.3	25.8
Denmark	16.2	12.7	12.8	12.9	13.0	13.1
Finland	17.3	11.6	-0.5	2.6	-0.5	2.7
Hungary	12.0	13.4	11.4	13.7	11.7	14.1
Korea	14.0	8.6	13.2	12.2	13.6	13.1
New Zealand	14.1	14.9	10.3	7.3	10.7	7.8
Norway	9.0	7.3	9.3	10.8	9.7	11.9
Sweden	18.7	13.1	7.7	5.4	7.7	5.4
Switzerland	7.0	4.6	10.2	10.2	12.1	15.6
United Kingdom	21.3	19.2	8.2	9.0	8.6	9.8
United States	23.9	19.7	20.9	18.7	21.4	19.3

Note: Negative benefits occur when excessively high forgone earnings cause excessively low estimates.
Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).
StatLink http://dx.doi.org/10.1787/068170623457

Table A9.6.

Private internal rates of return for an individual obtaining a university-level degree, ISCED 5/6 (2003)

	Rate of return when the individual immediately acquires the next higher level of education		Rate of return when the individual, at age 40, begins the next higher level of education in full time studies, and the individual bears:			
			Direct costs and foregone earnings		No direct costs but foregone earnings	
	Males %	Females %	Males %	Females %	Males %	Females %
OECD countries						
Belgium	10.7	15.2	20.0	28.2	21.1	32.2
Denmark	8.3	8.1	12.4	10.2	12.5	10.5
Finland	16.7	16.0	16.2	13.2	16.4	13.4
Hungary	22.6	15.0	25.1	19.4	27.8	22.0
Korea	12.2	14.9	15.0	27.7	15.9	31.1
New Zealand	9.3	12.9	6.5	7.5	7.2	8.8
Norway	12.1	15.7	15.6	15.9	15.8	16.2
Sweden	8.9	8.2	10.4	8.2	10.8	8.7
Switzerland	10.0	9.8	10.9	20.6	11.3	22.2
United Kingdom	16.8	19.6	11.4	14.9	12.5	16.8
United States	14.3	13.1	12.9	9.7	15.1	13.0

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).
StatLink http://dx.doi.org/10.1787/068170623457

A9

Table A9.7.

Public internal rates of return for an individual obtaining an upper secondary or post-secondary non-tertiary education, ISCED 3/4 (2003)

Assuming that all individual after lower secondary level of education will receive the minimum wage

	Rate of return when the individual immediately acquires the next higher level of education		Rate of return when the individual, at age 40, begins the next higher level of education in full time studies, and the individual bears:			
			Direct costs and foregone earnings		No direct costs but foregone earnings	
	Males %	Females %	Males %	Females %	Males %	Females %
OECD countries						
Belgium	11.4	9.4	2.2	6.4	2.1	6.2
Denmark	11.1	8.5	2.1	1.9	2.1	1.9
Finland	8.2	4.7	-9.2	-2.6	-9.2	-2.6
Hungary	8.3	8.9	3.3	5.9	3.2	5.7
Korea	6.7	3.0	3.2	3.7	2.6	3.0
New Zealand	8.3	5.2	3.0	-2.2	2.7	-2.4
Norway	5.5	3.5	0.4	-0.2	0.2	-0.4
Sweden	10.4	6.9	-0.2	-0.1	-0.2	-0.1
Switzerland	1.7	2.4	-4.1	-3.1	-4.6	-3.7
United Kingdom	13.4	10.6	4.8	4.1	4.3	3.4
United States	12.5	9.7	14.2	13.1	13.7	12.5

Note: Negative benefits occur when excessively high forgone earnings cause excessively low estimates.
Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).
StatLink http://dx.doi.org/10.1787/068170623457

Table A9.8.

Public internal rates of return for an individual obtaining a university-level degree, ISCED 5/6 (2003)

	Rate of return when the individual immediately acquires the next higher level of education		Rate of return when the individual, at age 40, begins the next higher level of education in full time studies, and the individual bears:			
			Direct costs and foregone earnings		No direct costs but foregone earnings	
	Males %	Females %	Males %	Females %	Males %	Females %
OECD countries						
Belgium	12.2	17.9	10.6	9.4	10.3	9.0
Denmark	7.8	6.9	3.4	1.0	3.3	0.9
Finland	13.6	11.3	10.7	8.7	10.6	8.6
Hungary	18.8	13.1	14.8	10.3	13.6	9.2
Korea	14.2	16.8	7.4	17.2	5.9	13.1
New Zealand	9.9	9.9	2.4	2.1	1.7	1.2
Norway	9.5	9.9	4.3	4.5	4.3	4.5
Sweden	7.5	6.3	3.6	1.8	3.4	1.6
Switzerland	6.3	5.8	-0.1	-0.7	-0.2	-0.9
United Kingdom	13.7	16.1	6.4	8.4	5.6	7.1
United States	14.1	13.0	9.6	6.0	7.3	3.2

Source: OECD. See Annex 3 for notes (*www.oecd.org/edu/eag2007*).
StatLink http://dx.doi.org/10.1787/068170623457

Reader's Guide

Coverage of the statistics

Although a lack of data still limits the scope of the indicators in many countries, the coverage extends, in principle, to the entire national education system (within the national territory) regardless of the ownership or sponsorship of the institutions concerned and regardless of education delivery mechanisms. With one exception described below, all types of students and all age groups are meant to be included: children (including students with special needs), adults, nationals, foreigners, as well as students in open distance learning, in special education programmes or in educational programmes organised by ministries other than the Ministry of Education, provided the main aim of the programme is the educational development of the individual. However, vocational and technical training in the workplace, with the exception of combined school and work-based programmes that are explicitly deemed to be parts of the education system, is not included in the basic education expenditure and enrolment data.

Educational activities classified as "adult" or "non-regular" are covered, provided that the activities involve studies or have a subject matter content similar to "regular" education studies or that the underlying programmes lead to potential qualifications similar to corresponding regular educational programmes. Courses for adults that are primarily for general interest, personal enrichment, leisure or recreation are excluded.

Calculation of international means

For many indicators an OECD average is presented and for some an OECD total.

The OECD average is calculated as the unweighted mean of the data values of all OECD countries for which data are available or can be estimated. The OECD average therefore refers to an average of data values at the level of the national systems and can be used to answer the question of how an indicator value for a given country compares with the value for a typical or average country. It does not take into account the absolute size of the education system in each country.

The OECD total is calculated as a weighted mean of the data values of all OECD countries for which data are available or can be estimated. It reflects the value for a given indicator when the OECD area is considered as a whole. This approach is taken for the purpose of comparing, for example, expenditure charts for individual countries with those of the entire OECD area for which valid data are available, with this area considered as a single entity.

Note that both the OECD average and the OECD total can be significantly affected by missing data. Given the relatively small number of countries, no statistical methods are used to compensate for this. In cases where a category is not applicable (code "a") in a country or where the data value is negligible (code "n") for the corresponding calculation, the value zero is imputed for the purpose of calculating OECD averages. In cases where both the numerator and the denominator of a ratio are not applicable (code "a") for a certain country, this country is not included in the OECD average.

For financial tables using 1995 data, both the OECD average and OECD total are calculated for countries providing both 1995 and 2004 data. This allows comparison of the OECD average and OECD total over time with no distortion due to the exclusion of certain countries in the different years.

For many indicators an EU19 average is also presented. It is calculated as the unweighted mean of the data values of the 19 OECD countries that are members of the European Union for which data are available or can be estimated. These 19 countries are Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic, Spain, Sweden and the United Kingdom.

Classification of levels of education

The classification of the levels of education is based on the revised International Standard Classification of Education (ISCED-97). The biggest change between the revised ISCED and the former ISCED (ISCED-76) is the introduction of a multi-dimensional classification framework, allowing for the alignment of the educational content of programmes using multiple classification criteria. ISCED is an instrument for compiling statistics on education internationally and distinguishes among six levels of education. The glossary available at *www.oecd.org/edu/eag2007* describes in detail the ISCED levels of education, and Annex 1 shows corresponding typical graduation ages of the main educational programmes by ISCED level.

Symbols for missing data

Six symbols are employed in the tables and charts to denote missing data:

a Data is not applicable because the category does not apply.

c There are too few observations to provide reliable estimates (*i.e.* there are fewer than 3% of students for this cell or too few schools for valid inferences). However, these statistics were included in the calculation of cross-country averages.

m Data is not available.

n Magnitude is either negligible or zero.

w Data has been withdrawn at the request of the country concerned.

x Data included in another category or column of the table (*e.g.* *x*(2) means that data are included in column 2 of the table).

~ Average is not comparable with other levels of education.

Further resources

The website *www.oecd.org/edu/eag2007* provides a rich source of information on the methods employed for the calculation of the indicators, the interpretation of the indicators in the respective national contexts and the data sources involved. The website also provides access to the data underlying the indicators as well as to a comprehensive glossary for technical terms used in this publication.

Any post-production changes to this publication are listed at *www.oecd.org/edu/eag2007*.

The website *www.pisa.oecd.org* provides information on the OECD Programme for International Student Assessment (PISA), on which many of the indicators in this publication draw.

Education at a Glance uses the OECD's StatLinks service. Below each table and chart in *Education at a Glance 2007* is a url which leads to a corresponding Excel workbook containing the underlying data for the indicator. These urls are stable and will remain unchanged over time. In addition, readers of the *Education at a Glance* e-book will be able to click directly on these links and the workbook will open in a separate window.

Codes used for territorial entities

These codes are used in certain charts. Country or territorial entity names are used in the text. Note that in the text the Flemish Community of Belgium is referred to as "Belgium (Fl.)" and the French Community of Belgium as "Belgium (Fr.)".

AUS	Australia	ITA	Italy
AUT	Austria	JPN	Japan
BEL	Belgium	KOR	Korea
BFL	Belgium (Flemish Community)	LUX	Luxembourg
BFR	Belgium (French Community)	MEX	Mexico
BRA	Brazil	NLD	Netherlands
CAN	Canada	NZL	New Zealand
CHL	Chile	NOR	Norway
CZE	Czech Republic	POL	Poland
DNK	Denmark	PRT	Portugal
ENG	England	RUS	Russian Federation
EST	Estonia	SCO	Scotland
FIN	Finland	SVK	Slovak Republic
FRA	France	SVN	Slovenia
DEU	Germany	ESP	Spain
GRC	Greece	SWE	Sweden
HUN	Hungary	CHE	Switzerland
ISL	Iceland	TUR	Turkey
IRL	Ireland	UKM	United Kingdom
ISR	Israel	USA	United States

References

Bowles, S. and **H. Gintis** (2000), "Does Schooling Raise Earnings by Making People Smarter?", K. Arrow, S. Bowles and S. Durlauf (eds.), *Meritocracy and Economic Inequality,* Princeton University Press, Princeton.

Eccles, J.S. (1994), "Understanding women's educational and occupational choices: Applying the Eccles *et al.* model of achievement-related choices", *Psychology of Women Quarterly,* Vol. 18, Blackwell Publishing, Oxford.

Kelo, M., U. Teichler and **B. Wächter** (eds.) (2005), "EURODATA: Student Mobility in European Higher Education", Verlags and Mediengesellschaft, Bonn, 2005.

OECD (2002), *Education at a Glance: OECD Indicators – 2002 Edition,* OECD, Paris.

OECD (2004a), *Learning for Tomorrow's World – First Results from PISA 2003,* OECD, Paris.

OECD (2004b), *Problem Solving for Tomorrow's World – First Measures of Cross-Curricular Competencies from PISA 2003,* OECD, Paris.

OECD (2004c), *Internationalisation and Trade in Higher Education: Opportunities and Challenges*, OECD, Paris.

OECD (2004d), *Education at a Glance: OECD Indicators – 2004 Edition,* OECD, Paris.

OECD (2005a), *Trends in International Migration – 2004 Edition,* OECD, Paris.

OECD (2005b), *PISA 2003 Technical Report*, OECD, Paris.

OECD (2005c), *Education at a Glance: OECD Indicators – 2005 Edition,* OECD, Paris.

OECD (2006a), *Education at a Glance: OECD Indicators – 2006 Edition,* OECD, Paris.

OECD (2006b), *Where Immigrant Students Succeed: A Comparative Review of Performance and Engagement in PISA 2003,* OECD, Paris.

OECD (2006c), *OECD Revenue Statistics 1965-2005,* OECD, Paris.

Tremblay, K. (2005) "Academic Mobility and Immigration", *Journal of Studies in International Education*, Vol. 9, No. 3, Association for Studies in International Education, Thousands Oaks, pp. 1-34.

Table of Contents

Name of the indicator in the 2006 edition

Foreword 3

Editorial 11

Introduction 15

Reader's Guide 19

CHAPTER A THE OUTPUT OF EDUCATIONAL INSTITUTIONS AND THE IMPACT OF LEARNING **23**

Indicator A1 To what level have adults studied? ..... 24 — **A1**

Table A1.1a. Educational attainment: adult population (2005) 36

Table A1.2a. Population that has attained at least upper secondary education (2005) 37

Table A1.3a. Population that has attained tertiary education (2005) 38

Table A1.4. Fields of education (2004) 39

Table A1.5. Ratio of 25-to-34-year-olds with ISCED 5A and 30-to-39-year-olds with ISCED 6 levels of education to 55-to-64-year-olds with ISCED 5A and 6 levels of education, by fields of education (2004) 40

Indicator A2 How many students finish secondary education? ..... 42 — **A2**

Table A2.1. Upper secondary graduation rates (2005) 50

Table A2.2. Trends in graduation rates at upper secondary level (1995-2005) 51

Table A2.3. Post-secondary non-tertiary graduation rates (2005) 52

Indicator A3 How many students finish tertiary education? ..... 54 — **A3**

Table A3.1. Graduation rates in tertiary education (2005) 67

Table A3.2. Trends in tertiary graduation rates (1995-2005) 68

Table A3.3. Percentage of tertiary graduates, by field of education (2005) 69

Table A3.4. Science graduates, by gender (2005) 70

Table A3.5. Relationship between motivation in mathematics at 15 years old (PISA 2003) and tertiary-type A graduation rates, by gender 71

Table A3.6. Survival rates in tertiary education (2004) 72

Indicator A4 What are students' expectations for education? 74

Table A4.1a. Percentage of students expecting to complete different levels of education (2003) 84

Table A4.2a. Percentage of students expecting to complete ISCED levels 5A or 6, by mathematics performance level (2003) 85

Table A4.3a. Percentage of students expecting to complete ISCED levels 5A or 6, by gender (2003) 86

Table A4.4. Odds ratios that students expect to complete ISCED levels 5A or 6, by socio-economic status (2003) 87

Table A4.5. Odds ratios that students expect to complete ISCED levels 5A or 6, by immigrant status (2003) 88

Name of the indicator in the 2006 edition

Indicator A5 What are students' attitudes towards mathematics? 90
Table A5.1. Means on students' attitudes towards mathematics, approaches to learning, and school-related indices (2003) 99
Table A5.2a. Relationship between students' attitudes towards mathematics and mathematics performance (2003) 100
Table A5.2b. Relationship between students' approaches to learning and mathematics performance (2003) 101
Table A5.2c. Relationship between school-related indices and mathematics performance (2003) 102

Indicator A6 What is the impact of immigrant background on student performance? 104
Table A6.1a. Differences in mathematics performance, by immigrant status (2003) 113
Table A6.2a. Percentage of native students at each level of proficiency on the mathematics scale (2003) 113
Table A6.2b. Percentage of second-generation students at each level of proficiency on the mathematics scale (2003) 114
Table A6.2c. Percentage of first-generation students at each level of proficiency on the mathematics scale (2003) 114
Table A6.3. Index of instrumental motivation in mathematics and student performance on the mathematics scale (2003) 115

Indicator A7 Does the socio-economic status of their parents affect students' participation in higher education? 116

Indicator A8 How does participation in education affect participation in the labour market? 124
Table A8.1a. Employment rates and educational attainment, by gender (2005) 132
Table A8.2a. Unemployment rates and educational attainment, by gender (2005) 134
Table A8.3a. Trends in employment rates, by educational attainment (1991-2005) 136
Table A8.4a. Trends in unemployment rates by educational attainment (1991-2005) 138

Indicator A9 What are the economic benefits of education? 140
Table A9.1a. Relative earnings of the population with income from employment (2005 or latest available year) 156
Table A9.1b. Differences in earnings between females and males (2005 or latest available year) 158
Table A9.2a. Trends in relative earnings: adult population (1997-2005) 159
Table A9.3. Trends in differences in earnings between females and males (1997-2005) 160
Table A9.4a. Distribution of the 25-to-64-year-old population by level of earnings and educational attainment (2005 or latest available year) 162
Table A9.5. Private internal rates of return for an individual obtaining an upper secondary or post-secondary non-tertiary education, ISCED 3/4 (2003) 165
Table A9.6. Private internal rates of return for an individual obtaining a university-level degree, ISCED 5/6 (2003) 165

A8

A9

Name of the indicator in the 2006 edition

Table A9.7. Public internal rates of return for an individual obtaining an upper secondary or post-secondary non-tertiary education, ISCED 3/4 (2003) 166
Table A9.8. Public internal rates of return for an individual obtaining a university-level degree, ISCED 5/6 (2003) 166

CHAPTER B FINANCIAL AND HUMAN RESOURCES INVESTED IN EDUCATION 167

Indicator B1 How much is spent per student? ..... 170 — B1
Table B1.1a. Annual expenditure on educational institutions per student for all services (2004) 186
Table B1.1b. Annual expenditure per student on core services, ancillary services and R&D (2004) 187
Table B1.2. Distribution of expenditure (as a percentage) on educational institutions compared to number of students enrolled at each level of education (2004) 188
Table B1.3a. Cumulative expenditure on educational institutions per student for all services over the theoretical duration of primary and secondary studies (2004) 189
Table B1.3b. Cumulative expenditure on educational institutions per student for all services over the average duration of tertiary studies (2004) 190
Table B1.4. Annual expenditure on educational institutions per student for all services relative to GDP per capita (2004) 191
Table B1.5. Change in expenditure on educational institutions for all services per student relative to different factors, by level of education (1995, 2004) 192

Indicator B2 What proportion of national wealth is spent on education? ..... 194 — B2
Table B2.1. Expenditure on educational institutions as a percentage of GDP, by levels of education (1995, 2000, 2004) 205
Table B2.2. Expenditure on educational institutions as a percentage of GDP, by level of education (2004) 206
Table B2.3. Change in expenditure on educational institutions (1995, 2000, 2001, 2002, 2003, 2004) 207
Table B2.4. Expenditure on educational institutions as a percentage of GDP, by source of fund and level of education (2004) 208

Indicator B3 How much public and private investment is there in education? ..... 210 — B3
Table B3.1. Relative proportions of public and private expenditure on educational institutions for all levels of education (1995, 2004) 219
Table B3.2a. Relative proportions of public and private expenditure on educational institutions, as a percentage, by level of education (1995, 2004) 220
Table B3.2b. Relative proportions of public and private expenditure on educational institutions, as a percentage, for tertiary education (1995, 2004) 221
Table B3.3. Trends in relative proportions of public expenditure on educational institutions and index of change between 1995 and 2004 (1995=100, constant prices), for tertiary education (1995, 2000, 2001, 2002, 2003, 2004) 222

			Name of the indicator in the 2006 edition
Indicator B4	**What is the total public spending on education?**	224	B4
Table B4.1.	Total public expenditure on education (1995, 2004)	230	
Table B4.2.	Distribution of total public expenditure on education (2004)	231	
Indicator B5	**How much do tertiary students pay and what public subsidies do they receive?**	232	B5
Table B5.1a.	Estimated annual average tuition fees charged by tertiary-type A educational institutions for national students (academic year 2004-2005)	244	
Table B5.1b.	Distribution of financial aid to students in tertiary-type A education (academic year 2004-2005)	246	
Table B5.1c.	Financial support to students through public loans in tertiary-type A education (academic year 2004-2005)	248	
Table B5.2.	Public subsidies for households and other private entities as a percentage of total public expenditure on education and GDP, for tertiary education (2004)	250	
Indicator B6	**On what resources and services is education funding spent?**	252	B6
Table B6.1.	Expenditure on institutions by service category as a percentage of GDP (2004)	260	
Table B6.2.	Expenditure on educational institutions by resource category and level of education (2004)	261	
Indicator B7	**How efficiently are resources used in education?**	262	
Table B7.1.	Estimates of technical efficiency for primary and lower secondary public sector education	268	
CHAPTER C	**ACCESS TO EDUCATION, PARTICIPATION AND PROGRESSION**	269	
Indicator C1	**How prevalent are vocational programmes?**	270	
Table C1.1.	Upper secondary enrolment patterns (2005)	277	
Table C1.2.	Annual expenditure on educational institutions per student for all services, by type of programme (2004)	278	
Table C1.3.	Performance of 15-year-old students on the PISA mathematics scale by programme orientation (2003)	279	
Indicator C2	**Who participates in education?**	280	C1, C2
Table C2.1.	Enrolment rates, by age (2005)	291	
Table C2.2.	Trends in enrolment rates (1995-2005)	292	
Table C2.3.	Transition characteristics from age 15 to 20, by level of education (2005)	293	
Table C2.4.	Entry rates to tertiary education and age distribution of new entrants (2005)	294	
Table C2.5.	Trends in entry rates at the tertiary level (1995-2005)	295	
Table C2.6.	Students in tertiary education by type of institution or mode of study (2005)	296	
Indicator C3	**Who studies abroad and where?**	298	C3
Table C3.1.	Student mobility and foreign students in tertiary education (2000, 2005)	317	

Name of the indicator in the 2006 edition

Table C3.2. Distribution of international and foreign students in tertiary education, by country of origin (2005) 318
Table C3.3. Citizens studying abroad in tertiary education, by country of destination (2005) 320
Table C3.4. Distribution of international and foreign students in tertiary education, by level and type of tertiary education (2005) 322
Table C3.5. Distribution of international and foreign students in tertiary education, by field of education (2005) 323
Table C3.6. Trends in the number of foreign students enrolled outside their country of origin (2000 to 2005) 324
Table C3.7. Percentage of tertiary qualifications awarded to international and foreign students, by type of tertiary education (2005) 325

Indicator C4 How successful are students in moving from education to work? ..... 326 — C4

Table C4.1a. Expected years in education and not in education for 15-to-29-year-olds (2005) 335
Table C4.2a. Percentage of the youth population in education and not in education (2005) 337
Table C4.3. Percentage of the cohort population not in education and unemployed (2005) 339
Table C4.4a. Trends in the percentage of the youth population in education and not in education (1995-2005) 341

Indicator C5 Do adults participate in training and education at work? ..... 346 — C5

Table C5.1a. Participation rate and expected number of hours in non-formal job-related education and training, by level of educational attainment (2003) 353
Table C5.1b. Expected number of hours in non-formal job-related education and training by age group and labour force status (2003) 355
Table C5.1c. Expected number of hours in non-formal job-related education and training, by level of educational attainment (2003) 357

CHAPTER D THE LEARNING ENVIRONMENT AND ORGANISATION OF SCHOOLS 359

Indicator D1 How much time do students spend in the classroom? ..... 360 — D1

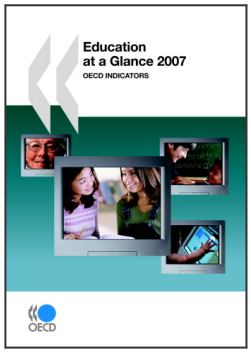
Table D1.1. Compulsory and intended instruction time in public institutions (2005) 369
Table D1.2a. Instruction time per subject as a percentage of total compulsory instruction time for 9-to-11-year-olds (2005) 370
Table D1.2b. Instruction time per subject as a percentage of total compulsory instruction time for 12-to-14-year-olds (2005) 371

Indicator D2 What is the student-teacher ratio and how big are classes? ..... 372 — D2

Table D2.1. Average class size, by type of institution and level of education (2005) 381
Table D2.2. Ratio of students to teaching staff in educational institutions (2005) 382
Table D2.3. Ratio of students to teaching staff, by type of institution (2005) 383

Name of the indicator in the 2006 edition

Indicator D3	**How much are teachers paid?**	384	D3
Table D3.1.	Teachers' salaries (2005)	396	
Table D3.2.	Change in teachers' salaries (1996 and 2005)	398	
Table D3.3a.	Adjustments to base salary for teachers in public institutions (2005)	399	
Table D3.4.	Contractual arrangements of teachers (2005)	401	
Indicator D4	**How much time do teachers spend teaching?**	402	D4
Table D4.1.	Organisation of teachers' working time (2005)	411	
Indicator D5	**How do education systems monitor school performance?**	412	
Table D5.1.	Evaluation of public schools at lower secondary education (2005)	418	
Table D5.2.	Use of information from school evaluation and accountability of public schools (lower secondary education, 2005)	419	
ANNEX 1	**Characteristics of Educational Systems**	421	
Table X1.1a.	Typical graduation ages in upper secondary education	422	
Table X1.1b.	Typical graduation ages in post-secondary non-tertiary education	423	
Table X1.1c.	Typical graduation ages in tertiary education	424	
Table X1.2a.	School year and financial year used for the calculation of indicators, OECD countries	425	
Table X1.2b.	School year and financial year used for the calculation of indicators, partner economies	426	
Table X1.3.	Summary of completion requirements for upper secondary (ISCED 3) programmes	427	
ANNEX 2	**Reference Statistics**	429	
Table X2.1.	Overview of the economic context using basic variables (reference period: calendar year 2004, 2004 current prices)	430	
Table X2.2.	Basic reference statistics (reference period: calendar year 2004, 2004 current prices)	431	
Table X2.3.	Basic reference statistics (reference period: calendar year 1995, 1995 current prices)	432	
Table X2.4.	Annual expenditure on educational institutions per student for all services (2004, USD)	433	
Table X2.5.	Annual expenditure on educational institutions per student for all services (2004, EUR)	434	
Table X2.6a.	Reference statistics used in the calculation of teachers' salaries, by level of education (1996, 2005)	435	
Table X2.6b.	Reference statistics used in the calculation of teachers' salaries (1996, 2005)	437	
Table X2.6c.	Teachers' salaries (2005)	438	
Table X2.7.	Tax revenue of main headings as percentage of GDP (2004)	439	
ANNEX 3	**Sources, Methods and Technical Notes**	441	
References		443	
Contributors to this Publication		445	
Related OECD Publications		449	



From:
Education at a Glance 2007
OECD Indicators

Access the complete publication at:
https://doi.org/10.1787/eag-2007-en

Please cite this chapter as:

OECD (2007), "Indicator A9 What are the economic benefits of education?", in *Education at a Glance 2007: OECD Indicators*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/eag-2007-11-en

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.