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Article

Recruiting High Quality Teachers

CESifo DICE Report

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Suggested Citation: Dolton, Peter (2004) : Recruiting High Quality Teachers, CESifo DICE Report, ISSN 1613-6373, ifo Institut für Wirtschaftsforschung an der Universität München, München, Vol. 02, Iss. 4, pp. 11-20

This Version is available at:

<https://hdl.handle.net/10419/166821>

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RECRUITING HIGH-QUALITY TEACHERS

PETER DOLTON *

The recruitment and retention of high quality teachers must be one of the main education policy priorities of any government. Not least because research has confirmed the importance of teacher quality and the detrimental effect that excessive teacher turnover may have on student achievement and performance. The future development of the next generation of adults rests in the hands of those currently teaching our children. The central questions to resolve are how can the education system recruit and retain the high-quality teachers it needs and what is the role of pay and other incentives intended both to attract people to the profession and to keep them.

Many countries have experienced recurrent crises in the recruitment and retention of teachers and in many there is a more or less continuous shortage of teachers, notably in secondary schools and in the most technical subjects. The shortage tends to be particularly acute in subjects like maths, science and modern languages and in specific geographical areas, where the “opportunity wage” for would be teachers is much higher. A growing body of economic research on the labour market for teachers is seeking to understand these shortages and provide insights into potential policy measures.

Every country needs a relatively large number of teachers, as on average, in OECD countries 2.6 percent of the total labour force are teachers (OECD 2004). In

most countries this means the education sector is the largest employer of university graduates. Accordingly, teachers pay is the largest component of a country’s educational expenditure with an average of 63 percent of the educational budget in 2000.

In any consideration of the quality of teachers we must be aware of the forces of supply and demand and the decisions governments choose to make about desirable pupil teacher ratios, teacher working hours, the length and quality of teacher training, teacher pay and incentives and the other non-pecuniary conditions in teaching which must be affected by government educational spending priorities.

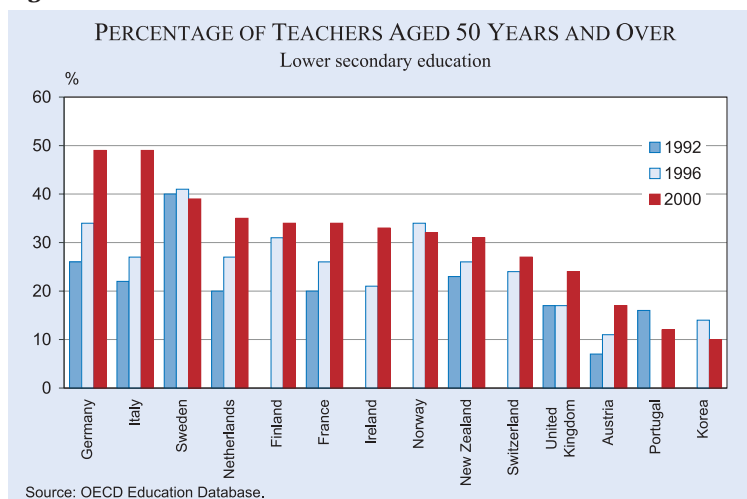
In this paper I provide a brief overview of the teacher labour supply problems across OECD countries and focus on evidence from the UK to illustrate the arguments in a more detailed way by referring to the considerable research which has been devoted to this policy issue.

The demand for teachers

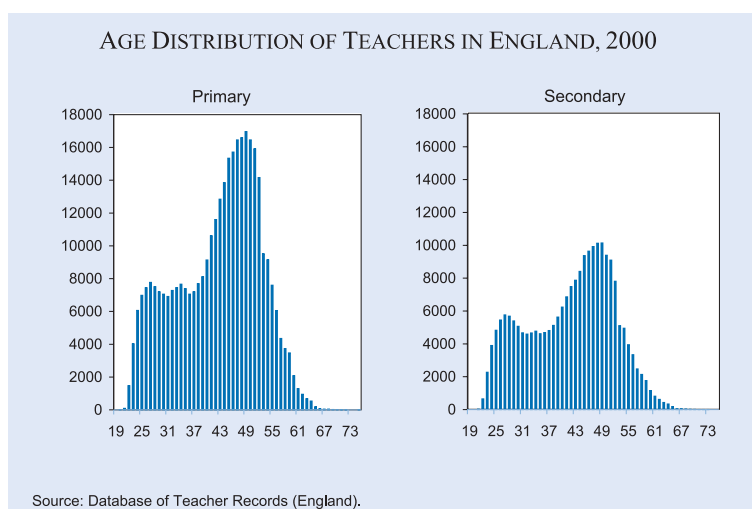
The first key element in the demand for teachers is the demographic pattern of pupil numbers, which fluctuates all the time with changing fertility patterns. In most OECD countries projected numbers of pupils will be falling over the next 5–10 years.



Figure 1



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Figure 2

The second demographic trend affecting the demand for new teachers relates to the age distribution of the stock of existing teachers. Figure 1 shows that in many OECD countries the teacher stock is aging as an increasing proportion of teachers in 1992, 1996 and 2000 are over 50.

Figure 2 shows the age distributions of primary and secondary teachers in England in 2000. 40 percent of all teachers are aged 45–55, and those aged over 55 account for another 6 percent of the workforce. Within the next ten years, nearly 50 percent of the current workforce is likely to have retired. Since, the number of pupils is not forecast to decrease significantly, at the current level of recruitment into teaching, a large shortage of teachers is therefore predicted.

A third factor in the demand for teachers is the size of class the government chooses for its pupils. This varies remarkably across countries as Figure 3 shows that pupil/teacher ratios in primary schools are over 30 to 1 in some countries and as low as 12:1 in Denmark. This will not only condition the demand for teachers but the quality of the teaching which is imparted to the children, as larger classes may mitigate against individual attention. In many OECD countries pupil/teacher ratios have been falling. In the USA average class size was 23 in 1965 – but this has fallen to 16 by 2000. This represents a dra-

matic growth in teacher supply over the last 35 years in the USA. In the UK primary class size had fallen continuously for 20 years to a low of 20:1 by 1985 – this has since risen to 24:1 by 2000. Of course what these aggregate figures hide are the increasing need for specialist teachers of subjects like ITC which are relatively new to the curriculum.

A fourth factor in demand is the governments choice of the length of the working day for teachers and how many teaching days there are in a year. Most coun-

tries make their elementary teachers teach between 650 and 800 hours in the year but some teach a lot more – including those in the USA. Figure 4 illustrates the variability of teacher hours in a year across countries and these differences must be reflected in the quality and intensity of the effort required of teachers in their job and hence the relative attractiveness of the job compared to alternatives.

Several other features may complicate the demand for teachers in different countries. First, if the financial administration of education is performed at a local level with autonomy and accountability then recruitment and retention will depend on local and school specific factors. Secondly, the determination of desired pupil-teacher ratios and teacher recruitment may be influenced by educational criteria at the state or local level. In some countries salaries are negotiated with trade unions that may have some influence over the final settle-

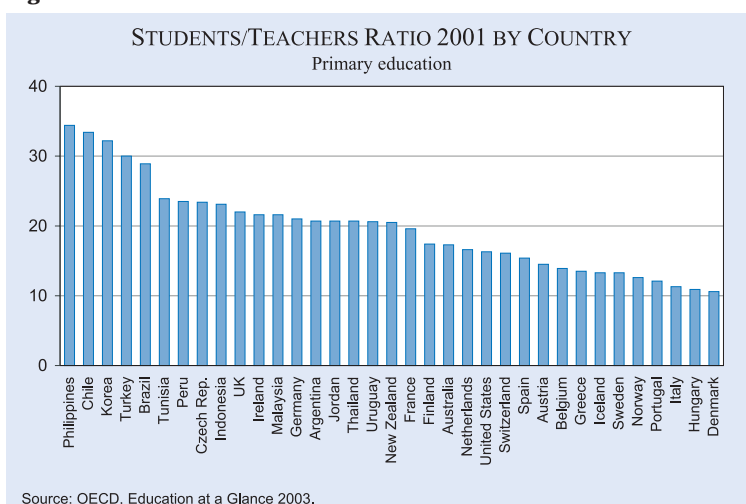
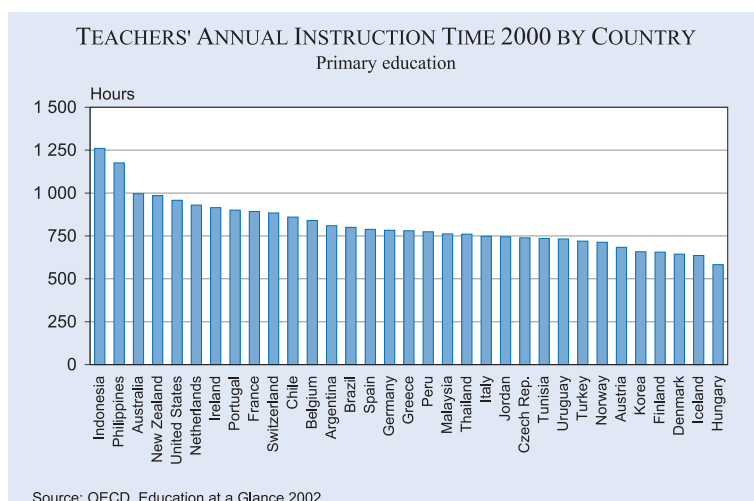
Figure 3

Figure 4

ment of pay and other working conditions – this may contribute to inflexibility in the teacher labour market. Thirdly, to some extent, the government can influence the retirement plans of existing teachers, perhaps by reforming pension rights.

Fourthly, most governments control the nature and length of teacher training – this can and has been changed in times of crisis. Finally different countries have different conventions about the extent to which school subjects, like mathematics may be taught by non-specialists. Clearly, allowing non-specialists to teach such shortage subjects will solve the short run problem of having a teacher in front of a class – but at what cost to the quality of teaching? All these factors may operate on the demand conditions in any specific country. Ultimately though the force of demand for teachers will depend on the political will that creates the policy on educational expenditure – since to a large extent teacher quality would not be a problem if a country was prepared to spend enough money. Naturally the political economy of public expenditure will mean that spending on teachers will always be balanced with the importance of spending on health, welfare, defence and other priorities. Hence, at different times in the history of each country, there have been problems with teacher demand outstripping supply but the government in question not necessarily prioritising expenditure on teachers enough to solve the problem.

Empirical evidence of teacher shortage in different countries is not easy to find. Calculating the precise extent of the shortage (or surplus) of teachers in different countries is difficult. Under certain assumptions it is possible to get an indication of shortage for the UK. Figure 5 shows the demand for teachers calculated by taking desired pupil-teacher targets, as published by the government, and multiplying them by actual pupil numbers. Teacher supply is taken from government data on the number of teachers in service,

and the “excess demand” – or teacher shortage – is the gap between demand and supply. This calculation suggests that in 2000, there was a national aggregate shortage of 34,000 teachers.

Figure 5 shows that there has been excess demand for teachers almost continuously throughout the post-war period in the UK. The main problem has been for secondary school teachers, although the difference in excess demand between primary and secondary school teachers disappeared towards the end of the 1990s. The 1970s are the only time in the post-war period when a (small) excess supply of teachers was apparent. In some cases, the demand for teachers appears to change sharply from one year to the next. This is not due to demographic change, but to modification of the official desired pupil-teacher ratio. Since a shortage of teachers appears to be a permanent feature, the remaining discussion focuses on the determinants of the supply of teachers.

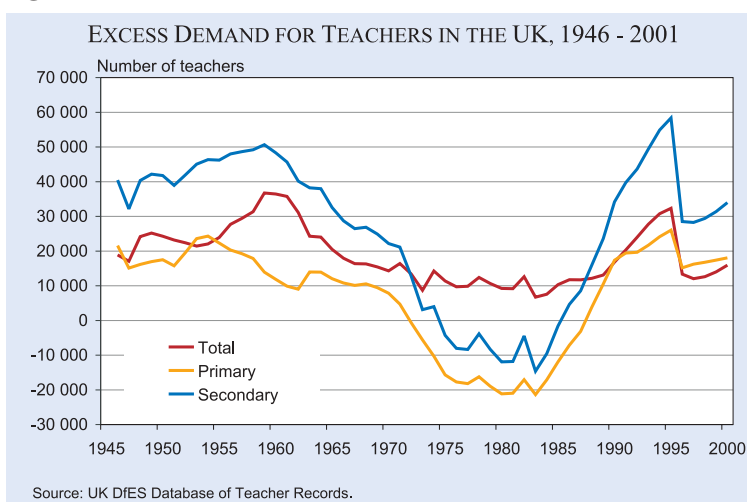
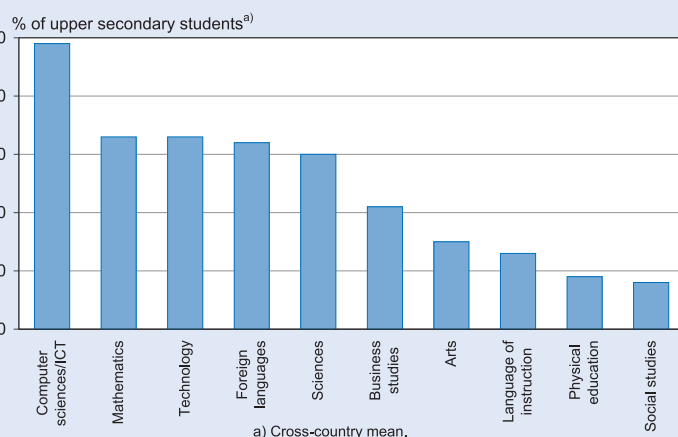
Figure 5

Figure 6**STUDENTS IN SUBJECTS WHERE TEACHER HIRING IS DIFFICULT, 2001**

Source: OECD International Survey of Upper Secondary Schools (ISUSS) database, 2003.

There is some evidence of teacher shortages by subject from data recently collected by the OECD (called the International Survey of Upper Secondary Schools, ISUSS). Figure 6 shows that school principals have found hiring particularly ICT, maths and technology, language and science teachers very difficult. In many countries principals also report that difficulties in teacher hiring will be affecting the learning of 15-year-old pupils. This is direct evidence on the quality of teachers and points to inadequacies in the recruitment. It also raises the issue of what determines teacher supply and will lead to a discussion of teacher pay.

Supply of teachers: quantity

Ultimately, the government has some control over the stock of teachers since it can determine how

many places are provided on courses at universities to train teachers.

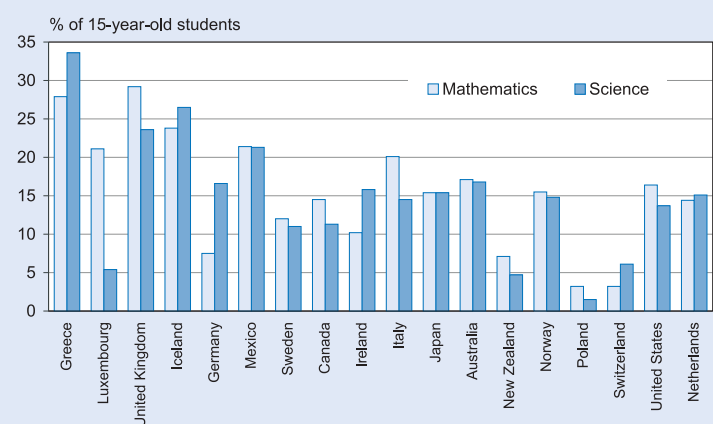
Many factors influence the choice of whether or not to become a teacher. In the UK teacher training courses are not always filled, and attendance varies by subject. In the mid-1990s, there were 20 percent fewer students than targeted in initial teacher training courses for secondary school teachers, although this shortage has decreased to approximately 6 percent more recently. By subject, the shortage is highest in

maths, modern languages and geography with shortfalls ranging between 20 percent and 30 percent in 2000/1.

Measures to increase the retention of trainees and new teachers have been on the forefront of the political agenda on education. The most prominent measures are repayment of student loans for up to ten years and a hardship allowance for students in shortage subjects committed to becoming teachers, bursaries for undertaking and completing the Postgraduate Certificate in Education and “golden hellos” of £4,000 for new teachers in shortage subjects.

It is evident that the flow of newly qualified teachers does not necessarily indicate the level of overall supply. Focusing on those currently working as teachers ignores individuals who are available for (and possibly seeking) work in teaching, but who are not currently employed as teachers. Supply can be calculated as consisting of those entering the profession and those remaining in teaching from the previous year.

But the difficulty is not just recruiting teachers but keeping them in the classroom. Some trainees drop out and others decide not to become teachers. Smithers and Robinson (2003) showed that for 100 registered trainees, 88 passed the final examination, but only 59 were

Figure 7**STUDENTS BY COUNTRY WHERE THERE IS A SHORTAGE OF TEACHERS**

Source: OECD PISA Database 2001.

teaching a year later. After three years, only 53 of the original trainees were still in the classroom. This wastage not only adds to the costs of providing teacher training but also has negative effects on child performance. The evidence is that higher teacher turnover is associated with lower educational pupil outcomes (Dolton and Newson 2003). This is of particular concern since we know that teacher turnover is highest in the most deprived areas. A further factor of concern is that male teacher wastage rates have been rising in many countries – and this of concern given the research which shows that a male role model may be good for male children and adolescents.

Supply of teachers: quality

One of the most important debates in education is whether teacher quality is high enough. While teacher quality is notoriously difficult to measure, research suggests that some teachers consistently perform better than others over time, showing that teacher effectiveness is an important determinant of pupil attainment.

But even if it is unclear whether teachers with better personal academic records or qualifications are necessarily better teachers, we need to be concerned about recruiting teachers from the lower end of the ability distribution. There is some evidence in the UK (Chevalier et al. 2001; Nickell and Quintini 2002) that teachers are being drawn from a lower part of the educational achievement or ability distribution than they were in the past. This clearly matters for teacher recruitment and for pupil performance.

It is hard to find direct evidence of the interrelation between teacher supply and shortage and the quality of teachers. One limited piece of evidence is that reported by the OECD (2004). Figure 8 comes from the OCED website. It shows how schools react when faced with a teacher shortage. In the usual course of events we would expect a school to advertise and hire a fully qualified teacher – if teachers are in short supply the school may resort to hiring a teacher with less than a full qualification, expanding the size of the classes, adding hours to other teachers courses or cancelling the planned courses. Figure 8 shows that these practices are frequently adopted in different countries. This must reflect on the quality of the teachers appointed and so it provides some evidence of the link between teacher shortage and teacher quality.

The issue of how to recruit better or smarter teachers and provide them with appropriate incentives is thus an important one. It is this we turn to next, beginning with a discussion of what has happened to teachers' relative wages through time.

Teachers' pay

The most important determinant of teacher supply is the relative wage on offer. There is a large body of econometric evidence which finds that relative earnings of teachers is a major factor in individuals decisions to become a teacher or remain in the profession. Figure 9 shows how variable teachers' wages are across countries by graphing average teachers' wages expressed as a proportion of GDP per head. This shows that there are some countries where teachers are earning approximately twice the national average GDP per head (like Denmark and Germany). Most countries pay their teachers between 1.3 and 1.7 times the GDP per head, including the UK, USA, Spain, Switzerland, and most other European countries. Clearly in some countries being a teacher accords a much higher earnings status than in others. This will reflect on the calibre of the people doing the job in that country.

Figure 8

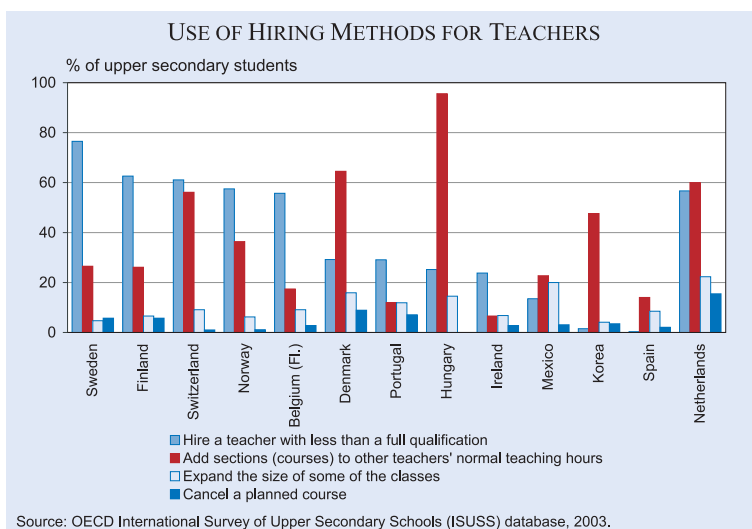


Figure 9

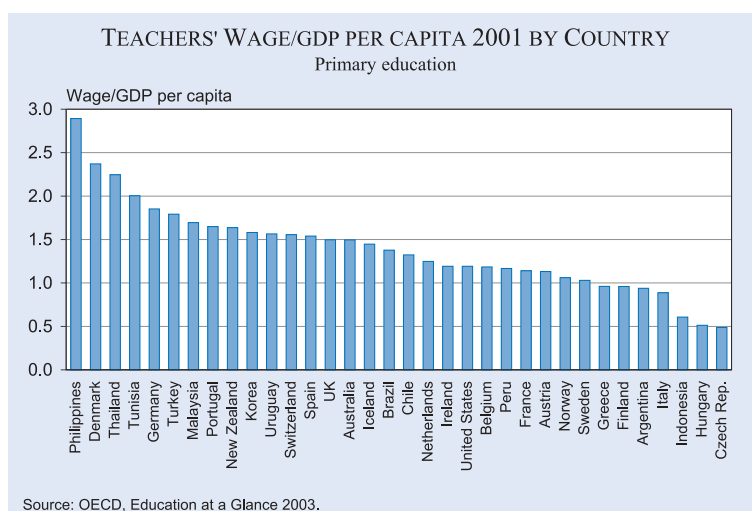


Figure 10

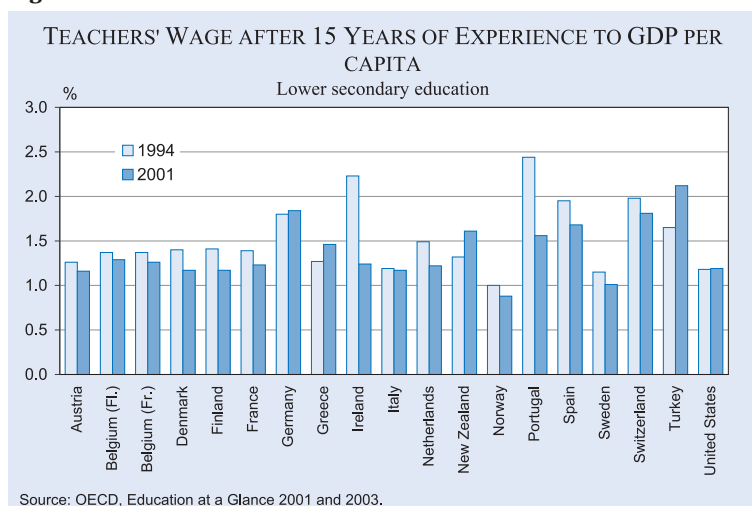
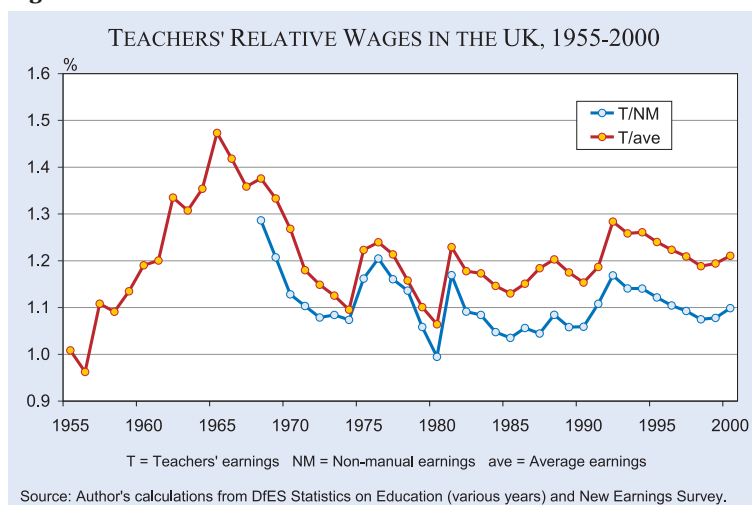


Figure 11



It is also of much concern that the relative wage of teachers in many OECD countries has been falling in recent years. Figure 10 shows the ratio of an

age pay rise of 29 percent following the Houghton report in 1974. This was followed by four or five years of decline in real pay before the Clegg

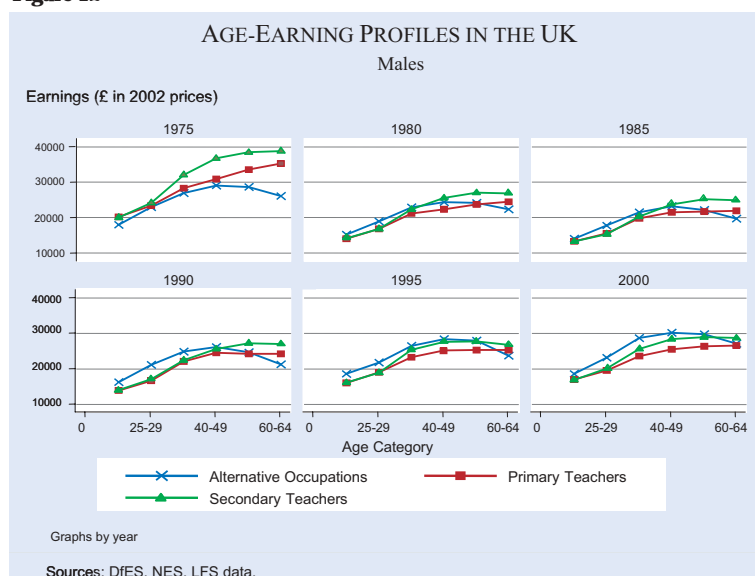
experienced teacher with 15 years of service in 1994 and 2001. For many countries their wage – expressed as a proportion of GDP per head has been falling. Notable exceptions are Greece, New Zealand and Turkey.

Tracking the relative pay of teachers over time in more detail is not straightforward in most countries. We can examine what has happened in the UK. Again since it is not pay in teaching alone that matters but teachers' pay relative to potential "forgone" earnings associated with an alternative career we graph teachers relative pay as measured against average manual and average non-manual earnings.

Figure 11 shows the relative earnings of teachers compared with average non-manual earnings from 1955 to 2000 in the UK. The decline in the relative earnings of teachers is evident. Since 1992, teachers' pay has fallen by 6 percent relative to average non-manual earnings (although the decline "bottomed out" in the late 1990s). Examination of the longer run pattern of change reveals that the pattern of teachers' pay exhibits a cyclical repetitive pattern, namely a period of sustained decline, followed by a dramatic increase, usually as a result of a major government report on the crisis in teacher supply.

Figure 11 shows the process of "catch-up" following a decline in relative earnings, the most notable example being the average

Figure 12



Commission award of 1980 restored 1974 “relativities”. Compared with the earnings of other public servants, teachers’ pay has also declined – by 11 percent relative to police earnings since 1981 and by 25 percent relative to nurses since 1973.

Another important but neglected aspect of remuneration is what individuals are paid over their lifetime. There is good evidence for the UK that teachers fair badly in this regard over the course of their whole working career and that the position has been getting worse. Figure 12 displays the age-earning profile for males for selected years. The alternative occupation legend represents the earnings in the alternative occupation for those with a teaching qualification who do not teach. This is a significant departure from the literature which looks at all graduate earnings at a specific point in time as the opportunity wage – this is clearly inappropriate as the decision should be made on the likely real alternative and over the life cycle. All earnings have been set to 2002 prices for comparative purposes.

Overall, in Figure 12, it is quite clear that the earnings of male teachers were uniformly higher than earnings in the alternative occupation in 1975. But over time, the earnings profile in the alternative occupation has been shifting up whilst that of teachers has been moving down. By 2000, it is clear that the wage in the alternative occupation is almost uniformly above that of teaching.

Additionally, the lower age categories appear to be earning a much higher level of earnings in the

alternative occupation in all years after 1975, while in the later age categories, earnings from teaching exceed earnings from the alternative occupation. This gap between the older age grouped teachers and non-teachers is clear in the 1980s. However, the age-earnings profile in the 1990s and into the new century appear to indicate a slow erosion of the higher level of earnings for the older age group in teaching compared to the alternative occupation. The graphs in Figure 12 indicate strongly that males benefit financially from being in an alternative occupation com-

pared to the teaching profession. In Dolton and Chung (2004) the same analysis for women shows that although the age-earnings profile in teaching drifts down over time, it is still above that in the alternative composite occupation. The authors show that internal rate of return to teaching has been declining for the last 25 years and is now negative for men and this means that on average men lose up to £40–£67k in terms of the Pet Present Value of Earnings over their lifetime whereas women gain approximately the same relative to an alternative occupation.

Who becomes a teacher?

It is clear that relative earnings in teaching have a marked effect on the occupational choice of graduates. In particular, the lower relative wages (or wage growth) are in teaching, the less likely a graduate will choose that career. Relative earnings affect both initial career choices, as well as choices made later in an individual’s career. Dolton (1990) also found that there is considerable inertia to remain in teaching and suggested that this effect may be partially due to the different individuals’ subjective evaluation of the relative pecuniary and non-pecuniary rewards to teaching.

Chevalier et al. (2001) overview the market position for teachers in the UK from 1966 to the mid-1990s using graduate cohort data from five separate cohorts of university graduates. The use of this data allows them to simulate the effect of possible

teacher pay rises over time. They find that relative wages in teaching compared to alternative professions have a significant impact on the likelihood of graduates choosing to teach, although the impact depends on the market situation at the time. The wage effect on the supply of teachers is strongest at times of low relative teachers' wages, or following a period of decline in those wages. It is also strongest for those individuals who have more recently graduated. For example, increasing wages of teachers by 10 percent would have led to an increase of nearly 10 percent in the supply of teachers in the mid-1980s but only 2 percent in the mid-1960s or early 1990s.

Labour market conditions at the time the occupational choice is made are also important. The most recent evidence from Dolton, Tremayne and Chung (2003) look at time series data over the whole post-war period in the UK and finds that aggregate labour market conditions, particularly unemployment levels, are important determinants of teacher supply. Notably, they find that the supply of graduates to teaching is counter-cyclical with most graduates' perception of teaching (and willingness to enter the profession) improving when teacher pay is high compared to alternative occupations and when graduate unemployment is high.

While relative pay affects the decision to become a teacher, it also affects the decision to remain a teacher. Analysing the decision to leave teaching, Dolton and Van der Klaauw (1995) show that the higher the relative earnings of teachers, the less likely they are to leave teaching. The importance of relative wages in teacher turnover decisions is examined by simulating a uniform 10 percent increase in relative monthly earnings. This leads to a 9 percent reduction in the total exit probability at five years of tenure, or a total retention rate of 69 percent. A 25 percent increase raises the percentage of teachers still in teaching after five years to 73 percent.

Work using US data suggests that raising teacher pay could improve the quality of the stock of teachers. But attracting more able students to teaching is not the only difficulty for policy-makers. Since individuals with higher ability generally command higher wages, high ability teachers are at a higher risk of leaving the profession than less talented teachers. To negate the lure of improved outside opportunities on "able" teacher retention,

some countries have introduced fast track programmes with the aim of recruiting and retaining the most able graduates by shortening pay scales while providing them with additional training, support and supervision.

Another important aspect of teacher supply is that teaching is a career that is relatively popular with female graduates. In nearly all OECD countries the majority of teachers are women particularly in primary education, where women consist of 80 percent or over of the teacher labour force. A crucial aspect of the distinction between male and female occupational choice is that often women are simultaneously making decisions about starting a family and hence deciding whether to participate in the labour market. This is particularly true in teaching since it is argued that a teaching career has complementarities with family formation and in particular, the ease with which one can return to teaching after a career interruption.

Dolton and Makepeace (1993) find that the choice of teaching as a career is intimately related to the decision to participate in the labour market for women. This is true in the sense that unobserved factors, which make a woman more likely to select a career outside teaching, make them less likely to participate in the labour market and vice versa. This generates a positive correlation in the teaching occupational choice decision and the decision to work.

Performance-related pay (PRP)

While the evidence shows that raising pay impacts positively on the supply of teachers, it is not informative how one can design an optimal pay package to guarantee a supply of high quality teachers. Numerous authors advocate the lack of efficiency of across the board pay increases (see, for example, Odden and Kelley 1997). Over the years there have been various attempts at providing differential pay for teachers, but since 2000 this seems to have been mainly focused on performance-related pay. While moves to introduce incentives into the wage structure of teachers seems, in principle, to be a good idea, there are many theoretical and practical reasons why it remains very unclear as to whether PRP is effective for teaching. (For a summary of this literature, see Dolton et al. 2003). In the UK performance-related pay is intended to boost

teachers' earnings, whilst making the increase in pay dependent upon teachers demonstrating effective performance in their jobs.

The performance management arrangement in the UK PRP system has two main elements. Firstly each teacher is appraised annually by his or her senior line manager on the basis of previously agreed objectives. At the second performance review stage, the assessment is used by the head teacher as a basis for teacher pay decisions in the coming year.

Of course, it is by and large an empirical question as to whether PRP schemes actually improve teacher performance. Evaluation of PRP in the UK is not possible since the scheme was introduced nationally. Evidence from elsewhere in the world tends not to support PRP schemes. In fact, over time, most PRP schemes for teachers have collapsed and there is evidence that the ability of PRP to motivate staff is limited.

It is unclear whether PRP is the appropriate vehicle to solve problems in recruitment and retention of teachers. For example, PRP may not be the best vehicle to improve teacher performance, since the outcome of interest, pupil achievements, is multi-dimensional and depends on the effort of a group of teachers rather than single individuals (Holmstrom and Milgrom 1991).

Non-financial incentives for teachers

Most government policies to retain teachers concentrate on financial incentives. But surveys of teachers reveal that earnings are not the only determinants of their dissatisfaction. Chevalier et al. (2002) find that teachers are less satisfied with their jobs than many comparable graduates working in other fields. Teachers are particularly dissatisfied with pay and hours worked. Compared with other graduates, teachers are 12 percentage points more likely to claim to be dissatisfied with the number of hours worked. Compared to other employees, teachers' hours worked are concentrated during term time with an average working week of 52 hours.

It has long been asserted that many people become teachers due to the non-pecuniary benefits offered by joining the profession, long summer holidays

being the classic example. But more recently, with the advent of the quasi-market and increased accountability, these non-pecuniary benefits may have become less attractive. In the UK, for example, the extra burdens of the national curriculum, and the rigours of the OFSTED inspection procedures may have caused an excessive increase in the administrative burden on teachers.

Interviews with teachers leaving the profession confirm that heavy workload and school characteristics rank higher than salary as a reason for quitting. For over 40 percent of the leavers surveyed by Smithers and Robinson (2003) in the UK, nothing could have made them stay. For the others, changes in workload or pupil behaviour were more likely to be cited than salary as an inducing factor to stay. To ensure a high quality teaching profession, all of these difficult issues need to be addressed.

Conclusions

Examining the pattern of evidence relating to teacher recruitment across OECD countries it is clear that there have been various trends. Notably that teacher relative earnings have been declining and that many countries have experienced teacher shortages particularly in subjects where graduates can earn a higher opportunity wage. Countries can disguise these shortages in a number of ways including having more pupils taught by non-specialist teachers. These factors mitigate the quality of teachers who are teaching children in schools.

Many governments have tackled their problems with teachers by reforming the training of new teachers or the retraining of existing teachers with professional development schemes or trying to introduce teacher appraisal and various incentive schemes into teacher pay. Little is known about the effectiveness of these schemes and one must suspect that they will not necessarily be a substitute for simply putting more government expenditure into education and teacher pay and according it a higher priority.

On the positive side educational standards are rising and we now know much more about how countries compare in the education of their children. What is less clear is how teacher quality and the shortage problems actually affect the achievement of children. More research is needed in this area.

There is little doubt that in many countries teaching as a career does not have as high a status as it used to. Fewer children grow up today thinking that they want to be a teacher. Some of this effect is due to their low relative wage and their difficult conditions of work, and some of it may be due to a perception created by the media of the value of the job. Governments seldom praise the efforts of their teachers and often try to reform their working conditions to have more control over the outcome which they value – i.e. increased educational performance of the pupils. In addition parents are becoming ever more critical of the quality of teaching their children receive – it is little wonder that recruitment of high quality teachers is problematic.

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