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AUTHOR Psacharopoulos, George
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ABSTRACT

Cost and expenditure developments in countries that are members of the Organisation for Economic Co-operation and Development are considered. The time evolution of overall educational expenditure without reference to a particular school level is examined, using National Account statistics. This analysis involves: examining the education share in the country's national income or overall state budget; comparing education's share in the state budget or national income to the share of other sectors like health and defense; and accounting for the changes in the share of education in the national resources by considering demographic, enrollment, and cost factors. Another analysis, which involves the distribution of public expenditure by level of education, addresses the following: the higher education share in overall educational expenditures; factors accounting for the changing share of higher education in the state budget; the allocation of resources within the tertiary education sector; and the allocation of resources within the university sector by field of study. Data are provided by country for 1965, 1970, 1975, and 1977. Additionally, aggregate expenditure and enrollment data are combined to derive unit costs per student, unit costs per graduate, unit costs by type of higher education institution, and unit costs by field of study. Nonpublic sources of university finance and the evolution of student support schemes also are addressed. It is predicted that governments will exert increased pressure on students to finance their education. This change might be approached by giving student loans rather than grants. (SW)

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HIGHER EDUCATION EXPENDITURE IN OECD COUNTRIES

The present report has been prepared under the Education Committee programme on Policies for Higher Education. It has been written by George Psacharopoulos in his capacity as consultant to the Secretariat.

It is circulated for reference and information.

The views expressed are those of the author and do not necessarily correspond to those of the OECD or the national authorities concerned.

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HIGHER EDUCATION EXPENDITURE IN OECD COUNTRIES

George Psacharopoulos

London School of Economics

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I

INTRODUCTION

The purpose of the analysis reported in this paper is to take a fresh look at cost and expenditure developments in OECD countries during the last two decades. This time horizon includes an initial period of rapid expansion of the higher education systems in most countries under consideration, followed by a period of relative slack in the growth of enrolments and expenditure. It is hoped that this boom-to-recession cyclical experience might provide a basis for the assessment of the behaviour of higher education costs under changing external conditions. Any gained experience regarding the past might be used in policy discussions concerning the future on matters of university costs and finance.

The paper is divided into six sections and an Appendix. The text contains digested, summary empirical information, while more detailed data are relegated to the Appendix.

The first section serves as an introduction to the issues, concepts and data sources. Section II deals with macro evidence on educational expenditure from National Accounts statistics, irrespective of the level of education the expenditure refers to. Section III focusses on higher education costs and expenditure with particular emphasis on the factors accounting for their variation over time. Section IV makes an attempt to further disaggregation by focussing on the cost per student or per graduate. Section V looks at the other side of the expenditure coin, namely the way this expenditure is financed. The last section attempts to draw some general conclusions from the analysis.

A. A few major issues

Perhaps the major issue facing educational policy-makers today is that of "rising costs". Say that, for whatever reason, the Government in a given country wishes to open up access to higher education. This willingness might never materialise if ex ante budgetary allocations to this level of education are feared to be prohibitive. Yet, the availability of more information on the exact nature of "costs", their disaggregation by type of institution the expansion of which is envisaged, the behaviour of unit costs as enrolment rises and cost differences by field of study, might lead to a more enlightened policy decision.

The converse issue is also at stake, namely the preservation of academic standards and university quality in case of falling enrolments. For example, it might be the case that as a result of graduate unemployment enrolments fall for given subjects of specialisation or for entire tertiary level institutions. How will this development affect the finance of higher

education? If financial resources are reallocated away from this sector during the period of slack, how does this affect the employment of real resources (physical and human) by the higher education system? Is it a matter of switch-on switch-off mode like daylight-evening electricity load? Or does a temporary slack afflict a permanent scar on the vitality of the university system?

Another major contemporary issue is the general tendency towards a cut in overall public expenditure. How does this affect the education sector as a whole and higher education in particular? Is higher education the weak link in the education sector in the sense that its higher unit cost makes it more vulnerable to budgetary cuts? Or, perhaps, one could envisage a reallocation of resources within the higher education sector itself (say, from longer towards shorter university cycles) thus absorbing the financial shock without any visible adverse effects on the number of entrants the sector can accomodate?

Related to the last issue is that of alternative sources of funding. What is the potential of tapping private sources of finance? If one removes, for the sake of the analysis, the political taboo of introducing "user charges" to higher education, what would be the public finance implications? Would the lessening of the financial burden on general taxation outweigh issues of distribution and equity? Or, perhaps, would the introduction of loans provide a middle-of-the-road solution to the issue of initial finance of full user charges?

One development linked to cost and finance issues is the (implicit or explicit) diminished emphasis in most advanced industrial countries to manpower considerations towards the satisfaction of social demand for university places. In such cases the university funding formula is mechanically linked to the number of students attending. Conversely, a fall of the student numbers tends to produce mechanistic "cuts". To what extent do these cuts put in danger the long term dynamism of the higher education system? How does one maintain (if he wishes to maintain) the research capacity of an institution? How does one set priorities between teaching and research and how are these priorities affected by financial considerations?

Still another issue is the extent to which the higher education sector can generate revenue by tapping the increased non-market-activity time (rather than "leisure") of the adult population and the demands of industry for research results. Do these developments contradict the traditional academic role of the university or they provide an expedient means for solving temporary financial difficulties?

It is not claimed that this paper will answer the above set of questions. However, knowledge of the "costs" involved by contesting the realities of the sixties and the seventies provides a modest base in assessing where we are heading.

B. Two methodological points

At the outset, two methodological procedures adopted in this paper should be made clear.

First, the emphasis of the paper is on the cost side of the educational cost-benefit calculus. Namely, no matter how "high" educational costs are, these costs might be justified if the social benefits provided are even higher. Such benefits could be the increased productivity of graduates, an improved income distribution or employment prospects. Educational benefit considerations are excluded from this paper where the emphasis is on an anatomy of costs. Thus, one might consider the data provided here as part of a cost-effectiveness (rather than cost-benefit) approach to educational evaluation, where the benefits are axiomatically given. For example, the policy of the Ministry of Education might be to increase the number of higher education entrants by 15 per cent relative to last year for reasons of satisfying social demand. The cost-effectiveness question then becomes: in what types of institutions or subjects should the new entrants be admitted as to minimise the cost?

The second methodological point is that the emphasis in this paper is within-country time-series comparisons, rather than cross-country comparisons. Most tables in this paper are organised in the following form:

Year ——→

Country
|

The reason for the emphasis on horizontal changes is to avoid the usual cross-country definitional and other related comparability problems. However, in a paper of this kind vertical comparisons are unavoidable. These have been kept to a minimum and the reader is reminded the many caveats associated with comparing countries that differ in many respects other than the statistic in question.

C. An omnibus of cost concepts

In the above presentation the terms "costs", "expenditure" "budgetary allocations" and the like have been used loosely and interchangeably. Although for exposition purposes we shall follow the same role in the rest of the paper, some strict conceptual differentiations are in order at this point.

Accounting versus opportunity cost. The convention in educational cost analysis is that it is entirely based on the book value of direct expenses for teachers, laboratories and equipment. However, a major part of the true economic (or resource) cost of education is the opportunity cost of students while they are in school. This is especially important in the case of

higher education where the indirect costs, as measured by the students' foregone earnings, represent about 50 per cent of the economic (i.e. not accounting) cost of education. Here is an example why this distinction is important: In cases of widespread unemployment of secondary school graduates (such as presently in Western countries), higher education becomes effectively cheaper. Although on pragmatic reasons this paper focusses on the book expenditure on education (as it appears in National Accounts statistics or state budgets) the reader should be aware of the existence of another major opportunity cost component.

Private versus social cost. This is an often neglected distinction in educational costing. Although it is agreed that expansion should be based on social cost considerations, the social cost used in the calculations seldom (if ever) includes the private cost component (the major part of which is the foregone earnings of students while studying). Yet it might be that some educational projects are cheaper relative to others on account of lower opportunity costs.

Nominal versus real costs. No one would disagree that costs in educational planning should be reckoned in real rather than nominal terms. However, there are two different (and non-mutually exclusive) ways one can assess the real cost of education. The obvious one, in tracing cost developments over time, is to correct for inflation. The other one, especially when making cross-country comparisons, is to relate the deflated cost to the particular country's real resources. A $4000 cost per university student in a Mediterranean country represents a much bigger claim on its resources relative to a similar nominal cost in North America.

Ex post versus ex ante costs. This seems to be an overlapping distinction to some already made. However, it draws attention to the fact that historical costs are sunk and that the evaluation of policy options today should be based on some assessment of anticipated costs in the future. Of course, cost forecasting (as any other kind of forecasting) is shaky and will have to be based on cost developments in the recent past.

Capital versus current costs. Educational capital costs appear to be substantial as they occur in erratic spurts corresponding to the years when construction takes place. However, when properly amortized on an annual basis, they are trivial relative to current costs. In most countries, the major educational expenditure is for personnel salaries and thus current costs represent as much as 90 per cent of the total annual accounting cost of education. This should not mean capital costs are unimportant. Although most educational cost analysis is conducted in terms of current expenditure, capital costs must be considered in cases of expansion of the system and because they occur in chunks they raise short-term finance problems. But again on pragmatic considerations the emphasis in this paper is on current costs.

Average versus marginal cost. This is a most crucial distinction for the cost per head of the existing student body (average cost) might not coincide with the cost per additional student (marginal cost). It is marginal cost that should be taken into account in policy discussions. Since the expansion of educational capacity seldom occurs in terms of an extra lump of students (say, by introducing a new university faculty) sometimes the term incremental cost is used instead of marginal cost. Again, this does not mean that average cost is not important. On the contrary, since the measurement of marginal cost is extremely difficult, one can infer the behaviour of marginal cost by observing the more readily available average cost. This inference is based on the theoretical economic relationship between average cost and marginal cost; if average cost per student is falling while enrolment increases, then the marginal cost per student must be lower than the observed average cost.

Budgetary allocations versus actual costs. State budgets are often either too pessimistic (and less often, too optimistic) regarding actual absorbed school expenditure. Care should be taken as to the exact source of cost estimates which, ideally, should be based on audited expenditures.

Resource cost versus transfer expenditure. All too often educational cost statistics mix expenditure on resource items committed to education (such as teachers' salaries and rent of buildings) with transfer costs (such as student grants). It is reminded this amounts to double-counting from the economic viewpoint. Student grants are not part of the resource cost of eduction; they are simply payments from the general taxpayer to the student population in order to finance the true resource cost.

D. Previous studies and data sources

The topic of educational cost accounting has been very popular and many studies have appeared in the literature since the late sixties. What follows is a selected list of such studies from which this paper has benefited and built upon:

- F. Edding and D. Berstecher, International Developments of Educational Expenditure, 1950-1965, UNESCO, 1969.

This is perhaps the first in-depth international comparisons study, although now dated and with no special focus on highe education.

- P.C. Coombs and J. Hallak, Managing Educational Costs, Oxford University Press, 1972.

Good on conceptual issues with emphasis on less developed countries.

- Lévy-Garboua, S. Newman, T. Noda, A. Peacock, T. Watanabe and M. Woodhall, Educational Expenditure in France, Japan and the United Kingdom, OECD, 1977.

Very detailed analysis of educational costs and finance, but limited to three countries.

- M. Debeauvais, "Trends in educational expenditure in OECD countries", OECD, 1978 (mimeo).

Second major in-depth analysis of educational costs in international perspective mostly of the "vertical" type with no special emphasis on higher education.

- J.C. Eicher and F. Orivel, "Le ralentissement de la croissance des dépenses publiques d'éducation dans le monde", Consommation, No. 3-4, 1979.

Regression analysis of aggregate UNESCO statistics with no special emphasis on higher education.

- J.P. Jallade, "Higher Education in Europe: Past Trends and Future Prospects", European Journal of Education, Vol. 15, No. 1, March 1980.

This study is specifically addressed to higher education and includes data from socialist countries, although at an aggregate level.

- G. Psacharopoulos, "Higher Education in Developing Countries: A Cost-Benefit Analysis", World Bank, Education Department, Staff Paper No. 439, 1980.

This is also a higher education specific study including data on the benefits side of education, although the emphasis is on less developed countries.

In addition to the studies listed above, the following material has been used for updating or adding raw data to this study:

- OECD, National Accounts of OECD Countries, 1961-1978, Volumes I and II, 1980.
- OECD, Public Expenditure on Education, 1976.
- OECD, Public Expenditure on Income Maintenance Programmes, 1976.
- OECD, Public Expenditure on Health, 1977.
- OECD, Demographic Trends, 1950-1990, 1979.
- OECD, Labour Force Statistics, 1967-1978, 1980.

- UNESCO, "Development of Education in Europe: A Statistical Review", Sofia Ministerial Conference, 1980.

- UNESCO, "A [illegible] in the World, 1960-1978", 1979.

- UNESCO, Statistical Yearbook, various years (latest, 1980.

- OECD, Educational Statistics Yearbook, 2nd edition (in press).

- UNESCO/OECD, Unpublished tabulations of the "Questionnaire on Statistics of Educational Finance and Expenditure", (latest return, 1978).

- Various monographs on particular countries listed separately in the sources.

The combination of these diverse data sources permitted a maximum horizon look from 1960 to 1978, although the statistical gaps increase rapidly from 1975 onwards. Also, the combination of National Accounts statistics, UNESCO questionnaire data and specific country monographs allows a macro cum micro look at educational cost developments.

However, it should be mentioned at the outset, that the state of educational cost information leaves much to be desired, as evidenced by the large number of blanks in the Appendix Tables. I have opted for leaving such blanks rather than reducing each table to the number of countries on which data exist, as to make them more conspicuous and incite interest in perhaps someone closing these gaps in the future

II

TIME TRENDS IN OVERALL EDUCATIONAL EXPENDITURE

The purpose of this section is take a macro look at the time evolution of overall educational expenditure without reference to a particular school level. This is a necessary introduction to the following section that is devoted to an analysis of expenditure on higher education. For it might be the case that budgetary allocations to university follow by inertia the overall tendency of public expenditure allocations, or they represent a constant share of the education budget as a whole.

This section is divided into three sub-sections. First, we look at the education share in the country's national income or overall state budget. Second, we compare the education's share in the state budget or national income to the share of other sectors like health and defince. Lastly, we attempt to account for the overtime changes in the share of education in the national resources by decomposirg its trend into demographic, enrolment and cost factors.

A. National resources devoted to education

These are represented by the total amount spent on all types of education by the Government and private individuals (families) on all types of expenditure, i.e. current outlay plus capital investment. Ideally, such information should be included in National Accounts statistics, a source we tackled in the first instance. Table A.1 to A.3 in the Appendix present different components of education expenditure as per cent of Gross Domestic Product (GDP) based on the CECD's latest edition of National Accounts Statistics. Table A.1 refers to Government consumption expenditure on education, Table A.2 to total Government outlay on education (which includes capital expenditure) and Table A.3 refers to private expenditure. Since the "consumption"(1) item is the major part of educational expenditure and also there exists more information regarding this item, we shall initially concentrate on it.

The general trend of this statistic is a rapid rise during the early seventies and a levelling off, if not decline, since 1975. Focussing on the countries for which information is available for 1978, we see that there has been an actual fall of the share of GDP devoted to public current expenditure to education i Japan, the Netherlands, the United Kingdom and the United States (see Table 2.1).

(1) This term is put in quotation marks because of the usual argument that this type of expenditure represents investment towards human capital formation.

National Accounts Information on total Government outlay since 1970 is summarised in Table 2.2. The data indicate the same inverted U-shape relationship with a peak in 1975.

A contrast between Tables 2.1 and 2.2 indicates what one misses by concentrating on current educational expenditure. For example, compare the following percentages of public resources devoted to education in 1978:

Country	Current	Current + capital
Australia	5.1	6.3
Italy	4.5	5.4
Japan	3.7	4.9
U.K.	4.4	5.8
U.S.A.	4.8	5.8
Average	4.5	5.6

TABLE 2.1 Government consumption expenditure on education as per cent of the Gross Domestic Product

Country	1961	1965	1970	1975	1978
Australia			3.0	4.7	5.1
Belgium	4.0	4.6	5.2	6.7	7.0
Greece	1.7	1.7	1.9	1.9	2.4
Italy			3.5	4.0	4.5
Japan			2.8	3.8	3.7
Netherlands			5.7	6.9	6.7
Norway	3.6	4.2	4.9	5.4	5.6
United Kingdom	2.6	3.1	3.7	5.2	4.4
United States	3.1	3.3	4.4	5.0	4.8

Source: Based on OECD, National Accounts of OECD countries. See Table A.1.

TABLE 2.2 Total government outlay on education as per cent of the Gross Domestic Product

Country	1970	1975	1978
Australia	4.2	6.2	6.3
Italy	4.4	5.0	5.4
Japan	3.5	4.8	4.9
United Kingdom	5.3	6.8	5.8
United States	5.3	6.4	5.8

Source: Based on OECD, National Accounts of OECD countries. See Table A.2.

Thus we can conclude that by focussing on current expenditure only (as we shall do so below), one misses about 20 per cent of the true level of resources directly(1) devoted to education. Restriction to current expenditure only is dictated by the year-to-year volatility of capital expenditure and also the lack of information on the latter (e.g., compare the relative completeness of Tables A.1 and A.2).

The last piece of evidence from National Accounts statistics refers to private expenditure on education (see Table A.3). This is a fairly well documented item and, as shown in summary Table 2. it amounts to about one half per cent of GDP and has followed more or less the same levelling off pattern after the mid-seventies as public expenditure. One should also note that there exist some sharp vertical discrepancies between countries in this statistic that cannot be only due to differential definitions.

TABLE 2.3 Private consumption expenditure on education as per cent of the Gross Domestic Product

Country	1961	1965	1970	1975	1978
Austria		.34	.35	.28	.31
Belgium	.18	.15	.13	.14	.13
Canada	.75	.96	1.6	1.6	1.6
France			.18	.19	.21
Greece	1.6	1.2	1.1	1.2	1.0
Italy			.32	.24	.23
Japan	.48	.54	.51	.30	.28
Netherlands			.08	.11	.12
Norway	.33	.32	.29	.28	.27
Sweden	.00[a]	.00	.00	.00	.00
United Kingdom	.74	1.1	1.2	1.3	1.4
United States	.96	1.0	1.2	1.3	1.2

Source: Based on OECD, National Accounts of OECD countries. See Table A.3.

Note: [a] Less than .004 per cent of GDP.

(1) Some evidence on the indirect component of educational expenditure will be presented in section V, below.

The information presented above from National Accounts Statistics has been checked against UNESCO data (see Tables A.4 and A.5). In spite of definitional differences in both the numerator (value added versus actual expenditure) and denominator (GDP versus GNP) of the two ratios used in National Accounts and the UNESCO questionnaire (respectively), the level and trend of resources devoted to education are very similar. For example, compare the following statistics referring to 1975:

Definition / Country	(Government outlay on education as % of GDP)	(Total public expenditure on education as % of GNP)
Australia	6.2	6.5
Italy	5.0	5.0
United Kingdom	6.8	6.4
United States	6.4	6.2

Source: National Accounts, UNESCO

Also, the UNESCO data in Table A.5 show that the current part of total public expenditure on education is of the order of 80 per cent and increasing.

We end this sub-section by presenting two additional pieces of summary evidence of overtime changes in overall educational expenditure. Table 2.4 shows vividly the relative stagnation of educational expenditure all over the World since 1975. Table 2.5 shows the elasticity of public expenditure on education with respect to Gross National Product. This parameter is defined as

$$e = \frac{\%(\text{change in educational expenditure})}{\%(\text{change in GNP})}$$

A value of e greater than 1 indicates that as GNP grows an increasing part of it is devoted to education. The evidence points to the fact that this elasticity is barely above unity, thus squaring with the evidence of relative educational expenditure stagnation given above. A disaggregation of the elasticity coefficient:

TABLE 2.4 Public expenditure on education and Gross National Product: Country group averages

Country Group	1965	1970	1975	1977
Europe	4.3	5.3	5.3	5.3
Developed Countries	5.1	5.6	6.0	6.0
World	4.9	5.3	5.7	5.7

Source: UNESCO, Statistical Yearbook 1980, p. 161.

TABLE 2.5 The elasticity of public educational expenditure with respect to Gross National Product: Country group averages, 1965-1977

Country group	Average annual rate of growth		Elasticity
	Educational Expenditure	GNP	
Europe	13.6	11.7	1.16
Developed countries	12.2	10.8	1.13
World	12.6	11.1	1.15

Source: UNESCO Statistical Yearbook, 1980, p. 121.

into two time periods reveals a dramatic fall during the seventies (see Table A.6):

		Elasticity coefficient
22 OECD countries average:	1965-71	1.29
	1971-77	1.13

B. The share of education in overall public expenditure

We now proceed to the next logical step in the allocation chain, which is the share of education in the state budget. Education is sometimes considered a "soft" sector having to compet for state funds with "harder" sectors such as construction and industry. It is possible that in an era of financial squeeze and falling tax revenues, a soft sector looses ground relative to other sectors.

Table A.7 in the Appendix presents the share of total public educational expenditure as per cent of all public expenditure since 1965 based on UNESCO information and Table 2.6 gives a summary for the countries we have information to 1977. The summary picture reveals indeed a significant fall from 18.2 to 14.6 per cent of all public expenditure between 1975 and 1977.(1) The same, more or less, picture is revealed by concentrating on the Government consumption expenditure of National Accounts (see Table A.8). Lastly, Tables A.9 and A.10 in the Appendix present the evolution of the share of Government consumption expenditure devoted to defence and health. Defence expenditure has been decreasing in some countries. Health expenditure has been generally on the increase.

(1) Simple arithmetic averages of the columns in Table 2.6, omitting Canada and Spain for which information is missing for 1975.

TABLE 2.6 Total public expenditure on education as per cent of all public expenditure

Country	1965	1970	1975	1977
Australia	11.2	13.3	14.8	16.2[a]
Austria	6.4	8.1	8.5	8.2
Belgium	16.9		22.2	19.2
Canada	18.5			33.2
Finland			16.7	12.9
Germany	9.2	12.0	9.1	8.8
Ireland		10.8	10.8	11.2
Italy			11.7	9.3[a]
Japan	22.7	20.4	17.5	16.5
Luxembourg	14.2	14.8	15.0	14.1
Netherlands	26.3	29.4	23.7	25.4
Norway	26.8	15.5	14.7	14.4
Portugal	8.6	9.5	16.4	14.5
Spain	11.0	15.2		16.8[a]
Sweden			13.4	12.7
Switzerland	20..	18.4	19.4	18.9
United Kingdom	13.4	14.1	14.0	14.3[a]
United States	18.0	19.4	18.1	17.7

Source: Based on UNESCO sources. See Table A.7.

Note: [a] Refers to 1976.

C. A decomposition of the sources of change of educational expenditure

What factors are responsible for the overtime changes in educational expenditure recorded above? One could classify such factors into two major groups: subjective and objective.

Subjective factors. These could simply refer to the political will of the Government towards public expenditure in general and educational expenditure in particular, or to the strength of the social demand for education. The political will of the Government and the social demand are shaped from expectations regarding the contribution of the school system to society at large or to individual incomes and occupational attainment.

Objective factors. These are more directly observable and include demographic changes, enrolment changes and cost changes. Or it could the changing economic situation as it affects the

overall Government budget.(1) These factors are usually considered exogenous to the educational system and no effort is made to explain them separately.

In practice it is very difficult to distinguish between the two groups of factors because of their mutual interdependence. Ideally, one should treat this problem in a framework of a model of social and private choice. As a second best, one could attempt an econometric estimation of the relative importance of the objective factors, relegating the subjective ones to the residual (or unexplained) component of change.

Operationally, such models could be fitted either within single countries in a time-series sense, or, given the relatively short time variation, by pooling cross-country and time-series data. The model could take the form:

$$\frac{C}{GNP} = f\left(\frac{P_s}{P}, \frac{S}{P_s}, \frac{C_s}{\text{Price level}}\right)$$

where C is educational expenditure

P is total population

P_s is school age population

S is the number of students, and

C_s is a cost index of schooling material (including, of course, teachers' salaries).

The model can be disaggregated to refer to specific levels of education. The standardized regression coefficient (beta) in a model of this kind would show the relative importance of demographic, enrolment and cost factors in determining the level of educational expenditure.

There are two reasons why such a model has not been fitted in this paper. First, there exist many blanks in the necessary statistical series (see Appendix Tables) and second, the series do not go deep into the 1970s. Hopefully, such a model will be fitted when data to 1980 become available.

Instead, we follow here a more pedestrian approach of decomposition, previously used by the OECD(2), which amounts to the manipulation of the following identity:

$$\frac{C}{GDP} = \left(\frac{P_s}{P}\right) \cdot \left(\frac{S}{P_s}\right) \cdot \frac{(C/S)}{(GDP/P)}$$

---

(1) Of course this might not be a significant factor over the period under review, but might become an important factor in the near future.

(2) See OECD, Public Expenditure on Education, 1976.

Thus, overtime changes in the share of educational expenditure (C) in GDP can be attributed to demographic changes (P_S/P), enrolment changes (S/P_S) and cost changes (last term in the above expression). It should be noted that although the cost index is obtained as a residual in order to maintain the identity, division of the cost per student (C/S) by per capita income (GDP/P) corresponds to some notion of real cost.

Tables A.11 and A.12 in the Appendix present the results of applying this formula to 1970 and 1975 data. Thus it is noticed that the dominant factor constributing to educational expenditure is the enrolment ratio, the demographic factor being in the second place and the cost factor contributing the least.

Table 2.7 summarises the information on 1970 to 1975 changes, where a value above 1 signifies an increase and a value below 1 a decrease. With the exception of two countries (Austria and Italy) the demographic factor has acted as a depressant of the share of educational expenditure in GNP, whereas the enrolment factor has acted as a mild stimulant. The behaviour of the cost factor is too varied as to make a generalisation.

TABLE 2.7 Factors associated with changes in public current expenditure in education, 1970 to 1975

Country	Share in GNP change	Demographic change	Enrolment change	Cost change
Austria	1,215	1,028	1,052	1,123
France	1,053	978	1,062	1,013
Italy	1,063	1,073	1,084	915
Netherlands	859	965	1,090	854
Norway	900	980	1,065	864
Spain	973	989	1,154	851
Sweden	963	959	1,089	919
United States	1,026	964	1,010	1,053
Yugoslavia	1,148	972	988	1,191

Source: Based on Tables A.11 and A.12.

Note: Numbers represent end-year to initial-year ratios.

III

EXPENDITURE ON HIGHER EDUCATION

We now proceed to the next logical step in the resource allocation chain, namely the distribution of public expenditure by level of education. This section is divided into four sub-sections: First, we examine the high education share in overall educational expenditure. Second, we try to account for the factors accounting for the overtime changing share of higher education in the state budget. Third, we present some evidence on the allocation of resources within the tertiary education sector by making a distinction between the university and non-university sub-sectors. Finally, we make an indirect attempt to carry the allocation process one step further, namely the allocation of resources within the university sector by field of study.

A. The share of higher education

Table A.13 in the Appendix presents the share of higher education in current public expenditure on education and Table 3.1 summarises the evidence for countries in which full information exists for the years 1965, 1970, 1975 and 1977. The overall picture that emerges in terms of averages is a definite rise in the share of higher education in expenditure from 1965 to 1970, a modest rise from 1970 to 1975 and stability (if not a slight decline) from 1975 to 1977 (see Figure 3.1).

TABLE 3.1 The higher education share in public current expenditure on education (per cent)

Country	1965	1970	1975	1977
Australia	12.2	13.4	14.7	15.3
Belgium	10.8	13.3	15.3	16.1
Canada	20.5	27.5	26.3	26.3
Denmark	18.5	20.8	20.8	17.5
Finland	7.6	9.8	12.8	12.7
France	11.0	17.4	13.7	13.6
Ireland	9.9	13.9	17.7	18.5
Japan	11.0	12.7	10.2	11.1
Netherlands	17.7	22.1	28.3	28.0
New Zealand	14.1	23.3	23.4	23.4
Norway	11.6	12.2	13.3	14.1
Sweden	12.2	14.5	12.3	11.0
Switzerland	18.5	17.5	17.0	16.5
United States	25.9	29.5	32.5	30.1
Yugoslavia	15.6	14.8	15.2	17.2

Source: Based on Unesco statistics. See Table A.13.

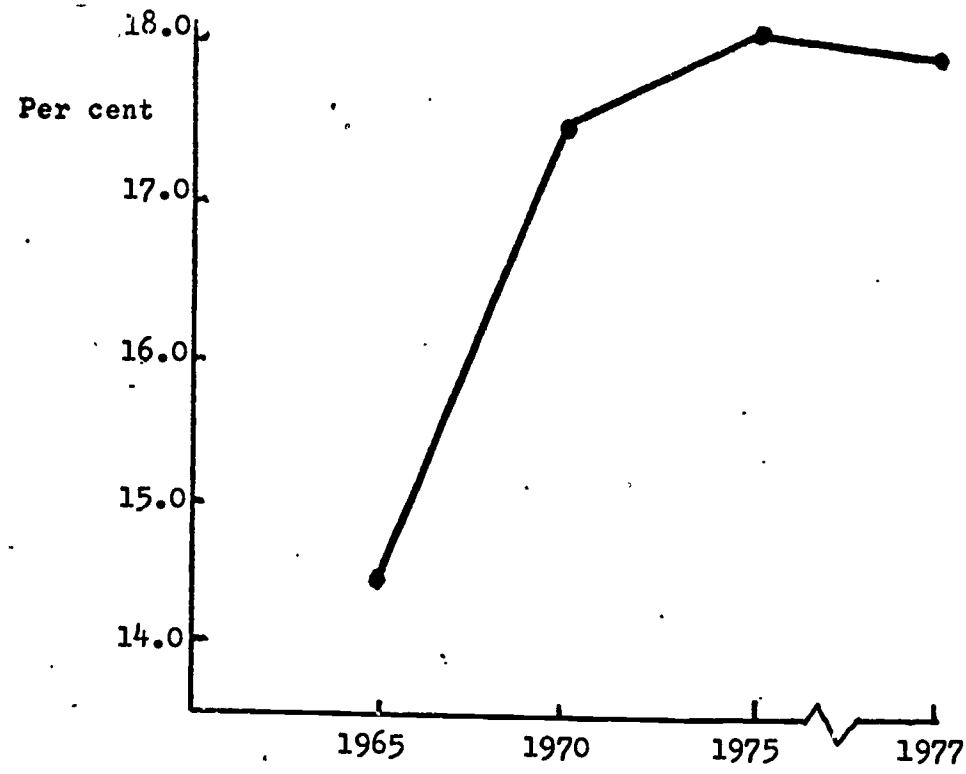

FIGURE 3.1 The higher education share in public current educational expenditure, OECD countries average.

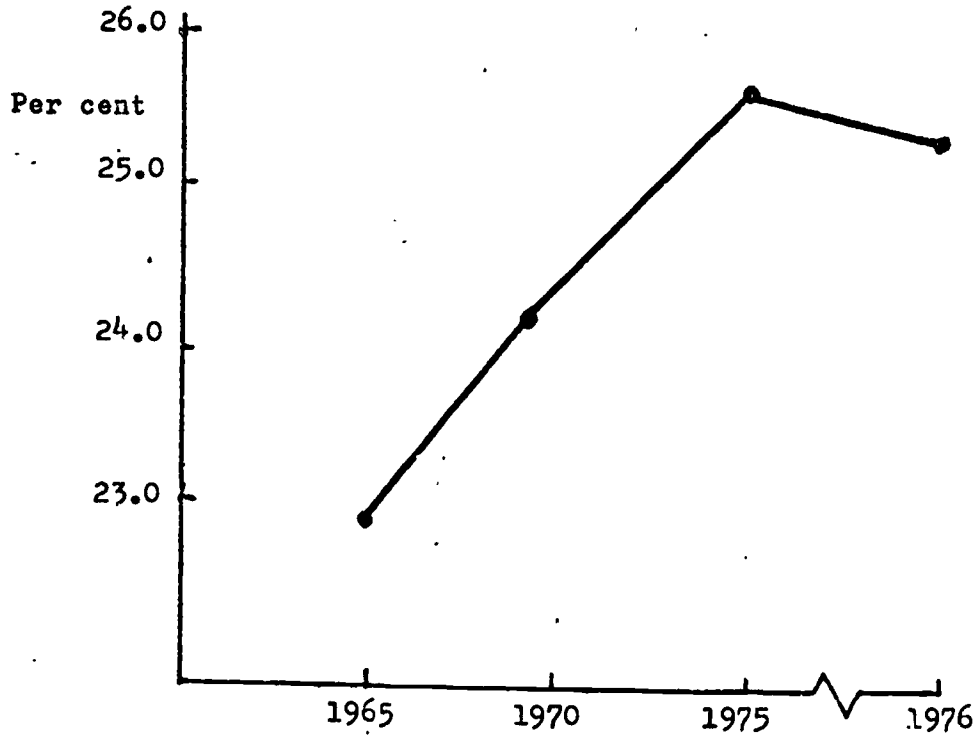

FIGURE 3.2 The share of higher education in public capital expenditure on education , OECD countries average.

Table A.14 in the Appendix presents the higher education share in public capital expenditure and Table 3.2 summarises the evidence for the countries with full information in year 1965, 1970, 1975 and 1976. Once more, the same overall pattern is detected, namely modest growth to 1975 and relative stagnation thereafter (see Figure 3.2).

The 1975 peak might of course be due to the fact that this year corresponds to the worse recession in OECD countries.

TABLE 3.2 The share of higher education in public capital expenditure on education (per cent)

Country	1965	1970	1975	1976
Canada	32.5	42.4	34.3	34.3
Finland	9.8	18.9	45.3	51.1
France	25.0	21.4	13.0	11.5
Ireland	11.7	14.9	19.5	19.6
Japan	21.0	12.3	6.8	7.4
Netherlands	35.4	33.1	20.6	25.2
New Zealand	29.7	30.8	26.7	27.5
Portugal	2.4	10.9	20.8	20.7
United States	41.1	40.7	39.4	40.4
Yugoslavia	19.0	18.6	16.9	15.6

Source: Unesco statistics. See Table A.14.

A further way of documenting the financial squeeze of higher education relative to the other school levels is to compare the average rate of growth of public expenditure to higher education with the growth of overall public expenditure on education. Tables A.15 and A.16 in the Appendix present the available evidence and Table 3.3 summarises the falling growth of higher education expenditure relative to the growth of overall educational expenditure.

B. Factors associated with the change in higher education expenditure

The determinants of higher education expenditure are more complex relative to the ones discussed above referring to overall education expenditure. The latter is more heavily influenced by demographic developments which can to some extent be predicted. Higher education expenditure, however, is in addition to demographic developments determined by a host of other factors that pertain to the choice of a particular individual. Because of the higher age group involved, one such important factor is labour force participation. Also, the changing sex-role stereotypes add an independent dimension to the demand for higher

TABLE 3.3 Ratio of growth rate of current public higher education expenditure relative to all educational expenditure, 1960-1975

Country	1960-65	1965-70	1970-75
Austria	1,127	1,257	1,109
Denmark		1,456	669
Finland		1,574	1,654
France	923	2,242	956
Germany	2,452	947	967
Japan	838	1,291	806
New Zealand	1,163	1,327	1,132
Norway	1,518	1,214	1,151
Sweden	1,609	1,519	781
United States		1,300	1,241
Yugoslavia		853	1,052

Source: Based on Tables A.15 and A.16.

education by females. Furthermore, the finance schemes available to students influence directly and indirectly the level of public expenditure on higher education. Or a falling private rate of return might have lowered the credibility of higher education as a preparation for employment. To this list one should add the prevailing general macro-economic conditions, as strength of the economy is directly related to the students' foregone earnings and hence inversely related to the demand for higher education.

Let us start analysing some of these complex factors by repeating the decomposition exercise of the previous section to higher education. Tables A.17 and A.18 in the Appendix present the higher education share in GNP decomposed into demographic, enrolment and cost factors in 1970 and 1975, respectively. There also exists an earlier OECD exercise comparing changes in these factors between 1963 and 1970. Table 3.4 summarises this information by considering changes within two sub-periods: 1963 to 1970 and 1970 to 1975. This table reveals the following facts: first, the fall of the share of GNP devoted to higher education between the two sub-periods under consideration. Second, the diminishing importance of the demographic factor in accounting for changes in higher education expenditure. Third, the highly mixed role of enrolment and cost changes in accounting for changes in higher education expenditure.

As mentioned in the previous section, this method of cost accounting is extremely aggregate and fails to catch finer details (say, on the relative cost composition of enrolments). This is a task we have relegated to the next section where we shall consider the available evidence on unit cost of particular types of higher education and fields of specialisation.

In an effort to document the female contribution to higher education expenditure Tables A.19 and A.20 in the Appendix present population estimates of the age group relevant to higher education (20-24) for the two sexes, and Tables A.21 and A.22 the respective labour force participation rates.

TABLE 3.4 Factors associated with changes in public current expenditure in higher education, 1963-70 and 1970-75

Country	Share in GNP change		Demographic change		Enrolment change		Cost change	
	1963-70	1970-75	1963-70	1970-75	1963-70	1970-75	1963-70	1970-75
Australia	1,759		1,113		2,105		751	
Austria	1,824	1,366	1,105	988	1,265	1,575	1,305	876
Belgium	1,952		1,180		1,794		921	
Canada	3,975		1,316		1,617		1,868	
Finland	1,725		1,459		1,273		928	
France	1,432	1,028	1,220	945	1,843	1,242	659	867
Germany	1,239		978		1,510		839	
Italy	1,904		1,028		2,132		868	
Netherlands	2,238	2,135	1,263	930	1,289	1,324	1,373	1,718
Norway	1,664	1,000	1,016	927	2,093	1,324	783	815
Sweden	1,787	821	1,082		1,711		966	
Switzerland	1,862		923		1,603		1,258	
United Kingdom	1,758		1,032		1,757		969	
United States	1,706	1,167	1,203	1,070	1,599	1,147	886	934
Yugoslavia		1,190		1,063		944		1,199

Source: 1963-70 change based on OECD, Public Expenditure on Education, op. cit., p. 25., 1970-75 change based on Tables A.17 and A.18.

In terms of aggregate higher education enrolment, the mid-decade changes are(1):

1955 - 1960: + 36%
1960 - 1965: + 52%
1965 - 1970: + 47%
1970 - 1976: + 17%

During the period of relative slack, however, the share of female enrolments increased substantially(2):

Year	Share of female enrolment in higher education
1965	32.4%
1970	35.4%
1975	41.0%

This is in spite of a contradictory tendency of increased labour force participation rates of this age group(3):

Year	Labour force participation of the 20-24 year old	
	Males	females
1965	88.1	51.6
1970	83.6	57.6
1975	81.3	61.2

An indirect inference from these statistics is that female enrolments must contribute increasingly to higher education expenditure.

C. The non-university cost component

Obviously, two additional reasons for the overtime variation of higher education expenditure are the possible change in the allocation of funds towards non-university institutions or university faculties whose unit cost differs from the average. Some evidence on the unit cost structure of different types and kinds of higher education will be presented in Section IV, below. In this and the following subsection we examine some evidence on the aggregate allocation of resources according to these dimensions.

(1) OECD, "Development of post-secondary education in OECD countries since 1965", SME/ET/79.21, 1979.

(2) Based on sixteen full information country averages in Table A.23.

(3) Based on 23 full information country averages in Tables A.21 and A.22.

Published international statistics on the allocation of public expenditure between the university and non-university sectors simply do not exist. Also, the response to the Unesco questionnaire on this issue has been extremely poor. (See Table A.24). Table 3.5 summarises the scanty evidence from this source, showing a definite increase in the share of public current expenditure of non-university education out of the total public current expenditure for higher education between 1970 and 1975. After this date, however, the evidence is rather mixed in order to offer a generalisation.

In view of the small number of countries in Table 3.5 an attempt was made to look at indirect evidence on a possible reallocation of resources towards or away from the non-university sector by focussing on the evolution of enrolments.

TABLF 3.5 The share of non-university public current expenditure to total higher education expenditure (per cent)

Country	1965	1970	1975	1977
Austria			.3	.6
Canada		20.5	26.1	27.1
France	6.4	9.9	31.1	29.5
Netherlands	.8	14.6	24.9	26.2
Sweden		3.2	18.7	29.9

Source: Based on Unesco unpublished data. See Table A.24.

Tables A.25 and A.26 present enrolment ratios in the university and non-university sectors in 1970 and 1976 (or nearest year), respectively, and Table 3.6 summarises the evidence of the changing ratio of non-university to university students. The overall picture confirms to cost data given above, namely there has been on balance a shift towards the non-university sector during the first half of the seventies.

D. The shift of resources between more expensive and cheaper faculties

Again, published evidence on the aggregate allocation of resources within higher education by field of specialisation are nonexistent for the simple reason that the accounting spending unit is the university as a whole. However, it is possible to obtain indirect evidence in this respect by looking at the over-time relative movement of enrolments by faculty, or by focussing on particular universities that cater mainly for certain fields of specialisation.

TABLE 3.6 The ratio of non-university to university enrolments, 1970 and 1976

Country	Circa 1970	Circa 1976
Australia	.24	.78
Austria	.11	.09
Denmark	.46	.65
France	.19	.26
Germany	.30	.30
Greece	.23	.28
Japan	.11	.12
New Zealand	.25	.18
United Kingdom	.43	.90
United States	.25	.28

Source: Based on OECD, Educational Statistics and unpublished Unesco questionnaire data. See Tables A.25 and A.26.

Out of the different faculty groupings available in this respect, the most important one is between technical-scientific and other faculties because the former use laboratories and related expensive equipment, hence any enrolment swing towards them must be associated with a higher level of expenditure. Table 3.7 presents summary evidence in this respect at three points in time by aggregating enrolments in pure science and technology.

In spite of the small number of countries covered the evidence points to a steady drop of the technical and scientific fields of specialisation in total university enrolments between 1965 and 1975. Clearly, the reallocation of enrolment between faculties must have somehow contributed to the overtime relative fall in public expenditure on universities.

TABLE 3.7 The share of pure sciences and technology in total university enrolment.

(per cent)

Country	1965	1970	1975
France	32.0	19.1	17.1
Germany	27.1	24.4	27.4
Italy	22.2	23.1	20.6
Japan	23.0	24.8	27.5
Norway	32.9	27.9	21.2
Spain	34.4	31.2	23.0
United Kingdom	44.6	41.1	36.0

Source: Based on OECD, Educational Statistics, Second edition, Tables 28 to 30.

IV

UNIT COSTS IN HIGHER EDUCATION

In this section we combine aggregate expenditure and enrolment data to arrive at the unit cost per student. The reduction of these two separate pieces of information into a single statistic is important because it links to issues of possible economies of scale from university expansion, the quality of higher education and, of course, identification of potential areas of savings of public funds. The section is divided into four subsections: first, on unit costs per student, second, on unit costs per graduate, third on unit costs by type of higher education institution and, finally, on unit costs by field of study.

A. The Average cost per student

Table 4.1 presents the behaviour of the average cost per student in higher education over an eleven year period in constant U.S. dollars. Abstracting from the considerable difference in the level of this statistic between countries, we observe a steady rise in the expenditure per student from 1965 to 1975 and a decline in many countries between 1975 and 1976. In terms of overall averages for the countries where information is available for the two adjacent years, the real cost per student has behaved as follows:

1975 US$2,520

1976 US$2,444

Although this might not be considered a "high" fall, the fact that it refers to only one year might mean that it signals the beginning of a more drastic fall of this statistic in the more recent years for which data are not yet available.

A fall in the average expenditure per student can have two possible economic explanations. First, economies of scale are in operation, namely the increased "mass production" in higher education (remember that the absolute level of enrolments has increased over time, although recently at a decreasing rate) has led to a more efficient utilisation of the fixed plant, hence unit costs have dropped. The second explanation is that the lower expenditure per student head could reflect a deterioration of university quality.

In a previous international cross-section analysis of the costs of higher education it was concluded there exist significant economies of scale following university expansion (Psacharopoulos, 1980, op. cit.). A cost per student (C/S) function fitted to 83 advanced and developing countries data gave the following result:

$$\frac{C}{S} = 4.235 - \underset{(3.85)}{.360}\ \frac{S}{P} + \underset{(.11)}{.255}\ (DC) + \underset{(3.71)}{5.312}\ (YEAR),\ R^2 = .263$$

TABLE 4.1

Total expenditure per student in higher education

(in 1970 US$)

Country	1965	1970	1975	1976
Austria	780	1500	2440	2360
Belgium	1010	1130	2720	2690
Denmark	2890	3290	4430	
France	1090	1150	1150	1100
Germany	2650	2600	2760	
Italy	540	540	830	700
Netherlands	2610	3360	5700	5580
Norway	1420	1550	2660	2860
Spain		390	280	430
Sweden	1910	1990	3020	3030
Switzerland	3220	2900	5630	4880
United Kingdom		3140	3250	
Yugoslavia		550	770	810

Source: Jallade, 1979, op. cit., p. 43.

where DC and YEAR are other standardizing factors(1) and numbers in parenthesis standard errors. The significantly negative coefficient on the enrolment variable (S/P) signifies the existence of returns to scale.

The possibility of existence of returns to scale in advanced countries cannot be ruled out when reference is made to a longer time span or to the behaviour of unit costs of relatively new higher education institutions. In France, for example, university enrolments increased on the average by 6.9 per cent per year between 1964 and 1978, whereas the real cost per student fell by 2.6 per cent per year during the same period(2). Also, when the "New Universities" were instituted in Portugal in the early seventies, enrolment increased by 15 fold between 1975 and 1979, whereas the cost per student fell by 3 fold(3).

(1) DC is a dummy variable having a value of 1 if a particular country belonged to the advanced group and YEAR a dummy variable having a value of 1 if the data referred to year 1975. See Psacharopoulos (1980), Table A.3.

(2) Information based on J.C. Eicher and L. Lévy-Garboua, Economique de l'Education, Paris; Economica, p. 262.

(3) Information based on Psacharopoulos (1980), op. cit., Table 4.4.

However, caution is in order before generalising this experience to the fall of the cost per student after the peak year of 1975. It might mean that the reduced expenditure is having repercussions on the quality of education provided, by increases of the teaching loads or less equipment. For example, the student-teacher ratio in Italy has considerably increased over the years and students in Greece have to attend lectures held in city theatres because of the lack of proper teaching rooms. Also, an important internal reallocation of resources between teaching and research might be taking place, an issue that cannot be easily investigated by the aggregate spending statistics at our disposal.

B. The cost per graduate

This is another statistic the evolution of which would be of extreme interest in policy discussions affecting the finance of higher education. Yet a look at a simplified formula to be used for its estimation reveals some of the complexities involved and the reason why such estimates have not appeared in the literature:

$$\text{Cost per graduate} = \frac{C_1S_1 + C_2S_2 + C_3S_3}{G_4}$$

where C refers to the annual real cost per student

S to the number of students of the same initial cohort (subscript 1) surviving in successive periods (2 and 3),

and

G the number of eventual graduates in period 4.

Even abstracting from issues of discounting, the cost per student-year must differ in real terms between successive periods. Also, the survival rate of a given student cohort would be a research issue on its own, let alone the problem of part-time students. In addition, the graduates from the initial cohort might not all graduate in year 4 (in this assumed example of a three-year higher education cycle) but they might obtain their degree in years t+1, t+2 or even t+10. This remark especially applies to countries like Greece and Italy that have large stocks of mature, not university attending "students" many of which might, sometime, become graduates.

An indirect way of assessing the approximate evolution of the cost per graduate is to compare the efficiency of the higher education system in producing graduates, simply measured by the graduate to student ratio. Tables A.27 and A.28 in the Appendix

present estimates of this crude "efficiency" statistic circa 1969 and 1977 and Table 4.2 summarises the results. Long cycle university systems, such as that of the Netherlands, appear with a low graduate efficiency statistic, while short cycle university systems, such as that of Ireland, appear with a high statistic.

What is of interest here is the evolution of this statistic over time, as an increase in it would denote better internal efficiency of the university system and hence a lower cost per graduate. Horizontal reading of Table 4.2 shows that in seven cases out of the 15 countries listed there has been some modest increase in graduation efficiency, and in six cases a decline. Thus, even on the basis of this indirect evidence we are not able to offer a definite generalisation as to whether the cost per graduate has been on the increase or decrease. Perhaps the safest proposition might be that it has followed the trend of the cost per student as a whole, as analysed earlier.

TABLE 4.2

The university graduate-to-student ratio circa 1969 and 1977

(Per cent)

Country	Circa 1969	Circa 1977
Austria	9	6
Belgium	11	16
Canada	21	19
Finland	13	15
Germany	24	9
Greece	11	12
Ireland	19	20
Italy	9	8
Japan	17	18
Netherlands	3	7
Spain	6	5
Sweden	14	21
Switzerland	11	11
Turkey	27	15
Yugoslavia	9	9

Source: Based on Tables A.27 and A.28.

C. The non-university distinction

The response to the Unesco questionnaire on the split between university and non-university expenditure as well as enrolments in the two types of institutions was extremely thin.

Thus it is not possible on the basis of this data source to establish the overtime movement of unit costs in non-university institutions. All this source allows is evidence on the relative non-university to university cost per student in a handful of countries for specific years. This evidence appears in Table 4.3 and points to the fact that non-university unit costs are only a fraction of university costs. When this fact is combined with the shorter duration of non-university courses, the cost per non-university graduate must be considerably lower relative to the cost of a university graduate.

Some evidence on the overtime evolution of costs is given in the OECD's Policies for Compulsory Education project and summarised among other data in Table 4.3. This evidence does not point to any overtime relative change in the ratio of non-university to university unit costs.

D. Unit costs by field of study

This is an even more uncharted area and aggregate public expenditure statistics are of no help because of the single accounting and spending unit. However, some evidence can be gathered in this respect by concentrating on single country case studies or on the budget of universities mainly offering one kind of field of specialisation.

TABLE 4.3

The relative cost per student in the non-university to university sectors

Country	Year	Non-university cost per student / University cost per student
Australia	1977	.99
Canada	1970	.77
France	1970	.23
Germany	1970	.42
Greece	1977	.71
United Kingdom	1974	.65
	1976	.76
	1977	.66
Ireland	1965	.78
	1970	.94
	1976	.78

Source: Based on Unesco unpublished data. United Kingdom and Ireland, OECD, "Politiques de l'Enseignement Obligatoire, Royaume-Uni", (SME/ET/80.7/17) and "Irlande" (SME/ET/80.7/10), 1980, Table 6. Greece, from Psacharopoulos and Kazamias, (1978), op. cit., Table 18.1.

Table 4.4 presents in index form the unit cost structure by field of study in five countries. If the unit cost of all higher education students is 100 (index base) then technical faculties such as engineering, sciences and medicine involving the use of laboratories, are much more expensive relative to general faculties such as social sciences and liberal arts. This proposition has also been extensively documented in the case of less developed countries (see Psacharopoulos, 1980, op. cit.).

TABLE 4.4

The unit cost structure by field of study, selected countries (Index base = 100 all fields)

Field of study (Year)	France (1975)	Greece (1977)	Norway (1966)	Portugal (1979)	U.K. (1972)
Engineering	191	194		118	137
Sciences	116		96		124
Medicine			248		
Social Sciences		25	42		61
Humanities	50	81		84	
Economics	43	25			
Liberal Arts			37		64
Law	43		25		

Source: France, based on Eicher and Lévy-Garboua (1979), op. cit., p. 245.

Greece, based on Psacharopoulos and Kazamias (1978), op. cit., Table 18.2.

Norway, based on J. Aarrestad, "Returns to Higher Education in Norway", The Swedish Journal of Economics, 1972, p. 227.

Portugal, based on Psacharopoulos (1980), op. cit., Table 5.4.

United Kingdom, based on A. Bottomley and J. Dunworth, "Rate of Return Analysis and Economies of Scale in Higher Education", Socioeconomic Planning Science, 1974, Table 1.

Regarding the overtime evolution of the unit cost by field of specialisation there exists some evidence in Bottomley and Dunworth (1974, op. cit.) who have documented the fact that as the overall average cost per student slightly dropped between 1967 and 1970, the cost index of technology faculties increased more relative to social studies (see Table 4.5). However, the evidence is of such limited coverage as not to support the hypothesis that the overall structure of the unit cost of different faculties does not follow that of the average cost per student documented in Section IV.A, above.

TABLE 4.5

The unit cost per student by faculty, United Kingdom, 1967 and 1970

Faculty	1967	1970
Technology	111	115
Sciences	123	122
Social studies	70	64
All faculties (index base)	100	100
Actual unit cost (in 1967 £)	2,405	2,321

Source: Based on Bottomley and Dunworth, (1974), op. cit., Table 1.

V

ON HIGHER EDUCATION FINANCE

The topic of higher education finance is vast and could be broken analytically into a series of distinct themes. One such theme that has received a lot of attention in the literature is the so-called "distributional equity" or "Hansen and Weisbrod" type of analysis(1). This analysis compares who really pays and who benefits from expenditure on higher education. The results of such studies have been pointing to the fact that the net tax-subsidy play has been in favour of wealthier families, although this is by no means a universal conclusion.

In what follows we shall abstract from this micro-distributional theme(2). Instead we shall concentrate on non-public sources of university finance (sub-section A), and the evolution of student support schemes (sub-section B).

A. Non-public sources of funds

It is reminded that the full social (resource) cost of higher education consists of two distinct parts, called direct and indirect. Direct costs include those covered in the previous sections of this paper in the sense of direct expenditure for teachers, classrooms and the like. The indirect cost of education consists of the foregone earnings of the student while he(she) is attending the university.

This direct versus indirect cost distinction is very important regarding the finance theme for the simple reason that the indirect cost of higher education is as a rule privately financed. It is very unfortunate that this elementary point is often missed in policy discussions. The reason is that this cost component is not as conspicuous as direct budgetary outlays and hence remains unrecorded by the educational cost accountant. However, it is the duty of the economist to bring this cost dimension to the surface.

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(1) For the original contribution see W. Lee Hansen and B. Weisbrod, Benefits, Costs and Finance of Public Higher Education, Markham, 1969, and for some controversy on this issue R. Pechman, "The Distributional Effects of Public Higher Education in California" Journal of Human Resources, Summer 1970, and W. Miklius, "The Distributional Effects of Public Higher Education: A Comment", Higher Education, Vol. 4, 1975.

(2) For some evidence on this theme in OECD countries, see OECD, Education, Inequality and Life Chances, Volumes I and II, 1975.

The privately financed indirect cost component of higher education is not trivial. Table 5.1 shows that foregone earnings account for one third to 80 per cent of the total (direct plus indirect) social cost of education in advanced countries.

It is reminded that the indirect cost component of higher education is measured by the foregone earnings of university students which is equal to the earnings of secondary school graduates (opportunity cost concept). The question that arises is what has been the overtime evolution of this cost component?

Although no detailed statistics are available on this item, it must be that the opportunity cost of higher education has declined in the second half of the seventies due to the adverse labour market conditions for youths, especially with secondary school qualifications(1).

TABLE 5.1 Student foregone earnings as a percentage of the total social cost of higher education

Country	Foregone earnings share
Belgium	31
Denmark	61
France	83
Japan	78
Norway	71
United Kingdom	44
United States	63

Source: Based on G. Psacharopoulos, The Returns to Education: An International Comparison, Elsevier, 1973, p. 177. France and Japan based on OECD, Educational Expenditure in France, Japan and the United Kingdom, 1977

(1) For an elaboration of this point using United States data, see G. Psacharopoulos, "Spending on Education in an Era of Economic Stress: An Optimist's View", Journal of Education Finance, Vol. 6, No. 2, Fall 1980.

B. The Evolution of student support schemes

Let us now turn to a more conventional aspect of higher education finance, namely the overtime evolution of student aid such as grants, loans or welfare expenditure(1). This, again, can be studied from either the pecuniary point of view or the student coverage point of view.

On the financial issue, the UNESCO questionnaire raised information since 1976 on student grants and welfare expenditure in higher education, although unfortunately the latest year of data refers to 1977 (see Appendix Table A.29). Table 5.2 gives a summary of the evolution of such expenditure between 1976 and 1977 showing that in practically all country cases such expenditure has clearly declined between the two years.

TABLE 5.2 Student grants and welfare expenditure as a per cent of total current higher education expenditure

Country	1976	1977
Finland	16.5	19.5
Ireland	6.8	5.0
Japan	.7	.6
Netherlands	6.7	6.7
Portugal	26.2	23.3
Switzerland	6.4	5.6

Source: Based on UNESCO data, see Table A.29

The availability of data on the number of students covered by different forms of public aid permits a longer view on the changing finance structure. As shown in Table 5.3, no clear decline in coverage can be detected between 1968 and 1974, Thus the decline in monetary expenditure to student aid between 1976 and 1977 documented in Table 5.2 must have been a concomitant of the financial squeeze of the higher education sector in the second half of the seventies.

(1) For an exposition of the nature of the different support schemes see M. Blaug and M. Woodhall, "Patterns of Subsidies to Higher Education in Europe", Higher Education, Vol. 7, 1978, or for a more detailed exposition, M. Woodhall, Review of Student Support Schemes in Selected OECD Countries, Document Series, CECD, 1978. For an in depth analysis of the costs and finance of higher education in France see B. Millot and F. Orivel, L'Economie de l'Enseignement Supérieur, Cujas, 1980.

TABLE 5.3 The percentage of university students receiving public aid

Country	1968	1974
Australia	35	58
Canada	15	25
Denmark	50	50
Finland	55	50
France	25	15
Germany	25	45
Japan	16	10
Netherlands	35	38
Norway	70	69
Sweden	72	70
United Kingdom	95	90
United States	n.a.	25

Source: 1968 from OECD, "Les Techniques du Financement de l'Enseignement et leurs Implications dans le Domaine Politique", DAS/EID/71.71, 1972. 1974 from OECD, "An Examination of the Influence of Admission and Financing Policies on the Demand for Education", SME/ET/78.60, 1978.

VI

SUMMARY AND CONCLUSIONS

Central to any policy discussions pertaining to higher education in the eighties will be the issue of "costs". Educational costs have always been an implicit or explicit constraint limiting policy options and, effectively, determining the ultimate outcome. Although the eventually adopted policy might appear to be the result of a political decision, cost considerations must have, one way or the other, affected this decision.

What have we learned from the behaviour of higher education expenditure from the preceding analysis?

Total educational expenditure

There has been a peak of educational expenditure circa 1975 and a marked decline thereafter. This type of expenditure is of the order of 5 to 6 per cent of national income. By concentrating only on current expenditure one misses about 20 per cent of the total level of expenditure (including capital investment). The capital component of educational expenditure is decreasing faster than current expenditure, thus denoting the possible operation of the acceleration principle working in reverse: whereas there exists much inertia regarding the behaviour of current expenditure, investment expenditure reacts more strongly to a slack of demand for educational services. To the extent that this is true it could have serious implications on the possibility of a revival of the school system if the present recession condi[illegible]s stop to exist.

Higher educational expenditure

This component has more or less followed the overall pattern of total educational expenditure, i.e. it has peaked circa 1975 and started to decline thereafter, especially the capital investment part of it. Although it has not been possible to detect any internal reallocation of resources between teaching and research, this deceleration effect might inflict a permanent scar on the future academic standards and vitality of higher education systems in most advanced countries. Contrary to the results of the decomposition exercise regarding the factors accounting for changes in overall educational expenditure, demographic developments are not as crucial. Instead, it is the strength of social demand plus the increased participation of females in higher education and labour market activities that will be the dominant factor putting pressure for increased public funds towards the higher education sector.

Unit costs

The cost per university student has fallen in real terms during the second half of the seventies. This could be due to economies of mass production, although one cannot rule out the possibility of a drop in university quality associated with the decline of expenditure per student head.

The non-university sector

Unit costs are much lower in this sector, except in newly created institutions where the cost per student is initially very high (because of the overhead investment) and then drops off very rapidly. Given the shorter duration of the non-university cycle, the cost per graduate is much lower relative to the university and there has been some aggregate shift of overall expenditure towards this sector during the seventies. Whether this trend will continue or not depends upon the balance of two opposite forces: first, the students pulling away from this sector because of the lower standard of the degree given by non-university institutions, and, second, the Government attempting to promote this type of education because of its relative cheapness and intended closer relevance to manpower demands in the economy. (Classic cases in this respect are England, France, Greece and Portugal.)

The field of specialisation

Non-vocational general faculties like liberal arts, humanities and the social sciences are much cheaper relative to engineering and technology. There has been a gradual shift of resources away from expensive towards cheaper fields of specialisation. It is anticipated that this trend might continue because of the increased enrolment of females mainly seeking admission to the humanities and the social sciences.

On finance

It is a myth that in state provided education systems higher education is a "free" good to the individual. For example, detailed analysis of the finance of higher education costs in France shows that the individual student and his (her) family pay privately 53 per cent of the total bill(1). One important element in fully understanding the finance structure of higher education is the foregone earnings of students while at the university, an item that is usually absent in policy discussions affecting higher education. However, the general financial squeeze on educational budgets has had its impact on more readily recorded student support statistics such as grants and welfare. Public expenditure on these items has clearly dropped during the late seventies. It is predicted that governments will put increased pressure on the student (i.e. the beneficiary himself of higher education) to foot the bill of educational provision. This change is now being discussed in England and according to a recent survey three-fifths of the general public and nearly two-fifths of the student body would prefer some form of student loan relative to the present system of grants(2).

(1) Eicher and Lévy-Garboua, 1979, op. cit., p. 270.

(2) See A. Lewis, C. Sandford and N. Thompson, Grants or Loans?, Institute of Economic Affairs, Research Monograph No. 34, 1980.

Concluding remarks

The analysis and generalisations made in this paper were based on a set of international statistics containing many gaps and full of comparability problems. Nevertheless, this analysis was felt necessary in order to be able to detect some overall trends in higher education expenditure in advanced Western countries. Although, in the opinion of the author, such major trends were pinned down, this study is no substitute for in-depth analysis within single countries by individual research teams fully familiar with each country's peculiarities, educational system and, most important, access to supplementary statistical information. It is hoped that some of the bold generalisations and hypotheses put forward in this paper will provide the challenge for individual country monographs on issues of higher educational expenditure and finance.

TABLE A. 1 . Total Government consumption expenditure on education as per cent of GDP.

Country	1961	1965	1970	1975	1978
Australia			3.0	4.7	5.1
Austria		2.4	3.1	4.6	
Belgium	4.0	4.6	5.2	6.7	7.0
Canada					
Denmark					
Finland					
France					
Germany					
Greece	1.7	1.7	1.9	1.9	2.4
Iceland					
Ireland					
Italy			3.5	4.0	4.5
Japan			2.8	3.8	3.7
Luxembourg					
Netherlands			5.7	6.9	6.7
New Zealand					
Norway	3.6	4.2	4.9	5.4	5.6
Portugal	1.4	1.2	3.8	3.5	
Spain			1.1	1.3	
Sweden		4.4	5.3	5.2	
Switzerland					
Turkey		2.8	2.3		
United Kingdom	2.6	3.1	3.7	5.2	4.4
United States	3.1	3.3	4.4	5.0	4.8
Yugoslavia					

Source: OECD, National Accounts Statistics, Table 3a.

TABLE A. 2 . Total Government outlay on education as per cent of GDP

Country	1970	1975	1978
Australia	4.2	6.2	6.3
Austria			
Belgium			
Canada			
Denmark		8.3	
Finland	6.4		
France		5.7	
Germany	4.0	5.4	
Greece			
Iceland			
Ireland			
Italy	4.4	5.0	5.4
Japan	3.5	4.8	4.9
Luxembourg			
Netherlands			
New Zealand			
Norway			
Portugal			
Spain			
Sweden			
Switzerland			
Turkey			
United Kingdom	5.3	6.8	5.8
United States	5.3	6.4	5.8
Yugoslavia			

Source: OECD, National Accounts Statistics, Annex.

TABLE A.3 . Private consumption expenditure on education as per cent of DGP

Country	1961	1965	1970	1975	1978
Australia					
Austria		.34	.35	.28	.31
Belgium	.18	.15	.13	.14	.13
Canada	.75	.96	1.6	1.6	1.6
Denmark		.26[a]	.34	.51	
Finland					
France			.18	.19	.21
Germany					
Greece	1.6	1.2	1.1	1.2	1.0
Iceland	.31	.24	.28		
Ireland					
Italy			.32	.24	.23
Japan	.48	.54	.51	.30	.28
Luxembourg					
Netherlands			.08	.11	.12
New Zealand					
Norway	.33	.32	.29	.28	.27
Portugal					
Spain		1.2	1.4	1.5	
Sweden	.00[b]	.00	.00	.00	.00
Switzerland					
Turkey					
United Kingdom	.74	1.1	1.2	1.3	1.4
United States	.96	1.0	1.2	1.3	1.2
Yugoslavia					

Source: Based on OECD, National Accounts Statistics, Table 5a.

Notes: a/ 1966. b/ less than .005.

TABLE A.4 . Total public educational expenditure as per cent of GNP

Country	1965	1970	1975	1977
Australia	3.6	4.3	6.5	6.3 a
Austria	3.7	4.6	3.7	5.5
Belgium	4.2		6.2	6.5
Canada	6.0	8.5	7.9	8.0
Denmark	5.7	6.8	7.8	6.7
Finland	6.0	6.2	6.7	7.0
France	4.2	4.7	5.8	5.8
Germany	3.0	3.4	4.4	4.2 a
Greece	2.3	2.0		
Iceland	3.4	3.9	4.2	
Ireland	4.2	4.9	6.5	6.2
Italy	5.2	4.3	5.0	5.1 a
Japan	4.3	3.9	5.5	5.4
Luxembourg	4.3	4.4	5.0	5.2
Netherlands	6.3	7.7	8.7	8.4
New Zealand	3.8	4.9	5.5	5.4
Norway	5.3	5.9	7.1	7.6
Portugal	1.4	1.6	3.7	3.6
Spain	1.6	2.1		2.2 a
Sweden	6.2	7.7	7.4	8.4
Switzerland	4.2	4.2	5.1	5.2
Turkey	3.7	2.9		5.4
United Kingdom	5.1	5.2	6.4	6.2 a
United States	5.3	6.4	6.2	6.4
Yugoslavia	4.3	4.7	5.2	5.0

Source: Based on Unesco, Statistical Yearbook, various issues.

Note: a/ 1976.

TABLE A.5 Public current educational expenditure as per cent of total public educational expenditure

Country	1965	1970	1975	1977
Australia	77.9	81.1	83.1	86.5 a
Austria	79.1	77.8	78.5	81.4
Belgium	91.5		91.7	91.5
Canada	75.0	84.5	89.7	89.9
Denmark	75.8	77.4	86.9	87.9
Finland	81.3	89.8	87.5	86.7
France				
Germany	67.0	72.1	78.1	80.9 a
Greece		81.6		
Iceland	75.5			
Ireland	81.0	83.9	86.3	85.7
Italy	83.0	97.2	89.2	88.0 a
Japan	76.0	72.7		
Luxembourg	75.5	74.2	77.7	80.1
Netherlands	78.9	79.7	82.2	85.0
New Zealand	78.7	74.4	79.7	83.0
Norway	74.1	77.5	80.6	81.0
Portugal	85.2	90.8	93.6	92.2
Spain	75.9	66.6		87.3 a
Sweden	79.2	82.0	90.8	89.9
Switzerland	80.2	74.2	80.9	85.2
Turkey	76.3	71.0		80.9
United Kingdom	77.6	85.2	89.6	90.9 a
United States	80.3	86.7	90.2	91.1
Yugoslavia	86.9	91.2	88.3	86.2

Source: Based on Unesco, Statistical Yearbook, various issues.
Note: a/1976.

TABLE A. 6 . Elasticity coefficients of public expenditure on education in relation to GNP

Country	1965-71	1971-77
Australia		
Austria	1.54	1.21
Belgium	1.27	1.17
Canada	1.67	.93
Denmark	1.28	.86
Finland	1.09	1.17 a
France	1.26	1.27
Germany	1.54	1.34 a
Greece	.55	1.05 b
Iceland	1.36	1.15 c
Ireland	1.34	1.20
Italy	.85	1.10 a
Japan		
Luxembourg	1.43	.98
Netherlands	1.40	1.12 a
New Zealand		
Norway	1.34	1.27
Portugal	1.25	2.23 a
Spain	1.90	1.04 a
Sweden	1.48	1.10
Switzerland	1.06	1.50
Turkey	1.02	1.30
United Kingdom	1.10	1.20 a
United States	1.48	.96
Yugoslavia	1.09	1.01

Source: Based on Unesco, "Development of Education in Europe: A Statistical Review," Sofia Ministerial Conference, 1980.

Notes: a/ 1971-76 b/ 1971-74 c/ 1971-75

TABLE A.7 • Total public educational expenditure as per cent of all public expenditure

Country	1965	1970	1975	1977
Australia	11.2	13.3	14.8	16.2 a
Austria	6.4	8.1	8.5	8.2
Belgium	16.9		22.2	19.2
Canada	18.5			33.2
Denmark	22.8	16.9	15.2	
Finland			16.7	12.9
France				
Germany	9.2	12.0	9.1	8.8
Greece	12.2	9.6		
Iceland	13.8	17.7	13.3	
Ireland		10.8	10.8	11.2
Italy			11.7	9.3 a
Japan	22.7	20.4	17.5	6.5
Luxembourg	14.2	14.8	15.0	14.1
Netherlands	26.3	29.4	23.7	25.4
New Zealand	11.1	14.3		
Norway	26.8	15.5	14.7	14.4
Portugal	8.6	9.5	16.4	14.5 a
Spain	11.0	15.2		16.8 a
Sweden			13.4	12.7
Switzerland	20.4	18.4	19.4	18.9
Turkey	19.4	13.7		
United Kingdom	13.4	14.1	14.0	14.3 a
United States	18.0	19.4	18.1	17.7
Yugoslavia				

Source: Based on Unesco, Statistical Yearbook, various issues

Note: a/ 1976

TABLE A. 8 • Government consumption expenditure on education as per cent of total Government consumption expenditure

Country	1961	1965	1970	1975	1978
Australia	21.9	20.7	24.2	29.8	30.6
Austria		15.1	18.2	20.4	
Belgium	32.9	35.5	38.3	39.9	38.8
Canada					
Denmark					
Finland					
France					
Germany					
Greece	14.3	14.3	14.7	12.7	15.1
Iceland					
Ireland					
Italy			25.3	26.3	28.2
Japan			36.8	37.8	38.0
Luxembourg					
Netherlands	29.5	34.0	34.7	38.2	36.5
New Zealand					
Norway	27.5	29.2	32.0	32.0	30.3
Portugal	11.1	9.8	11.5	22.9	
Spain			13.7	14.6	
Sweden		25.0	25.0	21.0	
Switzerland					
Turkey		22.1	18.1		
United Kingdom	15.6	18.3	21.1	23.5	21.5
United States	17.0	19.7	22.9	26.5	26.4
Yugoslavia					

Source: Based on OECD, National Accounts Statistics, Table 3a

TABLE A. 9 • Government consumption expenditure on defence as per cent of total Government consumption expenditure

Country	1961	1965	1970	1975	1978
Australia	25.8	30.2	25.4	13.9	13.6
Austria		9.1	7.3	6.2	
Belgium	24.7	22.7	18.3	16.2	15.9
Canada					
Denmark					
Finland					
France					
Germany	23.9	25.7	18.5	14.9	14.0
Greece	35.7	28.6	36.8	44.1	41.1
Iceland					
Ireland					
Italy			13.8	12.4	12.0
Japan			9.9	8.5	8.5
Luxembourg					
Netherlands	29.5	26.0	20.5	17.1	16.3
New Zealand					
Norway	25.5	25.0	23.0	19.1	16.3
Portugal	48.5	55.3	50.4	28.8	
Spain			20.0	18.9	
Sweden		25.0	16.7	14.1	
Switzerland					
Turkey		31.6	26.7		
United Kingdom	37.8	35.0	26.7	22.2	22.4
United States	50.0	42.7	39.9	30.6	28.5
Yugoslavia					

Source: Based on OECD, National Accounts Statistics, Table 3a

TABLE A. 10. Government consumption expenditure on health as per cent of total Government onsumption expenditure

Country	1961	1965	1970	1975	1978
Australia	12.3	12.7	13.3	20.1	20.2
Austria		24.2	23.6	23.9	
Belgium					
Canada					
Denmark					
Finland					
France					
Germany					
Greece	7.1	9.5	9.9	7.8	8.6
Iceland					
Ireland					
Italy			20.7	22.2	20.8
Japan			4.5	4.1	3.6
Luxembourg					
Netherlands					
New Zealand					
Norway			5.7	8.0	13.2
Portugal	5.1	7.6	11.1	19.0	
Spain			8.2	13.5	
Sweden		20.0	22.2	23.9	
Switzerland					
Turkey		8.4	8.6	21.3	22.4
United Kingdom	20.0	18.3	21.1		
United States	4.3	4.3	4.8	6.2	6.3
Yugoslavia					

Source: Based on OECD, National Accounts Statistics, Table 3a

TABLE A. 11 . Decomposition of the share of public current education expenditure in GNP, 1970

Country	Per cent GNP	Demographic ratio	Enrolment ratio	Cost ratio
Australia				
Austria	3.30	.327	.478	.211
Belgium				
Canada				
Denmark				
Finland				
France	3.21	.363	.567	.156
Germany	2.25	.318	.475	.149
Greece	1.38	.341	.478	.085
Iceland				
Ireland				
Italy	3.79	.329	.489	.235
Japan	2.66	.382	.453	.155
Luxembourg				
Netherlands	5.06	.395	.621	.206
New Zealand	5.72	.353	.527	.308
Norway				
Portugal				
Spain	1.10	.375	.312	.094
Sweden	5.16	.314	.582	.283
Switzerland				
Turkey				
United Kingdom	3.56	.338	.538	.196
United States	5.29	.411	.620	.208
Yugoslavia	3.86	.399	.487	.199

Source: OECD, Statistics on Education, Second Edition

TABLE A. 12 . Decomposition of the share o_ public current education expenditure in GNP, 1975

Country	Per cent GNP	Demographic ratio	Enrolment ratio	Cost ratio
Australia				
Austria	4.01	.336	.503	.237
Belgium				
Canada	4.81	.414	.641	.181
Denmark				
Finland				
France	3.38	.355	.602	.158
Germany				
Greece				
Iceland				
Ireland	3.63	.412	.641	.138
Italy	4.03	.353	.530	.215
Japan				
Luxembourg				
Netherlands	4.53	.381	.677	.176
New Zealand				
Norway	5.15	.346	.561	.266
Portugal				
Spain	1.07	.371	.360	.080
Sweden	4.97	.301	.634	.260
Switzerland				
Turkey				
United Kingdom				
United States	5.43	.396	.626	.219
Yugoslavia	4.43	.388	.481	.237

Source: Based on OECD, Statistics on Education, Second Edition.

TABLE A.13 Higher education share of public current expenditure on education (per cent)

Country	1965	1970	1975	1977
Australia				
Austria	12.2	13.4	14.7	15.3
Belgium	10.8	13.3	15.3	16.1
Canada	20.5	27.5	26.3	26.3
Denmark	18.5	20.8	20.8	17.5
Finland	7.6	9.8	12.8	12.7
France	11.0	17.4	13.7	13.6
Germany	19.4	18.4	15.0	15.1 a
Greece		15.5	13.5	
Iceland				
Ireland	9.9	13.9	17.7	18.5
Italy	7.7	8.8	13.3	12.0 a
Japan	11.0	12.7	10.2	11.1
Luxembourg	1.8	1.8	2.2	1.8
Netherlands	17.7	22.1	28.3	28.0
New Zealand	14.1	23.3	23.4	23.4
Norway	11.6	12.2	13.3	14.1
Portugal	10.7	10.9		10.8
Spain		18.2		15.1 a
Sweden	12.2	14.5	12.3	11.0
Switzerland	18.5	17.5	17.0	16.5
Turkey				14.5
United Kingdom		24.8	21.1	19.9 a
United States	25.9	29.5	32.5	30.1
Yugoslavia	15.6	14.8	15.2	17.2

Source: Based on Unesco, Statistical Yearbook, various issues.
Note: a/1976.

TABLE A. 14. The higher education share of public capital expenditure on education (per cent)

Country	1965	1970	1975	1976
Australia				
Austria		17.6	17.7	12.2 a
Belgium			16.7	9.7
Canada	32.5	42.4	34.3	34.3
Denmark	22.6	22.0	16.4	
Finland	9.8	18.9	45.3	51.1
France	25.0	21.4	13.0	11.5
Germany	27.6	32.4	18.7	
Greece		13.9	73.2 b	
Iceland	2.8	71.1 c		
Ireland	11.7	14.9	19.5	19.6
Italy		37.5	10.5	11.5
Japan	21.0	12.3	6.8	7.4
Luxembourg	7.5	10.1	10.5	6.5
Netherlands	35.4	33.1	20.6	25.2
New Zealand	29.7	30.8 d	26.7	27.5
Norway			12.1	13.4
Portugal	2.4	10.9 b	20.8	20.7
Spain		20.8		21.5
Sweden				
Switzerland		17.6	20.3	21.3
Turkey		44.2		
United Kingdom		24.1	17.4 b	
United States	41.1	40.7	39.4	40.4
Yugoslavia	19.0	18.6	16.9	15.6

Source: Based on Unesco, Statistical Yearbook, various issues

Notes: a/ 1977 b/ 1974 c/ 1971 d/ 1969

TABLE A.15 Average annual growth rate of public current educational expenditure (in current prices)

Country	1960-65	1965-70	1970-75
Australia	26.32		
Austria	12.17	13.23	26.02
Belgium			..
Canada		20.67	8.64
Denmark		11.59	24.96
Finland	9.56	10.99	19.99
France	16.70	11.02	20.24
Germany	7.36	15.72	25.35
Greece			
Iceland			
Ireland	..	5.98	22.79
Italy	14.18	9.29	15.01
Japan	16.34	14.00	26.99
Luxembourg			
Netherlands		12.30	18.46
New Zealand	12.14	32.03	12.79
Norway	11.06	23.12	17.92
Portugal	4.76	15.16	40.69
Spain		16.59	22.04
Sweden	14.55	18.49	15.66
Switzerland		6.72	31.51
Turkey			
United Kingdom		6.53	23.98
United States		13.76	10.16
Yugoslavia		13.97	21.58

Source: OECD, Statistics on Education, Second Edition.

TABLE A. 16. Average annual growth rate of public current expenditure on higher education (in current prices)

Country	1960-65	1965-70	1970-75
Australia			
Austria	13.72	16.63	28.86
Belgium			
Canada			
Denmark		16.87	16.71
Finland		17.30	33.06
France	15.41	24.71	19.34
Germany	18.05	14.89	17.66
Greece			
Iceland			
Ireland			27.64
Italy			
Japan	13.70	18.07	21.75
Luxembourg			
Netherlands			40.48
New Zealand	14.12	42.49	10.48
Norway	16.79	28.07	20.63
Portugal	7.04		
Spain			
Sweden	23.41	28.09	12.23
Switzerland			28.90
Turkey			
United Kingdom		8.12	
United States		17.89	12.61
Yugoslavia		41.91	22.71

Source: OECD, Statistics on Education, Second Edition

TABLE A. 17 . Decomposition of the share of public current expenditure on higher education in GNP, 1970

Country	Per cent GNP	Demographic ratio	Enrolment ratio	Cost ratio
Australia				
Austria	.41	.678	.113	.534
Belgium				
Canada				
Denmark				
Finland				
France	.36	.849	.178	.240
Germany	.43	.661	.117	.553
Greece	.09	.724	.125	.101
Iceland				
Ireland				
Italy				
Japan	.37	.104	.362	.987
Luxembourg				
Netherlands	.89	.897	.146	.677
New Zealand				
Norway	.70	.818	.145	.590
Portugal				
Spain	.24	.763	.951	.336
Sweden	.78	.789	.238	.415
Switzerland				
Turkey				
United Kingdom	.76	.771	.116	.854
United States	1.44	.896	.312	.515
Yugoslavia	.58	.883	.124	.528

Source: Based on OECD, Statistics on Education, Second Edition.

Note: The demographic ratio is in x10 units

TABLE A.18 Decomposition of the share of public current expenditure on higher education in GNP, 1975

Country	Per cent GNP	Demographic ratio	Enrolment ratio	Cost ratio
Australia				
Austria	.56	.670	.178	.468
Belgium				
Canada	1.50	.960	.191	.817
Denmark	.97	.742	.256	.511
Finland	.58	.891	.224	.291
France	.37	.802	.221	.208
Germany				
Greece				
Iceland				
Ireland	.86	.837	.120	.852
Italy	.42	.693	.245	.246
Japan	.39	.741	.053	1.011
Luxembourg				
Netherlands	1.90	.834	.126	1.163
New Zealand				
Norway	.70	.758	.192	.481
Portugal	.30	.100	.075	
Spain	.18	.762	.246	
Sweden				
Switzerland				
Turkey				
United Kingdom				
United States	1.65	.959	.358	.481
Yugoslavia	.69	.939	.117	.633

Source: Based on OECD, Statistics on Education, Second Edition.

Note: The demographic ratio is in x10 units.

TABLE A. 19. Male population aged 20-24

(Thousands)

Country	1950	1960	1970	1975	1980	1985	1990
Australia	329	345	551	586	630	651	639
Austria	244	245	265	259	289	321	303
Belgium	331	288	370	385	414	430	403
Canada	551	596	914	1,073	1,247	1 263	1,083
Denmark	148	153	214	192	190	197	201
Finland	165	155	229	216	203	194	178
France	1,639	1,477	2,116	2,162	2,140	2 168	2,106
Germany	1,809	2,452	1,905	2,140	2,322	2,303	2,430
Greece	351	371	330	332	361	372	397
Iceland	6	6	9	10	11	12	11
Ireland	108	83	107	121	134	149	156
Italy	2,014	2,053	2,062	1,994	2,073	2.298	2,306
Japan	3,850	3,814	5,370	4,630	4,053	4 168	4,460
Luxembourg	12	11	12	14	14	14	12
Netherlands	404	410	608	577	593	622	607
New Zealand	73	78	117	132	150	162	153
Norway	119	109	161	156	157	157	170
Portugal	380	376	312	371	416		
Spain	1,329	1,140	1,278	1,302	1,488	1,593	1,594
Sweden	230	236	337	288	281	289	307
Switzerland	167	210	243	233	235	249	240
Turkey	978	1,178	1,532	1,830	2,281	2,651	2,871
United Kingdom	1,754	1,725	2,153	1,982	2,140	2,392	2,319
United States	5,745	5,569	8,645	9,679	10,520	0,317	9,033
Yugoslavia	771	734	868	1,009	965	937	914

Source: Based on OECD, Demographic Trends 1950-1990, Paris 1979

TABLE A. 20. Female population aged 20-24

(Thousands)

Country	1950	1960	1970	1975	1980	1985	1990
Australia	312	324	524	574	608	620	612
Austria	246	237	256	253	278	310	292
Belgium	324	285	354	364	383	393	367
Canada	557	582	913	1,056	1,211	1,226	1,053
Denmark	148	150	202	183	180	190	191
Finland	162	160	216	205	196	187	173
France	1,580	1,406	2,001	2,086	2,076	2,093	2,031
Germany	1,847	2,336	1,820	2,100	2,271	2,554	2,393
Greece	369	369	309	306	342	353	375
Iceland	6	6	8	10	11	11	10
Ireland	100	79	102	116	128	143	(149)
Italy	2,017	2,014	1,981	1,920	1,995	2,193	2,209
Japan	3,906	3,876	5,410	4,560	3,924	4,011	4,289
Luxembourg	11	11	11	14	13	13	12
Netherlands	396	396	577	553	570	597	583
New Zealand	69	75	115	125	146	156	148
Norway	113	102	152	146	151	151	159
Portugal	382	345	349	384	409		
Spain	1,352	1,099	1,233	1,311	1,437	1,528	1,524
Sweden	230	227	321	277	267	277	293
Switzerland	192	196	244	240	226	240	231
Turkey	961	1,127	1,391	1,663	2,083	2,426	2,639
United Kingdom	1,780	1,680	2,099	1,894	2,039	2,282	2,200
United States	5,886	5,566	8,539	9,550	10,398	10,192	8,920
Yugoslavia	813	803	839	966	923	896	877

Source: As in Table A.19

TABLE A.21. Labour force participation of males aged 20-24

(Percentages)

Country	1950	1960	1970	1975	1980	1985	1990
Australia		95.5	93.3	91.0			
Austria		90.5	87.8	88.4	87.7	87.7	87.4
Belgium	85.5	87.4	83.5	81.0	78.4	75.5	
Canada	91.7	90.4	88.5	86.4	78.4	77.3	75.1
Denmark	91.9	91.3	82.9	80.2	72.5	69.5	66.7
Finland	90.9	86.2	78.4	77.9	72.3	70.3	67.6
France	91.7	90.9	86.5	81.5	80.9	80.8	80.7
Germany	93.4	91.1	86.3	78.0			
Greece		56.6	49.0	46.2	42.1	42.2	42.0
Iceland	91.6	85.0	89.8	90.2	90.3	89.7	89.9
Ireland		90.0	88.9	91.9	91.9	91.0	
Italy		88.5	76.1	72.1	70.5	68.9	68.3
Japan		87.7	80.7	75.8	72.7	70.3	
Luxembourg		83.8	84.7	86.9	84.8	85.2	85.4
Netherlands		91.2	84.7	79.2	75.9	74.0	73.3
New Zealand		94.9	91.9	91.3	88.6	84.7	86.9
Norway		81.9	78.3	61.3			
Portugal		95.0	94.2	96.2			
Spain		90.4	80.2	79.2	82.5	82.0	82.1
Sweden	90.0	74.9	76.7	82.7	82.2	84.1	81.4
Switzerland		91.2	87.7				
Turkey		94.3	85.3	79.3			
United Kingdom		97.0	90.6	87.7	87.8	87.7	86.5
United States	90.4	91.4	85.3	84.5	85.5	85.4	85.0
Yugoslavia		91.3	82.7				

Source: As in Table A.19

TABLE A.22. Labour force participation rates of females aged 20-24

(Percentages)

Country	1950	1960	1970	1975	1980	1985	1990
Australia		50.0	62.6	65.8			
Austria		76.0	68.7	68.3	68.0	68.0	67.9
Belgium	42.7	51.3	60.9	64.6	67.9	70.5	
Canada	47.1	46.3	57.7	66.2	63.2	63.4	63.9
Denmark	48.6	58.9	67.0	74.3	65.9	63.0	59.9
Finland	64.2	60.8	63.8	64.1	63.1	64.3	63.7
France	53.6	58.6	62.0	65.9	70.1	73.4	76.6
Germany	70.4	75.7	69.8	69.1			
Greece		54.1	37.8	37.0	40.1	40.0	40.0
Iceland	51.1	45.0	59.8	61.1	60.2	59.8	60.0
Ireland		67.4	65.3	67.2	69.0	69.8	
Italy		40.9	43.2	45.3	49.2	50.2	51.4
Japan		70.6	70.5	65.7	63.9	61.6	
Luxembourg		49.2	53.3	54.1	53.8	53.4	53.3
Netherlands		52.8	55.2	60.8	61.9	62.6	64.2
New Zealand		49.5	53.8	57.2	56.3	55.1	56.9
Norway		47.7	48.4	56.8			
Portugal		26.5	47.1	71.9			
Spain		28.2	45.0	47.9	58.0	59.2	61.0
Sweden	57.2	57.3	65.2	73.7	77.2	82.7	84.3
Switzerland		69.9	71.2				
Turkey		65.8	53.1	42.2			
United Kingdom		60.4	61.6	65.4	67.2	67.2	66.7
United States	45.6	46.5	57.3	64.0	70.6	76.7	80.3
Yugoslavia		53.2	56.4				

Source: As in Table A.19

TABLE A. 23 . Female enrolment in higher education

(per cent)

Country	1965	1970	1975
Australia		39.6	44.6
Austria	24.2	28.9	35.6 a
Belgium	32.7	38.2	41.5
Canada	38.4	39.2	41.3 b
Denmark	34.3	37.8	41.1
Finland	50.9	48.5	50.3
France	40.3		
Germany	18.8	26.1	33.7
Greece	30.2	31.3	35.0
Iceland			
Ireland	29.5	34.0	38.6
Italy	32.9	37.2	38.5 b
Japan	24.2	28.0	30.1 b
Luxembourg			
Netherlands	25.2	26.3	30.5
New Zealand		38.8	39.8
Norway	38.7	37.7	40.9 a
Portugal	37.5	43.8	42.6
Spain	28.1	28.3	36.4
Sweden		44.6	45.3 b
Switzerland			
Turkey	21.0		
United Kingdom		40.0	41.7 a
United States	38.9	41.5	44.8
Yugoslavia	33.5	39.4	40.9 a

Source: OECD, "Development of Post-secondary Education in OECD Countries since 1965," 20 August 1979.

Notes: a/ 1974 b/ 1973 c/ 1966

TABLE A. 24 . The share of non-university public current expenditure in overall higher education expenditure

Country	1965	1970	1975	1977
Australia				44.9
Austria			.3	.6
Belgium				
Canada		20.5	26.1	27.1
Denmark			5.3	
Finland			.3	
France	6.4	9.9	31.1	29.5
Germany		9.4		
Greece		3.5		
Iceland				
Ireland				
Italy				
Japan				
Luxembourg				
Netherlands	.8	14.6	24.9	26.2
New Zealand				
Norway				
Portugal				
Spain				
Sweden		3.2	18.7	29.9
Switzerland				
Turkey				
United Kingdom	35.1			
United States				
Yugoslavia				

Source: Unesco questionnaire, unpublished tabulations

TABLE A.25 . Enrolment ratios in higher education by type of institution, early 1970's

Country	Year	Non-university	University	(Non-university / University)
Australia	1971	.8	3.4	.24
Austria	1970	.5	4.7	.11
Belgium				
Canada	1970			.33 a
Denmark	1970	2.2	4.8	.46
Finland				
France	1970	1.6	8.5	.19
Germany	1971	1.8	6.1	.30
Greece	1972	1.0	4.3	.23
Iceland				
Ireland				
Italy				
Japan	1970			.11 a
Luxembourg				
Netherlands	1970	3.7	4.4	.84
New Zealand	1970	1.4	5.7	.25
Norway	1970	5.1	4.9	1.04
Portugal				
Spain	1970	3.1	4.4	.70
Sweden				
Switzerland				
Turkey				
United Kingdom	1970	1.5	3.5	.43
United States	1970	4.1	16.2	.25
Yugoslavia				

Source: Based on OECD, Statistics on Education, Second Edition except a/ based on Unesco questionnaire, unpublished tabulations

TABLE A. 26 • Enrolment ratios in higher education by type of institution, circa 1976

Country	Year	Non-university	University	(Non-university / university)
Australia	1976	3.1	4.0	.78
Austria	1976	.3	8.1	.09 a
Belgium	1976			.09
Canada				
Denmark	1976	4.7	7.2	.65
Finland				
France	1976	2.2	8.6	.26
Germany	1976	2.4	8.0	.30
Greece	1973	1.9	6.9	.28
Iceland				
Ireland	1975	2.3	5.0	.46
Italy				
Japan	1976	1.9	12.8	.12 a
Luxembourg				
Netherlands	1976		6.2	
New Zealand	1976	1.1	6.1	.18
Norway	1976	4.5	5.2	.29
Portugal	1975	1.1	3.4	.32
Spain	1975	.7	9.3	.08
Sweden	1975	2.3	7.1	.32
Switzerland	1976	2.1	5.7	.37
Turkey				
United Kingdom	1974	3.6	4.0	.90
United States	1976	5.2	18.7	.28
Yugoslavia				

Source: As in Table A. 25

TABLE A. 27 . The graduate-student ratio, late 1960's

Country	Year	Ratio
Australia		
Austria	1969	.09
Belgium	1965	.11
Canada	1970	.21
Denmark		
Finland	1970	.13
France	1966	.08
Germany	1969	.24
Greece	1969	.11
Iceland	1970	.08
Ireland	1965	.19
Italy	1969	.09
Japan	1970	.17
Luxembourg		
Netherlands	1969	.03
New Zealand		
Norway	1970	.09
Portugal		
Spain	1969	.06
Sweden	1970	.14
Switzerland	1969	.11
Turkey	1969	.27
United Kingdom	1969	.20
United States	1969	.14
Yugoslavia	1969	.09

Source: Based on Unesco, Statistical Yearbook, various issues

Note: Refers to Unesco "level B" qualifications

TABLE A. 28 . The graduate-student ratio circa 1977

Country	Year	Ratio
Australia	1977	.16
Austria	1976	.06
Belgium	1977	.16
Canada	1977	.19
Denmark	1977	.11
Finland	1977	.15
France		
Germany	1976	.09
Greece	1977	.12
Iceland		
Ireland	1977	.20
Italy	1976	.08
Japan	1976	.18
Luxembourg		
Netherlands	1976	.07
New Zealand	1976	.11
Norway		
Portugal	1977	.18
Spain	1976	.05
Sweden	1976	.21
Switzerland	1976	.11
Turkey	1976	.15
United Kingdom		
United States		
Yugoslavia	1976	.09

Source: As in Table A.27
Note: Refers to Unesco "level 6" qualifications

TABLE A.29 . Grants and welfare expenditure as per cent of total public current higher education expenditure

Country	1976	1977
Australia		
Austria		15.4
Belgium		
Canada		19.6
Denmark		.1
Finland	16.5	19.5
France		14.1
Germany		
Greece	9.5 a	
Iceland		
Ireland	6.8	5.0
Italy	25.3	
Japan	.7	.6
Luxembourg		8.5
Netherlands	6.7	6.7
New Zealand		
Norway		
Portugal	26.2	23.3
Spain	30.0	
Sweden		
Switzerland	6.4	5.6
Turkey		20.3
United Kingdom		
United States		
Yugoslavia		

Source: Based on Unesco, Statistical Yearbook, various issues

Note: a/ 1974