Underutilisation of Skills, Bumping Down and Low-Wages

by *Lex Borghans*, *Andres de Grip* and *Peter J. Sloane*

Introduction

In many industrialised countries there is a tendency for more educated individuals to obtain jobs that used to be held by workers with a lower level of educational qualifications. To what extent does this trend indicate underutilisation of skills (overeducation) and to what extent does this process lead to 'bumping down' of less skilled workers out of their traditional occupations are questions that need to be answered[1].

The measurement of over – and undereducation is far from straightforward as the notion of a particular level of education being required for a job is both dubious and problematical. For example graduates in lower level jobs may change the nature of such jobs and technological and organizatorial change and shifts in demand may also alter the relative demand for graduates and non-graduates in particular occupations.

Whether overeducation is harmful or beneficial is also disputed. Some authors argue that overeducation results in reduced worker effort, increased production costs and lower productivity, while others argue that employers hire overeducated workers precisely because they are more productive and reduce the cost of training. Following on from this important questions are what is the 'right' level of education for a job? How should overeducation be

1. These questions are dealt with more extensively in Borghans, de Grip and Sloane (1998).

measured; and what are the causes of underutilisation and their consequences?

What is the Right Level of Education for a Job?

It is common for employers to require certain levels of education for particular jobs, i.e. applicants for accountancy posts are normally required to have a bachelor's degree. At the extremes we may assume that jobs of a certain level cannot be performed by people with lower qualifications and that people with higher qualifications than are required for the job waste their training as the marginal productivity of their additional qualifications is zero. However, many empirical studies question the implied rigid relationship between productivity and educational background (Hartog, 1997). Occupational productivity profiles which plot the relationship between productivity, the wage and years of schooling suggest that the relationship is non-linear. De Grip, Borghans and Smits (1998), for example, classify occupations in the Netherlands according to their required level of education, allowing for the relationship described above between productivity and wages. They find in the lower segment of the labour market certain occupations such as lower skilled jobs in printing or chemicals tend to be matched exclusively to one educational level (Intermediate Vocational Education), but others such as lower technical and transport jobs seem to present a wide spectrum of educational qualifications.

There are many reasons why in practice there may be a mismatch between educational and job levels. There may be shifts in wage schedules as a result of changes in demand for certain occupations as measured in units of production or in labour supply at certain educational levels. Alternatively shifts could occur as a result of changes in the occupational production profile. Underutilisation may result from an excess supply of labour which reduces the rate of return to education. If, on the other hand, changes in the production process increase the demand for relatively highly educated workers, wages for this group will rise and as a consequence there may be overutilisation of lower educated labour.

How Should Overeducation (Underutilisation) Be Measured?

There are three main alternatives in the measurement of overeducation.

(i) the so-called objective measure depends on the systematic evaluation by professional job analysts who attempt to specify the required level and type of education in particular occupations. Examples are the Dictionary of Occupational Titles (DOT) established by the US. Employment Service and the ARBI-code developed by the Dutch Department of Social Affairs.

(ii) A subjective measure based on worker self assessment. Examples include the Michigan Panel Study of Income Dynamics question which asks "how much formal education is required to get a job like yours?", the British Social Change and Economic Life Initiative data set question which asks 'if they were applying today what qualifications if any, would someone need to get the type of job you have now?' and the Spanish Living and Working Conditions Survey of 1985 (ECUT) which includes two separate questions, first 'considering the job you do how long would it take some-one with the required education, who begins the job, to do it correctly?' and second, 'what kind of education does a person need in order to perform the job?' Finally, some data sets allow for the fact that there is no unique educational requirement. Thus, the 1980 UK National Survey of Graduates and Diplomates asks 'What was the MINIMUM formal qualification required for (entering) this job?' The above definitions are clearly different from one another, but may not necessarily be perceived as so by the respondents.

(iii) Where there is no direct question on the extent of over- and undereducation overeducation has often been defined as a level of education more than one standard deviation above the mean (and undereducation correspondingly as a level of education more than one standard deviation below the mean) for a given occupation. This is clearly different from the above measures in defining overeducation as substantially overeducated. It also implies symmetry and will clearly give biased estimates where

the tendency to overeducation or undereducation is skewed, which is generally the case in many countries. In such cases it seems more appropriate to consider the over – and undereducated in relation to the mode rather than the mean. Clearly, these three measures can lead to divergent estimates. The job analysis approach ignores the fact that there is likely to be a distribution of required education within occupational groups. Required schooling levels may vary according to the ability of job incumbents. Levels of education ignore the type of education received and some workers who are mismatched may be misclassified.

It has been claimed that the worker self assessment method may be biased because workers may be inclined to overstate the requirements of their job in order to enhance the perceived status of their position. Alternatively, workers may simply state current hiring standards and these may be influenced by the state of the labour market.

The standard deviation approach is also very sensitive to labour market conditions, so that it may understate the extent of overeducation under conditions of excess supply of labour and overstate it under conditions of excess demand. In defining overeducation as being substantially overeducated, it will also clearly reduce the incidence of mismatch relative to the other two measures. In general, it seems to be the least adequate measure of mismatch of the three alternatives, given the asymmetry of over- and undereducation. However, most studies in practice measure whether workers are overeducated or not. A superior approach is to examine the degree of overeducation (Sloane, Battu and Seaman, 1995).

Finally, perhaps we should follow Mason (1996) in only regarding workers as 'overeducated' if first the jobs in question have not been substantially modified to take advantage of the skills of the overeducated workers and second, no salary premium is on offer to the overeducated compared to these workers who have only the required level of education in that job. Care needs to be taken, therefore, in interpreting findings of overeducation.

Causes of Underutilisation and Their Consequences

According to matching theory the allocation of individuals with different levels of education is regulated by the trade-off between higher wages and increased productivity. If, for example, the supply of those with the highest level of educational qualifications goes up or the demand for such workers goes down, such workers will shift into lower level jobs provided that relative wage becomes low enough and their productivity is high enough to make it attractive to employ this highly educated group in lower level occupations.

In general, the lower the wage elasticity of demand for different levels of educated labour the greater will be the bumping down effect on the lowest segments of the labour market. At the extreme the bumping down process will end in an increase in unemployment for low skilled workers. Consistent with this low skilled individuals tend to suffer more from recession than those with higher levels of education (Teulings and Koopmanschap, 1989).

The alternative explanation that matching theory offers for shifts towards lower level jobs in the employment structure by individuals with a certain level of education is upgrading. Let us suppose that due to the introduction of new technologies or organisational changes productivity goes up, requiring a broader variety of skills and higher average skills from the workforce. The result will be an increase in employment of higher educated individuals in jobs that were formerly occupied by lower educated individuals. Such upgrading might again induce a chain of shifts in the occupational domains of workers with different levels of education accompanied by wage decreases for the lower educational categories.

The precise effects resulting from the above changes depends in part on what happens to wages. Since in a neo-classical framework wages should be equal for all labour with the same personal characteristics, wages will fall not only for those who have to accept a job that used to be in the occupational domain of those who are lower educated, but also in their own 'traditional' occupational domain. This will tend to reduce the returns to education. In contrast, in the job competition model (Thurow, 1975) it is assumed that every job is characterised by a constant wage level and

educational qualifications simply place individuals at the front of the job queue. In this case, however, decreasing demand will not necessarily provide a signal to reduce educational investments.

Policy Conclusions

The occurrence of a bumping down process initiated by an excess supply of educated workers suggests that additional investments in education will not be very effective. However, if the increase in employment of higher educated workers in jobs that were formerly occupied by lower educated workers is due to a process of upgrading there is a need for increased educational investment. In practice, it might be very difficult to distinguish these two cases, since both processes will lead to a shift in the employment structure of higher educated individuals towards jobs that were previously occupied by the less well educated. Training will only be useful if it increases the supply at a level of education for which the upgrading process created new demand. Training that increases the supply of those with a level of education below the level where these upgrading tendencies occurred will only stimulate further the process of bumping down.

References

Borghans L., de Grip A. and Sloane P. (1998), *Underutilisation of Skills, Bumping Down and Low Wages*, paper presented at the LoWER seminar on policy analyses, Milan, March 1998.

de Grip A., Borghans L. and Smits W. (1997), "Future developments in the job level of high-skilled workers", in Heijke and Borghans (eds.), *Towards a Transparent Labour Market for Educational Decisions*, Aldershot, Ashgate, pp. 21-56.

Hartog J. (1997), *On Returns to Education: Wandering Along the Hills of ORU Land*, paper presented at the Conference of the Applied Econometrics Conference in Maastricht, May 1997.

Mason G. (1996), "Graduate utilisation in british industry; the initial impact of mass higher education", *National Institute Economic Review*, May, pp. 93-111.

Sloane P.J., Battu H. and Seaman P. (1995), *Overeducation, Undereducation and the British Labour Market*, University of Aberdeen Department of Economics Working Paper, No. 95-09.

Teulings C. and Koopmanschap (1989), "An econometric model of crowding out of lower education levels", *European Economic Review* 33(8), pp. 1653-1664.

Thurow L. (1975), *Generating Inequality*, Basic Books, New York.