

## **RESOURCE IMPLICATIONS OF DEMOGRAPHIC CHANGE FOR EDUCATION**

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### **1. INTRODUCTION**

The aims of the paper\* are as follows:

- to establish how much has been spent in real terms on core education activities at each level over the last fifteen years;
- to derive projections of future resource requirements of the Department of Education in the light of recent and projected demographic change; and
- to assess the likely implications of such change.

#### *Background*

Ireland's demographic profile is unique in the EU. High fertility rates have resulted in the youngest population in Europe, with 44 per cent of the country's inhabitants aged under 25 in 1991. This skewness in the population profile coupled with increasing participation by older children in education necessitated the development of a school system designed to cope with almost one million students.

The sharp decline in the number of annual births since 1981, will have major implications for the education system over the next two decades. Numbers enrolled at first level have already begun to decline, from a peak of 0.57m in 1987 to 0.52m last year.

Although extensive projections of pupil numbers have been prepared, the implications of falling numbers on the level and distribution of required Exchequer resources has not been investigated in great detail. The absence of research in this area is worrying given

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\*This paper is based on a report prepared by the author as part of the requirement for an M.Sc. in Trinity College, Dublin. The author is responsible for the views expressed and errors contained in the paper.

the level of public expenditure - £1.7bn. (6.0 per cent of GDP) on core activities in 1993 - and the importance of teaching staff as a proportion of the labour force (total teaching staff at all levels of 48,000 accounted for 4.3 per cent of persons employed in 1993). This paper aims to address this gap and provide an assessment of the possible impact of demographic change on the Irish education system.

### *Scope*

Constraints of time, expertise and resources have imposed a number of constraints on the scope of this paper. It was not possible to carry out an exhaustive investigation of all aspects of such a broad topic. Too broad an approach risks the production of a superficial and ineffectual analysis while restricting coverage to one or two areas would preclude the presentation of a global picture.

In an attempt to strike a balance, it was decided to limit the scope of the paper to what might be called "core activities" within the four education votes - i.e. activities at each of the three levels of the Irish education system as well as the cost of central administration of the system by the Department of Education (DoE). In keeping with previous studies such as those by Murphy (1983) and Tussing (1978), peripheral activities which would be regarded as educational only in a broader sense (e.g. youth and sport expenditure, funding of the National Museum and Art Gallery) are excluded. Furthermore, the introduction of National Lottery funding of these areas (£36m in 1994) could, if included, distort spending trends. Excluded activities account for less than 2 per cent of total (gross) spending in 1993.

### *Depth*

Essentially, the paper provides a broad brush picture of possible developments and omits certain aspects which should ideally be included in a more comprehensive report. Analysis is based on global student numbers and does not cater for regional variation. Regional and local trends may not follow national trends and although the national picture may indicate a significant reduction say in the number of school buildings needed (and consequently in capital investment), local population increases may necessitate some new construction work.

While regional trends should ideally be taken into account, this would be unrealistic given the scale of work and depth of local knowledge which would be required. Moreover, the type of data used in the preparation of this paper mainly takes the form of aggregate public expenditure in different aspects of education and is not available at subregional level.

### *Projection Period*

Long-term planning is of considerable importance in an area so responsive to demographic trends. Forecasts cover a twenty year span and projections are supplied for two sample years - 2005 and 2015. This period was selected to coincide with work currently being undertaken by a Steering Committee established under the aegis of the Higher Education Authority on (inter alia) projected demand for higher education and the resource implications of this demand.

### *Structure of Paper*

The next section describes the data sources and methodology. Section 3 provides an overview of the main trends in real expenditure on core activities and by educational sector while the assumptions and forecasts based thereon are outlined in section 4. Sensitivity analyses are provided in section 5 while the final section assesses some of the implications of forecast requirements.

## **2. METHODOLOGY**

This section outlines first the data sources used and describes the attempt to construct a consistent time series. Next, the DoE's pupil projections are examined in the light of the recent developments. Finally, the forecasting approach chosen is briefly explained.

### *Data Sources*

Three categories of data were used: financial (past and present expenditure), numerical (student and teacher numbers) and demographic (concerning fertility and migration patterns).

Financial data was culled primarily from the Revised Estimates for Public Expenditure. Although it is more usual to use the Appropriation Accounts, the Estimates were preferred as they are more user-friendly and supply clearer and more comprehensive explanations of subheads' contents. There is little danger that the use of the provisional outturn figures in the Estimates would lead to significant inaccuracies - comparison with the relevant figures in the Appropriation Accounts for a number of years showed only very minor variations of less than 1 per cent.

A number of secondary sources were used when clarification or more detail was required. Financial statements in the DoE annual statistical report enabled the apportionment of school transport and central administration costs (part of the Minister's Office Vote) to each sector. University accounts were also examined so that an estimated pay/non pay breakdown of block Higher Education Authority (HEA) grants could be made.

The main source for student and teacher numbers is the DoE statistical report with additional data on pupil projections provided by the Statistics section of the DoE.

Demographic data is drawn from the CSO's Population and Labour Force Projections as DoE enrolment forecasts are linked to one of the core projections contained in the CSO document. Since its publication in 1988, a substantial quantity of additional information has been published and this is used to determine the likelihood of significant deviation from assumptions used by the DoE. (In this connection it should be noted that at the time of writing, work on new CSO projections was in progress). EUROSTAT reports on Population and Demographic Trends are also referred to.

### *Construction of Expenditure Time Series*

A necessary first step in the prediction of future education expenditure is to establish the level and distribution of present and past education spending. This is by no means a simple task. Tussing (1978) refers to the absence of single source published data in this regard and notes that *"While information on public expenditures does exist, it must be drawn together from a variety of sources, and the person doing so is left to his or her own devices in interpreting data sources and their comparability"*. Since the publication of Tussing's report, the DoE has altered the composition of the financial statements in its Statistical Report which now gives details on overall current and capital spending by Vote and broad heading. Unfortunately, these tables, while useful, only cover items falling within the education Votes and also include spending on non-core activities. Movements between the four votes<sup>1</sup> and to and from non-education Votes are quite common even over a period as short as fifteen years.

The only way therefore to ensure consistency was to construct a brand new series - a time-consuming task which involved wading through books of estimates for the last fifteen years. The series is concerned only with central Exchequer expenditure. Payments made to Local Authorities are included but amounts spent by them from their own resources are not. Similarly, co-funding by school or diocesan authorities is not covered. Details of omissions, inclusions and allocations between the three education sectors are attached in the Appendix.

Expenditure in the Minister's Office Vote is excluded with the exception of central administration and school transport costs which are allocated between sectors on the basis of the DoE's approach<sup>2</sup>. Excluded expenditure in this Vote which is not funded from the National Lottery accounts for only a tiny proportion (0.2 per cent) of overall spending.

On completion of the allocation of expenditure by level, amounts are classified under six broad headings:

- Administration (covering DoE costs)
- Teacher Pay
- Teacher Pensions
- Capitation (including grants to third level students)
- Other Current (including salaries of non-teaching staff)
- Capital

This facilitates forecasts of expenditure in each area by educational sector. In many cases, classification by type was problematic. Almost 40 per cent of third level expenditure<sup>3</sup> in 1993 is accounted for by block grants paid to colleges via the HEA. Some notional breakdown by type of such a large amount is critical to the success of the prediction exercise. As state funding forms only part of the colleges' income, it was decided that the grants should be sub-divided in proportion to total college spending. This was done after examination of financial accounts for the four universities (DCU, NUI, TCD, UL) which received 98% of HEA grants in 1993. Pay/non-pay breakdowns also had to be made for a number of other institutions (breakdowns of outturn figures are not always supplied in the Estimates).

#### *Conversion to Real Expenditure*

A key issue here is the choice of deflator. The problem and its solution is well summarised by Dennison (1984): *"If all prices changed at the same rate it would be easy to convert every expenditure, whenever made, to a base year... However, relative price changes as the name implies, are never as simple as that, and differential allowances have to be calculated"*. These concerns are echoed by Murphy in the NESC report "Education: The Implications of Demographic Change" (1983) where he states that *"Projections of current costs are hazardous, particularly in view of the relative price effect..."*.

So what deflator should be used? The CPI would seem inappropriate since it is based on consumer expenditure. Amounts spent should be seen from the State's point of view in terms of the relative costs of supplying services. Previous reports provide no consistent guidance. Support for the implicit GDP deflator comes from Tussing (1978) while a report on the Irish educational system submitted by the DoE to the OECD (1989) used two different indices - the CPI and the implicit price index for public consumption - in separate chapters. A report by the Radical Statistics Education Group (1987) notes that similar confusion exists in the UK.

In the absence of any clear precedent and bearing in mind the comments of Dennison and Murphy referred to above, it was decided to select a dual deflator. The first of these - the index of "Net expenditure by public authorities on current goods and services" - is applied to current expenditure. The second - "Gross domestic physical capital formation" - is used to deflate amounts spent on capital items.

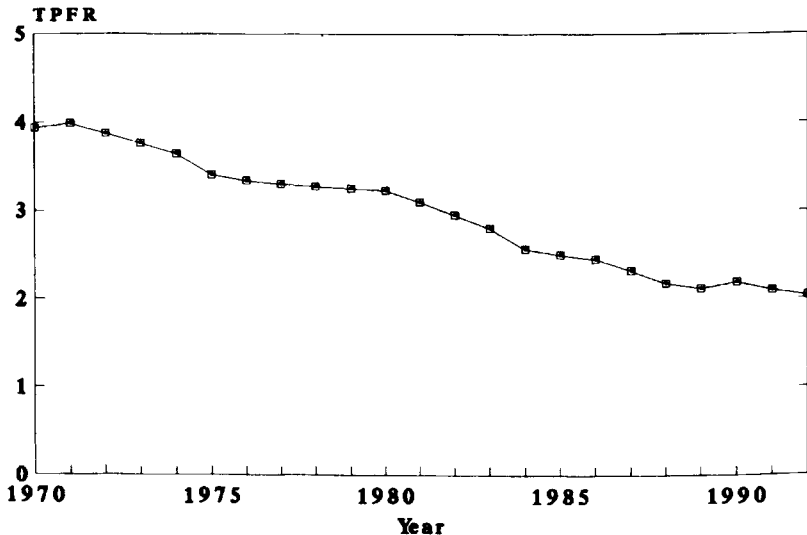
## Projecting Enrolments

As stated in the introduction, the purpose of this section is not to second-guess the DoE's forecasts, but to examine the underlying assumptions in the light of recent data. Forecasts made in October 1992 supplied by the Statistics Section cover enrolments to 2005, while additional figures to 2013 were also made available. The three key assumptions underlying the forecasts concern future fertility, migration and participation rates. It is worth examining these to ascertain whether any significant divergence is likely and what the impact of such divergence would be. The primary focus is on fertility since the impact of variations in future numbers of births is likely to have a much greater long-term impact on enrolments than changes in migration patterns.

### (a) Fertility

The DoE uses the CSO assumption F1 which envisages a Total Period Fertility Rate (TPFR)<sup>4</sup> of 2.1 (replacement rate) over the entire projection period. Figure 2.1 shows that the TPFR fell steadily from 3.98 in 1971 to 2.12 in 1989. Although figures for 1990 (2.19) and 1991 (2.10) would seem to indicate at least a temporary halt to the fall, further decline seems likely. The rate of decline has been erratic and almost levelled out in the late 1970s before plummeting again and an apparent stabilisation in recent years may be no more than another quirk in the downward trend.

**Figure 2.1 Total period fertility rate, Ireland 1970-1992**



Recent information on birth statistics indicates that further reductions in fertility rates should be expected. The total number of births has fallen steadily since 1990.

Almost 53,000 births were registered in 1990 but a slight fall in 1991 was followed by a much sharper fall of 1,600 in 1992. Registrations for the first three quarters of 1993 are well down on 1992 and if the trend continues for the fourth quarter, total births will fall to around 48,600 (a reduction of more than 4,000 or 8% in just 3 years).

The experience of other EU member states provides further support for the assumption of continued decline. Table 2.1 shows that despite the sharp decline in recent years, Ireland's TPF<sub>R</sub> remains by far the highest in the EU. There would appear to be considerable room for decline in Ireland's case as identified by the CSO fertility assumption (F2) which envisaged a fall to 1.75 by 2021. Post-replacement rate decline continued in every EU state with the average rate falling by 13% after five years and 23% after 10 years. The rate of decline in Ireland for the five year period (1984 - 1989) *prior* to replacement rate was about two thirds of the average rate of decline experienced by other EU states before they reached TPF<sub>R</sub> of 2.1. Assuming that this trend were to continue would yield a TPF<sub>R</sub> in this country of 1.8 by the turn of the century, much quicker than envisaged in the CSO projections.

**Table 2.1 Total period fertility rates in the EU for selected years**

| Country     | 1970 | 1980 | 1990 |
|-------------|------|------|------|
| Belgium     | 2.20 | 1.67 | 1.62 |
| Denmark     | 1.95 | 1.55 | 1.67 |
| France      | 2.48 | 1.95 | 1.78 |
| Germany     | 2.02 | 1.44 | 1.45 |
| Greece      | 2.34 | 2.09 | 1.42 |
| Ireland     | 3.87 | 3.23 | 2.19 |
| Italy       | 2.43 | 1.69 | 1.26 |
| Luxembourg  | 1.97 | 1.50 | 1.60 |
| Netherlands | 2.57 | 1.60 | 1.62 |
| Portugal    | 2.76 | 2.19 | 1.50 |
| Spain       | 2.84 | 2.22 | 1.33 |
| UK          | 2.44 | 1.89 | 1.84 |
| EU Average  | 2.45 | 1.92 | 1.59 |

*Source: Eurostat, various years*

In the light of this information, it is useful to consider an alternative fertility assumption. The total number of births for 1993 should fall to about 48,000 (TPF<sub>R</sub> approx. 1.9) and

further reductions should not be ruled out. It is assumed for the purposes of section 5 that births will continue to fall by 1,000 per year for the next three years, thereafter remaining constant (approximate TFR of 1.8 in 1997).

#### (b) Migration

The difficulty in estimating migration levels was noted in the CSO Population Projections (1988) where it was stated that "...the volatile nature of migration itself makes the projection of Irish population a very uncertain exercise even in the short term". Over the last century there has been considerable variation in migration patterns with average annual migration ranging between -42,000 (1956-61) and +13,600 (1971-79), while annual swings have in recent years been put as high as 30,000. The migration assumption used in the DoE projections is the core CSO assumption (M2) which envisages annual net outward migration of 25,000 to 1995 and 20,000 each year thereafter.

Although recent years have seen low net inward migration, the ESRI Medium Term Review (1994) forecasts that net outward migration will resume until at least 2000, although at a slower rate than experienced in the late 1980s. In this light, the CSO's assumption does not seem unreasonable.

#### (c) Education Participation Rates

The DoE are best placed to identify trends in this area and it is not proposed to question their expertise or methodology. Their expectation that participation rates will continue to rise is supported by the Medium Term Review which envisages a 1% annual increase over the next decade.

#### *Forecasting Method*

Despite the availability of vast quantities of published material on the subject, there is no simple solution to the problem of choosing the right forecasting method. Chatfield (1988) notes that "*There is still lively controversy as to the relative merits of different forecasting procedures. It is now generally accepted that no one method is 'best' in every situation given the wide variety of forecasting problems each requiring different treatment*". Freed from the shackles of accepted wisdom, he advises the analyst to select a method he feels happy with.

Should one opt for an automatic or non-automatic method? The use of the automatic approach by forecasters is similar to judges' reliance on legal precedents. Although wide judicial discretion may not lead to unjust decisions, there is a risk of inconsistency given the spectrum of views within the judiciary. Reliance on precedent is a self-imposed restriction on discretion, limiting the circumstances in which non-automatic decisions are required. Similarly, the advantage of automatic forecasting methods is that the user is



incapable of influencing (either deliberately or subconsciously) the outcome. Predictions have the merit of being transparent and protected against allegations of bias on the part of the forecaster.

Conversely, slavish adherence by the forecaster to the outcomes of automatic forecasting could per se be regarded as an error of judgement. A major disadvantage of automatic methods is their lack of flexibility. Historical data, although usually regarded as a cornerstone of future predictions, may bear no relation to likely future trends. Purely mechanical extrapolation based on such data may yield results so outlandish as to force even the most ardent advocate of automatic methods to rethink his or her strategy. The danger of producing misleading results is increased where influential policy changes have only recently or will shortly come into effect. In such circumstances some judgemental element is required.

Non-automatic methods allow greater flexibility but allowing unrestricted discretion weakens the theoretical basis for predictions. Some constraints must be retained in order to preserve at least an element of objectivity.

Chatfield makes a number of general recommendations concerning the choice of method. In particular he notes that "*complex models often give forecasts no better than simple models*" and that "*the analyst should be prepared to improvise and to apply subjective judgement to objective forecasts*". A quick glance at the historical data for the Irish education system (Tables A2 - A5) will show that some aspects of past expenditure display a consistent trend (e.g. growth in teacher pay) but that in other cases (notably capital expenditure) no clear pattern emerges. Events of particular years such as the spending cuts of the late 1980s may distort general patterns. Automatic forecasting alone therefore would seem inappropriate and some flexibility is required.

In an attempt to strike a balance between the objectivity of automatic methods and the flexibility allowed by non-automatic forecasting, it was decided to opt for a restricted form of non-automatic forecasting involving simple linear regression. Per pupil expenditure figures<sup>5</sup> for each education sector were disaggregated by type and regressed against time. Multiplying the resultant equations by projected enrolments at each level yielded estimated future expenditure. Judgement is then made as to the reliability of the forecasts. As rejection of results should not (in order to preserve objectivity) be taken lightly, figures were revised only where the original forecast yields a negative value or where additional external evidence supported revision.

### 3. HISTORICAL TRENDS

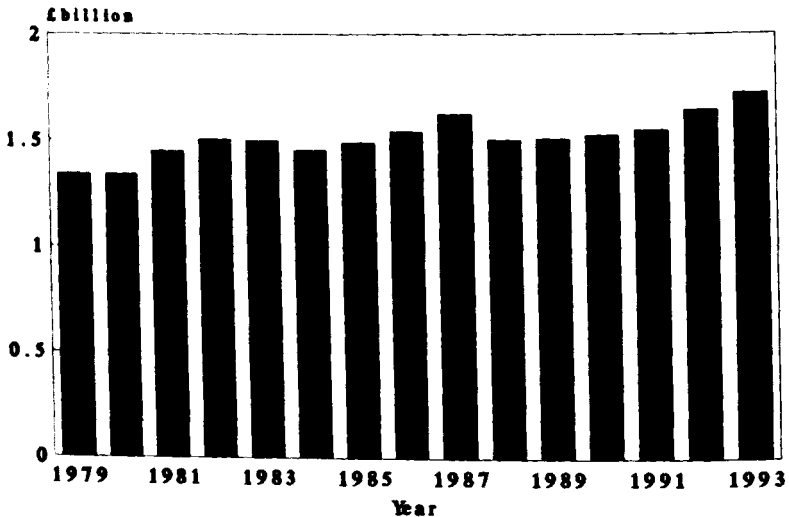
The aim of this section is to outline the main historical trends in Government spending on education over the last fifteen years. This task fulfils a dual role identified by Tussing: *"to examine present and recent data on school enrolments and expenditures..., not only so that we can understand them better, but so that we can use this information, along with other data and methods, to make as accurate a set of forecasts as we can..."*.

Total amounts (EU funding not deducted) spent on core education activities are set out in real terms and then expressed as a proportion of GDP. The steady rise in pupil numbers is outlined and expenditure per pupil figures derived. The section also looks at distribution of spending by educational sector and type of expenditure.

#### *Total Expenditure 1979 - 1993*

Total Government expenditure on core activities in 1993 amounted to £1.72bn. This represents an increase in real terms of almost £400m or 29% over 1979. However, as Figure 3.1 illustrates, this trend has not been uniformly upward.

**Figure 3.1 Real expenditure on core activities 1979-1993**



Although the Government is spending more in real terms on education now than at any other time, present expenditure is not significantly above 1987 levels. This reflects the severity of the public spending cuts which were introduced in the late 1980s in order to reduce the national debt. All areas of public spending suffered significant cuts, but it would appear that the effects on education have had a lasting impact.

Spending as a proportion of GDP has remained fairly constant over the period (see figure A1 in the Appendix) with a low of just under 5 per cent in 1990 and a high of around 6.2 per cent in 1981. The proportion fell after the 1987 cuts but has begun to recover and in 1993 stood at 6.0 per cent. By European standards the Irish proportion is quite high. Table 3.1 shows that in 1988 Ireland occupied a respectable mid-table position, well above wealthier nations such as the UK and Germany. By 1991, we had climbed to second place in a table of eight countries (data for France, Italy and Luxembourg unavailable). As a proportion of total public expenditure, Ireland is placed second behind Denmark.

**Table 3.1 Comparison of public education spending in the EU, 1988<sup>6</sup>**

| Country        | % GDP      | % Total Public Exp. |
|----------------|------------|---------------------|
| Denmark        | 6.8        | 11.6                |
| Netherlands    | 6.3        | 10.9                |
| Belgium        | 6.1        | 10.5                |
| Luxembourg     | 6.0        | -                   |
| <b>Ireland</b> | <b>5.8</b> | <b>11.5</b>         |
| France         | 5.1        | 10.2                |
| Italy          | 4.8        | 9.4                 |
| United Kingdom | 4.7        | 11.4                |
| Portugal       | 4.7        | 10.7                |
| Germany        | 4.3        | 9.1                 |
| Spain          | 3.9        | 9.7                 |

Source: *Education at a Glance, OECD (1992)*

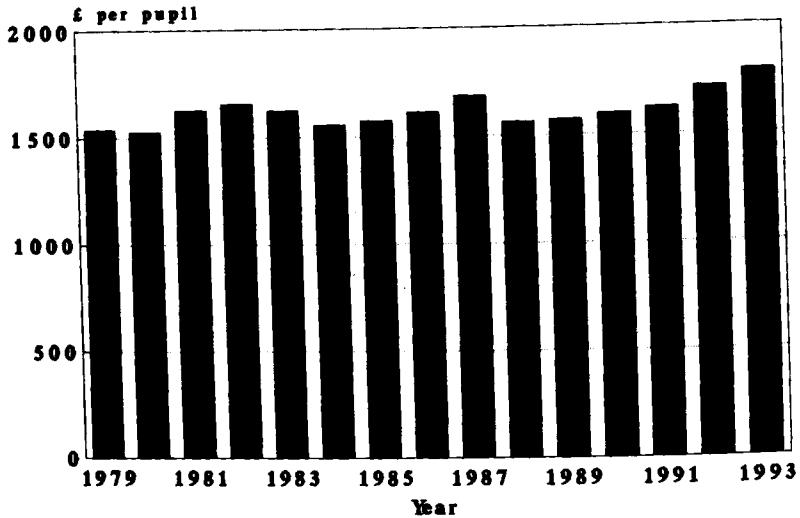
*Data for Greece unavailable.*

It should be noted that the table covers only public expenditure. In some cases, notably Germany (private funding equivalent to 1.9% GDP), the inclusion of private funding would make a significant difference. Simply spending a higher proportion of GDP on education does not necessarily indicate a better system. This is noted in an OECD (1991) review of Ireland's national policy on education which recognises that "*in order to provide the same variety and intensity of educational services as most other OECD countries, Ireland would have had to devote a much higher percentage of its GDP and its public expenditure to education simply because it was catering for greater numbers*"

So what happens when pupil numbers are taken into account? Total enrolments increased steadily throughout the 1980s to reach a peak of 0.96m in 1988. A gradual decline over the next few years was followed by renewed growth in 1992 and last year's total enrolment figure is only marginally (1,200) below peak levels. Per pupil

expenditure, as shown in figure 3.2, has varied considerably. Despite recent strong growth in expenditure, the figure for 1993 of almost £1,800 represents real growth of just 6 per cent over the pre-spending cuts situation in 1987.

**Figure 3.2 Real gross spending per pupil 1979-1993**

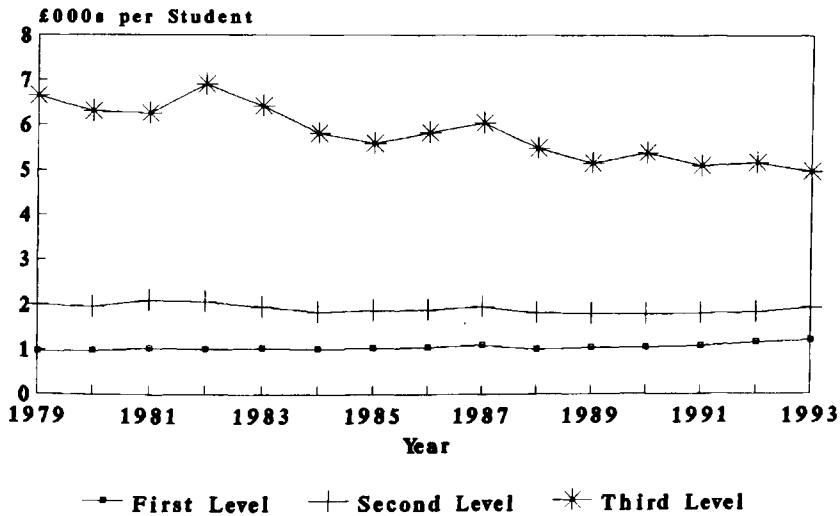


*Expenditure by Educational Sector*

Over 40 per cent of total education spending in 1993 went to second level. First level follows closely behind with 36 per cent. Although third level lags some way behind with less than a quarter of the spending cake, this represents a steady increase since 1979 (18 per cent) and reflects the sharp growth in third level enrolments (which have more than doubled in fifteen years).

As figure 3.3 illustrates, third level expenditure per student is much higher than in the other sectors. This is not surprising since a much greater and more expensive network of support services is required. Rapid growth in student numbers has however led to a sharp fall in the level of per capita support at third level (£5,100 in 1993 as against £6,700 in 1979). This may be partly explained by the concentration of recent expansion in relatively low cost courses such as business and humanities which, relative to more technical subjects (e.g. engineering, science) require less investment in expensive equipment and laboratories. Consequently, growth may be achieved at low marginal cost (additional teaching staff and perhaps space) and per student expenditure falls. Growth in expenditure has also been kept in check by an increasing staff-student ratio and a reduction in space per student.

Figure 3.3 Spending per student by sector, 1979-1993



The increase in per capita funding at first level in recent years is mainly attributable to falling enrolments. Similar increases have been recorded for second level even though enrolments have yet to peak. However, the 1993 figure of almost £2,000 per pupil remains only fractionally higher than the 1987 equivalent. This is partly explained by the lingering impact of the late 1980s spending cuts which appear to have had their greatest impact within education at second level. Non-pay current expenditure was trimmed by 10 per cent at first level but the equivalent reduction at second level was far higher at over 45 per cent. Most severely hit was the vocational sector and even in 1993, non-pay support for the VEC's remains well below 1987 levels in real terms. This type of expenditure provides a softer target for those wielding the spending axe, especially at second level where (unlike first level) there may be more scope for transferring current costs to the community.

Compared to other EU states Ireland's spending per pupil is relatively low. In terms of US\$ per student paid from public sources in 1991, Ireland was placed sixth out of seven states (the others being Belgium, Denmark, France, Portugal, Spain, UK) with £3,600 per pupil<sup>7</sup> and when private funding is taken into account, we drop to last. (Our equivalent position in 1988 was ninth in a table of eleven states). This comparison does not take account of the relative wealth of different countries, but it is possible to compare relative funding on a "level playing field" by looking at expenditure per student as a percentage of GDP per capita. Even on this basis, Ireland fares badly, placed sixth with

19.8% and well behind Denmark (31.2%), the UK (28.1%) and Portugal (27.8%). Once again, when private contributions are taken into account, we drop to last place. It would however be a mistake to take these OECD figures at face value since differences reflect variations in the relative price of resources (e.g. teacher salaries may be much higher in Denmark), differences in demographic and educational structures as well as in the level of Government commitment to education.

### *Expenditure by Type*

Table 3.2 shows that teacher pay is by far the most important category of expenditure and that its importance has grown over the years. The low proportion spent on non-teaching costs contrasts with the situation in other countries. The 1991 OECD review noted for example that the low proportion devoted at the time to such costs contrasted with New Zealand's allocation of 46.5%.

**Table 3.2 Breakdown of education expenditure by type**

| Type           | 1979        |                | 1986        |                | 1993        |                |
|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
|                | £m          | %              | £m          | %              | £m          | %              |
| Teacher Pay    | 845         | (63.0)         | 1004        | (65.1)         | 1174        | (68.1)         |
| Capitation     | 90          | (6.7)          | 89          | (5.8)          | 102         | (5.9)          |
| Pensions       | 67          | (5.0)          | 51          | (3.3)          | 75          | (4.4)          |
| Administration | 24          | (1.8)          | 24          | (1.6)          | 23          | (1.3)          |
| Other Current  | 210         | (15.7)         | 251         | (16.3)         | 269         | (15.6)         |
| Capital        | 102         | (7.6)          | 125         | (8.1)          | 81          | (4.7)          |
| <b>TOTAL</b>   | <b>1339</b> | <b>(100.0)</b> | <b>1543</b> | <b>(100.0)</b> | <b>1724</b> | <b>(100.0)</b> |

*Figure in brackets denote percentage of annual total expenditure.*

Teacher pay dominates first and second level expenditure, accounting for almost 80 per cent of total spending, while the equivalent figure at third level is just 37 per cent. The explanation for this lower proportion is identified by Dennison (1984): *"The main feature emerging from any analysis of institutional expenses is the dominant position of salaries (especially of teaching staff)...The fact that teacher costs become proportionately less important with advanced level teaching simply reflects a greater number of clerical staff (justified by an increased administrative load) and more technical support to service sophisticated equipment"*.

The other point worth noting from table 3.2 is the fall in the level of capital expenditure, which is not surprising given the fall in enrolments. However, falling enrolments will not mean the complete abolition of capital investment. Regional and local population fluctuations will necessitate some new construction while support for maintenance of existing buildings will still be required. Moreover, with demand for third level places

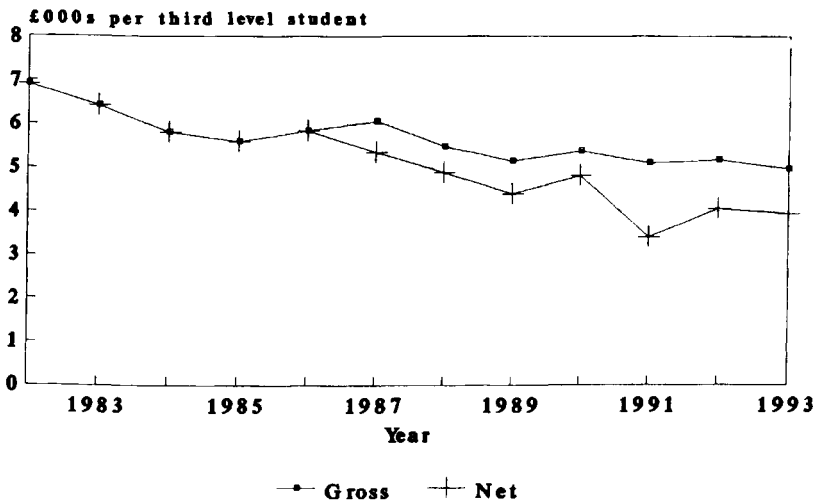
expected to continue to increase for some time to come, continued expansion and increased capital investment over at least the next decade will be required if supply is to meet increasing demand.

*EU Funding*

Analysis so far has concentrated on gross Exchequer expenditure without netting off EU contributions. In percentage terms these contributions have assumed growing importance in recent terms. In 1979, EU funding amounted to £5.7m (less than 0.5% of gross expenditure) while the proportion for the last three years exceeds 9 per cent. Just over 40 per cent of the funds are allocated to second level. The significance of EU funds is greater at third level where receipts per student in 1993 amounted to almost £1,100 per student or one fifth of total gross expenditure per student. (The equivalent figures at second level are £161 or 8.2 per cent).

Netting off EU contributions against gross expenditure produces some interesting trends. In particular at third level, the deduction of EU funding (provided since 1987) would imply a much sharper reduction in per student expenditure at third level as illustrated in figure 3.4.

**Figure 3.4 Third level spending comparing gross and net expenditure**



## 4. ASSUMPTIONS AND FORECASTS

This section implements the approach described in section 2 to produce a set of core projections. Details of general assumptions are provided and the impact of projected change on global requirements is assessed for two target years: 2005 and 2015. Next, each of the three levels is examined in more detail with explanations of relevant specific assumptions given where appropriate. All projections are in constant 1993 prices.

### *General Assumptions*

#### (a) Enrolments

As stated earlier in section 2, DoE enrolment estimates which are based on specific demographic assumptions, are used for the core projections.

#### (b) Baumol's Disease

This theory suggests that the costs of most public services will tend to increase exponentially. Its impact on the cost of the Irish education system is acknowledged by O'Hagan (1984) while Tussing (1978) notes that "*education is especially likely to be affected*".

Briefly, Baumol's Disease is linked to differential growth in productivity and wage costs. Productivity (output per unit of input - such as labour or teaching hour) grows at different rates in all economies, but especially quickly where mass production of uniform products is possible. Conversely, it tends to grow more slowly where a public service is provided.

Generally, wages and profits tend to grow at about the same rate (in the longer term) in western economies. In most industries, increased costs can be paid for by increased productivity but where productivity is low, cost increases must be funded through raising prices by more than the average increase. Thus in education as in other public services, wage costs should (and this is borne out by historical data in respect of teacher pay in the previous section) increase in real terms. Tussing states that the cost per unit of education output (defined as "child-years of schooling") will rise at about the same rate as personal incomes "*even apart from and in addition to the combined effects of inflation [and] enrolment growth....*" and considers that in Ireland, "*it is virtually an inexorable force*".

It is therefore assumed that per pupil costs will, all other things held equal, show a tendency to increase.



(c) EU Funding

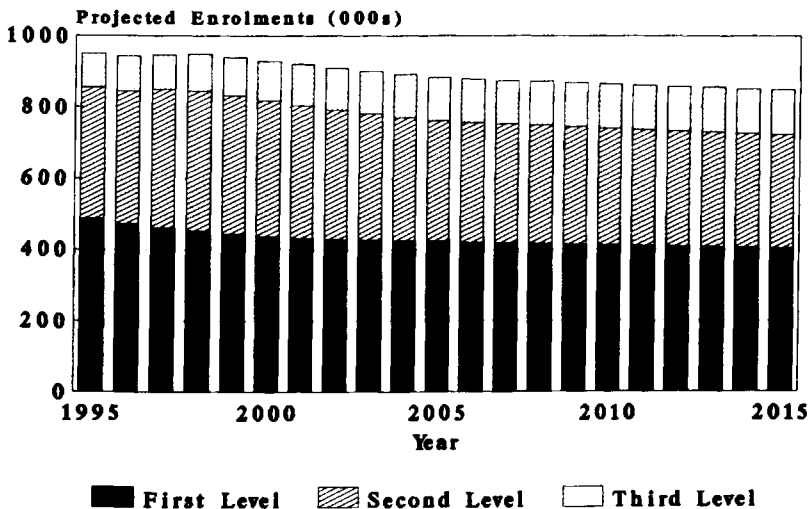
Given the growth in the relative importance of EU support for Irish education, an assumption as to future contributions is a key element in forecasting future resource requirements. Historical trends do not provide a reliable guide to future levels of support and a long term prediction is little more than a "shot in the dark".

The recent package negotiated in connection with the Structural Funds will yield about £200m per annum until 1999 for education. This is almost £50m above the average payment for the period 1991 - 1993. It is generally acknowledged that Ireland is unlikely ever to receive the same level of EU support in one block and for simplicity, it is assumed that assistance in each of the target years will match the average contribution for the past three years, or £150m per annum, (with the allocation of amounts between educational sectors assumed to remain constant at the average proportions for the period). In fact, many would argue that this scenario is not sufficiently pessimistic<sup>8</sup>.

*Core Projections - The Global Picture*

Over the next twenty years enrolments (figure 4.1) are expected to fall by (12 per cent) to 850,000 in 2015.

**Figure 4.1 Projected enrolments by level: 1995-2015**



One might reasonably expect this reduction to be mirrored by a reduction in total expenditure, but core projections suggest that this will not be the case. Table 4.1 indicates that expenditure will show increases of 20 per cent (£340m) - or 1.5 per cent per annum - by 2005 and 30 per cent (£520m) by 2015.

**Table 4.1 Projected Total Expenditure, 2005 and 2015**

| Category                   | 1993 | 2005 | 2015 |
|----------------------------|------|------|------|
| Enrolments (000s)          | 963  | 883  | 849  |
| Expenditure per pupil (£s) | 1790 | 2339 | 2642 |
| Total Expenditure (£m)     | 1724 | 2065 | 2242 |
| Increase on 1993 (£m)      | -    | 341  | 518  |
| % increase on 1993         | -    | 20   | 30   |

*Enrolment figure for 2015 is based on continuing the trend underlying DoE forecasts beyond 2013.*

Two key factors which contribute to these increases are now examined in the context of a breakdown of projected spending by sector and type.

#### *Breakdown of Projected Expenditure by Educational Sector*

At present, first level accounts for more than half of all enrolments but just over a third of gross expenditure. Conversely, third level spending is disproportionately high compared to its share of enrolments, with almost a quarter of total expenditure allocated to cover the cost of educating just 8 per cent of all students.

Over the course of the projection period, the anticipated fall in first level enrolments (down by almost 100,000 to 422,000 in 2005) will be accompanied by a sharp rise (up by 40,000 in the same period) in third level numbers. However, as we have already seen (figure 3.3) per capita spending is highest by far at third level and the increase in third level expenditure will more than offset (see table 4.2) any savings likely to accrue from the net fall in total enrolments across all three sectors.

Changes in enrolment distribution will contribute further to the disproportionate allocation of funding to third level, with just one seventh of all students accounting for one third of expenditure in ten years time. The comparative lack of resources devoted to first level education has not gone unnoticed. Tussing (1981) remarks that *"The most pressing single need in Irish education is for substantially increased resources for national schools"*.

**Table 4.2 Projected expenditure by educational sector**

| Category          | 1993 |      |            | 2005 |      |            | 2015 |      |            |
|-------------------|------|------|------------|------|------|------------|------|------|------------|
|                   | Exp. | Exp. | Inc. on 93 | Exp. | Exp. | Inc. on 93 | Exp. | Exp. | Inc. on 93 |
| First Level       | 624  | 587  | - 37       | 625  | 625  | 1          |      |      |            |
| Second Level      | 697  | 822  | 125        | 895  | 895  | 198        |      |      |            |
| Third Level       | 403  | 656  | 253        | 722  | 722  | 319        |      |      |            |
| Total Expenditure | 1724 | 2065 | 341        | 2242 | 2242 | 518        |      |      |            |

*All figures in £m.*

#### *Breakdown by Type of Expenditure*

We saw earlier (Table 3.2) that teacher pay dominates education spending, with pay costs in 1993 accounting for more than two thirds of Government expenditure (prior to netting off EU contributions). Teacher salaries rose steadily in real terms over the last decade and it is assumed for the purposes of the core projections that this trend will continue. However, greater pay restraint in the 1990s means that this sharp growth may not be repeated (see section 5 for impact of restricting the growth in pay per teacher). As table 4.3 shows, the projected growth in pay costs accounts for the bulk of the overall increase in spending.

Although the highest proportional growth is expected in pension costs (highlighting the danger of forecasting pension costs by reference to past trends), this aspect will still account for a mere 5 per cent of total expenditure. The lower proportional increase in pay may be attributed to the increasing weight of third level expenditure (pay being less important at third level).

**Table 4.3 Breakdown of projected expenditure by type**

| Category  | 1993 | 2005  | 2015  |
|---|------|-------|-------|
| Teacher Pay                                     | 1174 | 1391  | 1545  |
| Pensions  | 75   | 98    | 121   |
| Capitation                                      | 102  | 130   | 134   |
| Other Current                                   | 292  | 373   | 379   |
| Capital   | 81   | 73    | 62    |
| Total   | 1724 | 2065  | 2242  |
| Increase over 1993                              | -    | 341   | 518   |
| Increase in pay as proportion of total increase | -    | 63.6% | 71.6% |

## *Teacher Numbers*

Changing enrolment patterns will naturally have staffing implications. Crude estimates of future teacher numbers may be obtained by applying pupil teacher ratios (PTRs) to projected enrolments<sup>9</sup>. Despite the existence of a Government commitment to reducing the first level PTR, the core projections in this paper assume that ratios remain constant at 1993 levels throughout the projection period. Changing too many factors at one time would limit the value of the exercise. The impact of lower ratios will therefore be considered separately in the next section. Overall teacher numbers (table 4.4) are projected to fall by 5 per cent by 2005 (8 per cent by 2015).

**Table 4.4 Projected teacher numbers**

| Category     | 1993 | 2005 | 2015 |
|--------------|------|------|------|
| First Level  | 20.7 | 16.8 | 16.1 |
| Second Level | 21.7 | 20.5 | 19.2 |
| Third Level  | 5.8  | 8.7  | 9.0  |
| Total        | 48.2 | 45.9 | 44.3 |

*All figures in thousands and rounded to one decimal place*

The slight overall reduction conceals the sharp fall in primary teacher numbers, down almost 20 per cent within twelve years. This explains the importance which the INTO attaches to achieving commitments on reduced PTRs at first level.

### *Analysis within Sectors*

It is not proposed here to examine assumptions and projections at each of the three levels in great detail. Tables A2-A5 in the Appendix provide details of historical trends from 1979 to 1993, including per pupil and total expenditure by type within each sector. Similar figures are also given for the two sample projection years.

Table 4.5 sets out the projected figures for each level and the percentage change on 1993.

**Table 4.5 Breakdown of projected expenditure by sector and type**

|                    | 1993        | 2005        |                     | 2015        |                     |
|--------------------|-------------|-------------|---------------------|-------------|---------------------|
|                    | £m          | £m          | % change<br>on 1993 | £m          | % change<br>on 1993 |
| <b>1st Level</b>   |             |             |                     |             |                     |
| Teacher Pay        | 486         | 460         | -5.3                | 493         | 1.4                 |
| Pensions           | 50          | 54          | 8.0                 | 62          | 24.0                |
| Capitation         | 20          | 16          | -20.0               | 16          | -20.0               |
| Other Curr.        | 49          | 41          | -16.3               | 40          | -18.4               |
| Capital            | 19          | 15          | -21.1               | 14          | -26.3               |
| <b>Total</b>       | <b>624</b>  | <b>587</b>  | <b>-5.9</b>         | <b>625</b>  | <b>0.2</b>          |
| <b>2nd Level</b>   |             |             |                     |             |                     |
| Teacher Pay        | 540         | 646         | 19.6                | 708         | 31.1                |
| Pensions           | 20          | 37          | 85.0                | 50          | 150.0               |
| Capitation         | 34          | 28          | -17.6               | 23          | -32.4               |
| Other Curr.        | 77          | 87          | 13.0                | 93          | 20.8                |
| Capital            | 27          | 25          | -7.4                | 20          | -25.9               |
| <b>Total</b>       | <b>697</b>  | <b>822</b>  | <b>17.9</b>         | <b>895</b>  | <b>28.4</b>         |
| <b>3rd Level</b>   |             |             |                     |             |                     |
| Teacher Pay        | 148         | 285         | 92.6                | 344         | 132.4               |
| Pensions*          | 5           | 7           | 40.0                | 9           | 80.0                |
| Capitation         | 49          | 86          | 75.5                | 95          | 93.9                |
| Other Curr.        | 166         | 246         | 48.2                | 246         | 48.2                |
| Capital            | 35          | 34          | -2.9                | 28          | -20.0               |
| <b>Total</b>       | <b>403</b>  | <b>656</b>  | <b>62.8</b>         | <b>722</b>  | <b>79.2</b>         |
| <b>Grand total</b> | <b>1724</b> | <b>2065</b> | <b>19.3</b>         | <b>2242</b> | <b>30.0</b>         |

*Totals may not add due to rounding. Other Current includes DoE administration costs.*

*\* VEC only*

**(a) First Level**

Although falls are projected in most aspects of first level expenditure, the fall in enrolments fails to yield significant savings in the longer term (though some interim gain would be made). The Report of the Primary Education Review Body predicted in 1990 that "In the years ahead savings will accrue from declining

*enrolments and the retention of these savings will result in some improvements". Although the period over which such savings would accrue was not specified, the projections for first level appear to contradict their predictions.*

Reducing the assumed rate of increase in pay per teacher would mean that first level spending in 2015 would be significantly below 1993 levels and this aspect is examined more closely in section 5.

#### (b) Second Level

The projected total increase at second level is broadly in line with the global percentage increase. Once again, this is mostly accounted for by growth in teacher pay. The highest proportional increase (85 per cent by 2005) occurs in respect of pensions. By comparison to other sectors (first level - 8 per cent, third level 40 per cent) this is a very high proportion and the lack of uniform patterns highlights the danger in forecasting pensions simply by reference to past trends.

Ideally, pension estimates would take account of factors such as the age structure of a workforce, survival rates and retirement trends. However, such a task would require considerable time and effort and could not be undertaken within the bounds of this paper.

As pension costs account for just 4 per cent of total spending in 1993, any errors in these calculations will have only minimal impact on the overall results. Some reassurance may be obtained from a glance at the age profile of secondary, community and comprehensive teachers (figure A2) which suggests that the retirement rate should increase substantially over the next twenty years. (Data for vocational teachers, who comprise about 30 per cent of the 22,000 was unavailable).

#### (c) Third Level

Expenditure at third level is forecast to grow rapidly as enrolments increase. Increases are projected for most aspects with the largest proportional increase occurring in teacher pay. Capitation here includes the Government's central contribution to student grants via Local Authorities. Implementation of a free third level education policy would shift equivalent amounts out of capitation and into other current, but would have little impact on global projections. The projected fall in capital spending is based on the assumption that most of the required expansion will have occurred between 1993 and 2005.

Given the scale of the projected increases in overall spending at third level, sensitivity analysis in the next section focuses on the impact of limiting the growth in future enrolments.

## 5. SENSITIVITY ANALYSES

The main difficulty with sensitivity analysis is to decide which assumption or combination of assumptions should be changed and by how much. It is impossible to cater for all of the countless permutations and combinations which might plausibly occur. This section focuses on the impact of varying four key assumptions:

1. The fertility rate
2. Teacher pay
3. Third level capacity
4. Pupil teacher ratios

Once each of the assumptions has been tested separately, a comparative analysis of all four and some possible combinations is undertaken.

### *Lower Fertility Rate*

Analysis in section 2 indicates that fertility rates have begun to fall sharply and may continue to do so for some time to come. An alternative to the core assumption might envisage an annual reduction of 1,000 births until 1996, thereafter remaining constant at 45,000 births per annum. (See Appendix, table A7 for details of figures).

The cumulative impact of such a rate is considerable with the effects felt at first level by about 1998 and at second level from 2006 onwards. By the end of the projection period, total enrolments would be expected to fall to 776,000 - some 72,000 (8.5 per cent) below the DoE projections and almost 180,000 (19 per cent) less than the current enrolment figure. Assuming an average third level entry age of nineteen (given a six year second level cycle), the impact on this sector within the projection period would be very limited.

Translating the lower enrolment figures into expenditure yields a fall in real terms of £172m below the core projections for 2015 (equivalent reduction for 2005 is £55m) with second level accounting for almost half the divergence. Nevertheless, the projected total of £2.07bn remains well above 1993 expenditure levels of £1.72bn. Thus, even if projected enrolments fall by up to 20 per cent below current levels, expenditure will still continue to show substantial growth. It is useful to note however, that in the lower fertility scenario, the rate of growth slows significantly after 2005 (as the impact is felt at second level) with total expenditure increasing in real terms by just £60m (3 per cent) in the following ten years.

### *Restricting Teacher Pay*

Given the importance of teacher pay as a proportion of total education spending, it is useful to consider an alternative assumption. Employment prospects within the profession will diminish as enrolments decline, possibly weakening the bargaining power of the teacher unions. Calls for public pay restraint form a familiar refrain and there is no guarantee that increases in real terms similar to those secured in recent years will be obtained. A reasonable alternative might therefore be to halve the projected growth in average pay per teacher.

Table 5.1 shows that applying the lower pay increases reduces projected pay costs by £100m in 2005 (£172m in 2015). Overall expenditure would still increase but only by two thirds of the rate in the core projections. Despite the lower figures under the alternative scenario, teacher pay would continue to dominate total spending, accounting for two thirds of expenditure in 2015.

**Table 5.1 Comparison of Alternative Pay Assumptions**

|                     | 1993 | 2005  | 2015  |
|---------------------|------|-------|-------|
| <u>Teacher Pay</u>  |      |       |       |
| Core                | 1174 | 1391  | 1545  |
| Alternative         | 1174 | 1291  | 1373  |
| Overall Expenditure | 1724 | 1966  | 2070  |
| % increase on 1993  | -    | 14.0% | 20.1% |

*All figures in £m.*

### *Limiting Capacity at Third Level*

The core projections implicitly assume that the Government will allocate sufficient resources to meet most of the projected increase in demand for third level places. This assumption might be questioned on a number of grounds.

Firstly, given Ireland's unique demographic profile, as time passes there should be greater availability and awareness of opportunities to study and/or work in other EU states (especially the UK). Walsh (1989) identifies this as a factor which may "*serve as a substitute for the provision of extra places in Ireland*".

Walsh cites as a second limiting factor, the temporary nature of the population bulge. He suggests that policy makers "*are now conscious of the fact that the rise in enrolments is a temporary phenomenon that will be followed by a sharp fall as the effects of the decline in the birth rate work their way through the population. There*



is now a reluctance to expand resources to cope with the temporary bulge". Although this view seems to discount the possibility of utilising spare capacity for alternatives such as adult, "second chance" education, in combination with other factors, it does provide some support for examining the impact of restricted capacity.

Finally, DoE enrolment projections involve some specific assumptions (e.g. completion of a number of capital projects, reduction in net usable space per student) which might not be realised.

In view of the foregoing, it might be useful to consider the impact of limiting third level expansion. A reasonable assumption might involve expansion sufficient to accommodate only half the projected increase in demand. Table 5.2 shows that this lower assumption results in a reduction of 20,000 enrolments with savings of £107m in 2005. However, it should be noted that halving growth in enrolments still results in overall expenditure similar to that projected when teacher pay was limited.

**Table 5.2 Impact of Alternative Capacity Assumptions at Third Level**

|   | 1993 | 2005  | 2015  |
|---|------|-------|-------|
| Enrolments (000s)                       |      |       |       |
| - Core                                  | 81   | 121   | 126   |
| - Alternative                           | 81   | 101   | 104   |
| Expenditure (£m)                        |      |       |       |
| - Core                                  | 403  | 656   | 722   |
| - Alternative                           | 403  | 549   | 595   |
| Total Exp. using alternative assumption | 1724 | 1957  | 2115  |
| % Increase on 1993                      | -    | 13.5% | 24.4% |

*Note: possible savings through reduced capital investment are not included*

### *Improving Pupil Teacher Ratios*

In order to limit the number of changing variables, the core projections assume that PTRs are held constant. In fact though, some reductions are likely. The Programme for a Partnership Government (1993) cites a reduction in the first level PTR to 22:1 by 1996 as a priority policy. Further falls at first and second levels should not be ruled out as enrolments fall since by European standards, there would seem to be some scope for improvement. OECD (1993) figures show that in 1991, Ireland's first level PTR of 26.9 was above the OECD average of 20.3 and was by far the highest of the ratios listed for EU states (next highest was France with 22.7 while

Belgium with 9.7 had the best ratio). At second level, Ireland's ratio was also the highest, but at 17.2, compared better with our EU counterparts (second highest PTR was Spain at 16.9 with Belgium best placed at 7.7).

Implementation of the promised first level reduction would cost £65m in 2005. If a similar reduction in the second level PTR (to say 14.5) was also introduced, the total cost would then rise to £158m.

### *Impact of Combination of Assumptions*

Having looked at the impact of varying each assumption separately, it might be useful to consider the impact of a possible combination of assumptions. Three combinations are considered.

#### (a) Likely Combination

The existence of a Government commitment to reduce the PTR at first level and the growing body of statistical evidence indicating a further fall in fertility rates, suggests that at least these two alternative assumptions are the most likely to come into effect. Given the growing dominance of teacher pay as a proportion of total spending, it might be useful to look at the impact of restricting pay growth in tandem with these assumptions.

#### (b) Low Needs Scenario

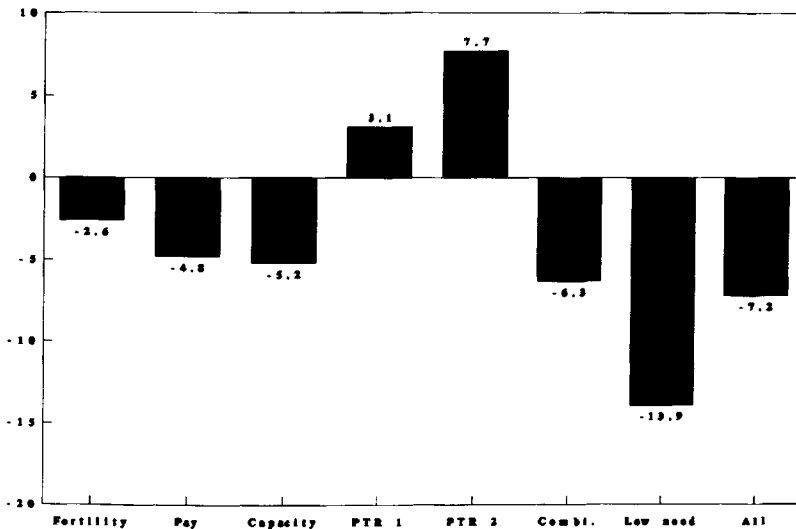
Expenditure growth would be most restricted in the event of lower fertility and reduced pay and capacity. No change is made to the PTR.

#### (c) Combination of All Variations

This measures the impact of simultaneously varying all four key assumptions.

Figure 5.1 shows that the projections are most sensitive to the change in third level capacity (deviation 5.2 per cent) and least sensitive to the change in fertility (deviation 2.6 per cent). Maximum divergence occurs in the low needs scenario, but even this unlikely combination of policy changes and lower fertility fails to provide any net savings on 1993 spending levels.

**Figure 5.1 Percentage Deviation from Core Projections in 2005**



PTR 2: reduced 1st and 2nd level PTRs

## 6. IMPLICATIONS

This section takes a brief look at some of the implications of the core projections.

### *Securing Additional Resources*

To some extent, it seems to have been assumed that declining enrolments would yield savings in total expenditure. The OECD 1991 review of Ireland's education policy notes that the Government's submission envisages "that money will be released from school building, general recurrent expenditure and teachers' salaries for use either elsewhere in education or elsewhere in total government spending." Long term plans such as those set out in the Green Paper (1992) may well have been formulated with these anticipated savings in mind.

So what if, as the core projections suggest, those savings don't materialise? How could we fund the projected 20 per cent increase (in real terms) over the next decade in total expenditure? Additional funds may also be required in respect of possible policy changes envisaged in the forthcoming White Paper. Where will the extra money come from?

It is probably reasonable to assume that growth in GNP over the next decade will be proportionately higher than the projected 20 per cent (1.5 per cent per annum) increase in education spending. Growth in the past has tended to average around 4

per cent per annum while the ESRI Medium Term Review predicts annual growth of between 4 and 5 per cent until 2005.

However, assuming that GDP growth will be adequate does not necessarily mean that sufficient resources will be allocated to education. In order to maintain its present share of public spending, the education sector will be forced to compete with the other main recipients of social spending: social welfare and health. As the population ages, the focus will shift more and more away from education of the young to care for the old. Increasing pension and other welfare costs will lead to an increase in social welfare expenditure - projected to rise in real terms by 30 per cent or almost £1bn between 1991 and 2016 (McCullagh, 1992). Improvements in mortality rates and an ageing demographic profile will mean that health costs will rise as people live longer and morbidity levels rise. However, spending cuts and rationalisation of the health service in recent years leaves less scope for future savings in this area. Education planners therefore cannot simply assume that their share of public funds will be maintained and will have to justify retention of their slice of the spending cake.

Another factor to be borne in mind is that continued high levels of EU funding are not guaranteed beyond 1999. If the assumption in the core projections that funding beyond 1999 will be maintained at 1991-1993 levels is not realised, the Government will be forced to allocate up to a further £150m per year from its own resources.

Additional resources will also have to be found if existing commitments in the Programme for Government are honoured. The annual cost of implementing these commitments will be substantial. We have already seen that reducing the first level PTR to 22:1 will cost £65m in 2005. Salary costs for 500 extra remedial staff would add a further £10m (at 1993 salary levels). Aspirations to improve access to and conditions of education for the disadvantaged as well as increasing opportunities for adult and second chance education will all add to the cost. Much will depend on the availability of additional resources and the ability (and political will) to make savings in other areas such as teacher pay.

### *Third Level Expansion*

The core projections indicate that the highest proportional increase in expenditure will occur at third level. A number of strategies for meeting increased resource requirements could be considered.

### Temporary or Rented Accommodation

This approach was considered (in relation to first and second levels) in a joint review carried out by the Departments of Education and Finance (1987). The

review cited the extensive use of prefabs and rented accommodation in other western countries to cope with temporary increases in enrolments and concluded that this was the most suitable option to cater for enrolment peaks. In some disciplines however (e.g. engineering/scientific), temporary accommodation might be unsuitable.

### Conversion/Disposal of Existing Facilities at other Levels

Declining enrolments at other levels could in theory provide some additional accommodation for third level. By 2005, first level enrolments are expected to fall by 100,000. The fall could be even greater (140,000) if the present trend in falling fertility rates continues. Such sharp reductions should leave some scope for rationalisation involving school closures and mergers, and productive use could be made of otherwise empty classrooms by allocating them as supplementary premises, to third level institutions.

This strategy would face problems. Firstly, an average 20 per cent fall in enrolments is likely only in exceptional cases to bring numbers below a minimum enrolment required to keep a school open. Strong opposition to rationalisation could be expected from teaching staff and especially the local community for whom Coolahan stated (in respect of earlier rationalisation plans) *"closure could be seen... as a vote of no confidence in their future...."*. The interdepartmental review noted that *"In some cases... the Department attempted to amalgamate the educational facilities in an area but due to pressure from various interested groups separate school developments went ahead...."*

Secondly, even if local opposition could be overcome, many of the premises would be unsuitable for third level either in terms of size, location or state of repair. Opposition from governing bodies and student organisations could also be expected.

A simpler solution would be to sell unused premises. However, as noted in the interdepartmental review, ownership of schools and sites is extremely complicated and the Government might not be empowered to order sale in many cases.

### Reduced Recurrent Costs

Significant savings could be made in this area by replacing student grants with an alternative such as Government financed low interest loans. This would face strong opposition and in the light of the Minister's statement of 26 July 1994 on the abolition of third level fees might not be considered as a favoured approach. However, with payments in this area projected to increase by 75 per cent by 2005, further consideration of this option might be worthwhile. Channelling savings into

the capital budget could fund a major increase in capital spending (which in 1993 accounts for just £35m).

### Other Options

These could include increased emphasis on economic and efficient use of resources in third level institutions and increased sponsorship (especially of capital projects) from the private sector. Funding from other sources for recurrent costs associated with expansion would be more difficult to secure.

### *Dominance of Teacher Pay*

The growing proportion of expenditure devoted to teacher pay means that potential support may be directed from other aspects of education. In times of economic hardship, the axe will always fall on the softest targets. As teacher pay is essentially a fixed cost (except insofar as numbers may be trimmed) to which the State is committed, variable cost items such as books, equipment as well as capital projects will bear the brunt of spending cuts. As has been seen in relation to current expenditure at second level, recovery from cuts is a gradual process and spending on non-pay items may remain below a desirable level for some time.

There is no universal agreed formula for the most effective allocation of resources. Optimal allocation will vary (inter alia) depending on the level of total funding available, the sector of education and the standpoint and bargaining power of the various stakeholders. As already noted, Ireland devotes a comparatively low proportion of funds to non-teaching costs. The projected increase in pay will reinforce this trend and possibly result in further movement away from an optimal mix.

### *Teacher Supply and Demand*

As this aspect has been the subject of considerable study elsewhere (e.g. the Primary Education Review Body has formulated first level requirements to the end of the century), there is little point in attempting in this paper to analyse prospects in detail. Falling enrolments will (unless accompanied by dramatic improvements in the PTRs) result in reduced teacher numbers at first and second levels (where prospects are already poor) and increased opportunities at third level.

Two main policy questions need to be addressed. Firstly, once demand has been determined, supply should be adjusted accordingly. There is no point in allocating resources to produce an over-supply of teachers at lower levels and support for training staff to work at third level may have to be increased.

Secondly, manpower planning aspects would need to be considered. This would involve managing recruitment to ensure a fairly constant age structure in the teaching profession in order to avoid sharp peaks and troughs in recruitment patterns and consequently in staff training. Additional measures could include temporary PTR changes and the promotion of early retirement among certain age groups.

## **7. CONCLUSION**

Education in Ireland is in the process of change. My main aim in this paper has been to use broad brush analysis to paint a financial and resource background against which possible Department of Education policy changes might be viewed. With such a broad topic it is impossible to give full and proper treatment to all the numerous issues involved. There is ample scope for much more comprehensive analysis of a number of areas and it is hoped that this paper might provide some kind of starting point for such work.

## **Footnotes**

1. Six if "Special Schools" and "Vocational Education" are included. These existed as separate Votes until their incorporation into the First and Second Level Education Votes respectively in the 1988 and 1982 editions.
2. The method of allocation, however, lacks consistency. No allocation of administrative costs seems to be made to third level prior to the 1988/89 report, nor is any provision made for the administration of non-core activities such as youth and sport. For simplicity, it is assumed that the proportions for early years correspond with the proportions in the 1992/93 report.
3. Excludes funding for research paid from other sources such as the Office of Science and Technology and the Health Research Bureau.
4. This is a measure of the total number of children an average female is likely to have throughout her reproductive period (usually taken as between ages 15 - 49).
5. Exceptions: teacher pay, where per teacher expenditure figures were multiplied by predicted teacher numbers (forecast on the basis of future enrolments and assumed PTRs) and pensions (regression of total amounts payable).
6. Figures for 1988 are used in preference to more recent but less complete data for 1991.
7. Converting from US\$ at the average rate for 1991.
8. For example, the ESRI's Medium Term Review assumes that the combination of the Irish economy converging towards the EU norm and expansion of the EU to include Eastern European states will result in a halving of Ireland's share in structural payments.
9. In practice a more sophisticated method involving two scales - the appointment and retention enrolments - are used.



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**Expenditure Data Drawn from:**

*Annual Report of the Comptroller and Auditor General and Appropriation Accounts* (various years)

*Estimates for Public Services (1979 - 1982)*

*Revised Estimates for Public Services (1983 - 1994)*

## APPENDIX

### Assumptions used in construction of Expenditure Time Series

With the exception of Department of Agriculture and Food support for certain third level courses, spending on any education-related items which has *at no time* (between 1979 and 1993) appeared in one of the education votes, is excluded.

Categories which have appeared in education votes since 1979 and are excluded (both expenditure and appropriations in aid) from the report are as follows:

- Funding for youth and sport including:
  - ◊ Grants for the provision of recreational/major sporting facilities
  - ◊ PSSRC
  - ◊ Youth Employment Grants
- Publications in Irish including:
  - ◊ Publication (and sale) of Irish Textbooks
- Funding for the National Library/Museum
- Pearse and Grattan Commemoration Projects
- Fees for Genealogical Research
- All matters relating to special exhibitions
- Funding for residential homes
- Grants to voluntary organisations towards the employment of development officers
- All other items which are presently funded from the National Lottery are also excluded

Allocation between votes follows the structure of the 1993 estimates except:

- School Transport is allocated between first and second levels on the basis of a DoE breakdown
- DoE administration costs (current only) are similarly allocated between each of the three levels
- Payments to Local Authorities in respect of superannuation charges are allocated to second and third levels in proportion to numbers of teaching staff actually employed at each level in the relevant year.

### *HEA Block Grants*

Inspection of accounts of seven institutions for selected years revealed that the proportion of total expenditure devoted to teaching staff pay has gradually declined (table A1). It was assumed that the decline occurred at a uniform rate of 1.35 per

annum between 1982 and 1991. HEA block current grants were then classified as pay and other current using the proportions derived for each year.

**Table A1: Proportion of Total Expenditure allocated to Teaching Staff Pay**

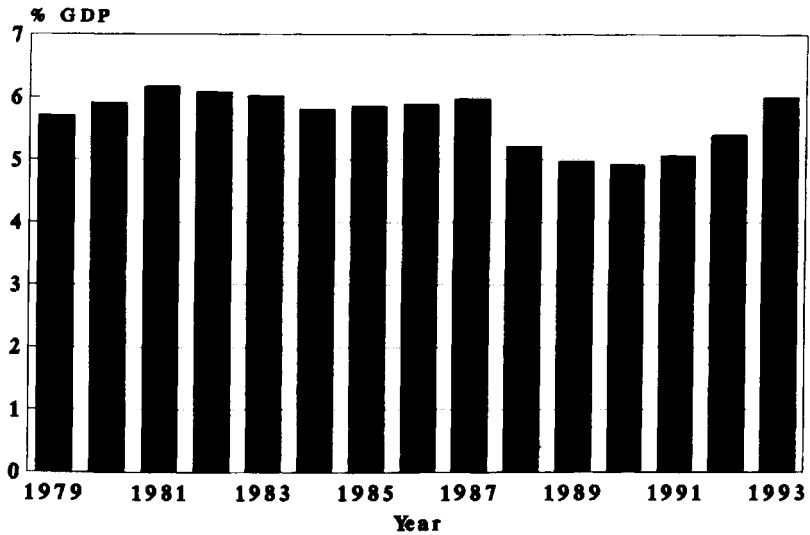
| College  | 1981 | 1982 | 1991 | 1992 |
|----------|------|------|------|------|
| UCC      | 37.2 | 34.6 | 30.5 | 30.5 |
| UCD      | 42.2 | 39.4 | 37.0 | 37.0 |
| UCG      | 43.5 | 44.1 | 33.3 | 32.5 |
| Maynooth | 45.6 | 43.9 | 36.6 | 35.6 |
| TCD      | 37.5 | 34.0 | 32.2 | 32.2 |
| UL       | -    | 33.1 | 25.5 | 27.4 |
| DCU      | -    | 35.6 | 35.3 | 37.4 |
| Average  | 41.2 | 37.8 | 32.9 | 33.2 |

*Miscellaneous*

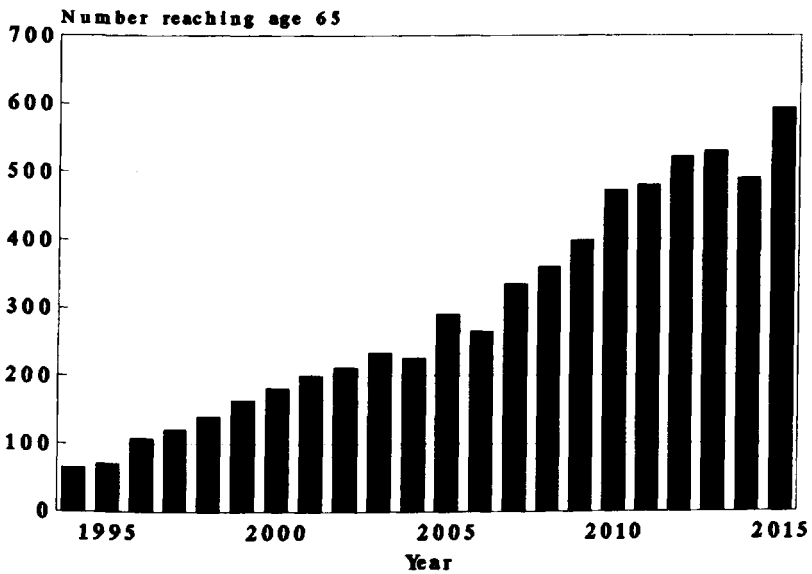
While pay and non-pay breakdowns were provided for all estimate figures, these were sometimes omitted in respect of outturn amounts. These amounts were classified using the breakdowns for the *following year's* estimates.

Pupil figures used in the paper concern pupils in schools and colleges aided by the Department of Education.

**Figure A1 Core activity spending as % GDP, 1979-1993**



**Figure A2 Teacher\* age profile**



\*Sec and C&C Schools only

**Table A2: Total Public Education Spending**

|  | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 2005 | 2015 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <i>Total Expenditure: 1993 Prices (£m)</i> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Administration                             | 24   | 25   | 25   | 25   | 25   | 23   | 24   | 24   | 23   | 22   | 22   | 22   | 23   | 24   | 23   | 21   | 20   |
| Teacher Pay                                | 845  | 870  | 929  | 959  | 984  | 942  | 957  | 1004 | 1082 | 1046 | 1057 | 1044 | 1065 | 1139 | 1174 | 1391 | 1545 |
| Teacher Pensions                           | 67   | 63   | 69   | 71   | 56   | 51   | 50   | 51   | 52   | 63   | 63   | 63   | 65   | 61   | 75   | 98   | 121  |
| Capitation                                 | 90   | 78   | 69   | 71   | 77   | 83   | 86   | 89   | 94   | 94   | 93   | 92   | 89   | 91   | 102  | 130  | 134  |
| Other Current                              | 210  | 208  | 234  | 238  | 231  | 246  | 254  | 251  | 262  | 212  | 217  | 233  | 244  | 257  | 269  | 352  | 359  |
| Capital                                    | 102  | 97   | 125  | 139  | 126  | 110  | 120  | 125  | 112  | 69   | 58   | 73   | 65   | 75   | 81   | 73   | 62   |
| Gross Total                                | 1339 | 1340 | 1450 | 1504 | 1499 | 1455 | 1491 | 1544 | 1625 | 1506 | 1511 | 1528 | 1551 | 1646 | 1724 | 2065 | 2242 |
| Less EU Funds                              | 5    | 5    | 9    | 23   | 20   | 28   | 45   | 45   | 71   | 64   | 63   | 62   | 185  | 131  | 142  | 152  | 152  |
| Net Total                                  | 1333 | 1336 | 1442 | 1481 | 1479 | 1426 | 1446 | 1499 | 1553 | 1442 | 1448 | 1466 | 1366 | 1515 | 1583 | 1913 | 2089 |
| <i>Expenditure Per Pupil (£)</i>           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| No Pupils (000s)                           | 872  | 879  | 891  | 908  | 923  | 935  | 949  | 958  | 963  | 964  | 962  | 957  | 957  | 959  | 963  | 883  | 849  |
| Administration                             | 28   | 28   | 28   | 28   | 27   | 24   | 26   | 25   | 24   | 23   | 23   | 23   | 24   | 25   | 24   | 24   | 24   |
| Teacher Pay                                | 970  | 991  | 1042 | 1056 | 1066 | 1007 | 1009 | 1048 | 1123 | 1085 | 1100 | 1091 | 1113 | 1187 | 1219 | 1575 | 1821 |
| Teacher Pensions                           | 77   | 71   | 78   | 78   | 60   | 55   | 53   | 54   | 54   | 65   | 66   | 66   | 68   | 64   | 78   | 111  | 143  |
| Capitation                                 | 103  | 89   | 77   | 79   | 83   | 89   | 90   | 93   | 97   | 97   | 96   | 96   | 93   | 95   | 106  | 147  | 158  |
| Other Current                              | 241  | 236  | 263  | 262  | 250  | 263  | 268  | 262  | 272  | 220  | 226  | 244  | 255  | 268  | 279  | 399  | 423  |
| Capital                                    | 117  | 110  | 140  | 153  | 137  | 117  | 126  | 130  | 117  | 71   | 61   | 76   | 68   | 78   | 85   | 83   | 74   |
| Gross Total                                | 1536 | 1526 | 1627 | 1656 | 1624 | 1555 | 1572 | 1611 | 1686 | 1561 | 1571 | 1595 | 1621 | 1716 | 1790 | 2339 | 2642 |
| Less EU Funds                              | 7    | 6    | 10   | 26   | 22   | 30   | 47   | 47   | 74   | 66   | 65   | 65   | 193  | 137  | 147  | 173  | 180  |
| Net Total                                  | 1529 | 1520 | 1618 | 1631 | 1603 | 1525 | 1524 | 1564 | 1613 | 1495 | 1506 | 1531 | 1428 | 1580 | 1643 | 2166 | 2462 |

**Table A2: Total Public Education Spending (continued)**

|   | 1979       | 1980       | 1981       | 1982       | 1983       | 1984       | 1985       | 1986        | 1987        | 1988        | 1989        | 1990        | 1991        | 1992        | 1993        |
|---|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Total Expenditure in Current Prices (£m)</i> |            |            |            |            |            |            |            |             |             |             |             |             |             |             |             |
| Administration                                  | 8          | 10         | 12         | 14         | 14         | 14         | 16         | 16          | 17          | 17          | 18          | 19          | 21          | 23          | 23          |
| Teacher Pay                                     | 273        | 342        | 442        | 517        | 575        | 595        | 639        | 701         | 801         | 806         | 857         | 888         | 966         | 1082        | 1174        |
| Teacher Pensions                                | 22         | 25         | 33         | 38         | 33         | 32         | 34         | 36          | 38          | 48          | 51          | 54          | 59          | 58          | 75          |
| Capitation                                      | 29         | 31         | 33         | 38         | 45         | 52         | 57         | 62          | 69          | 72          | 75          | 78          | 81          | 86          | 102         |
| Other Current                                   | 68         | 82         | 111        | 128        | 135        | 155        | 169        | 175         | 194         | 163         | 176         | 198         | 222         | 244         | 269         |
| Capital   | 47         | 52         | 76         | 93         | 90         | 82         | 93         | 100         | 94          | 61          | 54          | 66          | 61          | 73          | 81          |
| Gross Total                                     | 446        | 540        | 706        | 828        | 892        | 932        | 1009       | 1090        | 1213        | 1169        | 1231        | 1304        | 1409        | 1567        | 1724        |
| Less EU Funds                                   | 2          | 2          | 4          | 12         | 12         | 18         | 30         | 31          | 53          | 49          | 51          | 53          | 167         | 125         | 142         |
| <b>Net Total</b>                                | <b>445</b> | <b>538</b> | <b>702</b> | <b>816</b> | <b>880</b> | <b>914</b> | <b>979</b> | <b>1058</b> | <b>1161</b> | <b>1119</b> | <b>1180</b> | <b>1251</b> | <b>1242</b> | <b>1442</b> | <b>1583</b> |

Table A3: First Level Education Spending

|  | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 2005 | 2015 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <i>Total Expenditure: 1993 Prices (£m)</i> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Administration                             | 10   | 11   | 11   | 11   | 11   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 9    | 9    |
| Teacher Pay                                | 359  | 368  | 393  | 398  | 428  | 427  | 432  | 441  | 481  | 439  | 456  | 447  | 454  | 494  | 486  | 460  | 493  |
| Teacher Pensions                           | 59   | 53   | 58   | 60   | 42   | 41   | 38   | 38   | 37   | 43   | 43   | 42   | 42   | 39   | 50   | 54   | 62   |
| Capitation                                 | 20   | 17   | 16   | 16   | 17   | 20   | 20   | 21   | 19   | 19   | 19   | 19   | 18   | 17   | 20   | 16   | 16   |
| Other Current                              | 33   | 36   | 37   | 39   | 41   | 42   | 42   | 42   | 40   | 36   | 37   | 38   | 37   | 39   | 39   | 32   | 32   |
| Capital                                    | 37   | 45   | 52   | 42   | 41   | 37   | 44   | 42   | 36   | 23   | 18   | 18   | 20   | 18   | 19   | 15   | 14   |
| Total                                      | 519  | 530  | 568  | 567  | 581  | 576  | 586  | 593  | 623  | 570  | 583  | 574  | 581  | 618  | 624  | 587  | 625  |
| <i>Expenditure Per Primary Pupil (£)</i>   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| No Pupils (000s)                           | 545  | 547  | 551  | 556  | 561  | 564  | 566  | 567  | 568  | 565  | 560  | 552  | 544  | 534  | 522  | 422  | 404  |
| Administration                             | 19   | 19   | 19   | 20   | 19   | 17   | 19   | 18   | 18   | 17   | 17   | 18   | 18   | 19   | 19   | 21   | 21   |
| Teacher Pay                                | 659  | 673  | 714  | 716  | 763  | 757  | 763  | 777  | 847  | 776  | 814  | 809  | 834  | 925  | 932  | 1090 | 1221 |
| Teacher Pensions                           | 108  | 97   | 106  | 109  | 75   | 72   | 67   | 66   | 65   | 76   | 76   | 76   | 78   | 73   | 96   | 128  | 154  |
| Capitation                                 | 37   | 30   | 30   | 30   | 31   | 35   | 35   | 36   | 34   | 33   | 35   | 35   | 33   | 32   | 38   | 38   | 38   |
| Other Current                              | 61   | 66   | 68   | 70   | 74   | 75   | 74   | 74   | 71   | 64   | 66   | 68   | 68   | 73   | 75   | 76   | 79   |
| Capital                                    | 68   | 81   | 94   | 76   | 74   | 65   | 78   | 74   | 63   | 41   | 33   | 33   | 36   | 33   | 37   | 36   | 36   |
| Total                                      | 953  | 968  | 1030 | 1020 | 1036 | 1023 | 1036 | 1046 | 1098 | 1007 | 1040 | 1039 | 1068 | 1156 | 1197 | 1390 | 1549 |



**Table A3: First Level Education Spending (continued)**

|   | 1979       | 1980       | 1981       | 1982       | 1983       | 1984       | 1985       | 1986       | 1987       | 1988       | 1989       | 1990       | 1991       | 1992       | 1993       |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <i>Total Expenditure in Current Prices (£m)</i> |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |
| Administration                                  | 3          | 4          | 5          | 6          | 6          | 6          | 7          | 7          | 7          | 7          | 8          | 8          | 9          | 10         | 10         |
| Teacher Pay                                     | 116        | 145        | 187        | 214        | 250        | 269        | 288        | 307        | 356        | 338        | 370        | 380        | 412        | 470        | 486        |
| Teacher Pensions                                | 19         | 21         | 28         | 33         | 25         | 26         | 26         | 26         | 27         | 33         | 35         | 36         | 38         | 37         | 50         |
| Capitation                                      | 6          | 7          | 8          | 9          | 10         | 13         | 13         | 14         | 14         | 14         | 16         | 16         | 16         | 16         | 20         |
| Other Current                                   | 11         | 14         | 18         | 21         | 24         | 27         | 28         | 29         | 30         | 28         | 30         | 32         | 34         | 37         | 39         |
| Capital   | 17         | 24         | 32         | 28         | 29         | 28         | 34         | 34         | 30         | 21         | 17         | 17         | 18         | 17         | 19         |
| <b>Total</b>                                    | <b>173</b> | <b>214</b> | <b>277</b> | <b>311</b> | <b>344</b> | <b>368</b> | <b>396</b> | <b>418</b> | <b>464</b> | <b>442</b> | <b>474</b> | <b>489</b> | <b>527</b> | <b>588</b> | <b>624</b> |

Table A4: Second Level Education Spending

|   | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 2005 | 2015 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <i><u>Total Expenditure: 1993 Prices (£m)</u></i> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Administration                                    | 12   | 12   | 13   | 13   | 13   | 12   | 12   | 12   | 12   | 11   | 11   | 11   | 12   | 12   | 12   | 11   | 10   |
| Teacher Pay                                       | 396  | 407  | 438  | 427  | 426  | 397  | 407  | 433  | 469  | 482  | 477  | 471  | 481  | 504  | 540  | 646  | 708  |
| Teacher Pensions                                  | 6    | 7    | 8    | 8    | 10   | 7    | 9    | 11   | 11   | 16   | 17   | 17   | 18   | 17   | 20   | 37   | 50   |
| Capitation  | 58   | 51   | 43   | 42   | 43   | 42   | 42   | 42   | 40   | 38   | 36   | 36   | 35   | 34   | 34   | 28   | 23   |
| Other Current                                     | 77   | 71   | 90   | 85   | 71   | 90   | 99   | 89   | 88   | 49   | 48   | 51   | 56   | 56   | 65   | 76   | 83   |
| Capital   | 32   | 25   | 36   | 64   | 58   | 48   | 51   | 51   | 47   | 26   | 26   | 22   | 21   | 20   | 27   | 25   | 20   |
| Gross Total                                       | 581  | 574  | 627  | 638  | 621  | 596  | 620  | 637  | 668  | 622  | 615  | 608  | 623  | 644  | 697  | 822  | 895  |
| Less EU Funds                                     | 5    | 5    | 9    | 23   | 20   | 28   | 45   | 45   | 32   | 30   | 17   | 25   | 69   | 48   | 57   | 57   | 57   |
| Net Total   | 576  | 569  | 619  | 615  | 601  | 568  | 575  | 592  | 636  | 592  | 598  | 583  | 554  | 595  | 639  | 765  | 838  |
| <i><u>Expenditure Per Pupil (£)</u></i>           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| No Pupils (000s)                                  | 291  | 294  | 299  | 309  | 316  | 323  | 332  | 337  | 341  | 342  | 341  | 341  | 345  | 351  | 361  | 339  | 319  |
| Administration                                    | 42   | 42   | 42   | 42   | 40   | 36   | 37   | 36   | 35   | 33   | 33   | 33   | 34   | 35   | 33   | 32   | 32   |
| Teacher Pay                                       | 1362 | 1387 | 1464 | 1383 | 1348 | 1228 | 1226 | 1285 | 1378 | 1410 | 1401 | 1382 | 1397 | 1436 | 1497 | 1902 | 2221 |
| Teacher Pensions                                  | 21   | 24   | 27   | 25   | 32   | 23   | 27   | 31   | 34   | 47   | 49   | 50   | 51   | 49   | 56   | 108  | 158  |
| Capitation  | 200  | 173  | 143  | 135  | 135  | 131  | 128  | 125  | 117  | 111  | 106  | 106  | 101  | 96   | 93   | 82   | 73   |
| Other Current                                     | 264  | 243  | 300  | 275  | 226  | 277  | 297  | 263  | 259  | 142  | 141  | 149  | 163  | 160  | 179  | 224  | 259  |
| Capital   | 110  | 86   | 121  | 209  | 185  | 149  | 154  | 150  | 138  | 78   | 77   | 63   | 62   | 57   | 75   | 73   | 63   |
| Gross Total                                       | 2000 | 1955 | 2097 | 2068 | 1964 | 1843 | 1870 | 1890 | 1960 | 1821 | 1806 | 1784 | 1807 | 1833 | 1933 | 2421 | 2807 |
| Less EU Funds                                     | 19   | 17   | 29   | 75   | 63   | 87   | 136  | 134  | 94   | 88   | 51   | 74   | 201  | 137  | 159  | 169  | 180  |
| Net Total   | 1981 | 1938 | 2068 | 1992 | 1901 | 1756 | 1734 | 1756 | 1866 | 1734 | 1755 | 1710 | 1607 | 1696 | 1774 | 2257 | 2627 |

Table A4: Second Level Education Spending (continued)

|  | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <i><u>Total Expenditure in Current Prices (£m)</u></i> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Administration   | 4    | 5    | 6    | 7    | 7    | 7    | 8    | 8    | 9    | 9    | 9    | 10   | 11   | 12   | 12   |
| Teacher Pay  | 128  | 160  | 208  | 230  | 249  | 251  | 271  | 302  | 348  | 371  | 387  | 401  | 437  | 479  | 540  |
| Teacher Pensions                                       | 2    | 3    | 4    | 4    | 6    | 5    | 6    | 7    | 8    | 12   | 13   | 14   | 16   | 17   | 20   |
| Capitation   | 19   | 20   | 20   | 22   | 25   | 27   | 28   | 29   | 30   | 29   | 29   | 31   | 31   | 32   | 34   |
| Other Current  | 25   | 28   | 43   | 46   | 42   | 57   | 66   | 62   | 65   | 37   | 39   | 43   | 51   | 53   | 65   |
| Capital  | 15   | 14   | 22   | 43   | 41   | 36   | 40   | 41   | 39   | 23   | 24   | 20   | 20   | 19   | 27   |
| Gross Total  | 192  | 229  | 303  | 352  | 370  | 382  | 420  | 450  | 499  | 483  | 502  | 519  | 566  | 612  | 697  |
| Less EU Funds  | 2    | 2    | 4    | 12   | 12   | 18   | 30   | 31   | 24   | 23   | 14   | 21   | 63   | 46   | 57   |
| Net Total  | 190  | 227  | 229  | 339  | 358  | 364  | 389  | 419  | 475  | 460  | 488  | 497  | 503  | 567  | 639  |

**Table A5: Third Level Education Spending**

|   | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 2005 | 2015 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <i><u>Total Expenditure: 1993 Prices (£m)</u></i> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Administration                                    | 1    | 1    | 1    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 2    | 1    | 1    |
| Teacher Pay                                       | 90   | 95   | 97   | 134  | 131  | 118  | 119  | 130  | 131  | 126  | 124  | 126  | 130  | 140  | 148  | 285  | 344  |
| Teacher Pensions                                  | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 5    | 5    | 7    | 9    |
| Capitation  | 12   | 11   | 9    | 13   | 17   | 21   | 23   | 26   | 34   | 37   | 37   | 36   | 36   | 40   | 49   | 86   | 95   |
| Other Current                                     | 100  | 100  | 107  | 115  | 119  | 114  | 114  | 121  | 133  | 127  | 132  | 145  | 151  | 162  | 165  | 244  | 244  |
| Capital   | 33   | 27   | 37   | 33   | 26   | 25   | 25   | 32   | 30   | 19   | 13   | 33   | 24   | 37   | 35   | 34   | 28   |
| Gross Total                                       | 238  | 237  | 255  | 299  | 298  | 282  | 285  | 313  | 334  | 314  | 313  | 345  | 348  | 385  | 403  | 656  | 722  |
| Less EU Funds                                     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 39   | 34   | 46   | 37   | 116  | 83   | 84   | 95   | 95   |
| Net Total   | 238  | 237  | 255  | 299  | 298  | 282  | 285  | 313  | 295  | 280  | 267  | 309  | 232  | 302  | 319  | 561  | 626  |
| <i><u>Expenditure Per Student (£)</u></i>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| No. Students (000s)                               | 36   | 37   | 41   | 43   | 46   | 48   | 51   | 54   | 55   | 57   | 61   | 64   | 68   | 75   | 81   | 121  | 126  |
| Administration                                    | 41   | 39   | 36   | 35   | 32   | 28   | 29   | 26   | 25   | 23   | 22   | 20   | 22   | 21   | 19   | 11   | 10   |
| Teacher Pay                                       | 2513 | 2521 | 2294 | 3103 | 2815 | 2439 | 2331 | 2424 | 2385 | 2191 | 2046 | 1968 | 1905 | 1878 | 1828 | 2349 | 2730 |
| Teacher Pensions                                  | 52   | 65   | 73   | 66   | 75   | 63   | 60   | 60   | 62   | 70   | 67   | 67   | 66   | 61   | 60   | 58   | 70   |
| Capitation  | 332  | 297  | 230  | 304  | 370  | 431  | 456  | 483  | 625  | 647  | 612  | 561  | 534  | 537  | 599  | 706  | 756  |
| Other Current                                     | 2790 | 2672 | 2628 | 2646 | 2557 | 2347 | 2231 | 2253 | 2416 | 2219 | 2175 | 2254 | 2213 | 2171 | 2034 | 2015 | 1940 |
| Capital   | 918  | 716  | 903  | 752  | 569  | 507  | 488  | 592  | 541  | 329  | 221  | 508  | 359  | 500  | 432  | 277  | 220  |
| Gross Total                                       | 6645 | 6310 | 6265 | 6905 | 6418 | 5815 | 5595 | 5838 | 6055 | 5480 | 5144 | 5378 | 5099 | 5168 | 4972 | 5415 | 5726 |
| Less EU Funds                                     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 708  | 596  | 749  | 571  | 1694 | 1113 | 1039 | 784  | 754  |
| Net Total   | 6645 | 6310 | 6265 | 6905 | 6418 | 5815 | 5595 | 5838 | 5347 | 4884 | 4394 | 4807 | 3405 | 4055 | 3933 | 4630 | 4972 |

**Table A5: Third Level Education Spending (continued)**

|   | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <i>Total Expenditure in Current Prices (£m)</i> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Administration                                  | 0    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 2    |
| Teacher Pay                                     | 29   | 37   | 46   | 72   | 76   | 75   | 79   | 91   | 97   | 97   | 101  | 107  | 118  | 133  | 148  |
| Teacher Pensions                                | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 4    | 4    | 4    | 5    |
| Capitation                                      | 4    | 4    | 4    | 7    | 10   | 13   | 15   | 18   | 25   | 29   | 30   | 31   | 33   | 38   | 49   |
| Other Current                                   | 32   | 39   | 51   | 62   | 69   | 72   | 76   | 84   | 99   | 98   | 107  | 123  | 137  | 154  | 165  |
| Capital   | 15   | 14   | 22   | 22   | 19   | 18   | 19   | 25   | 25   | 17   | 12   | 30   | 23   | 36   | 35   |
| Gross Total                                     | 81   | 97   | 126  | 165  | 177  | 181  | 193  | 222  | 250  | 244  | 255  | 296  | 316  | 367  | 403  |
| Less EU Funds                                   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 29   | 26   | 37   | 31   | 105  | 79   | 84   |
| Net Total                                       | 81   | 97   | 126  | 165  | 177  | 181  | 193  | 222  | 221  | 218  | 218  | 265  | 212  | 288  | 319  |

**Table A6: Teacher Related Statistics**

|  | 1979               | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | PROJECTED |      |
|--|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|------|
|  |                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 2005      | 2015 |
| <b><u>Estimated Teacher Numbers (000s)</u></b> |                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |      |
| First Level                                    | 18.4               | 18.9 | 19.4 | 19.9 | 20.4 | 20.7 | 20.9 | 21.1 | 21.1 | 21.2 | 20.4 | 20.3 | 20.4 | 20.7 | 20.8 | 16.8      | 16.1 |
| Second Level                                   | 17.9               | 18.4 | 18.9 | 19.5 | 19.9 | 19.5 | 20.0 | 20.4 | 20.8 | 20.4 | 20.1 | 20.0 | 20.2 | 20.9 | 21.7 | 20.5      | 19.2 |
| Third Level                                    | data not available |      |      |      |      | 5.5  | 5.6  | 5.8  | 5.8  | 5.0  | 4.9  | 5.2  | 5.4  | 5.6  | 5.8  | 8.7       | 9.0  |
| Total  |                    |      |      |      |      | 45.8 | 46.5 | 47.3 | 47.8 | 46.6 | 45.4 | 45.6 | 46.1 | 47.2 | 48.2 | 45.9      | 44.3 |
| <b><u>Pupil Teacher Ratios</u></b>             |                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |      |
| First Level PTR                                | 29.6               | 29.0 | 28.4 | 27.9 | 27.5 | 27.2 | 27.1 | 26.8 | 26.8 | 26.7 | 27.5 | 27.2 | 26.6 | 25.8 | 25.1 | 25.1      | 25.1 |
| Second Level PTR                               | 16.2               | 16.0 | 15.8 | 15.8 | 15.9 | 16.6 | 16.6 | 16.5 | 16.4 | 16.7 | 16.9 | 17.0 | 17.0 | 16.8 | 16.6 | 16.6      | 16.6 |
| Third Level Staff/Student Ratio                |                    |      |      |      |      | 8.8  | 9.2  | 9.2  | 9.6  | 11.4 | 12.5 | 12.5 | 12.6 | 13.3 | 14.0 | 14.0      | 14.0 |
| <b><u>Pay per Teacher (£000s)</u></b>          |                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |           |      |
| First Level                                    | 19.5               | 19.5 | 20.3 | 20.0 | 21.0 | 20.6 | 20.7 | 20.8 | 22.7 | 20.7 | 22.4 | 22.0 | 22.2 | 23.9 | 23.4 | 27.4      | 30.6 |
| Second Level                                   | 22.1               | 22.1 | 23.2 | 21.9 | 21.4 | 20.3 | 20.4 | 21.2 | 22.6 | 23.6 | 23.7 | 23.5 | 23.8 | 24.1 | 24.9 | 31.6      | 36.9 |
| Third Level                                    |                    |      |      |      |      | 21.4 | 21.3 | 22.4 | 22.8 | 25.1 | 25.5 | 24.5 | 23.9 | 25.1 | 25.6 | 32.9      | 38.2 |

**Table A7: Divergence between fertility assumptions**

| Year | Core (DoE) assumption | Lower fertility assumption | Difference | Cumulative difference |
|------|-----------------------|----------------------------|------------|-----------------------|
| 1993 | 52.6                  | 48.0                       | 4.6        | 4.6                   |
| 1994 | 52.0                  | 47.0                       | 5.0        | 9.6                   |
| 1995 | 51.6                  | 46.0                       | 5.6        | 15.2                  |
| 1996 | 51.3                  | 45.0                       | 6.3        | 21.5                  |
| 1997 | 51.0                  | 45.0                       | 6.0        | 27.5                  |
| 1998 | 50.7                  | 45.0                       | 5.7        | 33.2                  |
| 1999 | 50.5                  | 45.0                       | 5.5        | 38.7                  |
| 2000 | 50.2                  | 45.0                       | 5.2        | 43.9                  |
| 2001 | 49.9                  | 45.0                       | 4.9        | 48.8                  |
| 2002 | 49.6                  | 45.0                       | 4.6        | 53.4                  |
| 2003 | 49.4                  | 45.0                       | 4.4        | 57.8                  |
| 2004 | 49.1                  | 45.0                       | 4.1        | 61.9                  |
| 2005 | 49.0                  | 45.0                       | 4.0        | 65.9                  |

*Note: All figures in 000s. Annual divergence remains constant at 4,000 after 2005.*

## DISCUSSION

**John Sheehan:** In proposing this vote of thanks I would like to congratulate Mr McCullagh for bringing so many important issues to our attention. The focus of public expenditure discussions in Ireland has tended to concentrate on short-term annual budgetary issues, understandably perhaps, in view of the running budgetary crises of the 1980s. However with the apparent solution of many of these deficit problems we now have an opportunity to take a longer view. This is very important, as it appears that demographic changes are about to exert significant influences on the demand for some of the main exchequer-financed services, notably health and education. Perhaps it has been a naive hope that an ageing population, which would increase the demand for healthcare resources, might simultaneously lower the demand for education, thereby freeing up some resources which could be transferred relatively painlessly over time. Mr McCullagh has shown that things are not likely to be so easy.

Turning to specific points raised in the paper, I would like to refer to the following main issues: (i) Choice of deflator, (ii) forecasting methodology, (iii) microeconomic efficiency aspects, (iv) data problems and (v) education expenditure in relation to GDP.

### **1. Choice of Deflator: GDP v Public Consumption.**

Due to the relative price effect (or Baumol's Disease), there is likely to be a persistent divergence between GDP (or other broadbased) deflators and the Public Consumption Deflator. If we deflate the nominal gross education expenditure by the Implicit GDP Deflator, the increase in real expenditure between 1979 and 1993 is 55%, compared with the 29% obtained in the paper by using the Public Consumption Expenditure (PCE) deflator (for the current component). Which is the appropriate procedure? In one sense it makes sense to use the PCE deflator as it probably corresponds more accurately to educational prices, and so we get a better idea of the real volume of resources in the system. However, from a broader perspective we need to look at the cost to society of education, that is at opportunity costs. Here the question is what has to be foregone (by taxpayers) when extra resources are put into education? If the answer is other goods and services in general, then the use to the GDP deflator provides a more appropriate indication, and the higher real increase in education spending reflects the higher real cost to society, largely via the Baumol relative price effect.

### **2. Forecasting Methodology**

A generally accepted procedure would be to specify a model in which real educational expenditure is a function of certain independent (i.e. exogenous variables), and then to forecast expenditure subject to given values of these



variables, and subject to a given set of policies. Next, one can vary the exogenous variables and policies, and estimate the sensitivity of results to these variations, as has been done in the paper in respect of teacher pay, staffing ratios, and third level capacity. The problem is that while some important variables (e.g. demographic) are for all practical purposes exogenous, others are not (e.g. participation rates, which in part depend on educational policy). Other variables such as real teacher pay are in part determined by general public sector policies on pay, and while they may be exogenous to education are endogenous to public policy in a wider sense. If these determinants of real expenditure are endogenous, then it is appropriate to model them. Clearly this is extremely difficult, especially for the crucial pay variable.

The approach adopted in the paper is to regress past real expenditure per pupil on time, to obtain a time-trend for real growth (or decline in the case of Third Level?). Using the resulting trend coefficients is really a form of projection of past trends into the future, rather than using a forecasting model in the strict sense. The trend coefficients incorporate the effects of past policy changes, past economic events (such as the late 1980s fiscal adjustment) which ought not to be taken as the basis for future changes. For example at third level, fees were increased significantly as a proportion of costs between 1979 and 1993, which allowed real public expenditure per student to decline (other factors such as scale economies may also have been at work): projection of this time trend implies continuing real increases in fees at third level. Is this realistic?

The really critical area is modelling personnel expenditure. Here the implicit assumption seems to be that the bargaining process will yield much the same increase in per-teacher real costs as before. However this begs questions about (a) changes in public sector pay policy (as the author acknowledges) and (b) the relation between general economic performance and real teacher pay. Looking at the latter, if real GDP were to grow at 4% p.a. on average over the forecast period, then this is likely to translate into a real per head increase in labour income of 2% to 2.5%. If however, real GDP growth were to average only 2% p. a., then real per capita incomes would be likely to increase by less: say 1% to 1.5%. It is reasonable to assume that in the long run teachers will maintain their relative position: put another way, real teacher pay costs are likely to be endogenous to real economic growth, and to that extent the proportion of GDP being spent on education is probably not going to be very sensitive to the growth rate. High growth may not bring "relief" in that sense (although the relation may not be symmetric: low growth or stagnation would undoubtedly bring problems).

### **3. Microeconomic aspects of efficiency**

Is there any cure for Baumol's disease? Must we accept that services such as health and education are inevitably going to underperform in terms of labour productivity?

Granted, there seem to be inherent limitations on capital-labour substitution in areas such as education, but this does not detract from the case for looking closely at incentives to efficiency and what might loosely be called market structures. I get an impression that in Ireland we are somewhat slow to appreciate the role of incentive structures, including quasi-markets, in promoting better performance in the provision of public services. There is a role for central planning in education, in terms of forecasting and making provision for the broad aggregate of required resources. However this does not extend to detailed determination of resource allocation at the micro-level. We do hear some consideration of devolving managerial responsibility to school boards, but if anything that seems to be a retreat from the financial mechanisms which have been prevalent for the aided sector (funding which is related to enrolments automatically via a PTR and a capitation payment), and which in some circumstances can be competitive in effect.

Also there appears (in education systems world-wide) to be a fixation with physical indicators such as PTRs, which needs to be questioned (effectively if one assumes that a lower PTR is a good thing, then this implies that the increasing relative price of education is not a symptom of Baumol's disease, but a sign of robust good health). As an experiment it might be worthwhile to give school managements the power to engage in some capital-labour substitution, via a degree of discretion over the PTR. If there is an optimum PTR in any given situation, then I get the impression that educational research has not identified it. Perhaps a school management, with good information about its own circumstances might get closer to the optimum.

Of course in measuring productivity in the education sector, one ought always be aware of the perennial problem of measuring output, and it is very difficult to evaluate the effects of different educational structures on the quantity and quality of output.

#### **4. Data problems**

There are two particular points which require attention:

- I. 3rd level labour intensity. Table A 1 shows teaching staff pay to be about 33 % of total costs for the universities. However teaching staff are a minority of all staff in universities and the current position is that all labour costs are approximately 70% of recurrent costs in the university system (and I suspect in higher education generally). Given that teacher pay is 80% of first and second level costs, this implies that for all education labour costs are in excess of 75 % of the total, and for recurrent costs the proportion is close to 80%. The extremely labour-intensive nature of education is therefore somewhat understated in Table 3.2.

II. Capitation and Student Grants: transfers. The treatment of education in the national accounts classifies support education in voluntary secondary schools as a transfer payment (unlike primary schools which are also aided institutions). This can be misleading. Following from this it might be helpful if, in the general classification of expenditure items used, transfers in the strict sense (maintenance grants to students) were identified as a separate item, and that capitation payments to aided schools were aggregated with expenditure on the non-pay costs of public sector schools and given some appropriate label. The policy issues likely to influence expenditure on these items are distinct ones.

### 5. Education Spending in relation to GDP

Quite correctly the paper states that a 20% increase in real public education expenditure does not imply an increase in the proportion of GDP going on such expenditure. A look at the 1979-1993 data should provide some consolation. Despite the poor economic performance, and the buoyant demographic situation of much of that period, the public education expenditure share of GDP did not show a rising trend<sup>1</sup>. In the next 15 years given the demographic and economic outlook, a stable share of GDP should prove attainable, and a falling share might well be compatible with the maintenance of present educational standards, but much depends on teachers' pay levels relative to earnings generally.

In conclusion, I wish to thank Mr McCullagh once again for starting an important debate. This paper should initiate a fruitful research agenda, and the first thing I would like to see would be a complementary paper on the implications of the same demographic developments for healthcare, using a similar basic framework. Then perhaps we shall begin to get a better overall perspective of demands on the exchequer for public services in the long term.

**Oliver Cussen:** I am, as you know, a civil servant and therefore not a policy decision maker. A civil servant's role is to advise on policy options and implement policy decisions. The Minister and the Government make the final decisions.

It gives me great pleasure to second the vote of thanks to John McCullagh for his very useful contribution to the policy formulation process. Systematic analysis of data and policy-related research is a key input to this process. Such research significantly

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<sup>1</sup> Of course the share of GNP would have been more appropriate, and would have shown a very modest increase, but the factors depressing the GNP/GDP ratio in the past will (we hope) not apply over the next 15 years.

enhances the quality and effectiveness of decisions and, very importantly, facilitates structured evaluation of the impact of policies.

I would also like to commend the Statistical and Social Inquiry Society of Ireland for supporting the publication of the work and promoting this debate.

At present we are approaching in education the completion of a major consultative process. This will lead, as the Minister has indicated, to a White Paper and education legislation.

The White Paper will be an important statement of Government policy. It will seek to set out a comprehensive framework for the development of education into the next century.

Subsequent legislation will be a major undertaking, particularly given the paucity of legislation in the education domain. An important feature of legislation is that it will define more clearly, and give a statutory basis to, respective roles and responsibilities at the various levels of educational administration, from the level of the school to national level. Combining this with a broad statement of the rights and duties of the key stakeholders in the education system would contribute substantively to a more coherent framework for policy formulation, policy implementation and policy evaluation.

In addition, many of you will be aware that there is a major study underway in relation to the future planning and development of higher education, under the Chairmanship of the Chairman of the Higher Education Authority. This will be an important input into shaping policy to meet future demand for higher education. Funding higher education to meet economic, social and student needs is among the most difficult dimensions of future education policy.

We are, I believe, on the threshold of exciting developments. Equally, the challenges are demanding. Successfully meeting these challenges will require innovation and creativity. Problems of long standing will need to be looked at in new ways. Many traditional moulds will need to be recast and accepted assumptions critically questioned. The philosophical adage that "the way we look at the problem is the problem" may well encapsulate a profound wisdom for public policy makers in the years ahead. These dimensions of the change process- sometimes referred to in the literature, I believe, as the cultural dimensions of change- are widely recognised as the most intractable obstacles in the way of effecting real and enduring change.

Therefore, contributions and debates of the type being promoted here this evening are coming at a particularly opportune time. More generally, the systematic linkage of relevant research into the policy-making process has the potential to enhance the quality of decision-making and the effectiveness with which policy implementation is evaluated.

### *Context of Policy Making*

I would like to refer briefly to the broader context of policy making in the public domain. Decisions on educational expenditure are made, in the first instance, by reference to educational priorities. Education priorities must compete for resources with a strong demand for resources from other major social areas e.g. the health and social welfare services. Embracing all areas of public expenditure are the fiscal and policy disciplines imposed by the country's overall economic strategy, including the nation's international commitments, particularly as a member of the European Community. Thus choices in the provision of public services are complex involving decisions as between, for example, more assistance to disadvantaged schools, more access to third level education, improved medical care, alleviation of poverty through social welfare improvements, a low inflation rate to protect real income, reducing public debt to free resources for service provision.

I set out these considerations not to diminish the case of any individual sectoral interests. Rather the purpose is to put in context the need for prioritisation, dictated in turn by the requirement to mediate demand from a competing range of highly meritorious causes, in order to target resources on areas of greatest need, and potential benefit, within the nation's available resources at any given time. For Ministers and the Government, this all has to be done in a manner which maintains and promotes social cohesion and progressively reduces social exclusion.

### *Education and Economic Social Development*

Increasingly educational policy making, and related resourcing decisions, need to take account of the actual and potential contribution of education to overall national economic and social development. Indeed, a significant feature of recent years has been the increasing centrality afforded to education in major social, political and economic strategy documents.

Among the more obvious examples here are the Programme for Economic and Social Progress, the Programme for Competitiveness and Work, the Programme for a Partnership Government, and the National Development Plan. Also, recent reports from the National Economic and Social Council and OECD publications underline the importance of education as an integral part of the overall fabric of social and economic development. Education is seen and accepted as a crucial contributor to economic prosperity and social well-being. Internationally, education is accepted as, at least, as important a component of national competitiveness and economic capacity as the more traditional forms of capital accumulation. There is a respected academic literature to support this contention and it is also borne out in the work of, for example, the OECD. This theme is also an important one in the Commission's White Paper on Growth, Competitiveness and Employment, thus weaving it into the fabric of future development in the European Union.

These developments signify a growing recognition, in influential national and international fora, of the importance of expenditure on education as an investment in capacity enhancement rather than simply a social service expenditure. This places the debate on resourcing education in an important, new context. The debate on resourcing education should increasingly be part of the wider debate on the most effective strategies for achieving social and economic cohesion and enhancing economic growth and national wealth. This in turn changes the context within which public services are funded.

Systematic research and review of the economic and social outcomes of education is important. This is not an echo of a narrow utilitarian argument, which seeks to suggest that education should be subverted, or indeed is being subverted, to simple economic needs. If I may suggest, this is a more complex argument about the interaction between education policy and economic and social policy and the contribution the former makes to the latter. It is not an argument about dependencies, it is an argument about inter-dependence.

It is also important to query the extent to which the private sector is disposed to invest, in a sustained way, in education. Employers should look more seriously at investment in education. The logic of this derives from the now well-documented movement in advanced economies towards knowledge-intensive, high-skill businesses.

This means that the key to competitiveness is a knowledge-based, adaptable and highly skilled workforce. For employers and business, investment in the graduates of, for example, third-level institutions is surely a matter as critical as investment in hardware and machinery. The latter is a core concern of employers, the former is perhaps not so central. There are encouraging signs of innovative developments and these provide a useful basis on which to build a new partnership in the future to the benefit of education and business.

#### *Some specific points on the Paper*

The Paper presents a very interesting and valuable analysis of possible future trends in expenditure in education. I do not propose to comment in detail on the technical analysis in the paper. However, I can assure the author and the society that the paper will receive very careful and full analysis within the Department.

The Paper relies heavily on historical data on growth as a basis for predicting likely future trends. This, as the author acknowledges, is an approach fraught with many difficulties because of the uncertainty about many of the factors which influence expenditure. Not least among such factors are the political, economic and social considerations, which take precedence at particular stages of the development of the education system.

For example, in the 1980's, many factors impacted on the expenditure level e.g. increased ESF funding, fiscal adjustments particularly in 1987-88. The PNR/PESP and Public Sector pay agreements all combined to determine past growth. The author acknowledges some of these and puts forward some alternative scenarios.

Also certain categories of expenditure do not lend themselves readily to extrapolation e.g. pension costs, where future growth will be predominantly influenced by age profile rather than past growth trends. Teachers pay is particularly problematic in projecting future trends on the basis of historical experience. I think it is worth pointing to the particular provisions in the Programme for Competitiveness and Work in relation to future pay-bargaining in the Public Service. Specifically of relevance in this regard is the linkage of special pay increases to increases in productivity. This may well set the basis for a new evolution of pay structures in relation to teaching and indeed the wider public service in the future.

I would also like to comment on the position in relation to EU financial support in the period post-1999. Obviously, it is difficult to predict accurately the situation at end of the century. However, there are certain important characteristics in Ireland's National Development Plan, as recently incorporated and agreed with the Commission in the Community Support Framework, which strengthen the credibility with the Commission of structural fund expenditure in the education area. A very significant dimension, in the current round, has been the closer alignment of EU-supported initiatives with national educational priorities. Particular examples of this are, early childhood education, the development of in-career training for teachers, the provision of comprehensive certification of Vocational Education and Training Programmes and the major restructuring of the Senior Cycle. These reflect a commitment on the part of the Commission to underpin and support key strategic, national priorities in education.

They also reflect a fundamental objective of the Commission to invest in building the capacity of our systems, and the economy as a whole, to meet future challenges. A key objective, in the education sector, has been to demonstrate to the Commission that structural fund expenditure in education supports long-term strategic objectives in the education area and that this, in turn, is an important underpinning of the creation of economic and social cohesion which is a major long-term objective of the funds.

In this context, it will be critical for this country, and its education system, to be able to demonstrate over the coming years the benefits which this European investment has brought, in terms of developing the capacity of our systems to better meet the needs of the individual and to promote economic and social development. If we demonstrate a clear commitment and capacity to do this then our case for structural funding continuing in support of educational priorities post-1999 will be significantly enhanced. In this regard, it is crucial that Ireland's educational expenditure is supported by analysis and research which demonstrates that educational expenditure is an investment in the future capacity of our economy and society.

## *Conclusion*

John McCullagh's paper highlights many critical issues for future planning. A key challenge facing the education sector is to demonstrate that education represents a critical investment in overall economic and social development and not simply a public expenditure. Educational policy and wider economic and social policy are inter-dependent and not dependent variables. This poses a challenge for all involved in the policy-making process, including the wider community of economists and social scientists, to put forward the key arguments in support of educational expenditure.

The business community will need to look upon investment in knowledge and higher-level skills with at least the same consideration as they look at investment in hardware and machinery.

It is also extremely important that the relationship between investment in education and economic growth generally is pursued vigorously. Apart from anything else the payoff of increased growth rates would be increased funding for education.

Another important element in the future funding of education will be securing a robust social consensus behind educational priorities and the consequent allocation of funding to those priorities. In a recent NESC Report, Ireland in a Comparative Institutional Perspective, the Council highlighted some weaknesses in our consensual policy-making framework in the social area generally. I believe that an important advance has been made in this consensual policy-making framework in the education area. I refer to the National Education Convention and subsequent multi-lateral meetings convened by the Minister for Education in relation to the future framework for educational development. Apart from sharing respective positions in relation to policy issues, an important outcome of this process has been an increased awareness on the part of all the partners in education of the need to prioritise resources against policy objectives. This, of course, is generally accepted at an intellectual, analytical level. There may be some way to go in translating this commitment into sustained support for decisions which target particular priorities, where this means less resources for less pressing priorities.

It would be incorrect to assume the continuation unchanged into the future of past modes of learning and institutional structures. The modes of learning and the flexibility of educational responses will be more diversified in the future. For example, course modularisation will allow increased flexibility of the timing and span of studies. Also distance learning and rapid developments in Information Technology should greatly increase the flexibility of learning opportunities for all ages. These developments should lead to more intense utilisation of existing facilities and possibly a decrease in the reliance on buildings and fixed structures as the normal means for the provision of learning. Indeed the use of existing facilities is also an important question. How effectively are they used on an all-year round basis to facilitate student access and learning.



Also extremely important is the development of the Vocational Education and Training Sector particularly in relation to Post-Leaving Certificate Courses. An important initiative this year has been the introduction of national certification for these programmes. This is an important development in providing an alternative to straight progression to higher education and meeting the needs of the economy for high-skills.

It gives me great pleasure therefore to second the vote of thanks. I want to assure John that he needn't feel in the least apprehensive about questioning Departmental projections or other policy assumptions. Such questioning is essential to the clarification of the assumptions on which policy is based and can only enhance its overall effectiveness.

Congratulations, John, for your contribution to the policy-making process.

**Jim McCaffrey:** It is a pity, I think, that Mr. Cussen was so respectful of the forecasts of enrolments produced by his employing Department. It seems to me that an examination of certain aspects of the forecasts would possibly be worthwhile.

The Department is forecasting enrolments at third-level of 121,000 in 2005 and 125,000 in 2015. For the moment, let us ignore the question of mature student enrolments and assume that all entrants to third-level will be school leavers. If the average length of stay per student in third-level is 3.5 years, then the forecast implies that there would be about 34,500 new enrolments each year; if the average duration is 4 years, the number would be over 30,000. On this basis, the forecasts imply that out of an age cohort of 48,000/50,000, between 30,000 and 35,000 will go on to third-level.. This represents participation rates of between 62.5% and 70% of the age cohort.

There are a number of points to be made about the possibility that enrolments might reach this level. At present, the State provides 20,000 places for school-leavers on Post-Leaving Cert. courses. These courses average two years each. On existing policies, these 20,000 places would be available in addition to the third-level places that would come on stream under the Department's projection. The places available on these two types of courses alone would equal or exceed the number of 18 year olds in the country. But then the State also provides 1 5,000 training places in FAS and further thousands of places in CERT, nurse training and in agricultural colleges. The great bulk of these places are filled by school leavers.

It seems clear that on present plans and projections, there will not be enough school leavers in the near future to fill available places. And, of course, should any take jobs directly after school or emigrate, the problem of over-supply becomes even greater. Perhaps the reduction in demand for places as a result of emigration or

employment of school leavers would offset the assumption that I have made that there will be no mature student enrolments.

Clearly rationalisation of provision will be required in the relatively near future. Such rationalisation should free up considerable resources for the expansion of third-level, if that is what the Government decides to provide.

However, even assuming that rationalisation will occur, it seems to me that there are reasons to be cautious about providing the number of third-level places envisaged in the Department's projections. First, there must be a point at which increasing the percentage of the age cohort going to third-level ceases to be a good investment. It is clear that not all school-leavers have the intellectual capacity to benefit from third-level. What percentage have that capacity, I do not know. However, I suspect that this question may be relevant when enrolments in excess of 60% of the age cohort are being planned. This question needs to be examined before decisions on future provision are taken.

Second, it is quite clear that enrolments at third-level will fall considerably as the age cohort of 18 year olds falls from 72,000 in 1998 to 50,000 or less in the space of about ten years. The wisdom of providing buildings that *Will* last 50 years or more, of hiring tenured staff and incurring all the other fixed costs associated with expanding the third-level system to meet a very temporary bulge in enrolments seems to me to be highly questionable - all the more so, when the UK institutions will have spare capacity in their system for the duration of the population bulge in this country.

**Reply by John McCullagh:** It has been a privilege to have the opportunity to present this paper to such a knowledgeable audience. I would like to thank all the speakers for their comments and especially thank John Sheehan and Oliver Cussen for their detailed responses to the paper. I should of course emphasise that any views expressed in the paper are personal ones and should not be interpreted as representing ESRI or Department of Education policy.

Some speakers have focused on the dangers in using past trends to project future developments. Forecasting is by its nature an exercise fraught with uncertainty. No one (with the possible exception of psychics!) can claim to have advance knowledge as to what will happen next year, let alone over the next two decades. There are many widely differing interpretations of the past, even though there is usually abundant objective evidence of what has occurred. It is only to be expected therefore, that there will be no unanimity on what is to come. Everyone will have a point of view and each may be equally valid.

Without some objective basis, assumptions are effectively arbitrary and have little value. Forecasters therefore try to find objective grounds on which assumptions may be based.

The most widely used approach is to use historical records and data to gauge what might happen in the future.

Historical data, although useful, do not of course provide a totally reliable guide to what will happen. If they did, there would be no scope for chance, no risk in the stockmarket, no market for horoscopes. Moreover, it simply may not be possible for past trends to continue indefinitely (e.g. where continuation of past trends would result in a theoretically impossible result such as a participation rate of 120%).

Departure from historical data may therefore be desirable and sometimes essential. However, such departures ought not be treated lightly and should where possible, be backed up by alternative objective sources. Otherwise there is a danger that predictions may be based on little more than intuition or "gut feelings". Although such forecasts may have a high degree of accuracy, they remain open to accusations of arbitrariness or even bias, which effectively limits their value.

Clearly a balance must be struck. Although historical data provide useful clues as to possible developments, there are times when it may be necessary to use alternative assumptions. Equally, it would not be prudent to completely ignore the lessons of history. In this paper I have attempted to strike a balance by relying on historical data except in circumstances where to do so would yield a theoretically impossible result (such as a negative value for expenditure) or where additional evidence supports a departure. Where there is some doubt as to accuracy I have tried to show the impact of alternative assumptions by using sensitivity analyses. I do not claim that my approach is better than others', nor do I totally reject criticisms of my assumptions. I merely wish to explain why certain paths are followed and would ask those who criticise and choose other paths, to provide some objective basis for their choices.

One speaker suggested that the fertility assumptions used in the paper are much too high and that a TPR of about 1.5, the level reached in some southern European states, should be used. This may well be the case, but I would be hesitant about making such a dramatic departure from CSO figures without some additional supportive evidence. It would seem necessary to first obtain some indication as to the underlying causes of the decline before making such a substantial reduction.

I agree with the comments concerning the preoccupation with physical indicators such as the Pupil Teacher Ratio. This is partly because other aspects of education, given their nature, are more difficult to quantify and measure. Moreover, there has traditionally been more attention given in the Civil Service to maximising efficiency and economy rather than evaluating effectiveness. The introduction of the Strategic Management Initiative has changed this, shifting the focus to effectiveness and value for money. Much of our work in the Department of Education will now concern the development of indicators to measure less tangible, qualitative outcomes.

To finish, I would like to quote some comments made by Joe Durkan at a previous meeting of the Society:

*"The reason we carry out forecasts is not to produce a single figure for one variable... The purpose of forecasting is to tell a story about likely future events, to highlight potential future stresses... The key element is... the story presented. The importance of this is not that your forecasts will be believed, but that you are presenting those who need forecasts with a set of reasoned propositions and it is up to them to make their own judgements. The future is essentially unknowable and the claim that we can foretell it lays us open to the 'absurd pretensions' charge".*

I hope that I have told an interesting story which highlights the stresses which demographic change and other factors will place on the education system in the years ahead. It is, I believe, a story based on reasonable assumptions and while changes in policy may mean that it may not actually come to pass, the story should not be regarded as a work of pure fiction.

It only remains for me to once again thank the Society for the opportunity to deliver this paper; to thank all the speakers for their contributions and to thank everyone for their kind attention.