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Chapter 10

The Reversal of Gender Inequalities in Higher Education: An On-going Trend

by

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This chapter analyses gender inequalities in participation in higher education and degree awards in OECD member countries. After documenting these inequalities, in both quantitative and qualitative terms, and presenting the main possible explanations for their reversal, we show that this new trend is more than likely to persist in coming decades. While it should probably continue to help reduce the wage inequalities which disadvantage women, its other possible social consequences have yet to be studied. However, in terms of educational inequalities, it would seem that in promoting equal opportunities for men and women the focus can no longer be solely on women.

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For many years men have received a better education than women. In OECD member countries, more men than women went on to higher education and obtained more degrees. Since the mid-1990s, however, the gender gap has mainly been to the disadvantage of men. To the extent that girls and boys share the same homes and the same social environments, it might be thought that greater egalitarianism between the sexes would have led to educational equality of the sexes rather than to inequalities to the detriment of men. Is this reversal of gender inequalities a temporary or permanent phenomenon? Will its social consequences be as great as the impact that gender inequalities had on women? These are the two questions that this chapter proposes to explore. The first section analyses the gender differences in participation in higher education and degree awards in OECD member countries and extrapolates these differences to 2025. It also underlines the marked gender differences in choice of study options. The second section outlines the main explanations for the reversal of gender inequalities, while the third and final section discusses whether they will last and their potential social implications.

10.1. Gender inequalities in higher education: international trends

International trends in gender inequalities in higher education can be determined by examining the changes in the composition of the student population in higher education, the relative share of degrees awarded to women each year, the levels of education attained by men and women and, lastly, the differences between the subjects studied by men and women.

Participation in higher education: trends in the gender gap

Until the 1990s, there were on average more male than female students in OECD member countries. Women were disadvantaged by inequalities in access to higher education. Since then, inequalities to the detriment of men have emerged in almost all countries. Table 10.1 shows that women accounted for 46% of students in higher education in 1985 (1.2 men for every woman). However, the faster increase in female participation in higher education has reversed the trend in OECD member countries (but not in most of the rest of the world). Of the 18 countries for which data were available in 1985 and 2005, women students were in the majority in 5 countries in 1985 compared with 16 in 2005. In 2005, the average share of the student population accounted for by women amounted to 55% in the OECD area (1.2 women to every man) (Figure 10.1). If past trends were to continue, the inequalities to the detriment of men would be well entrenched at the aggregate level in 2025, with some 1.4 female students for every male. In some countries (Austria, Canada, Iceland, Norway, the United Kingdom) there could be almost twice as many female students as male. A linear projection of recent trends shows that only four countries would fail to achieve at least parity between men and women by 2015: Korea, Turkey, Japan and Switzerland (even though the last two would be very close, with a female student population of 47% and 49% respectively in 2015). The probability ratios of women and men entering into higher education are rising in all countries, indicating a narrowing

Table 10.1. **Percentage of women students in higher education: past twenty years and projections**

	1985	1990	1995	2000	2005	2015	2020	2025
Australia	m	m	50	54	54	55	55	56
Austria	44	45	48	51	54	61	66	72
Belgium	47	49	49	52	54	58	59	60
Canada	49	54	53	56	58	60	62	64
Czech Republic	m	m	48	50	53	53	54	54
Denmark	48	50	52	57	57	59	59	60
Finland	49	52	53	54	54	54	53	53
France	52	53	55	54	55	56	57	57
Germany	m	m	43	48	50	54	56	58
Greece	m	m	49	50	51	53	53	53
Hungary	m	m	52	54	58	59	60	60
Iceland	m	m	58	62	65	67	67	68
Ireland	43	45	49	54	55	58	58	59
Italy	45	48	52	56	57	57	57	57
Japan	m	41	44	45	46	47	47	48
Korea	m	m	35	36	37	38	39	40
Luxembourg	m	m	m	m	m	M	m	m
Mexico	m	m	47	49	50	52	52	52
Netherlands	41	44	47	50	51	53	54	54
New Zealand	46	52	55	59	59	59	60	60
Norway	50	53	55	58	60	63	64	65
Poland	m	m	m	58	58	58	58	58
Portugal	53	m	57	57	56	56	56	56
Slovak Republic	m	m	m	50	55	58	59	59
Spain	48	51	53	53	54	55	55	55
Sweden	52	53	55	58	60	62	63	63
Switzerland	32	34	37	43	46	49	51	52
Turkey	31	34	38	40	42	43	43	43
United Kingdom	45	48	51	54	57	65	68	71
United States	52	54	55	56	57	60	61	62
Average	**46**	**48**	**50**	**52**	**54**	**56**	**57**	**58**
Comparable average	**46**	**48**	**51**	**53**	**55**	**57**	**58**	**59**

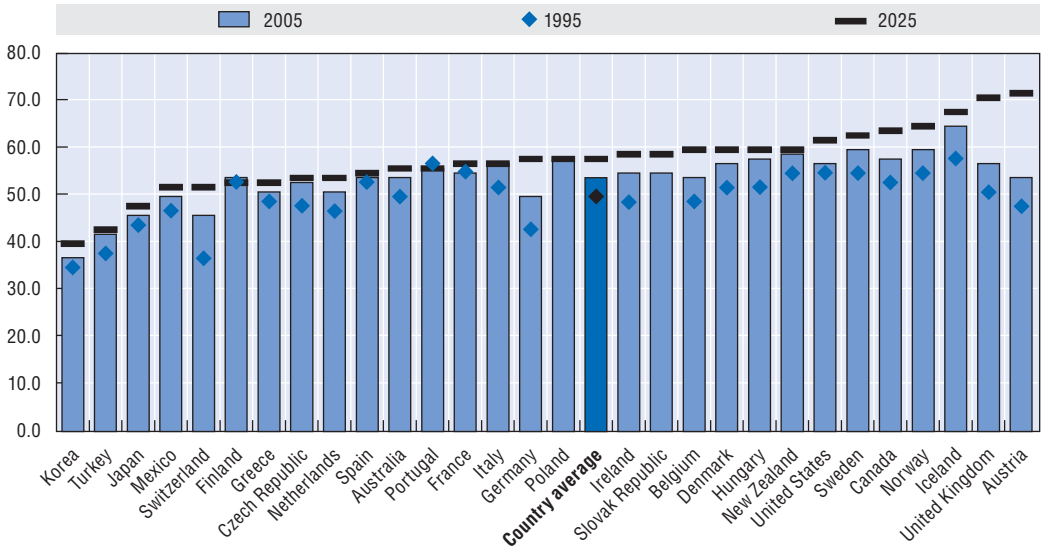
m = missing.

Note: The gross enrolment rates by gender were derived by linear regression from the changes between 1998 and 2005 and applied to the corresponding age cohorts according to UN projections.

of the gender gap in the four countries mentioned above and a widening of the gender gap to the detriment of men in all the others. However, this strengthening of inequalities is primarily attributable to stronger growth in female participation compared with that of males. With the exception of Austria, Canada and the United Kingdom, where male participation (measured in terms of gross enrolment rates) has fallen slightly over the last decade, the number of men entering into higher education continues to grow. Thus a young man still has more chance of receiving higher education in 2005 than in previous decades and, if recent trends continue, he will have a greater chance of entering into higher education in 2025 than he did in 2005.

To the extent that, in some countries, more women resume their studies or follow vocational rather than general higher education programmes, it is possible that these averages conceal trends less favourable to women within the system.

Figure 10.1. **Share of females in tertiary education enrolments (1995, 2005 and projections)**



Does the trend reflect age-related participation models?

The international data do not permit analysis by age cohort. Nevertheless, data on the sex and age of students over the past decade are available for a great many countries. In the OECD area, women were on average in the majority or at parity with men in all the age cohorts for which data were collected in 2005.[1] In one OECD country, for example, 54% of students under the age of 24 years were women. In most OECD member countries, the share of women in the youngest student population is either close to or above the average share, except in Iceland (59% of women among students under 24), New Zealand (55%), Sweden (56%) and, to a lesser extent, the United Kingdom (54%) and the United States (55%). Between 1998 and 2005, the share of women increased in all age groups for which data were collected. For students aged over 40, the 23 OECD member countries for which information was available had, on average, a similar proportion of women in 1998 and 2005 (52% and 54% respectively). On the other hand, the typical gender gap across countries is three times greater for students over 40 than it is for other age groups. In 2005, the percentage share of students over 40 accounted for by women exceeded the percentage share of women in the under-24 population by 10% or more in some countries (Hungary, Iceland, New Zealand, Norway, the Slovak Republic, Sweden, the United Kingdom, while the reverse was true in Turkey). However, insofar as students over 40 represent on average only 8% of the student population in OECD countries, compared with 61% of the under 24 population, the sex of the older students has little impact on the overall gender composition of student populations.

Are there significant differences according to the type of higher education followed by men and women?

The international data do not allow an in-depth response to this question firstly because the historical series pre-1998 are not sufficiently detailed, and secondly because the International Standard Classification of Education (ISCED) does not distinguish between types of institutions but rather between types of education: general higher

education (ISCED 5) can therefore be provided by different types of institution in terms of status and perception at national level. In Japan, *junior colleges* (*tanki daigaku*) are institutions where women students are very much in the majority, while men still remain in the majority in the universities. In the Netherlands, women far outnumber men in the HBOs (higher vocational colleges) while men are more numerous in the universities. In the United States, the share of women in *community colleges* is higher than in universities, even if women are also over-represented in the elite universities, which in some cases have introduced admission criteria that favour men (Long, 2007; Bailey and Smith-Morest, 2006). In Israel, women are relatively more numerous in *colleges* than in universities, where they are also in the majority, among other things because *colleges* train students for teaching, which is an essentially female profession (Shavit *et al*., 2007). However, this trend is by no means systematic: in Germany, the *Fachhochschulen* admit a majority of men, which is no longer the case of the universities whose status is more prestigious (BMBF, 2005).

The international data do, however, allow the composition of the student population to be broken down by type of higher education since 1998. In 2005, there was virtually no difference in the gender composition of the student population in technical higher education (ISCED 5B) and that in general higher education (ISCED 5A), although there were slightly more women in higher technical education than general higher education.[2] Table 10.2 shows that between 1998 and 2005 the two sectors converged: the percentage of women in general higher education increased and declined in higher technical education. It should be noted, however, that the averages hide a greater difference across countries for vocational higher education than for the other two levels. In Austria, the Czech Republic, Germany, Japan and the United Kingdom, the share of women in vocational higher education is over 10% higher than in general higher education, the reverse being true in Denmark. (Poland, Finland, Iceland and Sweden also have contrasting models, but technical higher education is not quantitatively significant in those countries.)

The situation remains slightly different for doctoral students since at this level (ISCED 6) the average share of the student population accounted for by women in one OECD country amounted to 45%, while in 7 of the 28 countries women were in the majority. A catching-up effect is nonetheless visible, even over a relatively short period of time (Table 10.2 and Figure 10.2). In the 24 countries for which data were available in 1998 and 2005, a rise of 7% and an average share of 46% can be observed (the weighted average for the OECD area being 47% or 1.1 men for every woman). The trend is therefore no different at this level, even if the catching-up has been slower. The same situation can sometimes be observed in the most elitist higher education institutions. In France, women are still in the minority in the *Grandes Ecoles d'Ingénierie* (Engineering Schools) but not in the *Grandes Ecoles de Commerce* (Business Schools). Moreover, some of these schools did not admit women until the 1970s (Givord and Goux, 2007). Even though a PhD can provide access to certain prestigious professions, students enrolled at this level in one OECD country accounted on average to only 3% of the student population in 2005 (and 2% of all students enrolled in the OECD area).

Conclusion

The last few decades have been marked by greater growth in the participation of women than men in higher education, which initially led to a reduction in gender inequalities and their subsequent reversal. On average there are more women than men,

Table 10.2. **Percentage share of women in the different sectors of higher education and size of sector (1998, 2005)**

	1998						2005					
	Theoretical higher (ISCED 5A)		Practical higher (ISCED 5B)		Advanced research (ISCED 6)		Theoretical higher (ISCED 5A)		Practical higher (ISCED 5B)		Advanced research (ISCED 6)	
	% total students	% women	% total students	% women	% total students	% women	% total students	% women	% total students	% women	% total students	% women
Australia	72	55	26	52	3	44	80	55	16	53	4	50
Austria	81	49	10	61	9	40	83	53	10	68	6	45
Belgium	m	m	m	m	m	m	46	51	52	58	2	40
Canada	72	57	26	52	2	43	97	58	m	m	3	46
Czech Republic	72	46	22	61	6	32	83	52	10	68	7	37
Denmark	54	50	43	63	2	40	84	59	14	47	2	45
Finland	77	52	16	63	7	45	93	54	0	32	7	51
France	72	56	24	53	5	47	72	55	24	56	4	48
Germany	85	44	15	63	m	m	85	48	15	60	m	m
Greece	71	51	28	49	1	35	61	53	35	49	3	43
Hungary	98	54	m	m	2	40	93	58	5	64	2	45
Iceland	82	60	18	59	0	36	95	66	4	49	1	59
Ireland	m	m	m	m	m	m	67	58	30	49	3	48
Italy	98	55	2	56	1	52	97	57	1	60	2	51
Japan	69	36	29	67	1	22	74	41	24	62	2	29
Korea	59	35	40	36	1	23	61	37	38	37	1	33
Luxembourg	24	50	76	52	a	a	m	m	m	m	m	m
Mexico	94	48	x	x	6	42	96	51	3	42	1	40
Netherlands	99	49	1	53	n	m	99	51	a	a	1	m
New Zealand	72	57	26	62	2	44	73	59	25	58	2	52
Norway	91	58	7	48	2	34	97	60	1	57	2	43
Poland	97	57	1	84	1	42	97	57	1	81	2	48
Portugal	77	57	22	54	1	49	94	56	1	56	5	56
Slovak Republic	m	m	m	m	m	m	92	56	3	64	6	41
Spain	91	53	5	49	4	50	82	54	14	51	4	51
Sweden	94	57	x	x	6	40	91	61	4	50	5	48
Switzerland	68	42	24	40	8	33	73	48	18	41	8	39
Turkey	71	37	27	45	1	35	69	43	29	39	1	40
United Kingdom	66	52	30	56	4	39	73	55	23	66	4	44
United States	77	56	21	56	2	42	77	57	21	60	2	51
Country average	**77**	**51**	**22**	**56**	**3**	**40**	**82**	**54**	**16**	**55**	**3**	**45**
Comparable average (24)	**77**	**51**	**20**	**56**	**3**	**39**	**82**	**53**	**16**	**54**	**3**	**46**
OECD	**77**	**51**	**20**	**54**	**2**	**41**	**79**	**53**	**19**	**55**	**2**	**47**

m = missing; x = included in another column; a = not applicable; n = negligible.

irrespective of age, in both general higher education and higher technical education in OECD member countries. It is only at the doctoral level that men remain, on average, in the majority, although women are visibly catching up and parity has almost been achieved.

Degree awards: trends in gender inequalities

Is the higher propensity of women to study reflected in a higher propensity to obtain degrees in higher education? The answer is yes. The trends in this area are the same. During the last decade, the gap in favour of women in the award of degrees widened. As shown in Table 10.3 and Figure 10.3, it is wider than the gap in participation (Table 10.1). In 2005, OECD countries awarded 57% of their degrees on average to women (1.3 female graduates for each

Figure 10.2. **Share of female students in advanced research programmes (ISCED 6) (1998, 2005)**

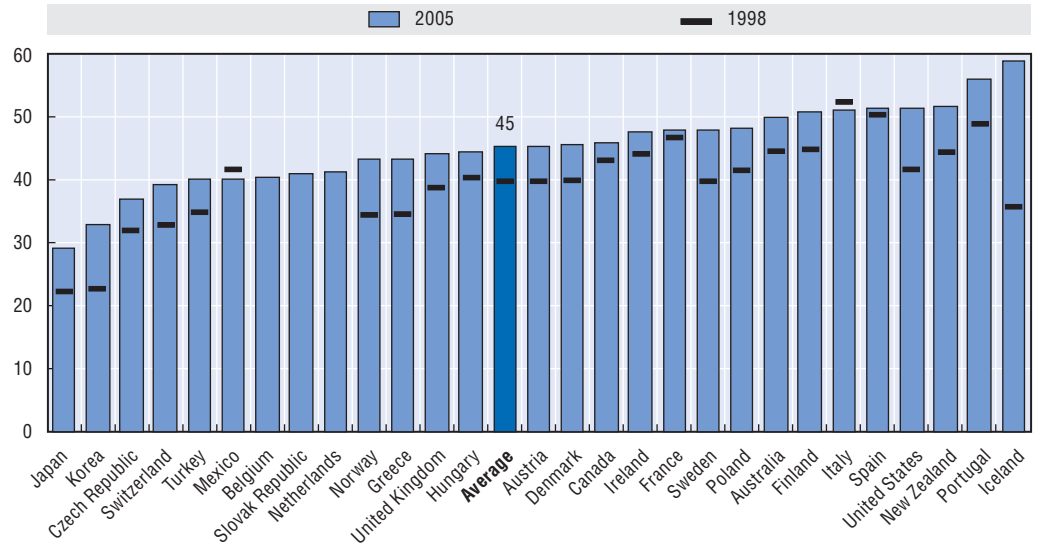


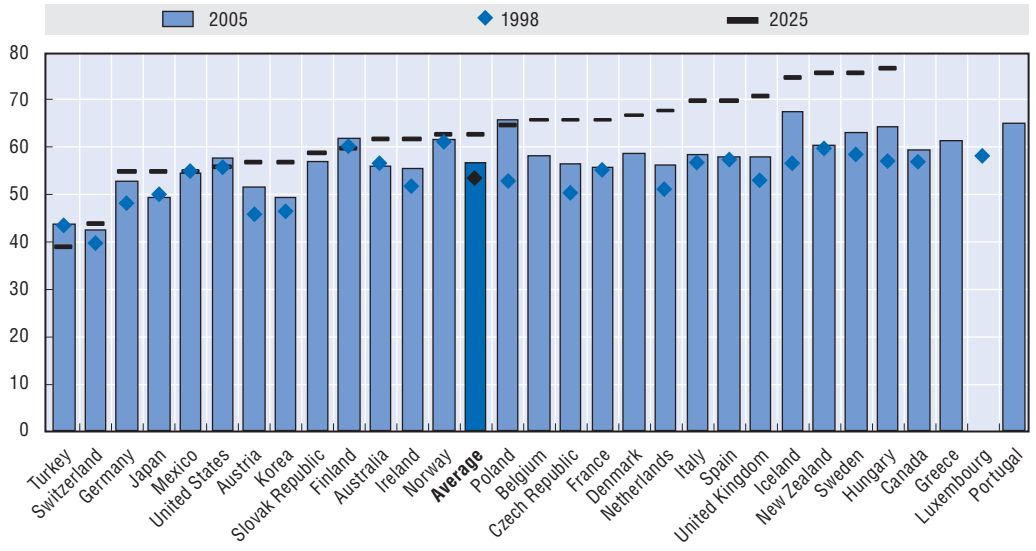
Table 10.3. **Percentage of women graduates in 1998, 2005 and projections**

	1998	2005	2015	2020	2025
Australia	57	56	62	62	62
Austria	46	52	62	60	57
Belgium	m	58	67	67	66
Canada	57	59	m	m	m
Czech Republic	50	57	55	61	66
Denmark	m	59	66	68	67
Finland	61	62	65	63	60
France	55	56	65	66	66
Germany	48	53	65	61	55
Greece	m	61	m	m	m
Hungary	57	64	66	73	77
Iceland	57	68	74	74	75
Ireland	52	56	59	59	62
Italy	57	59	68	70	70
Japan	50	49	49	54	55
Korea	47	49	54	56	57
Luxembourg	58	m	m	m	m
Mexico	55	55	46	51	55
Netherlands	51	56	70	70	68
New Zealand	60	61	74	74	76
Norway	61	62	65	65	63
Poland	53	66	63	62	65
Portugal	m	65	m	m	m
Slovak Republic	m	57	54	55	59
Spain	58	58	64	68	70
Sweden	59	63	74	76	76
Switzerland	40	43	49	48	44
Turkey	44	44	35	37	39
United Kingdom	53	58	72	72	71
United States	56	58	61	57	56
Country average	**54**	**57**	**62**	**63**	**63**
Comparable average	**54**	**57**	**63**	**64**	**63**

m = missing

Note: The projections are based on a linear regression of rates of award of degrees by gender observed between 1998 and 2005, then applied to the UN population projections by gender.

Figure 10.3. **Percentage of women graduates in 1998, 2005 and projections**



male graduate). If recent trends were to be maintained, the percentage could reach 63% by 2025 (1.8 female graduates for each male graduate). Here too, the widening of the gap between men and women does not reflect a decline in the number of degrees awarded to men so much as the higher rate of growth in the percentage of women graduates.

Studying levels of education in the population by gender allows this question to be viewed in terms of generations. On average (not weighted), the male and female populations aged from 25 to 64 years have the same level of education. OECD countries had an average of 26% of men and women graduates (on average 8% type B or vocational degrees and 19% type A or general).

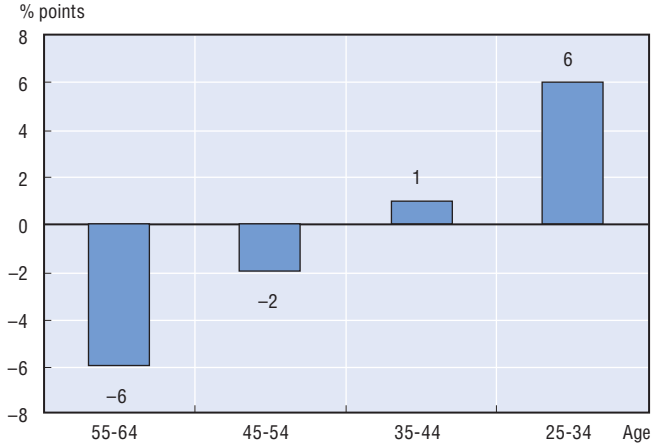
Table 10.4 and Figure 10.4 show that there are nonetheless differences between countries and types of higher education. In 2005, the female population aged 25 to 64 years had a higher level of education in 16 OECD countries, the reverse being true in 12 others. However, the weight of the oldest cohorts weighs heavily on the analysis: women outnumber men in 25 out of 30 countries in the 24-35 year-old age bracket, and in only two in the 55-64 year-old bracket (2 other countries have parity). Men born between 1941 and 1960 are therefore, on average, better educated than women of their age, the reverse being true for subsequent age groups. The reversal of gender inequalities occurred later in general higher education and can be seen only in the youngest age group (whereas there was parity for the age cohort in vocational higher education). While the numerical superiority of women is still primarily on higher technical diplomas (type B), that is no longer the case for the youngest students, among whom the gender gap is more marked in general education than in technical education. For the age group born between 1971 and 1980, the gap between the proportion of women and men graduates is 6% on average. In terms of growth, women have gained 12 points compared with men between the oldest and the youngest age groups, *i.e.* in thirty years. While their advance will probably start to slow (otherwise there would be an 18-point gap between men and women in the lower age groups in 30 years time), the difference between the rates of men and women graduating could well exceed 10% on average between now and 2025.

Table 10.4. **Difference between the percentage of the female and male population with a tertiary degree by age group (2005)**

	Tertiary education type B (F-M)					Tertiary-type A and advanced research (F-M)					Total tertiary education (F-M)				
Age	25-64	25-34	35-44	45-54	55-64	25-64	25-34	35-44	45-54	55-64	25-64	25-34	35-44	45-54	55-64
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Australia	2	4	2	3	0	0	5	1	–1	–5	3	9	3	2	–4
Austria	–2	1	–2	–3	–6	–3	1	–2	–3	–6	–5	2	–5	–7	–12
Belgium	7	10	8	5	4	–4	0	–4	–7	–8	2	10	5	–1	–5
Canada	7	6	8	7	6	0	7	1	–2	–7	7	13	9	5	0
Czech Republic	x(11)	x(12)	x(13)	x(14)	x(15)	–3	1	–3	–4	–5	–3	1	–3	–4	–5
Denmark	–2	–1	–3	–3	–3	8	11	9	9	2	5	9	6	7	–1
Finland	8	8	13	9	3	1	11	1	–1	–4	9	19	14	7	–1
France	2	3	2	2	0	0	5	0	0	–3	2	8	2	2	–3
Germany	–4	0	–3	–5	–7	–5	0	–4	–5	–9	–8	–1	–7	–10	–16
Greece	–1	0	–1	–2	–2	–1	5	0	–6	–7	–3	5	–1	–8	–9
Hungary	0	0	0	0	0	2	6	4	2	–4	2	6	4	2	–4
Iceland	4	3	5	7	0	3	10	6	–3	–6	7	12	11	5	–6
Ireland	3	4	3	2	3	0	5	–2	–2	–4	3	9	1	0	–1
Italy	0	0	0	0	0	1	6	2	–1	–3	1	6	2	–1	–3
Japan	16	21	21	17	6	–19	–15	–22	–23	–16	–3	7	–1	–6	–10
Korea	0	3	–2	–2	–1	–10	–3	–15	–13	–10	–11	0	–17	–15	–10
Luxembourg	1	6	2	–1	–2	–6	–2	–7	–6	–11	–5	3	–5	–7	–13
Mexico	0	0	0	0	0	–6	–3	–7	–10	–8	–6	–3	–6	–10	–8
Netherlands	0	0	0	–1	–1	–5	2	–4	–8	–10	–5	2	–4	–9	–12
New Zealand	7	3	5	10	11	–1	4	0	–3	–5	6	7	4	7	6
Norway	–2	0	0	–3	–4	7	15	9	5	–1	5	15	9	2	–5
Poland	x(11)	x(12)	x(13)	x(14)	x(15)	4	11	5	2	–2	4	11	5	2	–2
Portugal	x(11)	x(12)	x(13)	x(14)	x(15)	4	10	4	2	0	4	10	4	2	0
Slovak Republic	1	1	1	1	0	–2	0	–3	–2	–5	–2	1	–2	–1	–5
Spain	–2	0	–2	–3	–3	3	10	4	–2	–6	0	10	2	–5	–9
Sweden	5	1	6	9	6	4	9	6	1	0	9	10	12	10	5
Switzerland	–8	–5	–9	–8	–8	–10	–7	–10	–11	–12	–17	–12	–19	–18	–20
Turkey	x(11)	x(12)	x(13)	x(14)	x(15)	–4	–3	–4	–4	–5	–4	–3	–4	–4	–5
United Kingdom	1	1	2	1	0	–1	1	–4	–3	–3	0	2	–2	–2	–3
United States	2	1	3	3	2	0	6	2	–2	–8	2	7	5	1	–6
OECD average	**2**	**3**	**2**	**2**	**0**	**–1**	**4**	**–1**	**–3**	**–6**	**0**	**6**	**1**	**–2**	**–6**

Note: x(a) included in column a; the totals are not always exact due to rounding up or down.

Figure 10.4. **Gap between female and male tertiary educational attainment by age group (2005)**



Choice of studies: significant differences between men and women

The reversal of gender inequalities, both in participation and degree awards, does not mean that the choice of studies has not remained highly gender-based. This is an important point in that gender wage differences are partly attributable to the subjects that men and women choose to study. Women, for example, are far more likely than men to study subjects relating to education, teaching, health and the social sector (and are subsequently over-represented in these professions). Men, for their part, are more likely to choose science or engineering which, in addition, lead to higher salaries in the labour market. Table 10.5 shows the differences in subject choices between men and women and trends from 1998 to 2005. 17% of women graduated in an education-related subject compared with 7% of men in 2005. Conversely, 21% of men compared with 5% of women graduated in engineering. Table 10.6 shows how this gender-based subject split is reflected in terms of percentage shares of degrees awarded to women and men in each subject. In 2005, 76% of education sciences degrees were awarded to women, but only 26% in engineering. International data allow more detailed comparisons than those shown in these tables, with each major subject group being broken down into several sub-groups. It will be noted that, among the sciences, there are two with a highly gender-oriented profile: 63% of natural science degrees are obtained by women (almost 2 women graduates for every man), but only 24% of information technology degrees (3 men for every woman). The gender imbalances in mathematics and physics favour men, but not to such a pronounced extent. Both tables show that, on average, all subjects increased their female share between 1998 and 2005. However, those with the greatest increase in women were the health, agronomy and services sectors, while science is increasing its share of women more slowly.

Gender segregation by subject, therefore, is still high and overall remained stable between 1998 and 2005. One simple way of measuring such segregation is to calculate an index which measures the number of people, men or women, who would need to obtain a degree in another subject to attain perfect equality between the sexes in each discipline.[3] Based on the major subject groups presented in Tables 10.5 and 10.6, OECD member countries had an average segregation index of 27 in 2005, compared with 28 in 1998. Thus, 27% of people on average would have to change subject to achieve perfect equality in the award of degrees. Figure 10.5 shows that this average hides contrasting trends across countries. Figure 10.6 shows the same index calculated more precisely on the basis of a more detailed classification (23 subject groups rather than 8) for those countries for which such data are available. In both cases, Turkey is the country with the lowest subject-related gender segregation: men and women are distributed evenly across the various subjects, although more men than women are graduates. Conversely, in both cases, the Nordic countries generally reveal strong subject-related gender segregation. A more detailed classification changes the ranking of certain countries. Based on the more precise measurement, Canada, Australia and the United Kingdom show greater subject-related gender segregation than Hungary, France and Italy, which is not the case with the index based on broader subject categories. As for other indicators (*e.g.* gross domestic product), small differences should not be interpreted too literally as they may not be significant. Major differences in level are more reliable.

In short, women have increased their participation in higher education and their level of education more rapidly than men over the last decades. Gender inequalities were therefore first narrowed and then reversed. This reversal of gender inequalities in the

Table 10.5. **Breakdown of male and female graduates by subject and subject-related gender segregation index (1998, 2005)**

Field of study		Education		Arts, and humanities		Social sciences, business and law		Sciences		Engineering		Agronomy		Health and social sector		Services		Total		Segregation index
		% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	2005
Australia	2005	14.4	6.8	12.8	8.4	39.2	42.6	9.1	19.6	3.1	12.6	0.8	0.9	17.9	7.2	2.7	1.9	100	100	23
	1998	18.3	8.4	17.0	10.8	28.3	37.1	8.4	15.7	2.9	14.5	1.1	1.8	21.7	8.8	2.4	2.9	100	100	29
Austria	2005	13.4	4.2	13.0	8.3	43.4	34.7	9.4	18.1	5.6	24.1	2.2	1.4	10.6	6.7	2.4	2.4	100	100	27
	1998	6.5	2.2	21.8	10.3	42.7	36.7	9.4	17.5	5.0	22.9	4.4	4.2	10.2	6.3	0.0	0.0	100	100	26
Belgium	2005	11.3	4.9	18.8	12.8	36.7	33.6	8.3	15.5	5.5	17.4	3.0	3.7	15.0	10.9	1.3	1.2	100	100	20
	2000	10.2	4.3	19.3	11.7	37.8	34.8	7.5	12.4	5.3	19.8	2.9	4.2	15.7	10.9	1.4	1.8	100	100	21
Canada	2005	17.0	8.3	16.3	12.4	36.8	38.8	8.5	16.0	3.7	15.9	1.0	1.1	14.2	5.0	2.6	2.4	100	100	22
	1998	19.2	9.7	16.5	13.1	37.9	37.3	9.1	15.8	3.2	14.9	1.0	1.6	10.3	5.3	2.7	2.3	100	100	19
Czech Republic	2005	26.4	12.0	10.7	6.9	35.4	27.4	5.7	11.2	6.6	29.6	3.9	3.7	9.2	4.0	2.1	5.2	100	100	32
	1998	27.1	9.3	9.6	5.8	33.3	28.0	3.2	8.2	9.9	33.2	4.9	6.4	10.6	6.6	1.5	2.6	100	100	31
Denmark	2005	12.5	7.0	16.3	13.2	21.5	32.8	4.9	13.9	4.8	17.7	1.0	1.2	38.5	11.9	0.5	2.5	100	100	35
	2000	1.2	0.8	33.2	14.3	39.9	49.4	10.7	14.5	4.7	13.0	3.2	3.2	6.7	4.5	0.4	0.3	100	100	22
Finland	2005	9.5	3.3	15.2	8.6	26.0	17.9	7.0	11.7	7.4	44.0	1.8	3.0	26.0	7.6	7.0	3.9	100	100	43
	1998	15.7	4.7	16.9	8.4	26.2	20.1	6.5	9.9	7.9	44.3	2.4	3.9	21.7	7.0	2.6	1.7	100	100	41
France	2005	3.6	1.3	21.7	9.8	46.4	35.6	10.9	20.4	5.6	19.6	0.8	0.9	8.2	8.0	2.9	4.4	100	100	25
	1998	10.3	6.1	26.9	12.1	40.1	33.9	14.1	19.3	5.1	23.9	0.4	0.5	2.2	2.4	0.9	1.8	100	100	25
Germany	2005	11.4	4.3	20.5	8.8	28.9	30.0	11.2	19.4	7.0	24.5	2.2	1.8	16.6	9.7	2.2	1.4	100	100	27
	1998	11.7	3.0	21.2	8.1	24.0	25.9	10.6	17.7	7.6	29.3	3.0	2.5	18.7	11.5	3.2	2.1	100	100	31
Greece	2005	18.0	7.6	23.7	7.7	30.5	26.3	13.2	27.0	6.5	16.1	1.8	3.8	4.0	6.2	2.2	5.3	100	100	31
Hungary	2005	23.6	12.5	7.9	6.6	45.6	37.6	2.1	6.0	2.6	13.6	2.2	3.7	9.4	5.2	6.5	14.7	100	100	25
	1998	31.6	11.8	11.7	8.5	33.4	31.7	3.6	5.8	5.5	24.3	2.7	5.5	7.8	3.5	3.8	8.9	100	100	29
Iceland	2005	32.1	12.6	11.1	11.2	31.3	40.6	5.3	16.8	3.1	12.5	0.4	1.4	15.2	4.6	1.5	0.3	100	100	31
	1998	21.0	6.2	16.8	11.1	28.5	45.6	8.1	20.0	2.3	10.9	0.0	0.0	23.4	6.2	0.0	0.0	100	100	38
Ireland	2005	10.9	4.1	27.7	20.0	26.2	29.3	12.3	22.6	3.3	16.5	0.5	1.0	18.2	5.5	0.9	1.0	100	100	27
	1998	12.2	5.6	25.9	18.3	30.5	31.4	14.9	19.3	3.9	17.2	1.4	1.9	9.5	5.4	1.6	0.8	100	100	19
Italy	2005	14.1	3.8	17.8	7.1	35.0	37.5	6.5	7.9	7.6	25.9	1.4	2.5	15.8	12.4	1.7	2.9	100	100	24
	1998	4.0	0.7	19.3	5.8	34.3	37.5	11.6	10.5	7.6	25.3	1.5	3.0	21.4	16.9	0.2	0.3	100	100	22
Japan	2005	9.0	3.8	32.3	9.5	31.9	41.2	3.2	6.0	5.8	31.1	3.3	3.3	9.6	4.8	4.9	0.2	100	100	37
	1998	12.6	4.2	40.2	8.5	27.7	44.1	3.3	5.2	5.3	30.4	3.7	3.5	7.3	4.0	0.0	0.0	100	100	43
Korea	2005	7.8	2.9	31.0	11.2	22.3	23.0	10.1	11.4	14.0	38.9	1.6	2.1	10.7	6.4	2.5	4.2	100	100	29
	1998	10.8	2.9	32.5	11.7	17.7	25.3	11.6	10.6	14.4	37.4	3.5	4.1	6.9	5.4	2.7	2.6	100	100	31
Mexico	2005	18.6	4.1	4.4	3.9	47.4	41.7	8.8	14.5	7.1	23.6	1.2	3.1	9.8	6.9	2.8	2.1	100	100	24
	1998	21.9	11.4	0.0	0.0	47.7	48.4	2.8	2.8	14.5	27.7	1.4	3.2	11.7	6.5	0.0	0.0	100	100	16

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Table 10.5. **Breakdown of male and female graduates by subject and subject-related gender segregation index (1998, 2005)** *(cont.)*

Field of study		Education		Arts, and humanities		Social sciences, business and law		Sciences		Engineering		Agronomy		Health and social sector		Services		Total		Segregation index
		% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	% F	% M	2005
Netherlands	2005	23.7	7.9	8.6	7.2	35.1	41.3	3.3	12.9	2.4	16.2	1.8	2.7	22.6	9.5	2.5	2.4	100	100	30
	1998	23.5	9.7	9.2	5.8	32.3	37.7	3.0	8.6	2.8	21.9	1.8	3.5	25.2	9.9	2.3	2.8	100	100	32
New Zealand	2005	14.4	4.4	16.8	13.6	36.2	42.0	9.3	20.4	2.6	9.4	0.7	1.5	18.8	7.4	1.3	1.3	100	100	24
	1998	10.9	3.8	26.5	20.6	25.5	34.2	10.4	18.2	3.7	11.7	1.3	2.8	20.0	6.7	1.7	2.0	100	100	26
Norway	2005	23.6	13.3	6.9	7.6	21.4	28.6	3.9	15.2	2.9	15.9	1.1	1.5	36.0	11.5	4.2	6.4	100	100	35
	1998	42.0	21.8	4.8	5.3	15.0	24.7	2.0	7.4	3.9	19.1	1.0	1.9	29.9	11.1	1.4	8.6	100	100	39
Poland	2005	20.1	10.8	8.8	4.9	49.3	42.4	4.5	11.1	3.3	15.1	1.5	1.9	7.6	6.4	5.0	7.4	100	100	21
	1998	58.3	18.6	9.3	11.2	27.3	42.7	0.6	2.3	1.5	16.4	2.9	3.4	0.0	3.9	0.1	1.4	100	100	40
Portugal	2005	24.2	9.5	8.9	7.3	24.7	26.2	8.2	15.5	6.1	21.5	1.7	2.1	21.4	10.8	4.7	7.1	100	100	27
	2000	24.1	9.0	8.9	7.8	38.9	38.1	4.1	8.6	6.6	22.9	1.6	2.1	12.6	6.9	3.3	4.5	100	100	23
Slovak Republic	2005	21.4	8.8	5.7	5.7	33.4	26.1	7.1	12.6	10.2	27.1	2.8	4.9	14.7	5.9	4.8	9.1	100	100	29
	2000	30.2	10.9	5.9	5.1	32.5	27.5	4.0	10.0	8.8	22.6	2.7	6.2	11.3	5.4	4.6	12.3	100	100	31
Spain	2005	17.9	6.9	10.3	8.2	31.6	29.6	7.1	14.1	7.3	24.9	2.2	3.7	18.9	8.2	4.7	4.4	100	100	26
	1998	16.8	7.5	11.4	7.9	38.8	38.0	7.3	12.4	4.9	20.0	2.2	3.8	15.3	6.8	3.3	3.6	100	100	22
Sweden	2005	23.3	8.9	5.3	5.5	22.4	25.1	5.7	11.3	8.3	35.0	0.6	0.9	33.4	11.9	0.8	1.3	100	100	36
	1998	26.6	9.9	6.9	6.2	24.8	25.9	5.4	14.2	6.2	30.7	1.0	1.2	28.9	11.5	0.2	0.4	100	100	35
Switzerland	2005	16.9	4.6	15.2	7.7	40.3	42.7	9.1	15.5	4.9	21.0	1.5	1.2	10.9	6.2	1.0	1.1	100	100	25
	1998	15.4	7.5	20.0	10.3	29.5	29.4	8.2	13.6	5.2	24.8	1.6	1.6	16.9	9.5	3.2	3.2	100	100	25
Turkey	2005	35.1	27.7	10.6	7.3	22.3	24.5	9.9	10.5	6.1	16.9	2.6	4.3	12.5	6.9	0.9	1.9	100	100	16
	1998	22.4	20.0	11.3	7.8	30.2	32.3	12.2	9.4	6.6	14.1	4.6	5.1	10.5	6.9	2.2	4.2	100	100	12
United Kingdom	2005	14.1	6.4	19.3	14.1	34.7	34.1	10.3	21.6	3.3	15.7	1.0	0.7	16.5	6.8	0.9	0.5	100	100	24
	1998	16.2	7.2	22.5	15.1	28.0	27.5	11.4	17.8	4.3	21.2	1.1	1.3	14.9	8.2	1.6	1.7	100	100	24
United States	2005	17.5	7.0	16.3	14.7	38.5	43.1	6.9	12.6	2.5	11.6	0.9	1.3	12.6	4.7	4.8	5.0	100	100	20
	1998	17.9	7.1	15.2	12.7	40.1	43.7	7.2	11.8	2.4	12.7	1.7	2.5	13.8	5.8	1.7	3.6	100	100	21
OECD average	**2005**	**17.4**	**7.6**	**15.0**	**9.3**	**33.6**	**33.7**	**7.6**	**14.9**	**5.5**	**21.2**	**1.6**	**2.3**	**16.4**	**7.6**	**2.8**	**3.6**	**100**	**100**	**27**
	1998	**17.5**	**7.0**	**16.3**	**14.7**	**38.5**	**43.1**	**6.9**	**12.6**	**2.5**	**11.6**	**0.9**	**1.3**	**12.6**	**4.7**	**4.8**	**5.0**	**100**	**100**	**28**
Average change (1998-2005) (%)		–0.1	0.6	–1.3	–5.4	–4.9	–9.4	0.8	2.3	3.0	9.6	0.7	1.0	3.7	2.8	–2.0	–1.4			–0.3

Table 10.6. **Percentage of degrees awarded to women by subject in 2005 (% F) and percentage point trends between 1998 and 2005 (% Δ)**

	Education		Arts, and humanities		Social sciences, business and law		Sciences		Engineering		Agronomy		Health and social sector		Services		Total	
	% F	% Δ	% F	% Δ	% F	% Δ	% F	% Δ	% F	% Δ	% F	% Δ	% F	% Δ	% F	% Δ	% F	% Δ
Australia	73.2	–0.9	66.1	–1.3	54.3	4.3	37.5	–3.7	24.2	3.6	53.4	9.8	76.1	–0.2	65.1	12.4	56.4	–0.4
Austria	77.5	5.9	63.0	–0.8	57.7	8.4	36.3	5.5	20.2	4.8	62.5	15.7	63.3	6.0	52.4	52.4	52.2	6.7
Belgium	73.3	3.1	63.8	1.4	56.6	4.5	38.9	1.2	27.3	6.3	49.3	9.0	62.1	3.0	56.4	12.8	54.4	4.3
Canada	75.1	2.8	65.9	3.7	58.1	1.0	43.7	0.7	25.2	3.2	55.3	8.9	80.6	8.9	61.6	0.7	59.5	2.8
Czech Republic	73.6	1.8	66.2	7.0	62.0	11.0	39.1	13.8	21.9	1.2	57.0	16.9	74.1	15.6	33.5	–0.8	55.8	9.1
Denmark	74.1	14.8	66.3	–2.9	51.1	7.2	36.0	–5.7	30.2	4.4	57.3	7.4	83.8	24.8	25.3	–28.6	61.4	12.2
Finland	82.8	2.4	74.4	2.9	70.5	8.8	49.4	4.5	21.6	3.5	49.9	6.8	84.8	5.5	74.5	8.5	62.1	6.8
France	77.6	8.9	73.0	–1.1	61.5	1.1	39.6	–8.8	26.1	4.6	52.0	–0.5	55.7	1.7	45.1	6.7	55.1	–1.2
Germany	72.2	–1.7	69.4	3.8	48.3	7.9	35.9	5.7	21.8	5.9	54.7	8.0	62.3	8.0	60.3	7.1	49.3	7.1
Greece	79.3	m	83.3	m	65.3	m	44.2	m	39.7	M	43.9	m	51.2	m	39.9	m	61.9	M
Hungary	77.4	–0.9	68.6	3.7	68.8	10.2	38.7	–6.5	26.0	2.6	51.7	12.1	76.5	1.9	44.3	7.8	64.4	7.1
Iceland	84.5	2.2	67.9	0.3	62.2	15.8	40.3	4.6	34.5	12.3	40.0	m	87.4	3.6	90.3	m	68.1	10.1
Ireland	79.2	7.1	66.6	3.8	56.2	2.6	43.8	–4.1	22.3	0.9	44.1	–2.9	82.6	15.0	56.6	–12.6	59.0	4.6
Italy	84.1	–4.0	78.0	–3.5	56.9	2.1	53.8	–5.8	29.4	0.9	44.7	5.2	64.4	1.7	45.7	–6.3	58.6	1.6
Japan	61.3	2.8	69.5	0.6	34.1	11.3	26.0	3.3	11.1	3.5	40.0	6.4	57.1	11.2	m	m	40.1	8.0
Korea	71.0	–0.1	71.5	6.9	46.8	15.2	44.5	2.6	24.6	4.4	40.7	4.9	60.2	14.7	35.4	–4.7	47.5	7.8
Mexico	84.9	13.8	57.9	m	58.4	m	42.8	m	27.0	M	32.3	m	63.7	m	62.2	m	55.3	m
Netherlands	79.6	7.9	60.8	–1.4	52.4	5.3	25.2	–1.4	15.9	4.2	46.6	11.9	75.5	2.9	58.3	12.5	56.5	5.4
New Zealand	83.7	3.8	65.8	1.7	57.5	6.7	41.7	–2.5	30.0	–0.7	43.8	5.2	79.8	–0.7	59.8	5.6	61.0	2.9
Norway	74.4	–2.0	59.9	–0.1	54.9	4.5	29.3	–2.2	23.0	–2.6	55.3	8.3	83.6	1.7	51.6	30.1	62.0	–0.7
Poland	78.1	m	77.3	m	69.0	m	43.6	m	29.6	M	59.8	m	69.4	m	56.2	m	65.7	m
Portugal	83.2	0.2	70.5	3.2	64.7	–0.2	50.8	4.7	35.7	1.2	61.4	3.7	79.4	2.7	56.0	–0.6	66.0	1.6
Slovak Republic	75.5	0.3	55.3	–0.5	61.7	5.3	41.6	11.4	32.1	2.2	41.5	9.0	75.9	6.4	39.9	11.1	55.7	3.5
Spain	79.6	3.8	65.3	–1.5	61.7	3.0	43.3	–1.5	30.6	5.1	47.4	2.7	77.5	1.6	61.8	6.1	60.1	1.9
Sweden	82.3	2.8	63.4	1.8	61.3	3.3	47.4	12.0	29.7	6.9	54.1	–0.3	83.3	4.8	51.8	13.9	64.0	4.8
Switzerland	73.8	16.5	59.9	4.0	41.8	2.3	30.8	2.6	15.2	3.2	48.6	9.7	57.2	3.6	42.6	3.1	43.2	3.7
Turkey	52.2	9.8	55.8	7.1	44.0	6.0	44.8	–1.2	23.6	0.2	34.2	–3.1	61.1	11.3	28.8	3.1	46.3	6.6
United Kingdom	73.3	2.4	63.1	1.3	56.1	3.6	37.4	–3.6	20.8	2.8	62.3	12.8	75.1	8.7	67.6	16.5	55.6	3.6
United States	77.2	1.8	59.9	0.5	54.6	1.8	42.4	–0.3	22.2	3.3	49.3	3.9	78.2	3.9	56.4	19.6	57.4	2.4
Average	**76.3**	**3.9**	**66.5**	**1.6**	**56.8**	**5.9**	**40.3**	**1.0**	**25.6**	**3.4**	**49.4**	**6.9**	**71.8**	**6.5**	**52.8**	**7.1**	**57.0**	**4.7**

lower age groups led to equality of education levels between the two sexes for the entire population aged 25 to 64 years. For purely demographic reasons, these inequalities will persist over the next few decades even if men manage to catch up their lag in the years to come. Given that adult education does not change much after a certain age, the increased participation of men in younger generations will be unable to have any impact on the overall population for several decades to come. However, the choice of studies by gender remains highly differentiated. While this segregation has probably declined over the last decades, there was very little change between 1998 and 2005. With the exception of agronomic subjects, the feminisation of higher education has in effect exacerbated the gender segregation of already highly feminised disciplines, namely health, services and education.

Figure 10.5. **Index of subject-related gender segregation (8 subject categories)**

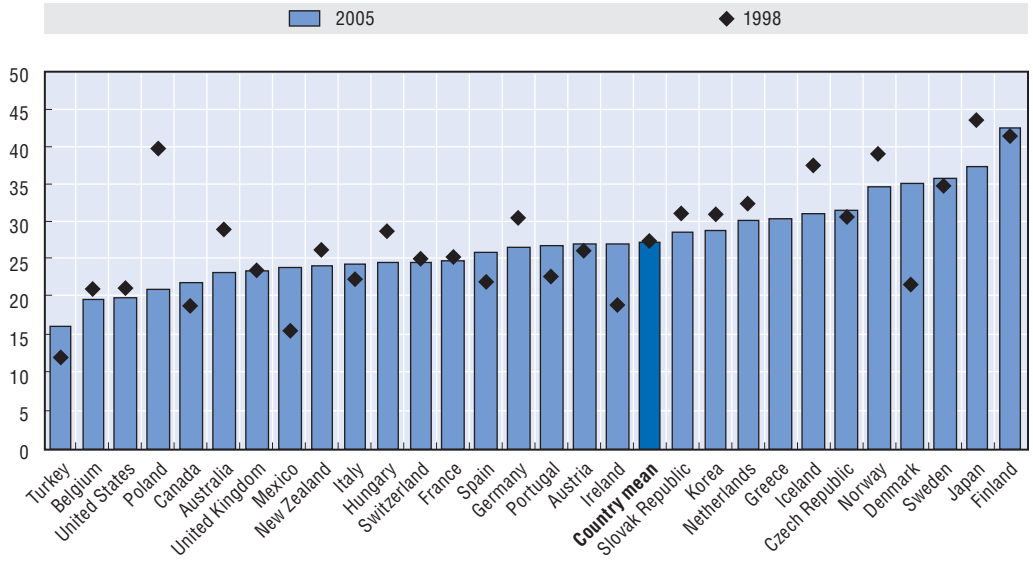
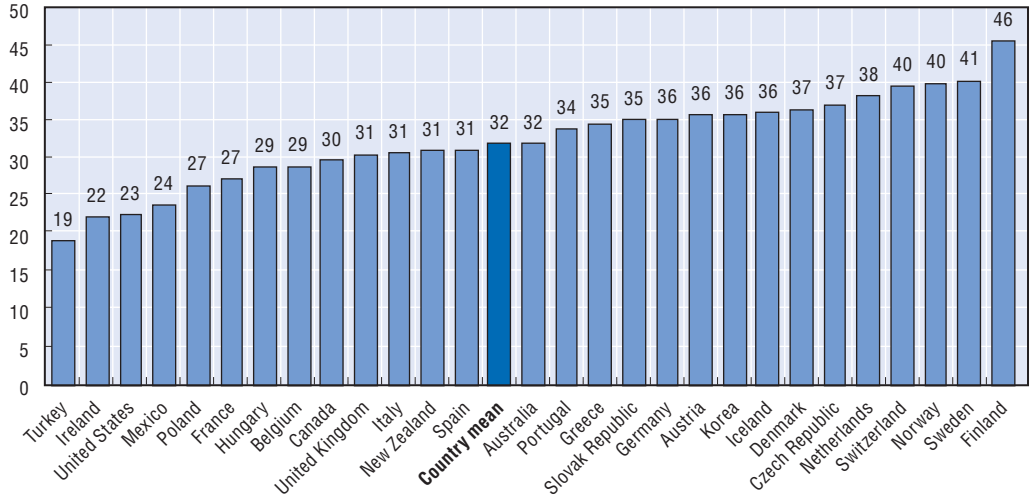


Figure 10.6. **Index of subject-related gender segregation (23 subject categories)**



10.2. What is the reason for gender inequalities?

How can this reversal of gender inequalities in favour of women be explained? It was to be expected that the removal of material and psychological barriers to the participation of women should enable them to catch up with men, but it was by no means self-evident that it would be replaced by a reversal of the inequalities to the detriment of men. To explain this outcome, answers must be found to two distinct questions. Why did inequalities to the detriment of women disappear and why did inequalities to the detriment of men arise? It is easier to answer the first question than the second. The explanation for these changes is based on complementary and often interrelated analyses of an economic, demographic, sociological and educational nature.

Demographic factors

Fecundity management and women choosing to marry and to have their first child at a later age are *demographic* factors which have allowed greater participation of women in higher education and a reduction in drop-out rates. They have also contributed to the greater participation of women in the labour market and to better career planning. The downsizing in families of OECD countries has also contributed to the greater participation of women in higher education.

The changes in demographic behaviour and policies of legalised contraception help to explain the rise in female participation in higher education in the last century. In the United States, studies show that the introduction of oral contraception in 1960 is one of the demographic factors which can explain the growing participation of women in higher education (Goldin and Katz, 2002) and the labour market (Bailey, 2006). Women were thus able to delay the age at which they married and had their first child, thereby enabling a greater number of women to start and complete their studies. However, these explanatory mechanisms vary according to culture and do not apply uniformly to all countries. In Japan, for example, the decision to marry and have a first child later probably explains in part the growing participation of women in higher education, but is not related to the introduction of oral contraception which was only legalised in 1999.

Family size is also an important demographic factor which can affect women and men differently regarding their access to higher education. In the United States, in past decades, the larger the family, and the more masculine the family, the less chance women had of participating in higher education (Averett and Burton, 1996). In Japan and Turkey the same thing has been seen (Ono, 2004; Tansel, 2002). The downsizing of families in OECD countries has thus contributed to greater participation in higher education, especially for women.

Sociological factors

Another series of explanations has more to do with *sociological* factors. These relate to the end or decline of discrimination in the labour market, changes in the behaviour of women in a more egalitarian society, changes in parents' decisions whether or not to invest in their sons' and daughters' education, in a social environment in which parents are better educated with greater equality between the sexes, or to the growth in the number of single parent families. What is required here, therefore, is an analysis of the mechanisms driving the reduction in discrimination and gender stereotypes in the labour market and families, and also the formation of individual identity.

Reduction in discrimination in the labour market

When the value of a degree cannot be readily realised in the labour market, there is less incentive to obtain one. All OECD member countries have experienced a rise, at varying rates, in female participation in the labour market and, more generally, greater social egalitarianism between the two sexes. The gradual disappearance of legal or tacit discrimination has encouraged women to study more. In the United States, over 50% of jobs were barred to married women between 1900 and 1950, forcing them to give up their job when they married. The abolition of this form of discrimination gave an added incentive to women to enter into higher education (Goldin, Katz and Kuziemko, 2006). In Japan, the law of 1985 on equal opportunities in employment (for men and women) led to a rise in female students' aspirations and increased participation by women in universities

to the detriment of the *junior colleges*, whose qualifications were practically worthless in the labour market (Edwards and Pasquale, 2003; Yonezawa and Kim, 2008). This type of social change can explain the reduction in inequalities to the detriment of women, but not their reversal.

Combining having a family with professional life

The life choices available to individuals relate specifically to a given generation and to the social environment in which that generation evolves. Women graduates therefore had to base their decisions on whether or not it was possible to reconcile a career with having a family. Goldin (2004) examined five cohorts of women graduates in the United States to track the long road they had to follow. According to his study, the generation of women who graduated between 1900 and 1920 seem to have chosen *de facto* between having a job or a family. The next generation (1920-1945) had a job then a family, the following generation (1946 to the late 1960s) a family first then a job, and only in subsequent generations (late 1960s to 1980, and the following cohort graduating between 1980 and 1990) did the majority combine work and family before the age of 40. In other words, while women graduates in earlier generations were often forced to give up a family or a job, the fact that the younger generations of women can more easily combine having a family and a career probably encourages them to study (because their social environment allows them to do so). The first countries to achieve this family-career balance were the Nordic Countries in Europe, and these are also the countries where the inequalities to the detriment of men are now the most pronounced.

Declining discrimination within families

The decline in discrimination against girls within families is another important sociological change which explains the rise in female participation. Feminism and the decline in gender stereotypes in society (Scott, 2006), and in education in particular, have changed the attitude of parents towards the education of their daughters (and perhaps their sons too). In Japan, for example, families have traditionally favoured their eldest son, and girls therefore had easier access to higher education if they had few or no brothers (Ono, 2004). In Turkey, too, it seems that family income has more impact on the educational fate of girls than boys (Tansel, 2002). In the majority of OECD countries, such differences in behaviour have declined considerably if not disappeared altogether.

Generally, as shown by studies in Europe (Alwin, Braun and Scott, 1992; Dryler, 1998), in the United States (Buchmann and DiPrete, 2006), or in Japan (Edwards and Pasquale, 2003), the higher the parents' level of education, the more open minded they are to women in the workplace and the greater the chances of their sons and daughters of participating on an equal footing in higher education. The general increase in the level of education of populations has thus led to a decline in gender inequalities. This factor alone can explain the elimination of inequalities in favour of men, but not their reversal. However, the gap in favour of women is to be found in all social environments in countries such as France, the United States or the United Kingdom and, in the first two instances, is more pronounced in the least advantaged social groups or minorities (Brinbaum and Kieffer, 2007; Buchmann and DiPrete, 2006; Burgess *et al.*, 2004; Machin and McNally, 2006; Gorard, Rees and Salisbury, 2001). In Japan, the social class of the family has more impact on the educational fate of boys than girls (Ishida, 2007). As the reversal is found in all social environments, it cannot easily be attributed to changes in the social structure of OECD member countries.

One rarely studied hypothetical explanation for this reversal is that families now favour girls, especially in disadvantaged areas. In France, for example, parents' aspirations are often higher for their daughters than their sons and in working class backgrounds (blue-collar workers and lower grades of white-collar workers) more markedly in immigrant than French families (Brinbaum and Kieffer, 2007).

Gender-oriented parental model and changes in the composition of families

Imitation plays an important role in the development of individuals and societies (Tarde, 1890). Parents are a model for their children. According to certain models of socialising through imitative behaviour, children develop by taking the parent of the same sex as their principal reference. Brought up in a single parent home (generally headed by a woman), boys would therefore suffer more than girls. The increase in divorce rates and single parent families may therefore have affected boys and girls in different ways. Likewise, if the mother's influence on studies was more important than the father's, as seems to be shown by the greater importance of the mother's social characteristics than the father's in many analyses of social inequalities, girls would also be favoured. Taking data for the United States, Buchmann and DiPrete (2006) show a change between the groups born between 1938 and 1965 and those born between 1966 and 1977. For the older groups, girls and boys born in highly educated families studied more or less in the same proportions, while less educated parents seemed to favour their sons. The study of more recent generations shows that families with the best educated parents continue to have an egalitarian attitude, but that those where the father is not a graduate or where the father is absent give marked advantage to girls (whereas it was in favour of the boys in the preceding groups). This might be explained by the unequal distribution of such parental situations by social environment, but a study of this rules out this hypothesis. Furthermore, boys from minorities are much less successful than girls in cases where their father is poorly educated or absent. Other studies stress the importance of brothers and sisters and not just the parents as role models for girls and boys (Loury, 2004).

Differences in the role of peer groups

Another factor which might explain the difference in the rate of participation and award of degrees between boys and girls lies in the different roles played by peer groups for girls and boys during adolescence. It is not only parents or siblings who influence young people but also their peers, *i.e.* their friends and *potential* friends (Coleman, 1961; Dornbusch, 1989; Akerlof and Kranton, 2002). Frank *et al*. (forthcoming publication) show that peer influence is much higher for girls than boys in the choice of whether or not to study mathematics in high school, although there was little difference between girls and boys with regard to other impacts. Their study confirms other research showing that girls are more responsive to their social milieu than boys (Eccles, Adler and Meece, 1984; Gilligan, 1982), even if this is not always the case (Ridgeway and Correll, 2004). Apparently, the girls' response is even stronger if the milieu has pronounced gender stereotypes (Correll, 2001). In the case of reversal of gender inequalities, this differentiated impact of peer groups could explain why a change in attitudes toward higher studies spreads more quickly among girls than boys, and accordingly why the increase in participation and degree awards has been more rapid for women. Even if there is no proof that this can be extrapolated at this level, it would also mean that the gap would continue to grow if higher studies or the study of certain subjects became socially perceived as a feminine activity.

Economic factors

Economic factors or arguments can also explain the reversal of gender inequalities in higher education. According to human capital theory, individuals make their decisions to study (or not) in terms of the economic return expected from their studies. This may have developed differently over the past few decades with regard to men and women. Analysts have also addressed the economic and non-economic alternatives to studying which may give rise to differentiated strategies of participation or non-participation in higher education.

Higher return on studies in higher education and degrees for women

The decline in inequalities could be explained by the increase in the period of return on degrees for women. The reversal in inequalities, for its part, would derive from a higher return on degrees for women than for men. Thus, higher incentives for one sex could be reflected in higher rates of participation in higher education. It should be noted, however, that the higher return on degrees for women is not incompatible with higher salaries for men in the labour market. Only the difference with the holders of secondary school certificates of the same sex matters.

International data on personal internal rates of return on a degree show that in 2003, the rate of return on a degree[4] was higher for women than for men in 5 countries (Belgium, Korea, New Zealand, Norway and the United Kingdom), more or less equivalent in 5 others (Denmark, Finland, Sweden, Switzerland and, to a lesser extent, in the United States, with a difference of 1%) and markedly lower in one country (Hungary) (OECD, 2007b, Table A9.6). Historical series would be necessary, however, to evaluate the soundness of this hypothesis at the international level.

Numerous empirical studies have studied the reversal of the gender gap in the United States. With regard to wages alone, the increase in the wage premium related to higher education is not significantly higher for women than for men, even though that is not the case according to some estimates (Dougherty, 2005; Jacob, 2002; Murphy and Welch, 1992). Moreover, according to Averett and Burton (1996), women respond less strongly than men to the wage premium on their degrees, thus the growth in the premium attached to degrees does not necessarily explain the growth in their participation. On the whole, the wage return on degrees does not provide a particularly convincing explanation for the situation in the United States (Cho, 2007). In Japan, too, the return on degrees is not a major factor in female participation in higher education (Edwards and Pasquale, 2003). Nevertheless, it may perhaps provide an explanation for trends in other OECD member countries.

Other derived approaches are also interesting. Charles and Luoh (2003) attribute the difference in the responses of men and women to the greater spread of the premium for men. As they are less sure than women of a positive wage premium, risk aversion prompts them to study less. This argument is only valid, however, if there is a significant overlap between the wage distribution for graduates and that for secondary-school leavers, such that young men have the impression that having a degree will not significantly enhance their chances of earning a better wage than a secondary-school leaver. By broadening the measurement of the return on degrees, by including measurements such as the wealth of the home, the probability of getting and staying married and avoiding poverty, DiPrete and Buchmann (2006) show that in the United States the return on degrees has increased more strongly for women than men over the past few decades and can therefore explain the difference in the growth in participation in higher education. It would be interesting to test

these different possible explanations in a systematic manner across OECD member countries.

Alternative choices and structure of economies

The alternatives to higher education for men and women with secondary school certificates can make higher studies less interesting or less accessible and, in certain circumstances, be a reason for the lower male participation in higher education. In France, for example, the abolition of compulsory military service for men in 1997 was associated with the decline in male participation in education and the probability of men obtaining a degree, especially those from a disadvantaged social background (Maurin and Xenogiani, 2007). In the United States, 4% to 6% of male participation in higher education could be attributed to draft-dodging (Card and Lemieux, 2001), such that women would have caught up more quickly without the secondary effect of the war. Also in the United States, the rise in the number of incarcerations is also cited to explain part of the decline in the ratio of male to female students (the number of prisoners rose fivefold between 1997 and 2004, with a prison population which was 93% male in 2004) (Long, 2007). Other alternatives are of a more economic nature. Low unemployment rates or high wages for activities which do not require higher qualifications can be an incentive not to study and to enter the labour market immediately, and *vice versa*. For example, Long (2007) shows that the differentiated growth in the gender gap in the different States of the United States has traditionally been associated with the structure of their economies: high wages in the finance, insurance and real estate sectors, which employ many more men, were linked to a higher proportion of women students, while high wages in services were linked to higher proportions of men.

Educational factors

A final series of explanations is based on *educational* factors. These relate to the difference in the academic preparation of men and women, which have changed over time, behavioural (or "non-cognitive") factors and developments in the provision of higher education, especially the introduction of new types of establishment or short courses more often pursued by women.

Changes in the academic preparation of girls and non-cognitive characteristics

The catching up and then overtaking of men by women could simply be attributable to improvements in their academic preparation compared with boys. As shown by the 2006 PISA study, a well-established international trend is that, at 15 years of age, girls score much higher in reading (+38 points on average in tests), obtain comparable results to boys in science (–2 points on average) and score slightly lower than boys in mathematics (–11 points on average). In the case of mathematics, the relative superiority of boys can be explained in many countries by a small number of boys who do very well in the subject: the majority of them have worse results than girls (OECD, 2007a). The changes in results by sex are not significant between the three editions of PISA (the first was in 2000). Some national longitudinal studies, however, indicate a trend in favour of girls over the past few decades, as in the case of the United States (see Box 10.1). In Germany, 57% of *Abitur*[5] were obtained by women in 2002 (BMBF, 2005). In France, girls have clearly made better progress than boys. In 2006, 53% of baccalaureates were obtained by girls and, in the age group which entered secondary school in 1989, 7 out of 10 girls obtained the baccalaureate compared with 6 out of 10 boys (Rosenwald, 2006). The same trend is also apparent in the United Kingdom. In England, for

Box 10.1. **Changes in academic preparation and non-cognitive skills of girls in the United States**

In the United States, an abundant empirical literature covers the changes in the academic preparation of girls using different types of panel data (Goldin, Katz and Kuziemko, 2006; Cho, 2007; Jacob, 2002; Buchmann and DiPrete, 2006).

The advantage of girls over boys in terms of school marks is not new since it dates back at least to the 1950s. It has, however, declined over the last three decades, as girls have increasingly chosen to study "difficult" subjects. The research into inequalities disadvantaging women has for many years been specifically aimed at resolving this paradox. However, the gap in terms of marks obtained at school did not correspond to girls' and boys' results in examinations, skills or IQ tests. In 1957, boys were well ahead of girls in mathematics and lagged slightly behind girls in reading. Between 1972 and 1992, girls considerably reduced their disadvantage in mathematics and increased their advantage in reading and foreign languages. During that period, the choice of courses chosen by girls converged with that of boys. Their study of mathematics and science became almost as intensive as boys (in terms of the number of units or classroom hours taken in these subjects). The changes in their academic preparation (class marks, test results and nature of courses) could explain, according to the methodologies used, from 30 to 60% approximately of the changes in obtaining degrees in higher education (Goldin, Katz and Kuziemko, 2006; Cho, 2007). These changes occurred simultaneously at all levels of cognitive skills and in all socio-economic environments. Indeed, the girls' advantage was greater in the most disadvantaged socio-economic environments.

In a study of four age cohorts, Jacob (2002) suggests that behavioural or non-cognitive skills might explain participation in higher education as much as social environment or cognitive skills. Although he finds the same cognitive differences between boys and girls in reading and mathematics as the previous studies, his composite index of cognitive skills is similar for boys and girls, as are the characteristics of their family background. The principal difference observable between boys and girls lies in their attitudes at school and towards school, also measured by a composite index (based, in particular, on the number of behavioural incidents, class marks, number of hours spent on homework and previous classes repeated). Combined with progress in their academic preparation, this behavioural advantage could be a determining factor in the differences in academic success between the sexes. Some authors, moreover, have interpreted the ease with which girls learn in an academic environment in terms of cost-benefit. The lesser effort by girls would increase the return on their degrees and encourage them to study more than boys (the benefits would be obtained at less subjective cost).

example, between 1974 and 2003, the gap in academic levels between boys and girls aged 16 widened in favour of girls, at the aggregate level (*i.e.* all disciplines together), in mathematics (with the girls catching up) and in English (where the gap widened). It could be attributed to the change in the form of examinations at the end of secondary school (again favouring girls) (Machin and McNally, 2006). This gap is found at all levels of pupils' academic performance, in all types of schools and for all social milieus, including the most disadvantaged. The gap appears to emerge in adolescence, between the ages of 11 and 16 years (Burgess *et al.*, 2004; Gorard, Rees and Salisbury, 2001; Machin and McNally, 2006).

Rise in educational and professional expectations of girls compared with boys

Another factor which explains the greater success of women may lie in the greater academic and professional aspirations of girls compared with boys. The 2003 PISA study shows

that girls aged 15 years have more aspirations than boys to obtain a general degree in higher education and to exercise a highly qualified intellectual profession by the age of thirty in all OECD member countries for which data are available (and where the differences are statistically significant) with the exception of Japan (Tables 10.7 and 10.8). Based on a comparison between FISS 1970, SISS 1983, TIMSS 1995[6] and PISA 2003, McDaniel (2007) shows that girls' academic expectations have risen faster than boys internationally. The rise in these aspirations reflects the reduction in social discrimination against women (Goldin, 2004). Having high expectations does not necessarily mean that these expectations will be realised, but an abundant sociological literature shows that they influence the actual careers of individuals.

Table 10.7. **Percentage of pupils expecting to obtain an ISCED 5A or 6 degree by sex (2003)**

	All pupils		Boys		Girls		Statistically significant difference
	%	S.E.	%	S. Er	%	S. Er	
Australia	62.8	(0.8)	56.6	(1.3)	69.1	(0.9)	F > G
Austria	24.3	(1.3)	22.8	(1.4)	25.7	(2.0)	
Belgium	35.3	(1.0)	32.4	(1.4)	38.5	(1.4)	F > G
Canada	62.5	(0.8)	56.1	(1.0)	68.7	(0.9)	F > G
Czech Republic	37.2	(1.1)	32.0	(1.4)	42.6	(1.7)	F > G
Denmark	25.5	(0.9)	24.6	(1.2)	26.4	(1.0)	
Finland	51.5	(0.9)	49.6	(1.2)	53.5	(1.1)	F > G
France	34.7	(0.9)	29.2	(1.4)	39.7	(1.2)	F > G
Germany	19.1	(0.9)	17.7	(1.3)	20.5	(1.0)	
Greece	64.5	(1.9)	58.5	(2.5)	70.1	(1.8)	F > G
Hungary	53.2	(1.4)	45.5	(1.8)	61.8	(1.8)	F > G
Iceland	36.1	(0.8)	30.7	(1.1)	41.8	(1.3)	F > G
Ireland	53.5	(1.1)	45.3	(1.6)	61.8	(1.4)	F > G
Italy	52.1	(1.2)	43.0	(1.7)	60.4	(1.6)	F > G
Japan	50.7	(1.3)	54.1	(2.1)	47.6	(2.2)	G > F
Korea	78.3	(1.0)	78.9	(2.0)	77.5	(2.0)	
Luxembourg	42.6	(0.6)	41.3	(1.0)	43.9	(1.1)	
Mexico	49.1	(1.5)	41.8	(1.7)	55.8	(1.6)	F > G
Netherlands	40.8	(1.5)	38.7	(2.0)	42.9	(1.6)	
New Zealand	38.8	(0.9)	38.2	(1.3)	39.5	(1.4)	
Norway	25.8	(0.9)	22.4	(1.0)	29.3	(1.2)	F > G
Poland	30.1	(1.0)	23.4	(1.1)	36.8	(1.2)	F > G
Portugal	52.2	(1.4)	43.7	(1.5)	59.9	(1.5)	F > G
Slovak Republic	43.0	(1.3)	37.9	(1.7)	48.3	(1.8)	F > G
Spain	48.4	(1.2)	40.7	(1.7)	55.7	(1.3)	F > G
Sweden	33.2	(1.1)	28.8	(1.2)	37.5	(1.4)	F > G
Switzerland	17.6	(1.4)	16.7	(1.6)	18.6	(1.4)	
Turkey	76.7	(1.8)	72.3	(2.4)	82.1	(1.9)	F > G
United States	64.4	(0.9)	61.2	(1.1)	67.6	(1.2)	F > G
Total OECD	**50.7**	**(0.3)**	**47.6**	**(0.5)**	**53.8**	**(0.5)**	**F > G**
Average OECD	**44.5**	**(0.2)**	**40.7**	**(0.3)**	**48.4**	**(0.3)**	**F > G**
United Kingdom[1]	31.5	(1.2)	27.0	(1.4)	35.4	(1.7)	F > G

1. Response rate insufficient to allow comparison.
S.E.: standard error.
Source: OECD PISA 2003 Database (OECD, 2007b).

Table 10.8. **Percentage of pupils expecting to exercise a highly qualified intellectual profession by the age of 30 years, by sex (2003)**

	Boys		Girls		Statistically significant difference
	%	S.E.	%	S.E.	
Australia	70.1	(1.1)	81.8	(0.7)	F > G
Austria	53.8	(2.2)	63.3	(2.0)	F > G
Belgium	60.5	(2.3)	75.1	(1.4)	F > G
Canada	m	m	m	m	m
Czech Republic	54.0	(1.8)	63.0	(1.8)	F > G
Denmark	m	m	m	m	m
Finland	m	m	m	m	m
France	67.7	(1.7)	71.5	(1.4)	F > G
Germany	52.6	(1.8)	69.8	(1.3)	F > G
Greece	72.0	(1.8)	81.8	(1.5)	F > G
Hungary	56.1	(2.3)	66.1	(1.8)	F > G
Iceland	65.3	(1.2)	75.7	(1.3)	F > G
Ireland	63.5	(1.7)	77.7	(1.3)	F > G
Italy	69.5	(1.9)	80.2	(1.4)	F > G
Japan	m	m	m	m	m
Korea	79.1	(1.1)	80.3	(1.4)	F > G
Luxembourg	m	m	m	m	m
Mexico	85.6	(1.0)	86.7	(0.9)	F > G
Netherlands	m	m	m	m	m
New Zealand	m	m	m	m	m
Norway	m	m	m	m	m
Poland	65.8	(1.3)	78.8	(1.2)	F > G
Portugal	79.8	(1.5)	88.3	(0.9)	F > G
Slovak Republic	55.5	(2.1)	64.0	(2.0)	F > G
Spain	m	m	m	m	m
Sweden	m	m	m	m	m
Switzerland	m	m	m	m	m
Turkey	m	m	m	m	m
United States	81.4	(0.9)	88.9	(0.8)	F > G
Total OECD	**68.2**	**(0.5)**	**74.8**	**(0.4)**	**F > G**
Average OECD	**59.0**	**(0.4)**	**66.5**	**(0.4)**	**F > G**
United Kingdom[1]	68.4	(1.7)	78.5	(1.4)	F > G

1. Response rate insufficient to allow comparison.
S.E.: standard error.
m: missing.
Source: OECD PISA 2003 Database (OECD, 2007b).

Changes in the provision of higher education

Another hypothesis to explain the rapid growth of female participation – and even the reversal of inequalities – relates to the supply of courses which accompanied the expansion of higher education. Some institutions or educational courses may have encouraged participation of women rather than men. For example, Long (2007) shows that the opening and spread of *community colleges* in the United States partly explains the elimination of the gap between men and women and perhaps its reversal. Older or part-time students are more likely to be women and study in a *community college*, among other things because they provide courses in traditionally "female" professions and have much lower fees than universities. In Japan, the rise in female participation is based partly on the opening of *junior colleges*. A similar process may have occurred in other OECD member

countries, where some education remains predominantly female. It is, however, hard to demonstrate whether this new provision encouraged female demand or whether female demand encouraged the emergence of the new provision.

Feminisation of the teaching profession and discrimination against boys

In the line of gender-oriented socialising models mentioned above, it may be thought that the feminisation of the teaching profession motivates girls more than boys and explains in part the greater academic success and perseverance of girls. The empirical research on this subject gives mixed, not to say contradictory, results. It often relies, in fact, on databases which are too small. In the higher education sector in the United States, however, it seems to be an established fact that having a female teacher in certain subjects, in one's first course in a predominantly "male" subject encourages girls to persevere, and *vice versa* (Bettinger and Long, 2005). Dee (2004, 2005, 2007) shows from a national database that teachers view their students more positively if they are of the same sex and the same ethnic/minority background as them, especially if they come from the most disadvantaged backgrounds (or the South of the United States), and that students have better academic results when they have a teacher of the same sex and the same ethnic/minority background. Closely linked to racial issues, these results cannot necessarily be extrapolated outside the United States context. In Israel, a natural experiment comparing the marks of the same students in the same examination conditions by their teachers and external examiners who had no information about them showed systematic bias against boys in the nine subjects tested (and in arts, science and mathematics), irrespective of the teacher's sex (Lavy, 2004). Teachers could in fact favour girls, perhaps because of their better behaviour in school. In Sweden, where the superiority of girls' results over those of boys continues to rise, Holmlund and Sund (2007) show that the gap is wider in subjects mainly taught by women, without being able to attribute it to the fact of having a teacher of the same sex. The difference with regard to earlier studies might stem from the fact that the Swedish students in their sample were highly motivated and performing students, so that the positive effect of having a teacher of the same sex might not be valid for all types of students.

A final hypothesis: what if these differences were *biological*? Perhaps past discrimination prevented women from realising their full potential which is no longer the case today. In fact, neuro-scientific research has not as yet found any differences in the cognitive capacities of girls and boys (OECD, 2007c). Moreover, in terms of social policy, biological explanations can only be a last resort, because they tend to legitimise the *status quo*. After all, thirty years ago, the "biological" argument showed that men had superior cognitive capacities to women…

The above explanations are both partial and complementary. As in the past, several necessary reasons are often needed to understand facts or trends rather than a single sufficient reason. A systematic exploration of the various factors which might explain the reversal of educational gender inequalities in OECD member countries is therefore an important programme of research with which to inform public policies.

10.3. What is the future and importance of gender inequalities in higher education?

The reversal of gender inequalities seems to be a continuing trend in higher education (and one which will eventually emerge in the four OECD countries where it has not yet

appeared). Indeed, all the explanatory factors mentioned above are very unlikely to change fundamentally or rapidly in coming decades. The gender balance in access to higher education and degree awards could be restored through a reversal of the trends that have contributed to the advance of women (*i.e.* a relative regression of women) or through the balancing of the factors which underlie the differences in the results achieved by men and women. Moreover, even were this to happen, it would take decades for such a trend to become visible in the rates of participation and obtaining of degrees by women and men. This is because, in the absence of highly dynamic lifelong learning, the replacement of generations is the major mechanism of change in education levels in OECD member countries and the pace is slow.

Will the reversal of inequalities last?

In terms of demographic factors, a reversal of the trend among women towards delaying getting married and starting a family until they have completed their studies and, more generally, towards control over fecundity, seems unlikely within the next two decades.

In terms of social change, the reduction in discrimination against women in the labour market and within the family is a social change found in all OECD member countries. Thanks to past and future struggles against inequalities to the detriment of women, the social and cultural barriers which stood in the way of female participation in higher education are likely to continue to disappear. Likewise, imitative socialising mechanisms point towards greater participation by women. The fact that a growing number of women are now graduating, and that more women than men are graduates in the younger generations, will continue to increase the participation of women, irrespective of their family environment, and favour females over males living in single-parent households (generally headed by women), if children are considered to be more influenced by their parent of the same sex. The impacts of peer groups would suggest the same conclusions. That will allow a catching up effect in countries and levels of studies where there is still a gap in favour of boys. In countries where almost two out of three students will be girls, there might even be a risk of new social stereotypes emerging and transforming higher education into a predominantly female activity, thereby further widening the gender gap. The impacts of peer groups are found to be even more pronounced on girls in respect of activities held to be "feminine". At the same time, the high level of subject segregation by gender reveals a far more complex picture.

From an economic standpoint, even if the return on degrees were similar for men and women in purely economic terms compared with secondary level education, it would probably still be higher for women once the return related to marriage is taken into account. Women are more likely to be poor because they are more likely to be the head of a single-parent household and to work part-time. Women graduates are more likely to avoid this situation, which can be enough to make the economic return on their degrees (in the broad sense) higher than for men, and thus, their incentives to study are stronger. However, the ageing of the population is likely to increase demand in the feminised service sectors, with two possible contradictory consequences: it might lead to a rise in demand among women for courses in subjects leading to those sectors or it might, on the contrary, lead to a decline in their rates of participation if the wages for jobs not requiring a higher qualification increased as a result of a shortage (which is unlikely, however).

Finally, and this is probably the major determining factor, the developments in educational factors have largely favoured women. Girls have always scored higher marks than boys at school, and the higher participation of boys in higher education could be attributed to their choice of subjects and their better results in mathematics and science. Over the past few decades, girls have maintained their advantage in terms of marks at school (which some regard as indicators of behaviour rather than aptitude), they have increased their advantage in languages and almost eliminated their disadvantage in science and mathematics, two subjects which have long been crucial to access to and success in higher education. Several countries continue to have public policies to encourage girls to study scientific subjects. Furthermore, the academic and professional aspirations of girls are higher than those of boys in almost all countries and have grown faster than those of boys in recent decades. Under these circumstances and in the absence of targeted policies, it is hard to see how boys would be able to catch up or even to prevent the gap from widening still further.

Certain economic factors might, however, offset these trends. Compulsory military service, war, rising unemployment or the absence of economic opportunities in "masculine" industries, for example, have in the past helped to fuel increases in boys' participation in higher education, thereby partly reflecting a strategy of avoidance. Other economic factors could have the same effects in the future. A decline in the number of boys leaving the educational system before the level required for entry into higher education or a stronger culture of lifelong learning or higher education for adults with a lower secondary school certificate might also offset this trend in the medium term (OECD, 2007d). However, as we have seen above, the gender gap is just as wide among older students, even though there are considerable differences between countries.

Do inequalities to the detriment of men matter?

Why should the new educational inequalities to the detriment of men matter to society? Research (or even speculation) on the subject is rare. If gender inequalities in higher education were merely the reflection of different preferences of boys and girls for education, perhaps they would be of little importance for society. It all depends on whether one considers gender equality in higher education desirable in itself or only as an instrument for gender equality in society. That said, the inequalities in the education sector may be both the effect and cause of inequalities in society. Modern democracies base their social hierarchy on a meritocracy in part founded on education, so that educational inequalities can amplify social inequalities, which would not be the case, for example, in societies based on a feudal system or a caste system where people's social position is determined from birth.

Insofar as the inequalities to the detriment of women in higher education reflected and prevented the reduction in social inequalities disadvantaging women, they were not necessarily symmetrical with inequalities to the detriment of men. It is possible to be in a dominant position without being numerically in the majority (Deleuze and Guattari, 1987). To the extent that men have not traditionally suffered from gender discrimination in OECD member countries, in the form of either legal barriers or belief in cultural stereotypes, the inequalities disadvantaging men in higher education may seem less important. Despite its impartiality in principle, the history of science and higher education has been strongly marked by discrimination against women (Le Doeuff, 2003). That would explain why policies and to a large extent the debates on gender inequalities in higher education focus

mainly on the increasingly few cases where women are still at a disadvantage (Eurydice, 2007). Countries with educational policies in favour of boys are few in number.

The two social consequences of educational gender inequalities most often mentioned are related to demography and to gender inequalities in the labour market.

Could the reversal of gender inequalities have negative demographic consequences? Homogamy between higher education graduates is high and has increased over the past few decades (unmarried unions also follow the same trend) (Schwarzt and Mare, 2005; Qian and Preston, 1993). Furthermore, while men often married women less qualified than them, women tend to marry men more (or less) qualified than them (hypergamy). Were this trend to be maintained, the reversal of gender inequalities in higher education would lead to a risk of a reduction in fecundity in that the probability of women marrying and having children would diminish. This was in fact the case among higher education graduates at the turn of the century in the United States (Goldin, 2004) and what can currently be seen in Japan where the lower rate of marriage among women graduates apparently accounts for 20 to 33% of the overall decline in the marriage rate (Raymo and Iwasawa, 2005). The "privileges" of male graduates would increase because they could become more selective in the choice of a spouse with a higher education degree, the reverse being true of women with only a secondary school certificate. For many OECD countries, where the legislation on equality between men and women has made huge advances, this argument probably assumes too much rigidity in the behaviour of women. Moreover, it overlooks the possible effects of stratification within systems. In the United States, demographic research refutes the idea that better qualified women would remain celibate and childless, as was generally the case in the early twentieth century (Goldstein and Kenney, 2001). The trend among women to hypergamy declined markedly in the 1980s and 1990s, and even disappeared altogether according to some indicators. The remarkable trend in this area lies rather in the sharp fall of marriage rates of less educated men (Rose, 2006). More than a decline in fecundity, the maintenance of a high degree of homogamy among higher education graduates and the decline in the probability of marriage of less educated persons could, in fact, help to entrench the social inequalities related to education (by tying them more to socio-economic groups). In short, the demographic arguments which claim that the reversal of gender inequalities might lead to a decline in the number of marriages and which point to the already declining fecundity rates in many OECD countries do not seem very convincing.

A second demographic question relates to the gender inequality in life expectancy and mortality. In 2005, the life expectancy at birth of women was higher than that of men by an average of 5.7 years in OECD countries. Research on the links between health and education has revealed that there is a strong correlation between the level of higher education and life expectancy, between countries as well as within countries: studies have shown this for the United States, Canada, Israel, Western Europe, and Eastern Europe (Cutler and Lleras-Muney, 2006; Kunst and Mackenbach, 1994; Mackenbach *et al.*, 2007). The benefits of higher education in terms of extending life expectancy seem to have increased in Europe as well as in the United States (Mackenbach *et al.*, 2007; Pappas *et al.*, 1993; Preston and Elo, 1995). Several studies have shown that the increase in life expectancy in the past decade is concentrated in populations continuing on to higher education and that is has diminished in the groups having high school diplomas or less (Meara, Richards and Cutler, 2008; Goesling, 2007; Dobson, 2006).

One could then think that the reversal of gender inequalities in education could increase the gender gap of life expectancy in favour of women. In reality it is difficult to conclude, given the lack of comparative studies between the relative and absolute benefits of tertiary education to life expectancy for men and women (as well as on the composition effects of the gender gap in tertiary education participation and attainment). Many national studies show that there are more social inequalities linked with the level of education and mortality between men than there are between women (Mustard and Etches, 2003). The extension of life expectancy associated with higher education seems in this way larger for men than for women (compared with men and women with respectively lower levels of education) (Preston and Elo, 1995; Makenbach *et al*., 2007; Meara, Richards and Cutler, 2008). These results do not contradict nor confirm the idea that the widening of the gender gap in tertiary education could accentuate the inequality in life expectancy between the sexes. The narrowing of the life expectancy gender gap in favour of women in industrialised countries in the past two decades also gives little response to this question: reasons for this trend are under debate, and we do not know what impact education has compared to other factors (Glei and Horiuchi, 2007).

Could the reversal of educational gender inequalities have negative social consequences? In particular, will it lead to a reversal of gender inequalities in the labour market, especially in terms of wages and access to the highest social positions in coming decades? An in-depth examination of this question lies outside the scope of this chapter and we shall limit ourselves to a few simple comments.

Combined with other factors, the rise in the level of education of women compared with men has contributed to the systematic decline in wage inequalities disadvantaging women in recent decades in all OECD member countries (OECD, 2002). Facilitating the increase in the level of education of women is also part of the arsenal of policy instruments used to reduce gender inequalities in the labour market, alongside other social policies, for example, relating to early childhood. However, the current reversal of gender inequalities in higher education and the continuation of this trend are probably not enough to achieve an evening-out of the conditions of men and women in the labour market in the medium term.

Indeed, the level of education of women is not enough in itself to explain the inequalities. The gender inequalities relating directly to the labour market may be more important than differences in education in explaining the differences in wages of young graduates of the two sexes, as is the case, for example, in the United States (Bobitt-Zeher, 2007). To understand this, it is simply worth recalling some of the factors which explain wage inequalities to the detriment of women. Women work on average fewer years than men (and thus earn less, even in the same sector), are more likely to work part-time, have greater difficulty in obtaining promotion to higher decision-making posts, often work in sectors or professions which pay less than those where men are in the majority, aspire on average less than men to work in the most lucrative sectors or professions (Chevalier, 2007; Correll, 2001), reduce their working time when they have children while men, conversely, increase it in under the same circumstances and, despite greater social egalitarianism, women continue to invest more than men in domestic activities and those related to children, whether by preference or in response to greater social pressure (Alwin, Braun and Scott, 1992). The reduction in gender wage inequalities was therefore attributed to the increase in women's education, and also the feminisation (or "integration") of traditionally male sectors or professions, the decline in wages of the least educated men, the emergence

of more egalitarian social standards as a result of feminism, and social policies, both at the firm and government level, which allowed women and, to a lesser extent men, to reconcile family and working life better (OECD, 2007d). A recent OECD study offers a detailed international analysis of these questions (OECD, 2002), while Blau and Kahn (2000) and Reskin and Bielby (2005) present a summary of the results of economic and sociological research, pointing out the technical difficulties of measuring and understanding these inequalities.

Nevertheless, the rise in the level of education of women explains *in part* the decline in gender wage inequalities over the past few decades and the reversal of educational gender inequalities is likely to continue to contribute to this decline. The difference between men and women in their choice of fields of study explains to a greater extent the wage differences than differences in levels of education. Thus, studies shows that the reduction in wage inequalities is more likely to come about through the equalisation of choice of studies than through changes in the level of education (Bobbitt-Zeher, 2007; Christie and Shannon, 2001; Shannon and Kidd, 2001; Blau and Kahn, 2000). Despite the rise in the level of women's education in the younger generations (and the narrowing of the gap between men and women) it is not for all that certain that a generational rationale is sufficient to eliminate wage inequalities between men and women over the next thirty years (Chauvel, 2004), even if the retirement of the age groups in which such inequalities were the most pronounced will also automatically lead to a reduction in these inequalities (at the macro level).

Although it is likely that it will take more than two decades on average for wage inequalities to the detriment of women to disappear, the pattern of reversal of gender inequalities in higher education might well change. Average wages could in fact mask considerable differences in wage distribution by gender. Men might have a much more heterogeneous social condition than women, as their wage or social advantage is attributable to the very great success of a small proportion of men. In other words, as in the case of the boys' results in mathematics tests, it is not impossible that men, on average, may have wages higher than women but that the majority of men (or many of them) are less successful than women. One might find men over-represented in the higher or lower echelons of society, both in economic terms and social status. Were that to be the case, the configuration of social relations and stereotypes might change. Perhaps a not negligible proportion of men might become more dependent on women and more involved in domestic affairs. Perhaps a greater number of men might find themselves socially excluded. In fact, the political and social consequences of a new social division of work and distribution of power between the sexes remain to be determined. The difference in the destiny of men and women with no degree, as well as its evolution, also needs further study. It is not, however, impossible that the reversal of educational gender inequalities might have problematic social consequences.

10.4. Summary and conclusion

The reversal of gender inequalities now seems well established in OECD member countries. More women than men enter higher education, irrespective of age or type of higher education. It is only at the doctoral level that women have not yet caught up with men, although current trends suggest that this will happen within a few years. All fields of study have therefore become feminised, even though gender segregation along subject lines still remains very pronounced. Science is still the field that is becoming feminised

more slowly and that is still very predominantly male, especially information technology and mathematics. This segregation matters to the extent that it explains the gender wage differences in the labour market. Male and female populations of working age now have the same level of education, but in younger generations women are better educated than men.

This reversal of the gender inequalities in higher education stems from various demographic, economic, sociological and educational factors. None of the factors which help to understand it appear likely to disappear or reverse in the next few decades. On the contrary, some of them point to more rapid growth in the level of women's education compared with men (which nevertheless continues to rise). Educational inequalities disadvantaging men are very likely to persist and increase. Generation replacement means that the female population will in any case continue to be better educated than the male population.

However, would lasting educational inequalities to the detriment of men lead to a social or demographic crisis or even to a reversal of gender wage inequalities in the labour market? It is hard to say. Would it therefore not be possible simply to ignore the educational inequalities disadvantaging men? This would, in fact, be neither prudent nor fair.

In democracies, combating inequalities is not just subordinate to equality in the labour market. It is a matter of principle. Equity consists of ensuring that everyone is given the right conditions in which to achieve his/her potential, but how can one be sure that the lesser academic achievements of boys do not reflect some form of discrimination against them? Furthermore, diversity (or in this case the mix) matters to the extent that it represents a social enrichment for all. For example, the elite American universities are starting to favour boys in their admission procedures because they think that the mix of their students is important for everyone. Lastly, educational inequalities in favour of women may also do them a disservice in the labour market if they are associated with greater gender segregation in terms of disciplines. Research shows that wage inequalities to the detriment of women are more associated with the percentage of girls studying a subject than the subject itself. While many countries encourage many girls to study science, to encourage a mix and promote gender wage equality, too few encourage men to improve their performance in languages and to work in feminised sectors. While girls must be encouraged to study disciplines dominated by boys, the new policies of equality between the sexes should pay more attention to boys and help them to improve their performance and participation in subjects dominated by girls (languages), and also those where the average performance of boys masks the weakness of the majority of boys and the excellence of a minority (mathematics and science). The trends in the academic performance and choice of studies by women over the past few decades show that these are not intangible factors. And such policies could be beneficial to men (from an educational point of view) and women (in terms of wages).

Another reason for concern about the reversal of inequalities has to do with the current ignorance of its possible social consequences. The permanent establishment of these new inequalities might, for example, give rise to undesirable social stereotypes, whereby higher studies would be the province of women. While they have little chance of becoming established in the most advantaged social milieus, they might be adopted in the most disadvantaged, where in several countries the inequalities to the detriment of boys

are already the most pronounced, and strengthen social inequalities. Furthermore, it is not unusual for social stereotypes to bring about new social standards and latent discrimination (this time against boys). Lastly, to the extent that the demographic weighting means that it will take decades to restore greater educational equality between men and women if such inequalities continue to increase strongly, is it prudent to wait for their social consequences to emerge before trying to remedy them?

At the very least, there is a need now to review policies on educational equality between the sexes by taking note of the fact that it is not now women who are necessarily at a disadvantage, and also by paying attention to the achievement of boys.

Societies have accommodated themselves to inequalities to the detriment of women for centuries. They could no doubt just as easily accommodate themselves to inequalities to the detriment of men. Nevertheless, the ideal of equality remains preferable.

Notes

1. The analysis is based on data by age cohort from 5 years up to 39 years (15-19, 20-24, 25-29, etc.), and an aggregate age cohort of over 40 years. The data are also available by age alone.
2. Three types of higher education are distinguished in the International Standard Classification of Education: type A tertiary education (ISCED 5A) are tertiary programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements, such as medicine, dentistry or architecture. A minimum cumulative theoretical duration (at tertiary) of three years' full-time equivalent, although typically they are of 4 or more years. Type B tertiary education (ISCED 5B) is typically shorter than in 5A and focuses on occupationally specific skills geared for entry into the labour market, although some theoretical foundations may be covered in the respective programme. It has a minimum of two years' full-time equivalent duration. Advanced research qualification (ISCED 6) designates tertiary qualifications which are directly accredited by the award of degree in advanced research, a doctorate, for example.
3. This index of segregation, known as the Duncan index, is equal to $\frac{1}{2}\sum_{i=1}^{N}|m_i - f_i|$ where m_i is the proportion of male graduates obtaining a degree in subject *i* and f_i the proportion of all women graduates obtaining a degree in subject *i*, and *N* the number of subject categories.
4. The personal rate of return is estimated on the basis of the increase in professional income after tax depending on the level of education, after deducted the personal costs arising from those studies (income foregone and personal expenses, other than indirect personal costs such as accommodation, subsistence, clothing, leisure, etc.).
5. Secondary school certificate giving entitlement to admission to higher education.
6. Conducted by the IEA (International Association for the Evaluation for Educational Achievement), the FISS (First International Science Study), SISS (Second International Science Study) and TIMSS (Third International Mathematics and Science Study) studies test, respectively, students of 18, 23 and 42 countries (including 22 OECD countries) in mathematics and science and collect contextual data.

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Table of Contents

List of Figures

List of Tables

List of Boxes