

Bulletin

IER Institute for Employment Research

HIGHLY QUALIFIED PERSONS

Highly qualified persons include all individuals who:

- hold a specific degree;
- have an equivalent professional qualification.

Many such individuals work in professional occupations, although an increasing number can also be found in the managerial and associate professional groups.

Special Features of the Market

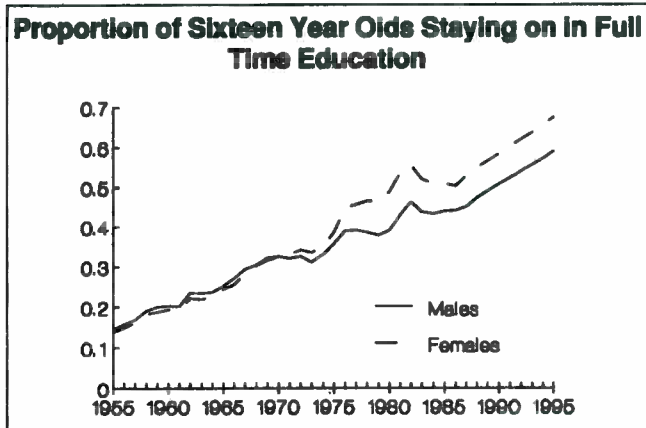
The labour markets for highly qualified persons have a number of special features:

- long periods of investment in human capital are required, giving rise to major private and social outlays and causing important lags in supply;
- education and training at this level tend to be concentrated amongst younger individuals, although there are an increasing proportion of mature graduates;
- associated labour markets are frequently national (rather than local) and, sometimes, international;
- individuals tend to work in activities involving high levels of technical and/or organisational skills, often associated with the dynamic performance of the economy;
- not all individuals with a degree (or equivalent) make direct use of the level or type of qualification which they hold, and not all managerial and professional jobs are undertaken by highly qualified persons.

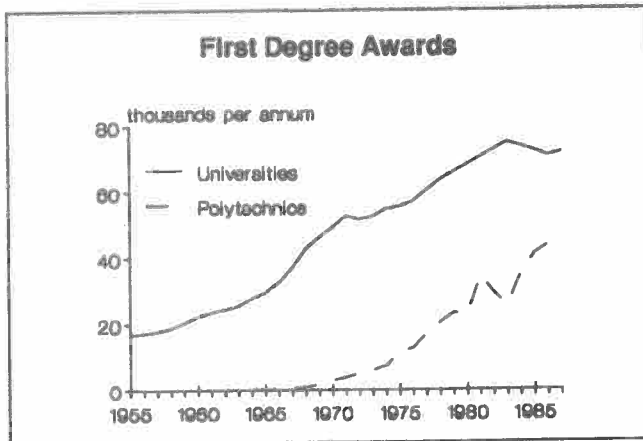
Trends in New Supply

Recent and ongoing work at the IER, sponsored by the Training Agency, has examined trends in the supply of new graduates. The proportion of young people staying on in education after the age of 16 has been increasing over the last 20 years or more. The percentage leaving school with two or more A levels increased rapidly from 1955 to 1970; while this proportion has continued to rise, the rate of increase

between 1970 and 1987 is much smaller. A variety of influences have been at work, including rising incomes, easier access and changing social class structure.



The increasing proportion and (until recent years) numbers of young people meeting higher education entry standards has been reflected in the growing number of students awarded first degrees. The most rapid growth of university degrees occurred in the mid-1960s, when a number of new universities were established, although growth has continued, albeit at a somewhat slower rate, until recent years, when there has been some decline in university awards. Interestingly, the decline in university applications from 1985 to 1988 has centred on the sciences (particularly combined sciences and engineering, engineering and technology); business administration grew particularly strongly, followed by social sciences and humanities. Since the 1970s the most rapid expansion has been in the public sector, with the numbers of graduates from polytechnics increasing almost 16 fold between 1970 and 1987 (to 46 thousand per annum). University graduates increased by around 50 per cent over the same period (to 72 thousand per annum).



The demographic changes which are currently underway will have a significant impact on the numbers of young people available for entry into higher education, other things being equal. The number of 18 year olds in the population is expected to fall dramatically to the mid-1990s, when it is forecast to recover sharply. The fall over the period 1982 to 1995 is around 40 per cent. While the decline is much less marked amongst social classes I and II, which, historically, have produced about two-thirds of university entrants, there is still a significant fall between the late 1980s and the mid-1990s.

Contraction of the youth cohort is expected to be off-set to some extent by a rise in participation in higher education. The official forecast is for a rise from just under 14 per cent in 1985 to 18.5 per cent by the year 2000. However, doubts have been expressed about whether this increase will materialise. Clearly, this will depend, in part, on the nature and size of student grants and loans. Any shift towards increased self-financing will reduce the rate of return and, thereby, the flows through the higher education system. Finally, the rapid reversal of the demographic trends after the mid-1990s may give rise to a period in which the remuneration and employment opportunities for the highly qualified "see-saw" (ie. the so-called cob-web cycles), particularly if higher education institutions are allowed to contract in line with the earlier downward trends.

Demand for Highly Qualified Persons

The demand for highly qualified persons in most discipline areas was severely affected by the recession, graduates entering first employment fell between 1979 and 1981, with sharp increases in graduate unemployment. Nevertheless, the graduate labour market was by no means so badly hit as those associated with lower levels of formal educational qualifications, such as craft skills. Some disciplines experienced a relatively buoyant market despite the recession, particularly those linked with the new technologies, such as microelectronics. Others have benefited as the economy has grown in the 1980s and as special projects, such as the Channel Tunnel, have been commissioned. There have been significant re-

gional disparities in both the level and rate of recovery of activity. The strength of demand has been greatest in the South East.

The period of persistent growth since the recession has resulted in marked increases in recruitment levels. First destination statistics show that, over the period 1979 to 1987, recruitment has increased most in banking and insurance, law and other commerce. Over this period as a whole recruitment has fallen in engineering and teacher training. Engineering in particular has been influenced by the depth of the recession in manufacturing, which took a considerable time to restore earlier activity levels, and, in recent years has experienced rapid productivity growth. Teacher training has been influenced by reductions in government spending, linked with the demographic trends outlined above.

Operation of the Market

The market for highly qualified persons is characterised by a number of major problems:

- cobweb cycles, associated with the "see-sawing" of remuneration and employment opportunities;
- possible monopsony power in key areas of employment, such as research and development (R&D);
- monopoly power arising from the existence of powerful professional organisations representing the views of the highly qualified.

U.S. data have revealed the existence of strong cobweb cycles for a number of groups, including engineers, physicists, lawyers and economists. These are caused primarily by the long lead times necessary to alter the volume and mix of the new supplies flowing through the higher education system. There is every indication that the same phenomenon exists in the U.K., although domestic data are too weak to pin-point it precisely. Such cobwebs are likely to be even more pronounced in R&D activities, which rely heavily on younger scientists and engineers and, therefore, on the market for newly qualified individuals.

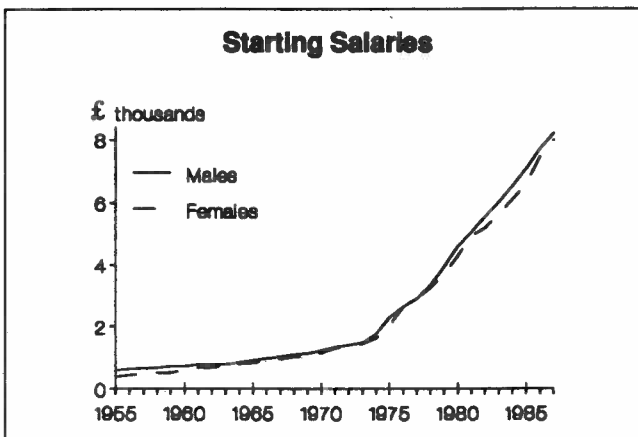
Recent research at the IER has outlined the high degree of concentration of R&D activities in a relatively small number of firms. Government funding of R&D performed in private industry was even more concentrated. Government itself is also a major employer of R&D personnel. One interesting consequence of this, particularly given the specialisms of the various firms and the lack of a powerful professional organisation for scientists and engineers, is that employers are likely to have a considerable degree of power in the market for professional scientists and engineers in R&D functions. The resulting level of pay in R&D is therefore likely to be lower than the competitive, market clearing wage. Given the spillover effects to other markets, this may have held down wages for professional scientists and engineers in other activities. The smaller number of job opportunities in R&D and

the depressed wage may have reduced the flows of individuals into science and engineering courses in higher education.

In other lines of activity, it is clear that the position is reversed. Many of the occupations most closely associated with higher educational qualifications have developed professional organisations to set standards of entry, negotiate wages and conditions of work, and to protect the position of their members. In this instance, job opportunities are still restricted, but remuneration will be better than under a more competitive system. The case of barristers and lawyers has been in the press recently, with the somewhat "watered-down" proposals for reform of the profession going some way towards removing the monopoly rights of these groups. The IER was involved in examining the market for Patent Agents, which, at the time, was shown to have some of these monopoly features. Steps were taken to remove these barriers to competition in a subsequent Office of Fair Trading ruling.

Market Outcomes

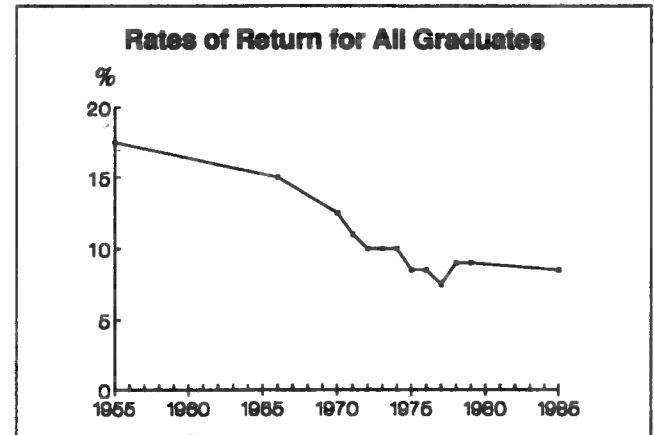
Earnings and Hours of Work. In essence, the relative pay of the male professional group, formed from individuals requiring a degree or equivalent (corresponding female data is incomplete), has broadly been maintained over the period from 1973. Some evidence was found for an improvement in the position of the health professions. Information about gross starting salaries of graduates in 1987 indicated a wide dispersion of remuneration, ranging from average annual salaries of £20 thousand in banking and finance occupations to around £9 thousand for social workers. Electronic engineers were considerably better paid than mechanical engineers, with a differential of around £3.5 thousand. Scientists



and, more particularly, teachers were much less well paid at around £13 and £9 thousand respectively.

Overall Rate of Return to Education. The private rate of return to education has been investigated in a series of reports from the IER. It is a summary indicator of the return to making the educational investment to become a highly quali-

fied person. The overall rate of return to obtaining a degree fell steadily over the period of the 1960s and 1970s, before levelling off in recent years at around 9 per cent. The main



causes of the downward trend in the first half of the period were the significant growth in higher education, first in the university system and later in the polytechnics, followed by the severe recession centred on 1980/81. The former increased the supply of the highly qualified and the latter reduced the demand for their services. Both factors had the effect of pushing down their relative remuneration levels. In recent years the declining value of the student maintenance grant has also been a factor. The recent levelling off can be attributed to the subsequent economic recovery of the 1980s and a slow-down in the rate of growth in the number of new graduates.

Rates of Return by Discipline. The more disaggregated evidence on the rates of return broken down by discipline indicate considerable differences across discipline areas. The distribution of rates of return again reflect the different market positions of the various groups involved. The high returns for doctors, for example, reflect the existence and strength of the associated professional organisation, the BMA, while the much lower rates of return for teachers are associated with the declining market power of their unions and the existence of a large and powerful buyer of their services, in the form of the government. The relative movements of the rates of return appear to mirror at least the more significant shifts in supply and demand for the associated qualifications. The pattern of the rate of return to engineering, for example, reflects the fluctuations in the demand for and supply of engineers.

Graduate Unemployment. Graduate unemployment rates have been consistently lower than for most other groups in the labour force. Evidence from the Labour force Survey, based on the previous industry and occupation of employment, suggest rates for all graduates as low as 2 or 3 per cent for the period from 1983. If anything these figures are likely to be slight underestimates. The university and polytechnic "first destination" statistics are considerably higher, ranging

Rates of Return to Professional Status			
	per cent		
	1955	1970	1985
Chemists	20.0	12.5	9.0
Engineers	14.5	13.0	10.5
Teachers	10.5 ¹	8.0	1.5 ²
Doctors	21.0	15.5	12.5 ²
Lawyers	14.0	11.5	n/a
All graduates	17.5	12.5	8.5

Notes: (1) 1960/61 (2) 1980/81

from about 10.7 per cent in 1983 to 6.8 per cent in 1987, although these are likely to be over-estimates. The first destination statistics indicate that unemployment amongst newly qualified graduates increased sharply from around 5 per cent in 1979 to a peak of over 12 per cent in 1982, falling back again to just below 7 per cent in 1987.

Stocks and Flows of Graduates. LFS data for 1987 suggest that the total "stock" of graduates of working age, excluding degree equivalents, was around 2 million. Around 90 per cent of these individuals were in the labour force. The numbers of individuals with qualifications higher than GCE "A" level was closer to 4.5 million in 1987. This stock of highly qualified persons is set to grow further over the next few years, as the flow of new entrants remains high, while the losses due to deaths and retirements remain relatively modest. This reflects the much greater propensity of young people to have undertaken higher education than the older people they are replacing in the population of working age.

Skill Shortages

Certain markets have been associated with a situation in which the demand for highly qualified persons has exceeded the supply over a substantial period of time. Engineers, in particular, have often been linked with significant skill shortages. This group form a good example of the changing nature of skill shortages in recent years. In the late 1970s and early 1980s, firms were still complaining about skill shortages and this was generally articulated, as in the *Finniston Report*, as a need for more (and higher quality) engineers. In practice, detailed investigation of the market revealed no general shortages.

What became clear, however, is that a number of specific shortages were being driven by major technological changes that continued despite the outward shift in the overall supply of highly qualified persons and the recession. The diffusion of microelectronics was accelerating at this time. The exponential nature of the diffusion process almost certainly

signified a situation of dynamic shortage, in which, although supply increased, it lagged behind increases in demand. The need for key electronics and computing skills was acute. The shortages may not have been helped by the existence of monopsony power in the market for R&D scientists and engineers, which may have held down remuneration for the associated groups.

Most other discipline areas were not so directly affected by such technological changes, although there were managerial and organisational innovations underway which may have helped to underpin the market for certain finance, accounting, etc. skills. Overall, however, the market for the more highly qualified went through a difficult period, with the statistics on the "first destination" of graduates indicating rising unemployment. Nevertheless, graduates remained better off than most, more lowly qualified groups, cushioned by the ability to compete with non-graduates in lower level jobs (ie. the "filtering down" process).

The subsequent period has been one of major economic recovery. The specific shortages, as in the case of electronic engineers, have been transformed into more general shortages as all markets for graduates have picked up. The fairly rapid and continuing growth in demand for graduates across most disciplines has left supply behind, during a period when new flows through higher education have been, at least in a historical context, relatively stagnant. A number of new specific, technology related shortages appear to be at various stages of evolution. The most obvious of these is associated with biotechnology skills, but shortages may also emerge as the new super-conductivity technologies emerge.

Other dimensions of market imperfection have given rise to key shortages. A classic example of this is the vicious circle of shortages of scientists and engineers that can be traced back to too few suitably qualified mathematics and science teachers. Historically at least, the position has accentuated by the inflexibility of the teachers' pay structure, which has not allowed a positive differential in remuneration to develop for those disciplines in scarcest supply. The result is a "chicken and egg" situation, where teacher shortages affect the quality and quantity of the supply of individuals in science and engineering disciplines, and the high level of demand in industry and commerce attracts individuals who might, otherwise, potentially become teachers.

Future Developments in the Market

The earlier discussion has already hinted at a number of important developments that will affect the future market for highly qualified persons:

- the demographic downturn
- changes in the system of student grants and loans
- the general economic climate
- the level of commitment to dynamic activities, such as R&D

- continued technological change and the emergence of new and largely unknown technologies
- continued organisational change
- changes in the nature of graduate recruitment
- the effects of movement to the single European market in 1992

The demographic downturn will have significant effects on the numbers flowing through higher education, even though the decline is somewhat less for social classes I and II, from which new entrants have usually been drawn. The effects will be further cushioned by the efforts of higher education institutions to spread their net more widely, continuing to attract more mature students. The impact of the demographic downturn on higher education may also be reduced by increased participation rates, which are forecast to rise from 14 to 18 per cent. However, whether this will materialise will depend not only on the movements in relative salary levels of the more and less highly qualified groups, but also the effect of the changes in student grants and loans on the rate of return to education.

The economy is forecast to continue to grow, albeit at a somewhat slower pace than that observed in the middle and late 1980s. However, productivity growth will be high, at least by the standards of the 1970s (although not as high as the more recent rates). This will affect the number of job opportunities for graduates, particularly in the manufacturing sector. Demand for both management and associate professional occupations are also forecast to be very buoyant, the latter perhaps more so than the professional group. Entry to these occupations are not limited to persons with degrees, and this may attract potential students away from higher education. Certain dynamic activities, such as investment in physical plant and machinery have recovered strongly in recent years, increasing the demand for highly qualified persons to install and operate the new units. Other activities, such as R&D have also recovered, but not strongly and, here, our

performance is well down on many of our major industrial competitors. A major growth of R&D would produce a significant boost in the demand for science and engineering specialisms, but might well accentuate the skill shortages which are already apparent.

Graduate recruitment and utilisation policies seem likely to be increasingly re-evaluated as shortages become more acute. Employers will be attempting to ensure that jobs are designed which fully exploit the skills of graduates, leaving less demanding tasks to other, less qualified members of their work-force. Recruitment is becoming more targeted, linked more closely to firm goals and objectives. Older style practices of recruiting staff "in their own image" will come under increasing pressure and the recruitment net will be spread wider. The ease of substitution between graduates and non-graduates, the growth of credentialism and the barriers created by professional institutes will also come under increasing scrutiny.

The movement to a single market appears to make Europe a potential source of graduates during periods of increasing shortage. In practice, the more advanced European countries have similar demographic trends to our own. The likelihood that they might be an alternative source of graduates is further reduced by their longer periods of investment in higher education and by their relatively high salary levels for graduates (as the U.K. has slipped down the international rankings of industrial countries). If anything these factors appear to suggest that the balance of flows might prove to be in the other direction.

All of these factors appear to indicate that existing graduate shortages will become worse rather than better. This will pose very real problems for both employers and those concerned with the provision of education and training in order to ensure that Britain has the skilled people that will be needed for future prosperity.

THE INSTITUTE

The Institute for Employment Research was established by the University of Warwick in 1981. The fields in which the Institute aims to promote advanced study and research include

- the macroeconomic, industrial and spatial factors affecting employment
- the relationship between the labour market and the rest of the economy
- labour market behaviour and policy
- developments in population, education, training and household behaviour affecting the labour market
- comparative international research in relevant areas.

The Institute has grown out of the former Manpower Research Group which was created in 1975 with a major programme grant from the Manpower Services Commission. This followed previous research in the general field of labour economics and employment forecasting. Since 1978, assessments of the economy and employment at a highly disaggregated level have been prepared each year. This work gave rise to the publication of *Britain's Medium-Term Employment Prospects* (1978) and *Economic Change and Employment Policy* (1980). The *Review of the Economy and Employment* was first published in 1981 in order to make the findings of the assessment available more widely on a regular basis and to stimulate discussion about the changing structure of employment and its implications for policy.

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