

Education and employment in OECD countries

Steven McIntosh

Paris 2008

UNESCO: International Institute for Educational Planning

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The publication costs of this study have been covered through a grant-in-aid offered by UNESCO and by voluntary contributions made by several Member States of UNESCO, the list of which will be found at the end of the volume.

Published in 2008 by the United Nations
Educational, Scientific and Cultural Organization
7 place de Fontenoy, F75352, Paris 07 SP

Cover design: Pierre Finot
Typesetting: Linéale Production
Printed in IIEP's printshop

ISBN: 978-92-803-1312-3
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Fundamentals of educational planning

The booklets in this series are written primarily for two types of clientele: those engaged in educational planning and administration, in developing as well as developed countries; and others, less specialized, such as senior government officials and policy-makers who seek a more general understanding of educational planning and of how it is related to overall national development. They are intended to be of use either for private study or in formal training programmes.

Since this series was launched in 1967, practices and concepts of educational planning have undergone substantial change. Many of the assumptions which underlay earlier attempts to rationalize the process of educational development have been criticized or abandoned. Yet even if rigid mandatory centralized planning has now clearly proven to be inappropriate, this does not mean that all forms of planning have been dispensed with. On the contrary, the need for collecting data, evaluating the efficiency of existing programmes, undertaking a wide range of studies, exploring the future and fostering broad debate on these bases to guide educational policy and decision-making has become even more acute than before. One cannot make sensible policy choices without assessing the present situation, specifying the goals to be reached, marshalling the means to attain them, and monitoring what has been accomplished. Hence planning is also a way to organize learning: by mapping, targeting, acting and correcting. The scope of educational planning has been broadened. In addition to the formal system of education, it is now applied to all other important educational efforts in non-formal settings. Attention to the growth and expansion of education systems is being complemented and sometimes even replaced by a growing concern for the quality of the entire educational process and for the control of its results. Finally, planners and administrators have become more aware of the importance of implementation strategies and the role of regulatory mechanisms, including the choice of financing methods and examination and certification procedures. The concern of planners is twofold: to reach a better understanding of the

validity of education in its own empirically-observed dimensions, and to help in defining appropriate strategies for change.

The purpose of these booklets includes monitoring the evolution and change in educational policies and their effect upon educational planning requirements; highlighting current issues of educational planning and analyzing them in the context of their historical and societal setting; and disseminating methodologies of planning which can be applied in the context of both the developed and the developing countries. For policy-making and planning, vicarious experience is a potent source of learning: the problems others face, the objectives they seek, the routes they try, the outcomes they achieve, and the unintended results they produce all deserve analysis.

In order to help the Institute identify up-to-date issues in educational planning and policy-making in different parts of the world, an Editorial Board has been appointed comprising professionals of high repute in their fields. The series has been carefully designed, but no attempt has been made to avoid differences or even contradictions in the views expressed by the authors. The Institute itself does not wish to impose any official doctrine. Thus, while the views are the responsibility of the authors and may not always be shared by UNESCO or IIEP, they warrant attention in the international forum of ideas. Indeed, one purpose of this series is to reflect a diversity of experience and opinions by giving different authors from a wide range of backgrounds and disciplines the opportunity to express their views on changing theories and practices in educational planning.

There is an increasing consensus that quality Education for All is an indispensable element of any strategy that aims at fostering national economic development in a globalized world. It is a preoccupying but very actual reality in developed as well as in developing countries that people with low qualifications – who are identified as such in view of their low level of education – find it difficult to integrate the labour market. The modern day developments that are arising as a result of new technologies and the growing role of information technologies in production and service provision are making low-skilled jobs scarcer, while simultaneously creating jobs that require higher qualifications.

Another phenomenon that threatens low-skilled jobs in developed countries is outsourcing, when unskilled jobs are lost to newly industrialized countries with lower salaries and cheaper production possibilities.

The aim of this booklet is to help planners and policy-makers to analyze the aforementioned challenges and to provide possible solutions to the difficult problem of unemployment among low-qualified individuals. The author explains the issues using various statistics of unemployment rates and employment ratios. He also discusses whether a high rate of unemployment is more attributable to the low qualifications of individuals or to the outsourcing strategies of companies. He then derives relevant conclusions for policy-makers, emphasizing the need to raise the level of qualifications of youngsters.

This booklet concentrates on industrialized countries. Another booklet will be prepared, which will address more specifically the issue in low-income countries.

IIEP is grateful to the author for this very interesting and innovative contribution to the series, and to Eric Hanushek, Senior Fellow of the Hoover Institution at Stanford University, for his contribution as Associate Editor.

Mark bray
Director, IIEP

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Preface

The wages and employment of individuals in the lower part of the overall earnings distribution are concerns of all developed and developing countries. One popular position is that development itself will aid these people. This view, characterized by the slogan that “a rising tide lifts all boats”, leads some to believe that the economy will take care of these problems in a somewhat automatic manner.

But there is another view. Specifically, as societies develop, it may be that the lower earners in society simply end up farther and farther way from the heart of the economy. In this vision of development, there is reason for concern and possibly for more government action.

Unfortunately, with concern about the position of low-wage workers, good intentions and casual observation frequently substitute for careful analysis and empirical study. Governments rush to make decisions that they believe will help without fully understanding what forces are at work in the economy. Part of this rush to action is readily explained. Understanding the dynamics of unemployment in an economy is difficult. Further, the existing research often presents contradictory views.

This situation motivates this volume by Steven McIntosh. By applying rigorous, but easily understood, economic arguments to the problem, he develops a framework that permits understanding the basic facts of a labour market that is increasingly disadvantaging the low-income worker.

The facts for more developed countries are straightforward. Workers with low skills, as identified by low levels of schooling, fare much worse in terms of employment than higher skilled workers, i.e. those with more schooling. Moreover, within the OECD, this relationship between skills and labour-market outcomes has strengthened, such that low-skilled workers are following farther behind.

The simplest version is that technology is evolving in ways that lead to increasing reliance on more skilled workers. This

Preface

‘skill-biased technological change’ further points to even larger problems for low-wage workers in the future. This process is reinforced by the development of more global markets, where many services of low-skilled workers can actually be economically supplied off-shore.

A number of countries have experimented with various ways to shield their low-wage workers from competition and from technological change. But these approaches appear quite costly, because new technologies and international trade have clear benefits to participating economies.

The alternative developed persuasively in this volume is that countries work to upgrade the skills of their workers. Specifically, direct actions to move the bottom of the skill distribution toward the middle make sense. These policies directly help the individuals involved by opening up better economic opportunities, but they do so by supporting rather than neglecting the development of a strong economy.

The discussion here concentrates on the developed country story. Clearly, developing countries – those that are currently supplying a disproportionate amount of the low-skill workers to the world economy – face potentially different forces. Yet, the strength of this analysis is the development of a powerful analytical framework by which to judge the day’s economic data. This strength can with great advantage be replicated and extended in developing countries. While the precise data of labour markets in developing countries may differ, the analytical approach carries over for the most part.

Eric A. Hanushek
Associate Editor

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List of abbreviations

GATT	General Agreement on Tariffs and Trade
ISCED	International Standard Classification of Education
NAFTA	North American Free Trade Agreement
NIC	Newly-industrialized country
OECD	Organisation for Economic Co-operation and Development

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Introduction

In this booklet the author looks at the relationship between education and employment in the countries of the Organisation for Economic Co-operation and Development (OECD).¹ He demonstrates that people with low levels of qualifications, or no qualifications at all, are disadvantaged in the labour market in terms of obtaining a job compared to people with high levels of qualifications. Furthermore, the booklet will show how the situation has been getting worse for the low-qualified over the last 30 years with the deterioration of their relative employment likelihood.

In order to know what educational planners and policy makers should do to help improve the labour market position of the low-qualified, it is important to understand why this situation has come about. This is the primary role of this booklet. A survey of the economic literature is provided, offering theoretical reasons for why the labour market position of the low-qualified is being lowered, and then a range of empirical evidence on the subject is presented.

This paper aims to show that the labour market position of the low-qualified has fallen in OECD countries because the demand for their services from employers has been reduced significantly, whilst highly-qualified workers are in demand in increasing numbers. The section on the fall in the demand for low-qualified labour in *Chapter II* is the core section of the booklet and will consider in detail why this has happened. Two theories in particular are considered: (i) new technology, particularly computer technology, is replacing the low-skilled jobs and requiring higher skills of the individuals who use it; (ii) globalization and the growth in international trade

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1. The Organisation for Economic Co-operation and Development was founded in 1960 as a body of 20 countries that shared a commitment to democratic government and the market economy. Today the organization consists of 30 member countries, from eastern and northern Europe (and Greece and Turkey), North America, Australia and New Zealand, and the developed Asian countries of the Republic of Korea and Japan, providing broad diversity between continents and even countries. The organization covers economic and social issues from macroeconomics to trade, education, development and science and innovation.

have brought OECD countries more into competition with the newly industrialized countries. These countries can supply low-skill labour-intensive goods much more cheaply than OECD countries due to lower wages, leading the latter to move away from the production of such goods and towards more specialized products requiring more highly-qualified labour. An additional argument related to the globalization of the world's economy is that it might be the outsourcing of particular low-skill *stages* of production that is harming low-qualified workers in OECD countries, rather than imported *final* goods from newly-industrialized countries. The results will show that skill-biased technological change is so far the dominant explanation for the fall in demand for low-qualified workers in OECD countries, though the impact of outsourcing is also certainly significant and cannot be ignored.

This booklet therefore focuses on diagnosing the cause of the deteriorating labour market position of the low-qualified in OECD countries. Without such a diagnosis, the implementation of a cure by educational planners and policy-makers would be difficult. This booklet ends with a discussion of possible policies to be implemented to begin this process of finding a cure.

I. Education and employment in OECD countries – what the statistics show

This chapter analyzes the relationship between education and employment using a range of facts and figures. First, survey data have been used to show the relationship between education level achieved and labour-force status.

Education and labour-force status in 2004

Table 1.1 presents the unemployment rate, the labour-force participation rate and the employment-population ratio in each OECD country by highest level of education attained. The data have been taken from the Labour Force Survey or equivalent in each country, and collated by the OECD, with the various labour force categories consistently defined across countries.

Three levels of education are represented; namely below upper secondary, upper secondary and tertiary education, or their equivalent in vocational qualifications. These groups correspond to Level 2 or below, Level 3, and above Level 3 respectively on the International Standard Classification of Education (ISCED) scale. They can be broadly thought of as low, intermediate and high levels of education. Thus a person not having completed upper secondary education or equivalent is classified here and throughout the booklet as low-qualified. Most people in this group leave education after completing the lower secondary stage (Level 2 on the ISCED scale), this often being the end of compulsory schooling. ISCED 1 relates to individuals who have completed the primary stage of schooling, but failed to complete the lower secondary stage. However, in developed countries at least, it is not worth studying this group separately, since modern compulsory schooling laws in the majority of countries require the completion of lower secondary schooling. Thus only small numbers are observed as failing to complete this level, most of whom are older workers who left education at a young age before current school-leaving ages were established. This is why all individuals at Level 2 and below (i.e. who have completed no more

than lower secondary education) will be defined as low-qualified throughout the booklet.²

Table 1.1 Unemployment, labour force participation rates and employment/population rates by educational attainment (ages 25-64), 2004

		<Upper secondary	Upper secondary	Tertiary	Ratio <upp. sec/ tertiary
Australia	Unemployment rate	6.2	3.9	2.8	2.21
	Participation rate	64.6	82.0	85.7	0.75
	Employment-population ratio	60.6	78.8	83.3	0.73
Austria	Unemployment rate	7.8	3.8	2.9	2.69
	Participation rate	56.6	76.7	85.0	0.67
	Employment-population ratio	52.2	73.9	82.5	0.63
Belgium	Unemployment rate	11.7	6.9	3.9	3.00
	Participation rate	55.4	77.7	86.9	0.64
	Employment-population ratio	49.4	73.1	84.1	0.59
Canada	Unemployment rate	9.9	6.1	4.7	2.11
	Participation rate	63.3	80.5	85.8	0.74
	Employment-population ratio	57.1	76.7	82.2	0.69
Czech Republic	Unemployment rate	23.0	6.4	2.0	11.5
	Participation rate	55.0	79.9	88.1	0.62
	Employment-population ratio	42.3	74.8	86.4	0.49
Denmark	Unemployment rate	7.8	4.8	3.9	2.00
	Participation rate	67.2	83.8	89.9	0.75
	Employment-population ratio	62.0	79.7	86.5	0.72
Finland	Unemployment rate	12.0	8.2	4.7	2.55
	Participation rate	64.7	80.8	88.7	0.73
	Employment-population ratio	57.0	74.2	84.5	0.67

2. Additional arguments for treating all individuals at Level 2 or below as low-qualified can be found in Steedman and McIntosh (2001).

*Education and employment in OECD countries
– what the statistics show*

France	Unemployment rate	12.1	7.6	6.2	1.95
	Participation rate	67.8	81.5	87.1	0.78
	Employment-population ratio	59.6	75.4	81.7	0.73
Germany	Unemployment rate	20.5	11.2	5.5	3.73
	Participation rate	61.1	78.2	87.5	0.70
	Employment-population ratio	48.6	69.5	82.7	0.59
Greece	Unemployment rate	8.4	9.7	6.9	1.22
	Participation rate	62.0	76.4	88.5	0.70
	Employment-population ratio	56.8	69.0	82.4	0.69
Hungary	Unemployment rate	10.8	5.0	1.9	5.68
	Participation rate	41.4	74.6	84.5	0.49
	Employment-population ratio	36.9	70.9	82.7	0.45
Iceland	Unemployment rate	3.1	2.8	1.0	3.10
	Participation rate	83.1	90.3	94.2	0.88
	Employment-population ratio	80.5	87.7	93.3	0.86
Ireland	Unemployment rate	6.4	3.2	2.1	3.05
	Participation rate	61.1	78.2	87.9	0.70
	Employment-population ratio	57.2	75.7	86.1	0.66
Italy	Unemployment rate	7.8	5.3	4.8	1.63
	Participation rate	56.0	77.7	86.5	0.65
	Employment-population ratio	51.6	73.5	82.3	0.63
Japan	Unemployment rate	6.7	5.4	3.7	1.81
	Participation rate	71.3	77.8	82.3	0.87
	Employment-population ratio	66.7	73.6	79.2	0.84
Republic of Korea	Unemployment rate	2.6	3.5	2.9	0.90
	Participation rate	68.1	72.5	78.9	0.86
	Employment-population ratio	66.4	70.1	76.7	0.87
Luxembourg	Unemployment rate	5.0	3.8	3.0	1.67
	Participation rate	62.4	71.2	85.7	0.73
	Employment-population ratio	59.3	68.5	83.2	0.71

Education and employment in OECD countries

Mexico	Unemployment rate	1.9	2.8	3.0	0.63
	Participation rate	66.0	65.6	84.8	0.78
	Employment-population ratio	64.8	63.8	82.2	0.79
Netherlands	Unemployment rate	5.7	3.9	2.8	2.04
	Participation rate	62.6	80.8	88.1	0.71
	Employment-population ratio	59.0	77.7	85.6	0.69
New Zealand	Unemployment rate	4.2	2.4	2.4	1.75
	Participation rate	68.0	84.0	86.0	0.79
	Employment-population ratio	65.1	82.0	83.9	0.78
Norway	Unemployment rate	3.6	3.8	2.4	1.50
	Participation rate	64.4	82.0	91.5	0.70
	Employment-population ratio	62.1	78.9	89.3	0.70
Poland	Unemployment rate	27.8	17.4	6.2	4.48
	Participation rate	51.9	74.3	87.8	0.59
	Employment-population ratio	37.5	61.3	82.3	0.46
Portugal	Unemployment rate	6.4	5.6	4.4	1.45
	Participation rate	76.8	85.1	92.1	0.83
	Employment-population ratio	71.9	80.3	88.0	0.82
Slovak Republic	Unemployment rate	47.7	14.6	4.8	9.94
	Participation rate	42.0	82.3	87.8	0.48
	Employment-population ratio	22.0	70.3	83.6	0.26
Spain	Unemployment rate	11.0	9.5	7.3	1.51
	Participation rate	64.6	80.7	88.3	0.73
	Employment-population ratio	57.5	73.0	81.9	0.70
Sweden	Unemployment rate	6.5	5.8	4.3	1.51
	Participation rate	71.6	85.7	89.2	0.80
	Employment-population ratio	67.0	80.7	85.4	0.78
Switzerland	Unemployment rate	7.2	3.7	2.8	2.57
	Participation rate	71.2	82.9	92.2	0.77
	Employment-population ratio	66.1	79.8	89.7	0.74

*Education and employment in OECD countries
– what the statistics show*

Turkey	Unemployment rate	8.1	10.1	8.2	0.99
	Participation rate	54.6	68.5	81.9	0.67
	Employment-population ratio	50.1	61.5	75.2	0.67
UK	Unemployment rate	6.6	3.7	2.2	3.00
	Participation rate	56.8	82.4	89.6	0.63
	Employment-population ratio	53.0	79.4	88.8	0.60
US	Unemployment rate	10.5	5.6	3.3	3.18
	Participation rate	63.1	77.2	84.7	0.74
	Employment-population ratio	56.5	72.8	82.0	0.69
Total OECD	Unemployment rate	10.3	6.2	3.9	2.64
	Participation rate	62.5	79.0	87.2	0.72
	Employment-population ratio	56.6	74.2	83.9	0.67

Source: OECD, 2005.

For each country in *Table 1.1*, the first row shows the unemployment rate³ for individuals in each education category. The final column shows the ratio of low-qualified to highly-qualified unemployment. The OECD average for this ratio is 2.64. Thus, on average across the OECD, individuals with only lower secondary education are over two and a half times more likely to be unemployed than individuals with a tertiary education. This ratio differs across countries, and in some (namely the Republic of Korea, Mexico and Turkey) it is even less than unity. In these countries, individuals with a low education are actually less likely to be unemployed than individuals with a high education. The common characteristic of these three countries is that they are later developers amongst the current group of OECD countries.

The majority of Western European countries have a ratio of low-qualified to highly-qualified unemployment of between 2 and 3 (or fractionally outside this range). The exceptions are the Scandinavian countries of Norway and Sweden (though not Finland), where the ratio is only around 1.5, and Germany, where the low-qualified perform relatively worse and the ratio is 3.73. In

3. Unemployment is defined according to the definition given by the International Labour Organization (ILO) – that is out of work, but looking for work and available to start.

contrast to the Western European countries, the difference between low-qualified and highly-qualified unemployment is much smaller in Southern Europe, with the ratio being well below 2 in each of Portugal, Spain, Italy and Greece. A significantly different pattern emerges again in Eastern Europe, where those with a low level of education have much higher unemployment rates than those with a high level of education. The ratio of the respective unemployment rates in these countries ranges from 4.5 in Poland and 5.7 in Hungary to 10 in the Slovak Republic and 11.5 in the Czech Republic. The latter ratios are the result of very high unemployment rates for low-qualified individuals, reaching almost 1 in 2 of all people with at best lower secondary education in the Slovak Republic. These very high unemployment ratios in Eastern Europe could explain why Germany has the highest ratio of all the Western European countries, given that modern Germany contains the former East Germany.

In the remaining non-European countries, there is no identifiable pattern to the unemployment ratios. The ratio is average in Australia and Canada, below average in Japan and New Zealand, and above average in the United States (US).

So far in this chapter, only the unemployment rate has been considered, which measures the proportion of those *able and willing* to work but who are not actually in employment. However, the unemployment rate tells only half the story, since it does not take into account those outside the measured labour force who are unable to take on a job and/or who are not looking for work. Therefore, going back to *Table 1.1*, the second row of figures for each country reports the participation rate – that is the proportion of working-age adults in each country who participate in the labour force (as either employed or unemployed). In the OECD as a whole, the participation rate for those with, at best, a lower secondary education is 62.5 per cent, whereas for those with a tertiary education it is 87 per cent. The highly-qualified are therefore about a third more likely to participate in the labour force than the low-qualified. There is much less variation in this ratio across countries than was observed for the unemployment ratio above. The countries that stand out as different from most are the Eastern European countries (with the exception this time of the Czech Republic). In Hungary and the Slovak Republic,

the highly-qualified are twice as likely to participate in the labour force as those with a low level of education.

The unemployment rate and the participation rate can be combined to produce an employment-population ratio. This ratio is reported in the third row of figures for each country in *Table 1.1*, and shows the proportion of working-age adults in employment in each country. Since, as previously illustrated, those with a low level of education are less likely to participate in the labour force in every OECD country, and once in the labour force are more likely to be unemployed and so less likely to find a job in almost every country, then those with a low level of education perform particularly badly when considering their employment-population ratio. In the OECD countries in 2004, 57 per cent on average – that is just over one in two of all people who did not study beyond lower secondary education – were in employment. This contrasts with 74 per cent of those individuals who completed upper secondary education, and 84 per cent of those who went on to tertiary education. Therefore, low-qualified individuals have a much lower chance of finding work than the highly-qualified (30 points' difference).

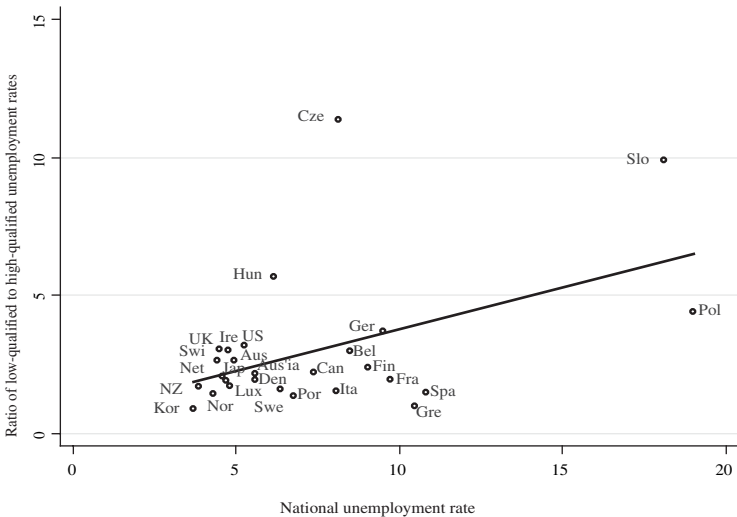
As expected, given the above results, the employment ratio of the low-qualified is worst in Eastern Europe, where they are less likely to participate in the labour force, and less likely to find a job even when they do participate. The employment-population ratio of low-qualified people is less than half in each Eastern European country, and even falls below one quarter in the Slovak Republic. In all other countries, with the exception of Iceland and Portugal where the ratio is higher, it lies between half and two thirds. Across the OECD there are clearly, therefore, large numbers of individuals with at best a lower secondary education without a job.

An interesting question is whether the low-qualified perform better or worse in countries with buoyant or depressed labour markets, and in countries where they represent a large or small part of the adult population. *Figure 1.1* below graphs the low-highly qualified unemployment ratio against the unemployment rate for each country. The question being asked is whether the low-qualified do relatively worse (i.e. the low-high education unemployment ratio is higher) in countries with higher unemployment. This would be the case if the extra unemployment in countries with depressed

labour markets fell mainly on those individuals with low levels of education.

The data points are shown by the dots (with the country label), with the solid line illustrating the line of best fit through these points. The relationship is clearly positive (the correlation coefficient is 0.47 and statistically significant), suggesting that where unemployment is high, those with a low level of education will have a relatively higher unemployment rate compared to the better educated. It is true to say, however, that the relationship is determined to a large extent by the countries of Eastern Europe, and if these outlying points were removed from the diagram, the remaining OECD countries would be largely clustered in a group with no strong visible relationship.

Figure 1.1 Relationship between the low-highly qualified unemployment ratio and a country's unemployment rate

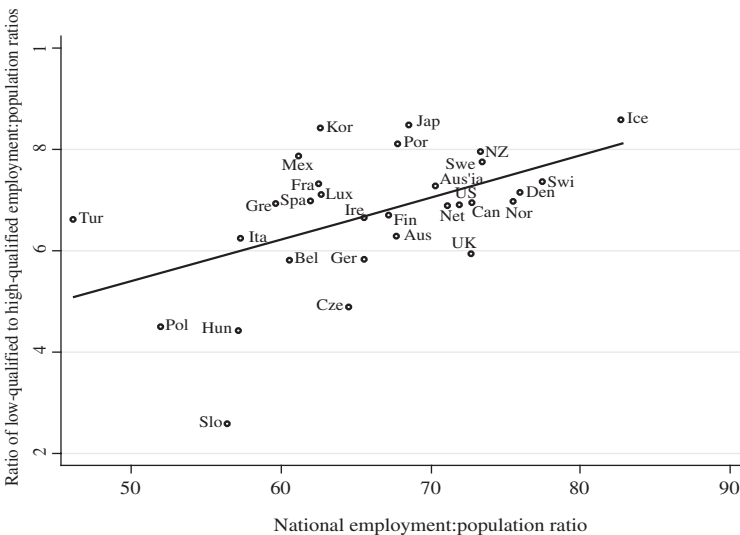


The preceding discussion revealed the importance of considering employment-population ratios rather than unemployment rates to reveal the true extent of the disadvantage faced by the low-qualified in the labour market. *Figure 1.2* therefore plots the ratio of the

low-qualified to highly-qualified employment-population ratios against each country's national employment-population ratio.

In this case there is again a positive relationship between the two data series (the correlation coefficient is 0.51, which is statistically significant), and it appears to be stronger given that it is not driven by obvious outliers in this case. Although the Eastern European countries all lie below the line of best fit, and so differ from the established relationship in the other countries to a certain extent, even if they were removed from the analysis, the relationship amongst the remaining countries would still be clearly positive (correlation coefficient 0.32). Thus, on average, in those countries that have a low employment-population ratio (i.e. have a high proportion of people not working), individuals with only a low level of education are over-represented amongst those out of work. In other words, when many people are out of work, the incidence of lack of employment falls disproportionately on the low-qualified.

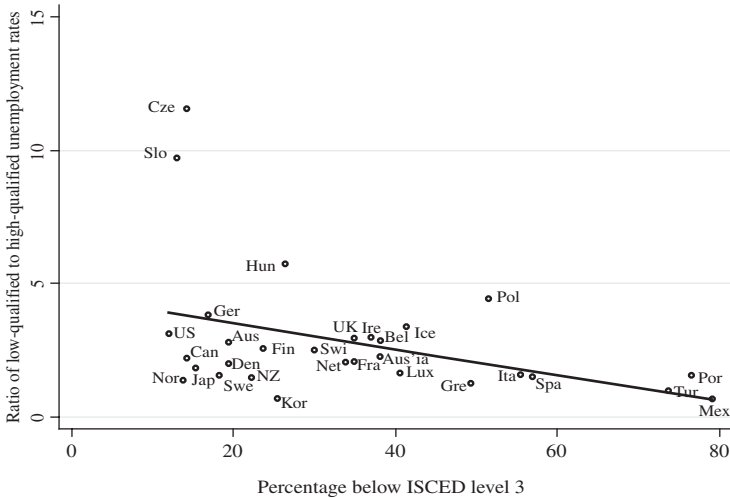
Figure 1.2 Relationship between the low-highly qualified employment-population ratio and a country's employment-population ratio



The following diagrams consider whether the ratio of low-qualified to highly-qualified employment and unemployment is related to the relative size of the low-qualified group. *Figure 1.3* shows the ratio of the low-qualified to highly-qualified unemployment rate against the proportion of the country's working-age population who are low-qualified (i.e. educated to ISCED Level 2 or below). The relationship is clearly downward-sloping (correlation coefficient -0.40). Again, the relationship is made to appear stronger by the presence of the outliers (the Eastern European countries), but even when these countries are not considered there is a weak negative relationship. In other words, in the countries where many low-qualified workers are found, such as Portugal, Turkey and Mexico, their chances of being unemployed are only a little higher than those of the highly-qualified. This suggests that where the majority of the working-age population are low-skilled, then firms are more likely to create jobs that require such workers, and so they can find work as easily as the highly-skilled. It is only when the low-skilled are few in number that they find it more difficult to obtain employment.⁴

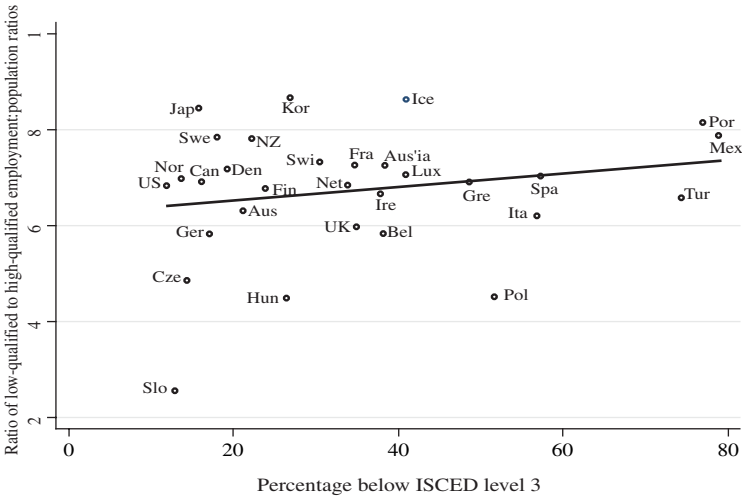
4. These facts are consistent with the theory of low skill traps, discussed later in *Chapter III*.

Figure 1.3 Relationship between the low-high qualified unemployment ratio and a country's proportion of low-qualified adults



Finally, the relationship between the ratio of low-qualified to highly-qualified employment-population ratios and the proportion of low-qualified adults in each country is considered across the sample of OECD countries. This is graphed in *Figure 1.4*. The relationship is positive, suggesting that the employment-population ratios of the low-qualified and the highly-qualified are more likely to be similar when the proportion of a country's working-age population who are actually low-qualified is larger. However, the relationship is not particularly strong, and the relative size of the low-qualified employment-population ratio (compared to the highly-qualified employment-population ratio) lies within a band between 0.6 and 0.8 in most countries, no matter how many low-qualified individuals they have.

Figure 1.4 Relationship between the low-high qualified employment-population ratio and a country's proportion of low-qualified adults



The change in the labour force status of the low-qualified over time

So far, this chapter has only considered the position of the low-qualified at one point in time, namely the most recent year for which data are available – 2004. What this does not tell us, however, is whether this relative position of the low-qualified is getting better or worse over time. In order to provide an answer to such a question, *Table 1.2* provides information on the level of unemployment and the participation rate of the low-qualified at various points in time, from the late 1980s to 2003. The figures reveal that, overall across the whole OECD, the unemployment rate of the low-qualified increased from 8.6 per cent to 11.6 per cent between 1989 and 2003. This has not been a continuous increase however, and in fact the intermediate figure for 1994 shows an even higher low-qualified unemployment rate of 12.6 per cent. Thus the low-qualified unemployment rate declined in a number of countries between 1994

and 2003, in particular in Finland, Ireland, the Netherlands, Spain and the United Kingdom (UK).

Table 1.2 Changes in the unemployment rate and labour force participation rates of low-qualified individuals, 1989-2003

	Unemployment rate			Participation rate		
	1989	1994	2003	1989	1994	2003
Australia	9.7	12.9	9.6	63.0	65.2	63.4
Austria	4.4	5.3	8.3	53.2	56.4	53.0
Belgium	12.3	14.1	12.5	49.6	48.5	47.1
Canada	..	16.5	14.1	..	57.8	59.5
Czech Republic	..	9.4	22.9	..	42.5	31.4
Denmark	..	10.3	8.5	..	87.4	62.3
Finland	4.5	24.2	14.9	64.6	57.1	53.0
France	..	15.6	13.9	..	53.6	55.6
Germany	..	11.8	16.3	..	54.7	51.1
Greece	..	7.7	7.7	..	54.7	54.7
Ireland	23.4	21.4	7.6	51.7	51.0	52.5
Italy	10.5	11.6	10.8	54.4	50.4	49.9
Republic of Korea	..	1.2	2.4	..	56.1	52.3
Mexico	..	5.7	2.4	..	59.8	58.8
Netherlands	..	9.1	5.0	..	55.0	61.5
New Zealand	..	8.8	7.4	..	60.0	62.2
Norway	8.0	8.6	7.2	62.6	56.4	60.1
Poland	..	15.8	28.4	..	42.5	33.4
Portugal	5.4	7.3	6.8	65.7	65.9	70.7
Slovak Republic	..	28.9	47.9	..	35.1	28.9
Spain	..	25.4	12.8	..	55.9	61.5
Sweden	1.8	9.9	9.1	76.1	71.1	62.3
Switzerland	2.0	6.7	9.0	62.4	50.6	49.8
Turkey	..	8.0	10.4	..	57.9	49.4
United Kingdom	11.4	14.8	9.8	68.8	62.1	55.7
United States	11.7	16.1	13.5	53.8	49.2	49.7
OECD average	8.8	12.6	11.6	60.5	56.0	54.0

Source: OECD, 2006.

The right hand side of *Table 1.2* makes clear that the labour force participation rate of the low-qualified has declined consistently over the period, on average across the whole OECD (from 60.5 per cent in 1989 to 56 per cent in 1994 and 54 per cent in 2003). This participation rate also declined in most (though again not in all) individual countries, with particularly noticeable falls observed in the Czech Republic, Denmark, Finland, Poland, the Slovak Republic, Sweden, Turkey and the UK. It should be noted that over this period the overall average labour force participation rate of individuals at all education levels across the whole OECD was actually growing, buoyed by growing participation of females and older workers. Here, then, is some evidence that the labour market position of the low-qualified is declining in developed countries, manifesting itself more in terms of declining labour force participation of the low-qualified rather than unemployment amongst those remaining in the labour market.

In addition, if this official OECD data had gone back further in time, then further changes in the unemployment rate of the low-qualified would have been observed. Evidence to suggest this was gathered by Nickell and Bell (1995), who used data collected from each individual country's own records rather than relying on international data sources such as those of the OECD. Thus there may be issues concerning the comparability of the data across countries, though the principal interest here is the variation over time within each country. Nickell and Bell's data, provided in *Table 1.3*, cover the period from 1971-1974 to 1987-1990, and the OECD began collecting its data at the end of that period, which is given in *Table 1.2*. It must be noted, however, that the former data consider men and unemployment rates only, and do not include employment-population ratios.

As can be seen in *Table 1.3*, the unemployment rate of low-qualified men increased faster than that of highly-qualified men, thus increasing the ratio of unemployment rates between the two. This was the case in every single country in the table, with the exception of Sweden, where the ratio did rise during the 1970s and 1980s but fell back again by the end of the 1980s. It therefore seems as though the largest relative rises in low-qualified unemployment occurred during the 1970s and 1980s. Looking at the whole of this

period, it is clear that the labour market has moved against the low-qualified over the last 35 years or so.

Table 1.3 Changes in the male unemployment rate, by educational attainment, from the period 1971-1974 to the period 1987-1990

	1971-1974	1975-1978	1979-1982	1983-1986	1987-1990
France					
High ed.			2.1	2.5	2.6
Low ed.			6.5	9.0	10.8
Ratio			3.1	3.6	4.1
Germany¹					
High ed.		1.6	1.6	3.0	2.9
Low ed.		3.1	4.5	8.8	7.6
Ratio		1.9	2.8	2.9	2.6
Italy					
High ed.			3.4		4.6
Low ed.			1.6		4.7
Ratio			0.5		1.0
Netherlands					
High ed.		2.1	2.4	4.6	
Low ed.		4.7	6.8	16.9	
Ratio		2.2	2.8	3.7	
Spain					
High ed.		4.5	7.9	11.0	8.8
Low ed.		7.7	13.5	21.4	17.7
Ratio		1.7	1.7	1.9	2.0
UK					
High ed.	1.4	2.0	3.9	4.7	4.0
Low ed.	4.0	6.4	12.2	18.2	13.5
Ratio	2.9	3.2	3.1	3.9	3.4
Australia					
High ed.			3.5	4.4	3.9
Low ed.			8.3	12.2	10.0
Ratio			2.4	2.8	2.6
Canada					
High ed.		2.6	2.4	4.3	3.4
Low ed.		8.2	8.3	12.5	11.3
Ratio		3.2	3.5	2.9	3.3

Table 1.3 Continued

	1971-1974	1975-1978	1979-1982	1983-1986	1987-1990
US					
High ed.	1.7	2.2	2.1	2.7	2.1
Low ed.	5.3	8.6	9.4	12.8	9.8
Ratio	3.1	3.9	4.5	4.7	4.7
Japan					
High ed.	1.2		1.6		1.4
Low ed.	1.6		2.9		4.1
Ratio	1.3		1.8		2.9
Norway					
High ed.	1.0	0.8	0.9	0.8	1.5
Low ed.	1.9	2.2	2.9	3.8	6.0
Ratio	1.9	2.8	3.2	4.8	4.0
Sweden					
High ed.	1.3	0.8	0.9	1.1	1.0
Low ed.	3.2	2.4	3.1	4.1	2.4
Ratio	2.5	4.0	3.4	3.7	2.4

1. German comparison for high/low occupation, rather than high/low education.

Source: Nickell and Bell, 1995.

Basic skills and labour force status

Throughout this chapter, the labour force status of different groups of individuals is considered as defined by the formal qualifications that they hold. Although formal qualifications are expected to be positively correlated with skills acquired, this correlation is likely to be less than perfect. This is because it is quite feasible for an individual to reach an intermediate or even a high skill level without having any formal qualifications at all, for example through acquiring experience whilst working. Such skills could be sufficient to ensure that such individuals are always in demand in the labour market and so easily find employment. When this occurs, it will weaken the observed relationship between qualifications and employment, since the low-qualified, and so apparently (though not in reality) low-skilled, are in frequent employment. A stronger relationship would therefore be expected between actual skills offered and labour force status, since ultimately it is those skills that

employers are interested in, rather than the pieces of paper declaring qualifications. It would therefore be interesting to investigate the relationship between skills and employment rather than qualifications and employment. The difficulty, of course, is in obtaining objective information on skills held. Subjective data could be obtained by asking individuals to self-report their skill levels, although with obvious limitations related to data accuracy. Obtaining objective data on individuals' skills would involve administering tests, which would clearly be very difficult to design and extremely expensive to administer, even if assessing a small range of skills and for an average sample size. Such exercises have therefore rarely been attempted. An exception was the International Adult Literacy Survey (IALS), which restricted itself to the basic skills of literacy and numeracy, and administered the same tests in a range of countries to ascertain respondents' abilities in these two skills.⁵ A questionnaire was also completed to obtain information about respondents' labour-force status and background characteristics. The literacy and numeracy test scores were converted into levels from 1 to 5; 1 representing the lowest level of skills.

The IALS data show that qualifications and literacy/numeracy skills are positively related, but far from perfectly so. Thus, there are plenty of examples in IALS of highly-qualified people with poor literacy and numeracy skills, and individuals with few qualifications who nevertheless have very good basic skills. This has important implications for employers in terms of hiring individuals with the appropriate knowledge and skills, rather than simply individuals with certain qualifications.

In terms of the relationship between basic skills and employment, *Table 1.4* reports unemployment rates for individuals with low literacy (prose) scores (at levels 1 and 2) and those with high literacy scores (at levels 3 to 5). The results reveal that in every single country included in the survey, the unemployment rate of those individuals with low literacy skills was higher than that of individuals with high

5. IALS was undertaken in the different countries in three batches (as shown by the thicker lines in *Table 1.4*) in the mid- and late-1990s. The countries in the top batch were interviewed first.

literacy skills. In most countries, the ratio of the unemployment rates was about 2, rising to over 4 in New Zealand.

Table 1.4 Unemployment rates by prose literacy levels

	Prose level 1 and 2	Prose level 3-5
Canada	16.0	7.8
Germany	14.2	7.8
Ireland	23.1	11.3
Netherlands	9.3	5.1
Poland	16.9	11.1
Sweden	11.1	7.4
Switzerland	4.5	3.4
United States	6.9	3.6
Australia	10.5	5.1
Belgium (Flanders)	17.4	6.8
New Zealand	16.1	3.8
United Kingdom	15.5	9.1
Chile	14.0	8.2
Czech Republic	7.6	4.3
Denmark	9.0	5.3
Finland	20.6	9.3
Hungary	15.0	13.4
Norway	5.6	3.0
Portugal	15.4	9.0
Slovenia	13.6	7.5

Source: International Adult Literacy Survey, in OECD (2000, Table 3.7).

Thus, regardless of whether formal qualifications or a measure of actual skills are used, the labour market position of the low-qualified/low-skilled appears worse than that of well-qualified/highly-skilled individuals.

II. Explaining the labour market position of the low-qualified in OECD countries

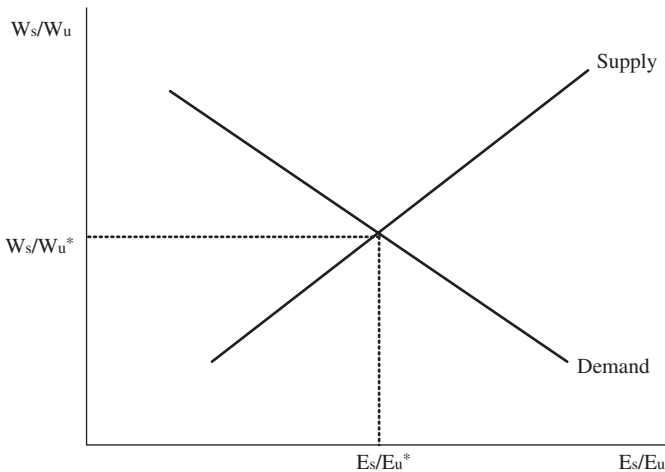
Labour market for highly- and low-qualified workers: relative wages and relative employment rates

The previous chapter revealed the problems faced by individuals with low levels of education in modern labour markets in developed countries. In particular, they face a higher probability of being unemployed than their more highly-qualified counterparts, and are significantly less likely to even participate in the labour market. So overall, a far smaller percentage of the low-qualified are employed, compared to the highly-qualified. In addition, evidence suggests that the situation is getting worse for the low-qualified; fewer and fewer of them are participating in the labour market altogether.

How can this bad – and worsening – situation for the low-qualified be explained? Economists usually frame their answers in terms of the supply-and-demand model of the labour market. In much of the discussion that follows, it is assumed that there are only two types of workers: skilled (highly-qualified) and unskilled (low-qualified). This assumption is usually made simply to aid exposition. In the diagram below, the vertical axis represents the relative size of skilled to unskilled wages (W_s/W_u). On the horizontal axis is the level of employment of skilled workers relative to the level of employment of unskilled workers (E_s/E_u). Onto these axes a ‘relative demand for skilled labour’ curve and a ‘relative supply of skilled labour curve’ can be drawn. The former is downward-sloping, showing that as the wage of skilled relative to unskilled workers rises, then, other things equal, employers will substitute unskilled for skilled labour, so that the relative demand for skilled compared to unskilled workers falls. The ‘relative supply’ curve, on the other hand, is drawn as upward-sloping, suggesting that as the wage of skilled relative to unskilled workers rises, more individuals will be willing to invest in their education to acquire skills, and so, other things equal, the relative supply of skilled compared to unskilled labour will rise.

If the labour market is free, in the sense that there are no artificial constraints on wages, then relative wages will adjust until relative demand equals relative supply. This is the wage W_s/W_u^* in Figure 2.1 below. At this wage level, the relative employment level will be E_s/E_u^* , with this number being both demanded by firms and supplied by workers. At any relative wage below this equilibrium level, the relative demand for skilled labour would be greater than the relative supply. Firms would then try to outbid each other, offering higher wages in an attempt to attract the scarce skilled labour, until the relative wage is bid up to the equilibrium level W_s/W_u^* , at which point there is no longer a shortage of skilled labour. Similarly, if the relative wage is initially above the equilibrium level, the relative supply of skilled labour would be greater than the relative demand. Thus skilled workers would try to underbid each other, offering to work for lower wages in an attempt to secure the scarce skilled jobs, until the relative wage is bid down to the equilibrium level W_s/W_u^* , at which point there is no longer a surplus of skilled labour.

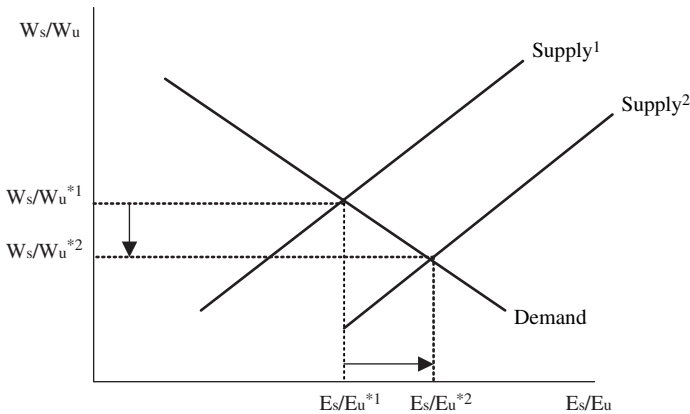
Figure 2.1 Equilibrium in the labour market



It was stressed above that the labour supply and labour demand curves were drawn ‘holding other things equal’. If other things actually change, then the supply and demand curves will move, and a new equilibrium relative wage and employment level will be

determined. For example, if more people started acquiring higher levels of education, then the supply of skilled labour would grow, and the supply of unskilled labour would contract. This could be represented in the above diagram by a shift down and to the right in the supply curve, since there would be an increased number of skilled workers available to work at any given wage. Such a shift is shown in *Figure 2.2* below.

Figure 2.2 Increase in the relative supply of skilled labour



The model predicts that, following an increase in the supply of skilled labour, there will be an increase in skilled relative to unskilled employment, and a decrease in the skilled relative to the unskilled wage. The first part of this prediction appears to be correct, since *Chapter 1* describes the poor and declining employment ratios of the low-qualified relative to the highly-qualified. The other part of the prediction has not been observed in most developed countries in recent years, however. In many countries, there has been an increase in wage inequality over the last 25 years, suggesting that the relative wage has actually increased.

If the relative wage is not falling in most developed countries, as *Figure 2.2* above shows, then something else must be added to the model. Most labour market analysts suggest that, although the relative supply of skilled labour might have increased, the relative demand for skilled labour has also increased, and the evidence

suggests that in many countries the relative demand has increased more than the relative supply of skilled labour. Such a situation is shown in *Figure 2.3* below.

Figure 2.3 Increase in the relative supply and relative demand of skilled labour

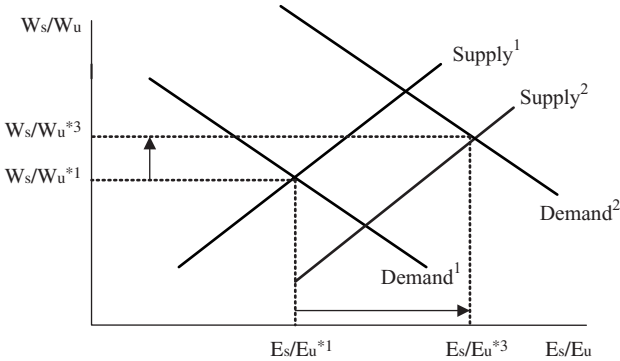


Figure 2.3 shows that, following an increase in the relative supply of skilled labour, and an even larger increase in the demand for skilled labour, then an increase in skilled relative to unskilled employment, *and* in skilled relative to unskilled wages, is predicted. This is exactly what has happened in many developed countries, and so *Figure 2.3* seems to be an accurate depiction of the labour market changes that have occurred.

Labour market for highly- and low-qualified workers: unemployment

The model developed in the previous section is useful in that it reveals the underlying cause of the deteriorating labour market position of the low-skilled, namely changes in the relative demands for well-qualified and low-qualified workers (the possible reasons for such relative demand shifts will be considered later). The model is, however, limited in that it is a market-clearing model, meaning that it assumes that prices (in this case, relative wages in the labour market) always move to clear the market, as described above. Thus, the wages of well-qualified and low-qualified workers are assumed

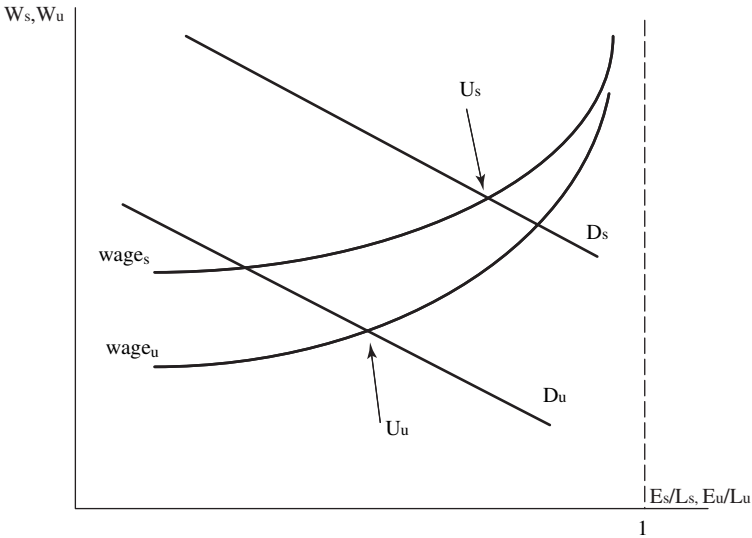
to adjust, until the demand for each type of worker equals the supply of each type of worker, and there is neither a shortage nor a surplus of either type. The model can therefore help us understand the relative *employment* levels of well-educated and low-qualified workers, but it cannot explain relative *unemployment* levels, as unemployment does not exist in the model (there is no surplus of either type of labour).

The model will therefore be developed to include unemployment.⁶ In *Figure 2.4* below, separate labour demand curves are shown for skilled and unskilled workers (D_s and D_u respectively), rather than combining them into a single *relative* labour demand curve as was done previously. The 'demand for labour' curve is still downward-sloping; at higher wage rates, fewer workers are demanded. Wage curves for skilled and unskilled workers are then added to the diagram. The wage curve is a diagrammatical representation of wage pressure in the economy. The principle behind this curve is the idea that unemployment acts as an inflation-controlling device by persuading workers to moderate their wage demands given the lack of alternative employment.⁷ Thus when the employment rate (E/L as measured on the horizontal axis, where L_u and L_s are the unskilled and skilled labour forces respectively, and E_u and E_s are the numbers of unskilled and skilled workers actually in employment) is low, wages are low as workers fear losing a precious job. As the employment rate rises, workers become less worried about losing their job because another one would be easier to find, and so they are confident to ask for higher wages. As the employment rate approaches 1 (full employment, as shown by the vertical dotted line in *Figure 2.4*), all wage control is lost, and wages start rising at an increasing rate. The wage curves are therefore drawn as rising, and increasingly steeply, as the employment rate rises. Therefore, unemployment must exist in equilibrium in such a model, because without any unemployment, wage demands would be exceedingly high (because it would be so easy for workers to find another job, and so difficult for firms to find another worker). The unemployment therefore exists to moderate such wage claims.

6. The model developed here is taken from Nickell and Bell (1995).

7. Such ideas were developed extensively in Layard, Nickell and Jackman (1991) and Blanchflower and Oswald (1995).

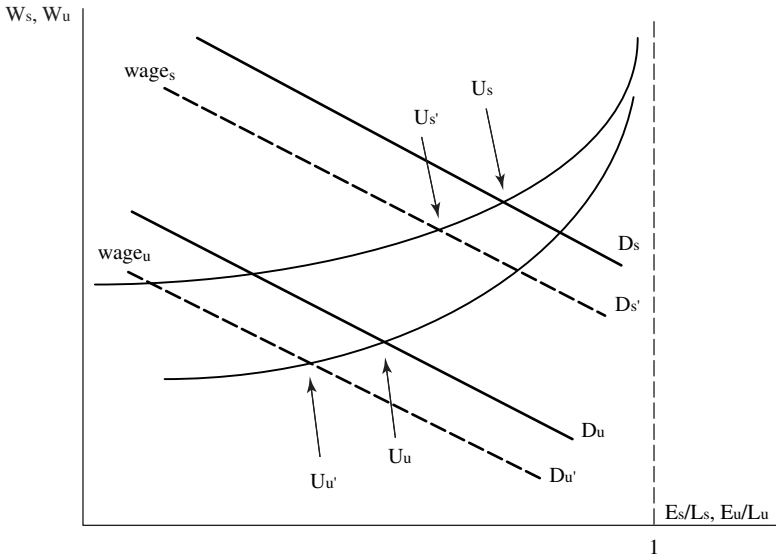
Figure 2.4 Determination of wages and employment rates for skilled and unskilled individuals



The wage and employment rate for each type of worker is determined by the intersection of the appropriate demand curve and wage curve, with surpluses and shortages of workers leading to wage changes that ensure that the equilibrium is reached, as before. The unemployment rate for each type of worker is 1 minus the employment rate, shown by U_s and U_u in *Figure 2.4*. As drawn, it can be seen that the unemployment rate of the unskilled is higher than that of the skilled.

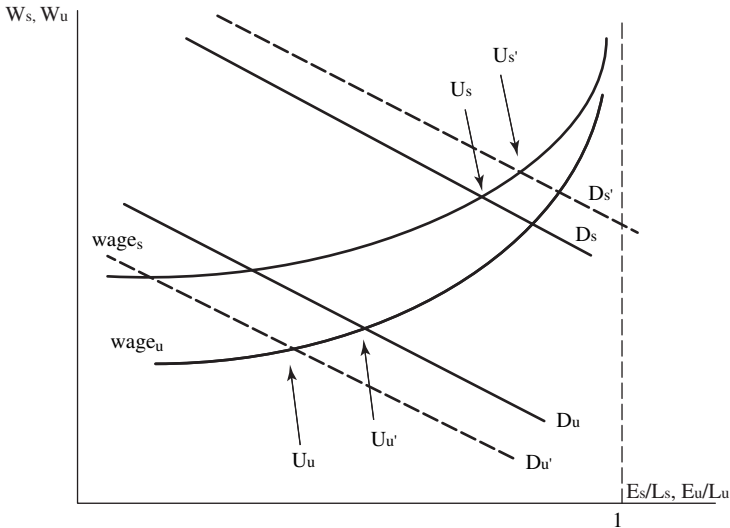
If there was a general recession in the economy, so that the demand for both skilled and unskilled workers fell, then the 'demand for labour' curves would shift to the left, resulting in a falling employment rate and so a rising unemployment rate for both types of labour. This is depicted in *Figure 2.5* below, where the unemployment rates of skilled and unskilled workers rise from U_s to U_s' and U_u to U_u' respectively.

Figure 2.5 Skilled and unskilled wages and employment rates after a general decline in demand



In the previous section, the situation considered was one of a relative increase in the demand for skilled labour. *Figure 2.6* depicts such a situation using the new model, with the ‘skilled demand’ curve shifting rightwards and the ‘unskilled demand’ curve shifting leftwards, indicating an *increasing* demand for skilled workers and a decreasing demand for unskilled workers. Not surprisingly, given these relative demand shifts, the outcome is rising unemployment for unskilled workers and falling unemployment for skilled workers. The situation in *Figure 2.6* therefore seems the most consistent with the data presented in *Chapter I*, particularly for the 1980s. Later in this chapter, reasons will be discussed as to *why* the demand for skilled labour has risen while the demand for unskilled labour has fallen.

Figure 2.6 Skilled and unskilled wages and employment rates after a skill-biased change in demand



Why are low-qualified workers more likely to be unemployed?

Figure 2.4 was drawn in such a way that the unemployment rate for low-qualified (unskilled) workers was higher than the unemployment rate for highly-qualified (skilled) workers, even before relative demands changed. This, of course, was done to make the figure consistent with the data presented in Chapter 1. Why, though, are low-qualified individuals more likely to be unemployed? Nickell and Bell (1995) discuss some answers to this question.

The first and most obvious reason is that a well-educated worker can do a low-skilled job, perhaps with a minimum amount of training, whereas it is unlikely that a low-qualified worker would be able to perform a highly-skilled job (without obtaining more education and becoming a highly-skilled worker him-/herself). Thus, when a firm is struggling and needs to reduce costs by reducing its workforce, it is much more likely that it will be the low-qualified workers who

will lose their jobs, since their job tasks can be covered by other workers, while the tasks of the better-educated cannot. Low-qualified workers are therefore 'crowded-out' of firms. However, Gautier, van der Berg, van Ours and Ridder (2002) fail to observe evidence for this phenomenon. They have a rich data set from the Netherlands, which matches workers to the firms in which they work. The firm information includes the complexity of the various jobs within each firm. This job complexity is measured on a six-point scale from 'very simple activities under direct supervision' to 'activities of an analytical, creative or contractual nature, which are undertaken independently'. Gautier *et al.*'s hypothesis is that if crowding-out of low-qualified workers within firms occurs, then we should observe an outflow of low-qualified workers and an inflow of well-educated workers into jobs of low complexity during bad years when firms are struggling. When they examine their data, they do find evidence in favour of the first part of this statement, but not the second part. Therefore, although low-qualified workers working in simple jobs do lose their employment status in downturns, there is no evidence that they are replaced by better-educated workers. Gautier *et al.* explain this through the additional evidence they found, which shows that highly-qualified workers are no more productive in simple jobs than low-qualified workers. If this is the case, then firms presumably argue that there is no reason for them to ask well-paid, highly-qualified workers to do simple jobs.

Another argument for why a firm will want to hold onto its skilled workers but will be more willing to allow its low-skilled workers to leave in bad times is that the firm will have invested more time and money in training the former group.⁸ The firm does not want to lose this investment before it has seen a full return, and so is more likely to want to continue to employ those highly-qualified, skilled employees that it has trained to be more productive workers. This would be the case even if the firm was in a serious slump and did not actually currently need the skilled workers, as the firm would prefer to keep the trained workers in place in anticipation of better times; that way these workers could immediately start producing

8. For evidence to show that the already better-qualified are much more likely to receive training than the less well-qualified, see, amongst many others, Booth (1991).

again, rather than the firm having to find and train new workers. Firms therefore 'hoard' well-qualified, skilled workers, rather than laying them off during a slump. Unskilled workers, on the other hand, can easily be found and put to work immediately when better times arrive, and so they are more likely to be made unemployed during the slump.

When explaining low-qualified unemployment at the economy level as opposed to that of the individual firm, one argument put forward is the so-called over-education, or 'bumping-down' theory. This is similar to the 'crowding-out' argument discussed above in that in both theories low-qualified workers are replaced by better-qualified workers. At the economy level, the bumping-down theory discusses how, as the supply of qualified workers expands in developed countries, there emerges a situation whereby there are insufficient skilled jobs for them to fill. Some well-qualified individuals therefore cannot find jobs to match their qualification level, and so accept a job requiring a lower level of education for which they are 'over-educated'. The process of bumping-down then occurs, all the way down to the low-qualified. For example, suppose that following an expansion of higher education there are too many tertiary-educated individuals in the economy for the number of graduate jobs available; in some instances graduates accept jobs for which only an upper secondary level of education is required. Individuals with an upper secondary education then find there are fewer employment opportunities for them at their own level, and so accept jobs for which a lower secondary education is required. Individuals with a lower secondary education are then bumped-down into jobs requiring low or no qualifications, and those who actually have no or only low level qualifications are replaced and so bumped-out of the labour market altogether.

While this theory of bumping-down sounds plausible, it requires the increase in the supply of highly-qualified (i.e. graduate) individuals to outstrip the rise in the demand for such workers, otherwise there would not be a surplus of qualified workers to bump down. However, if this were the case, then it would be expected that the surplus of highly-qualified workers would drive down their relative wage (as suggested by *Figure 2.2* above). There is no evidence that such a fall in highly-qualified wages has occurred though. Machin (1999) and

Machin, Harkness and McIntosh (2002) present evidence showing that the 'returns' to high level qualifications (in other words, the gap between the wages of highly-qualified and low-/unqualified individuals) increased considerably in the UK during the 1980s. McIntosh (2006) extends the period of analysis to the twenty-first century, and shows that these returns have not fallen again. There is therefore no evidence for a surplus of skilled workers in the UK, or in many other OECD countries. Despite this fact, other research has found that so-called 'over-education' exists in a wide range of OECD countries.⁹ An individual is defined as being over-educated if the formal qualifications acquired are of a higher level than the qualifications required to obtain the job held. For example, if a job advertisement asked for upper secondary school qualifications but the position was eventually filled by a university graduate, then that graduate would be described as being over-educated for the job. It was once thought that the existence of over-educated workers provided strong evidence in support of the idea of there being too many highly-qualified individuals in developed economies, the argument being that if there are graduates willing to work in non-graduate jobs, then there must be an insufficient number of graduate jobs. More recent research, however, has suggested another reason for such over-education. A reasonable argument is that all graduates are not the same, and that some will have more marketable skills than others, more work commitment than others, or more natural ability than others. Once this is accepted, then it is reasonable to expect that graduates who are weaker along these dimensions will be the most likely to be in non-graduate jobs. Although they might appear to be over-educated in terms of their formal qualifications, they are actually in jobs commensurate with their skills and abilities.¹⁰

If bumping-down does not seem to be a key explanation of unemployment among the low-qualified, then other explanations must be found. Another possible reason for higher unemployment among the low-qualified is that, because low-qualified wages are typically considerably lower than the earnings of the highly-qualified,

9. A review of the over-education literature can be found in Hartog (2000).

10. Evidence in support of this 'heterogeneous skills within qualifications categories' argument can be found in, for example, Allen and van der Velden (2001), Bauer (2002), Chevalier (2003) and Green and McIntosh (2007).

whilst unemployment benefits are the same for all, then the ratio of unemployment benefits to wages¹¹ will be higher for low-qualified than for highly-qualified individuals. If they can receive a higher proportion of their expected wage by remaining unemployed, there is less incentive for low-qualified workers to try to find work than for highly-qualified workers, and some may therefore choose to remain unemployed.

The previous argument about unemployment benefits suggests that there is a wage floor, below which they cannot fall. If an individual can receive so much money when unemployed, then the necessary wage to persuade him or her to work at all will need to be at least equal to this level of benefits, probably higher. Similarly, anything else that creates a floor below which wages cannot be reduced means that low-qualified wages may not be able to fall far enough to ensure that all low-qualified workers will find a job. Possibilities include minimum wage laws and the presence of trade unions, particularly large general unions supporting semi- or unskilled manual workers. If the demand for low-qualified workers has fallen to such an extent that the market-clearing wage for such labour is below the wage set by minimum wages or unions, then firms will respond by not hiring low-qualified workers. This idea will be returned to in *Chapter IV*, which discusses whether making wages more flexible, and in particular whether allowing low-qualified wages to fall, would be a successful way of reducing low-qualified unemployment.

A fall in the demand for low-qualified labour in developed countries

(i) Sectoral changes in the relative demand for labour

The previous section offered potential explanations as to why the low-qualified are more likely to be unemployed than individuals with a higher level of education. However, it was shown earlier in *Chapter I* that the labour market position of the low-qualified is not only bad, but has also worsened over the last 35 years, particularly during the 1980s. So explanations are required, not only for the poor

11. This ratio is called the 'replacement ratio'.

position of the low-qualified in modern OECD labour markets, but also as to why the situation is getting worse.

The economic models developed at the beginning of this chapter suggest that the root of the explanation as to why the labour market position of the low-qualified is worsening lies in changes in the relative demands for highly-qualified and low-qualified labour (see *Figures 2.3 and 2.6*). The next questions are therefore: why has the relative demand for skilled labour increased? And why are more highly-qualified workers and fewer low-qualified workers in demand in OECD economies? Two possible explanations have dominated the literature on such matters. The first is the so-called 'skill-biased technological change' hypothesis (see, for example, Berman, Bound and Machin, 1998). The argument put forward here is that there has been a change in the technologies used to supply both goods and services over the last quarter of a century. This has been linked to the use of computers and information technology more generally. The argument applies to the whole spectrum of computer use, from personal computers in offices to large computer-driven machinery in factories. Such advanced technology, so the argument goes, has replaced the unskilled jobs, while requiring more skilled workers to operate it.¹² Thus, with a fall in demand for unskilled workers and a rise in demand for skilled workers, there is a double effect on the relative demand for skilled labour.

The second argument put forward for the rising relative demand for skilled labour in the developed world is the international trade argument (see, for example, Wood, 1994). The argument here is that there has been a growth in manufacturing output in the newly-industrialized countries (NICs), particularly in the economies of South-East Asia such as the Republic of Korea, Taiwan, Singapore, Philippines and Thailand, and more recently in India and China. This increase in manufacturing output in such countries, coupled with the growth in world trade and the globalization of the world economy, has provided competition to OECD countries. In

12. These changes are not necessarily of equal, but opposite size. Thus one highly-qualified worker could be required to operate the technology that has replaced ten low-qualified workers, for example. Technological change may therefore increase overall unemployment, and not just amongst the low-qualified.

particular, the NICs have a competitive advantage in the production of labour-intensive, low-skill goods because of the much lower level of wages in those countries. Manufacturers of such goods, such as textiles, clothing, footwear and toys, in the developed countries cannot compete with low-cost competitors in emergent countries, and so the OECD countries move out of such sectors and divert attention towards capital-intensive and skilled-labour-intensive manufactured goods. The same arguments are now also being applied not just to manufactured goods, but also to some services that can be supplied from a distance, such as call centres. The outcome in the developed countries is that unskilled or semi-skilled labour-intensive sectors are disappearing, mostly from manufacturing but not exclusively, and therefore the demand for the workers who once worked in such industrial sectors is falling.

A great deal of research effort has been spent on empirically distinguishing between these two competing explanations. Much of this research focuses on the share of employment taken up by skilled rather than unskilled workers, or in some cases the share of the total wage bill that is paid to skilled workers. The latter approach, considering the wage bill share rather than the employment share of skilled workers, recognizes the fact that changes in the relative demand for skilled workers will show up in both employment changes and wage changes, as the diagrams above show. Occasionally the studies look at wages only, or, more specifically, at changes in wage inequality.

The methodology usually adopted rests on decomposing the total change in the skilled employment share (or wage bill share) into a ‘within sector’¹³ and a ‘between sector’ component. Thus, if there has been a rise in the share of skilled workers in total employment, the research investigates the extent to which the share of skilled labour is getting larger in each sector while the size of each sector remains constant (this ‘within sector’ effect). It also investigates the extent to which the share of skilled labour remains constant in each sector, but the sectors in which the skilled share

13. ‘Sector’ here means the industrial sector in which an individual works, for example in furniture manufacture, construction, retail trade, education, etc. A sector can be a manufacturing sector or a services sector.

is largest are growing, while the sectors in which the skilled share is smallest are contracting, so that the aggregate share of skilled workers in national employment is growing (the ‘between sector’ effect). The former – the within sector effect – is associated with the skill-biased technological change argument. If all industries are embracing new technology (to a greater or lesser extent), each sector is hiring more skilled workers and reducing the number of unskilled workers. The latter – the between sector effect – is associated with the international trade argument. In this case, or theory, no sector changes its share of skilled workers, but employment in sectors that use mostly unskilled workers declines due to foreign competition, while the skill-intensive sectors, in which developed economies have a comparative advantage, expand.

In the instance of such transformation, the majority of the increase in the share of employment or the wage bill taken up by skilled workers occurs *within* sectors. Many studies have replicated this result. Taking the study by Berman and Machin (1998) as an example, because it considers a range of countries, they found that when they studied 450 US sectors during the 1980s, 70 per cent of the change in the non-production¹⁴ share of employment occurred within sectors. Even when they disaggregated to 360,000 plants or workplaces, they still observed 71 per cent of the increase in the non-production share of employment occurring within these plants. Similarly in the UK, the proportion of the increase in the non-production share of employment accounted for by changes within 100 sectors or 402 workplaces was 82 per cent and 83 per cent respectively. Berman and Machin go on to consider the change in the skilled-unskilled (the ratio of non-production workers to production workers) wage ratio in 12 different countries, again decomposing the change into within and between sector components. In every country, in both the 1970s and the 1980s, the majority of the change in the relative wage occurred within sectors. The average percentage across the 12 countries occurring within sectors was 84 per cent in the 1970s and 92 per cent in the 1980s.

14. Non-production workers are taken as skilled workers, with production workers treated as unskilled. Whilst this is clearly a very simplistic measure of skills, it does have the advantage of being available on a consistent basis across countries.

Berman and Machin's results suggest some pervasiveness of the technology effect across countries. Even when the poorer of the OECD countries are considered, the results are qualitatively similar. For example, Esquivel and Rodriguez-Lopez (2003) consider the case of Mexico. This example is interesting, since Mexico trades mostly with countries that are more developed than itself (the US and Canada), and so clearly has more abundant low-wage, low-qualified labour compared to its trading partners. Thus the trade effect and the technology effect will have opposite impacts on the demand for low-qualified labour in Mexico, making the distinction between them more clear-cut. This is because, if the trade effect works as described above, the production of low-skill-intensive goods should switch from the high-skill-abundant country (in this case the US or Canada) to the relatively low-skill-abundant country (in this case Mexico). Thus if the trade effect is dominating, then the demand for low-qualified labour should have *risen* in Mexico; whereas if the technology effect has dominated, the same *fall* in the demand for low-qualified workers as described above should have been observed in Mexico. An additional reason why the Mexican results are of interest is that Mexico signed the North American Free Trade Agreement (NAFTA), which came into force in 1994, thus opening up its trade, and so allowing an investigation of whether the relative labour demand effects intensify after trade liberalization.

Esquivel and Rodriguez-Lopez (2003) examined the wage gap between skilled and unskilled workers during a twelve-year period (1988-2000) and found that it increased by 27 per cent in Mexico. Most of this rise occurred in the period 1988-1994, with little change between 1994 and 2000. Putting the change in the skilled-unskilled wage gap down in part to a trade liberalization effect and in part to a technological effect, they found that the impact of technology on relative skill demands has been pervasive throughout the period considered, leading to an increase in the skilled-unskilled wage gap. On the other hand, they found that the impact of trade reduced the wage gap, implying a rise in demand for low-qualified labour, as would be expected in a relatively low-skill, labour-intensive country. Perhaps surprisingly, this trade effect actually fell after NAFTA, although it is true that Mexico had already liberalized its trade in 1985 with the General Agreement on Tariffs and Trade (GATT).

Across the whole period, however, the technology effect has dominated, and Mexican wage inequality has increased, suggesting a rising demand for well-qualified workers and a falling demand for low-qualified workers.

Beyond the OECD, Berman and Machin (2000) studied 37 countries from all stages of development, investigating the change in demand for labour by skill level in each one. As argued above for the case of Mexico, if growing trade competition from newly industrialized countries is the source of the fall in demand for low-qualified workers in OECD countries, then a *rise* in the demand for low-qualified workers would be anticipated in the low-skill-intensive, non-OECD countries as the production of goods specializing in such labour moved to the latter group of countries. This is not what was observed by Berman and Machin (2000), however, whose results show a rising demand for highly-qualified labour, and thus a falling demand for low-qualified labour, in middle-income non-OECD countries (such as Venezuela, Uruguay, Chile, Columbia, Peru, Guatemala, Malaysia and the Republic of Korea), and possibly also in the low-income countries that they studied (typically the Indian subcontinent or Africa), though the evidence in these latter cases is not as strong. They therefore concluded against the international trade explanation and in favour of the skill-biased technological change affecting labour demand by skill level across the globe.

There is therefore a lot of evidence to suggest that the increase in demand for skilled workers is occurring within rather than between sectors. This is not to say that there have been no between-sector changes in the demand for skills; indeed there have been such changes, but they were dominated empirically in the 1980s and 1990s by the within-sector changes. This is also not to say that there have been no changes in the size of sectors over time, since there clearly have been with the decline in manufacturing sectors and the growth in service sectors that has taken place over this period in most OECD countries. The results presented above do not deny that such changes have taken place, but simply that they have not been the prime factor causing the fall in demand for low-qualified labour. For the switch from a manufacturing-dominated economy to a service-dominated economy to be able to explain the fall in

demand for low-qualified workers, the jobs lost in manufacturing would have to be of a lower skill level on average compared to that of the jobs gained in services. Given the results presented above, this does not seem to have been the case.¹⁵

(ii) Further evidence for skill-biased technological change

So far, the results in this section have focused on shifts in demand for highly-qualified and low-qualified labour that have occurred within or between sectors. The section has also interpreted the observed shifts as being *consistent with* the idea that it is skill-biased technological change rather than the alternative theory of globalization and international trade that is behind the rise in demand for highly-qualified workers and the fall in demand for low-qualified workers. However, the evidence described so far does not *prove* that skill-biased technological change is the driving force behind the changes in the labour market. Further evidence has therefore been accumulated to determine whether there is stronger support for the idea that it is skill-biased technological change that causes the problems for the low-skilled in the labour market.

One approach that has been adopted is to examine the characteristics of those sectors increasing their demand for skilled workers the most. The evidence above suggests that all sectors are increasing their share of skilled workers, but some more than others. For example, Machin (1996) obtained data on research and development (R&D) and innovation counts by sector in the UK. He found that both indicators of technology use are positively associated with the size of the within-sector increase in the share of skilled workers. Thus, the demand for skilled workers is going up more in sectors with higher R&D expenditures or higher innovation counts, i.e. more technologically advanced sectors. Machin also obtained data on computer usage at the establishment level, and shows that those workplaces that have expanded their use of computers the most are also the ones that have seen the largest increases in non-manual employment, particularly senior professionals, and

15. The results of Manning (2004), discussed in the next chapter, provide some evidence in support of this statement by showing that much of the recent growth in jobs has been in terms of low-skill service sector jobs in, for example, the retail trade, hospitality and care sectors.

declining employment of manual workers, particularly unskilled manual workers.

Machin and van Reenen (1998) expand the analysis to consider seven countries (Denmark, France, Germany, Japan, Sweden, the UK and the US). After the usual analysis decomposing the change in the demand for skilled workers into its within-sector and between-sector components, they then correlate the size of the within-sector components across the seven countries. These correlations turn out to be positive and very large (the correlation coefficient being above 0.9 in each case except where Denmark was one of countries being considered). In other words, it is the same sectors in each country that are expanding their use of skilled workers the most. Which sectors are these? The answer is sectors such as computers and machinery, electricity and communications, chemicals and drugs, paper products and transport goods, i.e. all technologically advanced sectors. When Machin and van Reenen relate the size of a sector's skill upgrading to its R&D expenditure or its computer usage, again strong positive relationships are observed. On the other hand, when they try to find evidence in support of the international trade argument, they find that the size of sectors' skill upgrading is unrelated to changes in their import penetration.

Similar results were obtained by Autor, Katz and Krueger (1998), who also consider the association between computer usage in a sector and the employment share of skilled workers, and find a positive relationship. Haskel (1999) calculates that the increasing use of computers is responsible for over half of the increasing difference in wages between the top of the earnings distribution and the bottom (thus consistent with the idea that the use of computers is increasing the relative demand for skilled labour and so pushes up the wages of those already earning at the top end of the distribution).

The studies mentioned above provide indirect evidence in support of the idea of skill-biased technological change by observing labour market outcomes that are consistent with what one would expect to observe if skill-biased technological change had occurred. More direct evidence, however, would actually examine jobs in order to observe whether skill demands are changing. This is exactly what has been done in a series of research examining the results from the 1986

Social Change and Economic Life Initiative survey and the 1997 and 2001 Skills Surveys in the UK (see Green, Felstead and Gallie, 1998; Ashton, Davies, Felstead and Green, 1999; Felstead, Gallie and Green, 2002). Since similar questions are asked in these surveys, an analysis of changes over time is possible. The authors show that skill demands indeed rose between 1986 and 2001. First, there was an increase in the proportion of jobs requiring some qualifications from 62 per cent to 74 per cent, while for high-level qualifications (above Level 3) the increase was from 20 per cent to 29 per cent. There was a fall from 66 per cent to 61 per cent in the proportion of workers whose jobs required less than three months of training, and an increase from 22 per cent to 24 per cent in the proportion of jobs with long (more than two years) training requirements. Twenty-seven per cent of respondents in 1986 said that they could master their jobs within only one month, while the equivalent percentage in 2001 was 20 per cent. All the evidence therefore points in the same direction: that there has been an increase in the use of, and hence demand for, skills. Hand in hand with this rise in the demand for skills is an increasing use of computers between 1986 and 2001, and at higher levels of complexity, as documented in Felstead *et al.* (2002). The proportion of all employees using computers or automated equipment in their jobs increased from 40 per cent in 1986 to 74 per cent in 2001. Of those using such equipment, 40 per cent considered such technology essential to their jobs – a figure up from 31 per cent in 1997 – while the proportion using computers for only simple tasks fell from 38 per cent to 31 per cent over the same period. Computers are therefore again identified as one of the prime sources of the increase in demand for skilled labour, although it is true to say that all generic skills considered by Felstead *et al.* (2002), with the exception of manual skills, show increasing use. Wage data in the skills surveys show that the use of computers in particular, even when used to only a moderate level of complexity, is associated with significantly higher rates of pay.

Gallie (1991) provides further evidence that computers have caused a rise in the demand for skills at work. He also uses the UK Social Change and Economic Life Initiative data from 1986, mentioned above, to show that individuals who use computer equipment are more likely to need qualifications to get their jobs. Thus,

though in some cases computers or computer-controlled equipment may have made jobs easier and less skill-demanding by performing tasks that previously required significant mental or physical input from workers, thus reducing labour's input to a monitoring role, it seems that on balance the computer revolution has increased the skills demanded of workers. Primarily this involves the skills needed to programme or otherwise use and interact with computers and computer-operated equipment. Even those workers whose tasks are reduced to monitoring computer-controlled machinery are likely to be selected by firms on the basis of having good qualifications and their ability to judge quality and identify faults (as argued by Simpson, Love and Walker, 1987). Thus, it is easy to come to the same conclusion as Haskel (1996), who, after surveying a number of case studies on skill demands, wrote that computers have significantly increased the demand for skilled labour.

(iii) Further evidence for international trade

Can any evidence be found to support the alternative explanation for the declining position of the low-skilled in the labour markets of developed countries, and that competition from newly industrialized countries is what persuaded companies in OECD countries to stop producing low-skill intensive goods and focus on high-skill, capital-intensive goods instead? Borjas and Ramey (1995) did find evidence that, in sectors impacted by trade, about half of the fall in employment of low-qualified workers in the US between 1976 and 1990 could be attributed to changes in international trade. The problem with this theory is that the sectors affected by trade are a small and declining part of the economy in developed countries. The decline in manufacturing and the growth of services, most of which cannot be traded across borders,¹⁶ means that although globalization is occurring and the restrictions on international trade are disappearing, the proportion of each economy in the OECD that is actually affected by this is limited. In addition, the international trade argument for the worsening labour market position of the

16. Note, however, that improved communications, partly through computers and the Internet, are increasing the ease with which some services can be traded between countries, suggesting a complementary relationship between technology and international trade.

low-qualified relies upon increased trade (imports) by developed countries from emergent economies.

However, while it is true that international trade between the original developed countries and the newly industrialized countries has increased, it remains a tiny proportion of the total quantity traded by OECD countries. For example, Krugman (2000) reports that, although imports from newly industrialized countries as a percentage of developed countries' GDP had grown from virtually zero in 1970, they still only stood at around 2 per cent by the end of the twentieth century. The conclusion therefore seems to be that trade with newly industrialized countries is simply not of significant enough size as yet to explain the large changes observed in labour markets in the OECD, and the decline in demand for low-qualified labour in particular. One caveat to this conclusion, however, is that there is very little evidence concerning the impact of international trade since the year 2000 and the entrance of China into the World Trade Organization, which led to a substantial increase in Chinese exports. So the strength of the international trade explanation could have grown since much of the research mentioned above was published. In addition, just because trade has not been the dominant explanation of changes in the demand for labour at different skill levels over the last 20 years it does not mean that it will not be the dominant explanation in the coming 20 years. As the initial impact of the computer revolution lessens and globalization continues to grow at an expanding rate, particularly as countries such as China and India become more important world players, such a reversal in the importance of the two factors is actually quite plausible.

Returning to the literature as it currently stands, faced with the evidence on computers, skill-biased technological change and international trade flows presented above, some theorists nevertheless contend that although trade flows may not be large enough to be able to explain directly the large fall in the demand for low-qualified labour, it could be that the mere *threat* of competition from countries with low labour costs has caused OECD countries to move away from such goods, and instead focus on goods produced using more skill-intensive *and* capital-intensive processes in which they still have a comparative advantage. It could be, therefore, that the technological change discussed above actually has as its root

cause the increased competition from developing countries. Haskel (1999) provides some evidence that relative import prices do have a negative effect on wage inequality, once computers are not controlled for in his equation and so allowed to vary. In other words, the gap between the top and bottom of the wage distribution, and therefore the demand for skilled labour, will be greater where the import price is lower and so where there is greater competition from cheaply produced, low-skill-intensive goods from abroad. Furthermore, this effect is stronger when the level of computer usage is allowed to vary and therefore increase in response to the cheap imports. These results do therefore offer some support for the idea that the mere threat of competition from developing countries might have indirectly reduced the demand for low-qualified labour in OECD countries by persuading the latter to undergo technological change to differentiate themselves sufficiently from the newly industrialized countries. However, when Green *et al.* (2003) examined the rate of computerization across industries, they found that it has actually been highest *outside* manufacturing, where international trade presumably has its strongest effect. Thus, even the indirect impact of international trade does not appear to be a dominant explanation, and it seems that skill-biased technological change was the principal cause of the declining demand for low-qualified workers in the 1980s and 1990s.

(iv) Outsourcing

The discussion of the effects of international trade above focused on the situation whereby OECD countries moved out of low-skill intensive sectors in which they could not compete with the newly industrialized countries in terms of labour costs. It was argued that such an effect would show up as a 'between sector' change over time in labour demand by skill level (that is, the average skill level in each sector remaining constant, with the low-skill sectors declining while the high-skill sectors expand). However, this may not have been the key mechanism whereby international trade and globalization have influenced OECD labour demand by skill level. Another route that could have had more impact is so-called 'outsourcing'. Outsourcing by OECD countries occurs when a product is completed for sale in an OECD country, but certain stages of production take place in other countries. Of prime interest here is the case where OECD

countries outsource any low-skilled stages of production to newly industrialized countries where labour costs are cheaper, while undertaking the higher skill or capital-intensive stage of production locally. Such outsourcing is probably what people are thinking about when they talk of jobs being lost overseas. Certainly newspapers in OECD countries regularly report on firms closing down a local workplace and relocating a particular facet of the company to an overseas country, with China and India currently receiving much attention. An obvious example of outsourcing is multinational companies that have workplaces in different countries around the world, but outsourcing need not follow this pattern. It could be that a firm in an OECD country does not own the workplaces in the overseas country, but simply contracts out the low-skill stages of production to other firms in newly industrialized countries. An example of outsourcing could therefore be the producers of laptop computers, which are obviously a high-skill, capital-intensive good, outsourcing the production of the plastic casing to manufacturing companies in low-wage countries. Nike is well known for employing all of its creative and marketing workers in the US, whilst the shoes themselves are completely made outside of the US. This example shows that the whole production aspect, rather than just a stage of production of a firm's business, can be outsourced overseas.

One key factor to note is that if outsourcing of the type described above occurs, then firms in OECD countries are sending the low-skill aspects of their business abroad, whilst keeping the high-skill intensive stages of production at home. When the change in the demand for low-qualified and highly-qualified labour is disaggregated into its 'within-sector' and 'between-sector' components, this would clearly show up as a *within-sector* fall in demand for low-qualified workers, and a rise in demand for highly-qualified workers. However, in the discussion of such desegregations above, within-sector changes were interpreted as being due to skill-biased technological change, and specifically *not* due to international trade. Therefore, if the impact of globalization on labour demand at different skill levels in OECD countries has occurred primarily through a process of outsourcing, then the interpretation of the empirical results presented above may have been erroneous. For this reason, the indirect decomposition approach used above will clearly not suffice if evidence of outsourcing is to be found, and more direct evidence must be sought.

A lot of evidence on outsourcing has been gathered by Robert Feenstra and various colleagues. Clearly, if it is to explain the *fall* in demand for low-qualified workers in OECD countries in the 1980s and 1990s, then there must have been an *increase* in outsourcing during this period. Feenstra (1998) shows that this was indeed the case. The share of total intermediate inputs to manufacturing industries accounted for by imports increased from 4 per cent in 1974 to 6 per cent in 1984 and 8 per cent in 1993 in the US, with the equivalent figures being 16 per cent in 1974, a fall to 14 per cent in 1984 and then an increase again to 20 per cent by 1993 in Canada. The largest increase in this share of imports in manufacturing intermediate inputs occurred in the UK, where it increased from 13 per cent in 1974 to 19 per cent in 1984 and 22 per cent in 1993. Around such averages, there will be variation in the use of imported inputs across sectors. Examples of high import-using sectors include clothing and footwear, electric and electronic machinery, jewellery, toys, and sports equipment.

Other papers have investigated the impact of this outsourcing on the demand for highly-qualified or low-qualified workers in OECD countries. Feenstra and Hanson (1996) measure outsourcing in the US as the “share of imported intermediate inputs in the total purchase of non-energy materials”. They show that such outsourcing had a positive effect on the change in the share of total wages that were paid to non-production workers¹⁷ in the 1980s. Based on the size of this effect, they estimate that outsourcing was responsible for about one third¹⁸ of the growth in demand for non-production (i.e. skilled) workers in the 1980s. Feenstra and Hanson (1999) compare the impacts of outsourcing and increased computer use. Although their results depend upon the specification of their estimated equation, they suggest that both effects have increased the demand for highly-qualified workers, with the effect of computers being about twice as large as that of outsourcing. Thus, skill-biased technological change is still the dominant explanation of the changing demand for labour by skill levels, but outsourcing certainly has a role to play too,

17. Being a non-production worker is again used here as an indicator of being more highly-skilled.

18. The full range of their estimates is 15-50 per cent.

which is more important than the original suggested international trade theory discussed above.

A weakness of the above studies by Feenstra and Hanson is that their measure of outsourcing considers imports of intermediate goods from *any* country, whereas if the aim is to explain the fall in demand for low-qualified workers in OECD countries, then it should be measured in terms of the extent to which goods are outsourced to (and therefore imports of intermediate products from) low-wage countries where low-qualified labour is abundant. Anderton and Brenton (1999) obtained data that allowed them to measure the extent of the UK's outsourcing from 1970 to 1986 specifically in this way. Their analysis focuses on just two sectors: textiles and non-electrical machinery production. The results show the importance of focusing on intermediate imports only from developing countries. Total imports of intermediate goods have no statistically significant effect on the wages and employment of low-skilled workers in the UK. However, when imports of intermediate goods only from developing countries are considered, then they push down the wages and employment of low-skilled workers. When the results are split by sector, the impact of outsourcing on demand for low-skilled workers is found to be larger (i.e. more negative) in textiles than in non-electrical machinery, which is consistent with anecdotal evidence about the extent of outsourcing in textiles and the decline of that industry in OECD countries. Anderton and Brenton's results suggest that outsourcing is responsible for around 40 per cent of the increased wage bill share of skilled workers in UK textiles during this period. Hijzen, Gorge and Hine (2005) similarly studied the case of the UK during the period 1982-1996. They define outsourcing narrowly to be imported intermediaries in a given UK industry from the *same* industry overseas. Their broader measure of outsourcing includes intermediaries from *all* overseas industries. The results show that these indicators of outsourcing increased over the period under consideration, particularly during the 1990s. The impact of this increase in outsourcing is then shown to be negative with respect to the demand for low-skilled workers (as classified by their occupation). Hizen *et al.* also make clear that technological change has also affected relative skill demands in the UK.

Turning to continental Europe, Geishecker (2002) considers the case of Germany. Similar results were again obtained, in that outsourcing (defined again as the industry's imported intermediate inputs as a proportion of that industry's total inputs) is shown to have increased in the 1990s by 10 percentage points in German manufacturing. Geishecker shows that the extent of outsourcing differs markedly across manufacturing industries, reaching 93 per cent and 86 per cent in wearing apparel and office machinery sectors respectively, but only 17 per cent and 9 per cent in wood products and fabricated metal products respectively. As usual, this outsourcing is negatively related to the wage bill share of low-skilled workers. Geishecker calculates that outsourcing can explain between 19 and 24 per cent of the fall in the wage bill share of low-skilled workers observed in German manufacturing in the 1990s. He also points out that the impact of skill-biased technological change has been at least as important as that of outsourcing.

Much of the discussion of outsourcing in this section has implicitly or explicitly been about the outsourcing of intermediate stages of production to newly industrialized countries in Asia. This need not always be the case however, and, particularly for countries in Central Europe, outsourcing to the cheaper labour markets of Eastern European countries increased in the 1990s following the fall of the Iron Curtain. Egger and Egger (2003) consider just this type of outsourcing for the case of Austria, which, they observed, increased dramatically in the 1990s by a rate of 11 per cent *per annum*. An innovation of the study by Egger and Egger is that they seek to explain *why* outsourcing became prevalent, and they show that it was indeed due to low-wage-seeking in the previously Communist countries. They then show that outsourcing to Eastern Europe is also associated with higher demand for highly-skilled workers in Austria, with a 1 per cent increase in such outsourcing, leading to a 0.1 per cent increase in the employment of skilled relative to unskilled workers.

Finally in this section, the studies above have been mainly concerned with the outsourcing of manufactured or material inputs to OECD countries' production. Amiti and Wei (2005) consider whether outsourcing of *services* has also become relevant. The common

perception is certainly that it is becoming more important,¹⁹ with perhaps the relocation of firms' call centres to India being the classic example. Amiti and Wei focus on computing and business services as those most likely to be outsourced, and show that, whilst outsourcing of such services has increased in countries such as the US and the UK, outsourced service inputs still represent a tiny proportion of all inputs to those economies (0.9 per cent in the US and 2.6 per cent in the UK in 2001). In terms of the value of business service inputs insourced, the US and the UK are the largest insourcers, followed by Germany, France and the Netherlands. However, sixth on this list for *importing in* service inputs is the country most often associated with *supplying* the service inputs: India. Considering the impact of service outsourcing in the UK, Amiti and Wei found no consistent evidence that it has had a negative effect on employment (and indeed found a positive effect in some of their specifications), although admittedly their data did not allow them to disaggregate employment by skill level, and so they were unable to specifically investigate the impact of service outsourcing on low-skilled employment.

Summarizing this section overall, it seems that considering outsourcing of intermediate stages of production implies a greater impact of international trade on the demand for low-qualified labour in OECD countries than was suggested in studies on trade in only final products. At the moment, this effect seems to be limited to the outsourcing of manufactured intermediate goods, rather than service inputs. Also, even with this increased role for globalization, skill-biased technological change still seems to be the dominant explanation for the fall in demand for low-qualified workers in the OECD. This final statement still requires the same qualification as earlier however; that all of these empirical studies consider the past, and what happens in the future – even the immediate future – could be very different as the globalization process continues to gather pace.

19. Amiti and Wei (2005: 309) report that “in just five months, between January and May 2004, there were 2,634 reports in US newspapers on service outsourcing, mostly focussing on the fear of job losses”.

III. Will the demand for low-qualified labour disappear altogether in OECD countries?

The low-skill bad-job trap

Chapter I showed that the demand for low-qualified labour is declining in all OECD countries. If such a trend continues, then a situation could emerge whereby the demand for low-qualified workers all but disappears within the OECD. Is such a desperate situation likely to come about? This chapter considers possible reasons why low-skilled jobs are not about to disappear in the OECD in the near future.

In the first instance, before the demand for and supply of low-qualified labour declines to any great extent, the presence of a large supply of such workers can create its own demand, that is, demand stays high because the supply remains high. This was called the 'low-skill bad-job trap' by Snower (1996). The reason the trap exists is that in countries that have a low proportion of skilled workers, there is no incentive for firms to create high-skilled jobs, as they will not find the workers to fill them. But if high-skilled jobs are not being created, there is little incentive for individuals to acquire skills. Thus there remains a high proportion of low-skilled workers, completing the vicious circle. Snower suggests that offering subsidies to firms that open high-skill jobs would help to avoid the low-skill bad-job trap. Alternatively, exogenous shocks to the supply of well-educated labour, for example government decisions to expand higher education, can be another way out of the trap, assuming of course that the quality of the education provided does not suffer following this adjustment.

Such arguments are formalized in the models developed by Acemoglu (1997, 1998). With endogenous technological choice (in other words, a freely chosen technology level by firms), firms may not adopt high-skill technology, even when available, if they do not believe that suitable workers will fill the jobs created. If only low-skilled workers are available, firms will adopt the appropriate technology. Thus, it need not be the case that technological change

will always be skill-biased; history is littered with examples of new technologies making jobs easier to perform with a lower level of skills. An expansion of the skill base would then increase the adoption of high-skill technologies, thus eventually raising job standards for all.

Similarly, Lloyd-Ellis (1999) develops a model with endogenous adoption of technologies. He argues that if there is a scarcity of skilled workers, competition for those that do exist will drive up their wages, leading to increased wage inequality. But the higher wages of skilled workers will persuade firms not to adopt technologies that require such workers. Thus, it is suggested that the slowdown in labour productivity growth and the contemporaneous rise in wage inequality that occurred in the US in the 1970s and the 1980s are due to the slowdown in the growth of skills. Lloyd-Ellis highlights new teaching methods that have reduced the acquisition of basic mathematical, scientific and technical skills as a possible cause of the slowdown in the growth of appropriate skills.

Evidence to suggest that the low-qualified are better off when there are proportionally more of them was observed in *Chapter I* above. *Figure 1.3* shows that there is a negative relationship between the ratio of low-qualified to highly-qualified unemployment, and the relative size of the low-qualified group. In other words, in countries such as Portugal, Turkey and Mexico, and to a slightly lesser extent Italy and Spain, there are still large numbers of individuals classified as low-qualified, and in these countries the likelihood of the low-qualified being unemployed is only slightly higher than the probability of the highly-qualified being unemployed. This is consistent with the idea that firms are more likely to open low-skilled positions when there are many low-qualified workers in the economy.

A different kind of technical change

The previous section argued that jobs for low-qualified individuals could remain where there are still large numbers of such workers. However, many OECD countries have probably gone past the 'tipping point', where expansions of education systems have produced large numbers of skilled individuals, and thus persuaded firms to open skilled jobs. This section therefore considers what will happen to low-qualified individuals in such countries.

In actual fact, recent research suggests that the outlook for the low-qualified in OECD countries need not be as bleak as the earlier analysis of the falling demand for such workers would suggest. It could be the case that, for now, the largest falls in the demand for low-qualified workers have occurred, and such demand will now continue at this lower level for the foreseeable future. Such arguments are made by Manning (2004).

The starting point of Manning's analysis is another recent paper by Autor, Levy and Murnane (2003) examining the skill content of technological change. The innovation of Autor *et al.*'s analysis is that they define jobs by the 'tasks' that they involve, and then consider the likely impact of technological change on a given job according to these tasks. In order to do so, it is first necessary to understand what computers do. According to Autor *et al.*'s definition, "they rapidly and accurately perform repetitive tasks that are deterministically specified by stored instructions (programmes) that designate unambiguously what actions the machine will perform at each contingency to achieve the desired result" (p. 1282). Autor *et al.* then divide jobs according to whether they are routine or non-routine, rather than skilled or non-skilled. A routine job is defined as one that includes repetitive tasks, either cognitive or manual, that could be performed by machines. Thus, taking measurements (length specifications, temperature, etc.) to check the quality of procedures could be performed by machines programmed to do this. Similarly, many aspects of production on a production line involve endless repetition of the same tasks (fitting a component, screwing together components, etc.) and so again could be performed by suitably programmed machines. On the other hand, many other jobs involve non-repetitive tasks where some response to outside stimuli is needed. Until computers can be programmed to react to all possible occurrences (and thus programmed to 'think' for themselves), the simple solution in such cases is to employ human labour to perform such tasks. The tasks involved could be found in jobs at either end of the occupation spectrum; for example being an executive director of a multinational company and helping school children across a road both require human workers to respond to existing conditions and make decisions.

To summarize, Autor *et al.* (2003) categorize tasks into one of four types: routine cognitive (e.g. record-keeping, calculation, repetitive customer service such as bank-telling); non-routine cognitive (e.g. forming/testing hypotheses, medical diagnosis, legal writing, selling, managing others); routine manual (picking and sorting, repetitive assembly); and non-routine manual (cleaning, driving). They argue that computers can be easily substituted for labour in routine tasks (both cognitive and manual), are complements (i.e. work best together) with labour in non-routine cognitive tasks, and have no impact either way on non-routine manual tasks. They then provide evidence that job content has changed over the last 35 years, with a reduction in routine tasks and an increase in non-routine cognitive tasks, with the changes being most marked in industries and occupations that have made more extensive use of computers.

Manning (2004) makes use of the Autor *et al.* analysis to argue that the concept of skill-biased technological change is too simplistic. It is not the case that technological change over the last 30 years or so has replaced low-skilled jobs and created more highly-skilled jobs. Rather the impact of technological change has depended on the task content of jobs, in particular whether they are routine or non-routine. Manning argues that the typical routine jobs that have been destroyed by technological processes are skilled craft jobs and intermediate non-manual jobs such as record-keeping. Therefore he argues that, rather than reducing the demand for the most unskilled, low-qualified labour, it is actually intermediate-skilled individuals that have been affected, while many of the least skilled work in non-routine manual jobs have been unaffected by technology.²⁰

Manning puts forward a range of evidence in support of his hypothesis. For example, looking at the growth in employment by occupation in the UK, he found that the fastest growing occupations were amongst the highest paying *and* the lowest paying occupations. Thus, the occupation with the largest percentage change in employment between 1979 and 1999 in the UK was that of care

20. Manning makes the same prediction as the literature on skill-biased technological change at the top end of the labour market, i.e. that technology has been complementary to labour in the most skill-intensive, best-paid jobs.

assistants, followed by educational assistants and hospital ward assistants in sixth and seventh place respectively. Of the ten lowest paying occupations in 1979, six increased in terms of employment numbers over the following two decades, with shelf-llers and retail check-out operators almost doubling in numbers, and bar staff and waiters increasing by more than 50 per cent.²¹ Similar trends can be noticed in the US. The US Bureau of Labor Statistics made predictions for employment growth over the period 2002-2012 (see Hecker, 2004). Of the ten occupations with the largest predicted employment growth, ve were among the lowest paying, namely retail sales persons, fast-food workers, cashiers, cleaners and nursing aides. Thus, far from being destroyed by technological change, a number of jobs typically hiring low-qualified labour are actually ourishing and increasing their employment numbers. The outlook for the low-qualified in OECD countries is therefore perhaps not as bleak as earlier discussions of skill-biased technological change implied.

Manning notes one other characteristic of the low-skilled occupations that are growing. Occupations such as those of care assistants, retail and hospitality workers are delivering ‘non-tradeable’ services, in the sense that they have to be in physical proximity to the purchaser. These services cannot be traded by middlemen across large distances. This means that low-qualified workers in these occupations are not at risk of competition from cheaper low-qualified workers in developing countries. Other low-qualified jobs producing goods or services not requiring physical proximity with the end user have been the ones that have declined in developed countries and moved to developing countries, such as textiles and call centres. Note that because these services that are growing do require physical proximity, this implies that the low-qualified will do best in terms of demand for their labour where there are also large numbers of well-paid, well-qualified individuals. As wage inequality grows, with the gap between the rich and the poor getting wider, increasing numbers of well-qualified individuals will be available to afford to hire the services of low-qualified individuals. Thus, for example,

21. Note that the low-paid occupation with the biggest *fall* in employment numbers was petrol pump forecourt attendants, and in this case the job content *did* involve routine tasks that have been replaced by technology.

occupations such as domestic help and nannying, after previously suffering long-term decline, are now growing again.

It therefore seems very unlikely that the decline in demand for low-qualified workers will accelerate in OECD countries in the near future. The statistics presented in *Chapter I* above have already shown that recent declines in employment of the low-qualified have been smaller than in previous periods, in particular the 1980s. The bottom line is that there will always be shops, bars and restaurants requiring staff, and there will always be some better-off individuals who are willing to pay others to perform life's more mundane tasks such as cleaning.

There are two potential problems with this more optimistic view for the low-qualified. Firstly, as noted above, the biggest losers of technological change have been intermediate-educated individuals such as skilled craft workers or record-keepers. If sufficient numbers of such workers lose their jobs and are willing to accept jobs requiring a lower skill level rather than remaining unemployed, then it could be the case that employers start to replace low-qualified with intermediate-qualified individuals, for example by hiring former miners or textile workers to work in shops and bars. In actual fact, although the case of graduates working in non-graduate jobs gets by far the most attention in the over-education literature mentioned in *Chapter II*, it is already the case that the largest number of over-educated individuals are actually those with an intermediate qualification working in a job for which no qualifications are required. Thus, although low-qualified jobs will not disappear anytime soon, it might not be low-qualified people filling them.

The other potential problem with the more optimistic picture painted for low-qualified workers is that although computers and machines cannot perform non-routine manual tasks now, this does not mean that they will always be so incapable. Self-service check-outs have already appeared in some supermarkets, and the image of the robot that can clean a house or serve drinks is so well-entrenched in our vision of the future that it seems unlikely that such machines will never be invented. While the very existence of low-qualified jobs in developed countries is certainly not under threat at the moment or in the near future, this may not always be the case.

IV. Policies to improve the labour market position of the low-qualified in OECD countries

So far this booklet has described the extent of the problem facing the low-qualified in modern OECD economies, and then analyzed in some detail why this situation exists. Armed with this knowledge, policy-makers and educational planners can develop solutions to the problem. This chapter provides some pointers.

The preceding evidence has made it clear that the reason for the poor position of the low-qualified in OECD labour markets is a fall in the demand for their services. Although the exact cause of this fall in demand is perhaps disputed, the fact that it has occurred is not. The most important cause seems to be the computer revolution and technological change more generally. Globalization and competition from newly industrialized countries that have lower labour costs and large supplies of relatively lower skilled labour is also a factor, particularly, it seems, in terms of OECD firms outsourcing the low-skill-intensive stages of multi-staged production to newly-industrialized countries. Both of these factors (technological change and outsourcing) have lowered the demand for low-qualified workers in OECD countries and increased the demand for higher-qualified, better-skilled workers. While it is always dangerous to predict the future, it also seems reasonably safe to say that neither of these processes is going to disappear. A policy response to help the low-qualified by reversing the processes that created the problem is therefore not an option. The response must be to understand the changes that have occurred, accept them, and then react to them. Some potential reactions will now be discussed.

Reducing low-qualified wages

In *Chapter II*, the last of the reasons put forward for the high unemployment rate of the low-qualified was that various labour market institutions, such as trade unions, minimum wages or the level of unemployment benefits, create a wage floor and so stop the wages of the least skilled in the economy from reaching the level

necessary to persuade employers to hire them. If employers do not think that low-qualified workers are sufficiently productive to justify receiving the wage created by the wage floor, then they will not hire low-qualified workers, and the unemployment rate of this group will rise. Of course, the wage floors are created for a reason, and some countries decide that it is better for some low-qualified individuals to be out of work than to give very low wages to all low-qualified workers, and consequently aggravate inequality. Krugman expressed this trade-off facing governments when he said that the “European unemployment problem and the US inequality problem are two sides of the same coin” (1994: 37). Thus, Krugman was expressing the view that continental European countries have sought to protect their low-qualified workers from very low wages at the cost of some of their jobs, whereas the more flexible American and British labour markets ensure that more people who want a job can find one, at the expense of very unequal wages. If this is true, then one way to reduce low-qualified unemployment is to create more flexible labour markets, so that wages can respond to the falling demand for low-qualified workers by declining in value for such workers.

Empirical support for this proposition can be found, for example, in Mortensen and Pissarides (1999), whose evidence suggests that, had the US had similar labour market institutions to Europe in the 1980s and 1990s (specifically, they consider unemployment benefits and employment protection taxes), then its unemployment rate would have been as high as in European countries. Similarly, Blau and Kahn (1996) examine wage inequality across countries and show that the extent of wage inequality correlates negatively with the presence of labour market institutions that hold up wages at the lower end of the market. In other words, when such institutions are present, wage inequality is lower, as wages at the lower end of the distribution are propped up.

However, when other authors have delved more deeply into the implications of the ‘Krugman Hypothesis’, evidence has been more difficult to find. For example, Card, Kramarz and Lemieux (1999) compare the US, Canada and France. They show that during the 1980s, wages grew fastest for those who already had the highest wages at the start of the decade (and also for those with a higher computer usage) in the US, suggesting a widening wage structure and growing

inequality there, as would be expected. However France, with its labour market institutions supporting wages, would be expected to have a problem of rising low-qualified unemployment. But Card *et al.*'s results show that the relative employment rate of individuals not using computers fell as much in the US as it did in France. The social protection of the higher low-qualified wages in France therefore did not seem to cause any more low-qualified job losses in the 1980s than were experienced in the flexible labour market of the US. Similar results were obtained by Krueger and Pischke (1997) comparing the US and Germany. As was seen, therefore, in *Table 1.4* above, low-qualified unemployment rose almost everywhere in the 1980s, whether countries tried to hold up low-qualified wages or let them fall to try and keep such workers in a job.

Even if making wages flexible downwards at the lower end of the wage distribution is successful in encouraging enterprises to hire low-qualified workers, an additional problem is that it is likely to create large numbers of so-called 'working poor', who have a job but find it difficult to earn sufficiently to enjoy an acceptable standard of living. The solution to this problem could be the payment of in-work benefits to such people, although this can create its own problems in terms of a lack of incentive for the workers to obtain better jobs, a lack of incentive for firms to pay a living wage (in effect, low-wage employers are subsidized) as well as in-work benefits, and therefore there arises a need to raise more taxes from other workers, which would again consequently have its own distortive effects. Thus other solutions probably need to be found.

Reducing the supply of low-qualified individuals

If the shifts in demand against low-qualified workers, described in *Chapter II* above, are assumed to have been the same in every country, which is reasonable given the proliferation of technology around the world, then the question is: why did some countries have better outcomes for low-qualified workers than others? Glyn and Salverda (2000) analyze this very question, seeking to discover what explains the variation in low-qualified/highly-qualified unemployment differences across countries. As the results of Card *et al.* (1999) and Krueger and Pischke (1997) would suggest, Glyn and Salverda find that labour market institutions play no part in

explaining this variation. Instead, they show that the unemployment difference between the highly- and low-qualified depends on the difference in literacy scores between them (obtained in the IALS tests described in *Chapter I*). Thus, where the difference in literary skills between those towards the top of the education distribution and those towards the bottom is smaller, the gap between their unemployment rates is also smaller. In other words, the labour market position of the lower-qualified is better in those countries where their literacy skills are closer to those of the higher-qualified.

Similarly, Nickell and Bell (1996) and Freeman and Schettkat (2000) consider how Germany (at the time of their respective studies) had achieved unemployment rates for the low-qualified similar to those in the US if they had experienced the same adverse demand shocks against the low-qualified, but had not seen low-qualified wages fall relative to highly-qualified wages as much as the US. Both papers look for the answer in the high level of ability achieved by the large numbers with middle-level qualifications in Germany, achieved primarily through vocational qualifications as part of an apprenticeship. Thus, the large majority of school-leavers who do not continue on the academic path to university in Germany still acquire valuable labour-market skills that are in high demand through their vocational training. Relatively few individuals are left behind at the low qualification levels. This suggests that, as concluded by Gregg and Manning (1997), it is a country's reaction in terms of the supply of qualified labour that determines the relative unemployment outcomes following a change in the relative demands for highly-qualified and low-qualified labour that results from something such as skill-biased technological change. Where countries have increased the supply of qualified labour (i.e. reduced the supply of low-qualified individuals) to the same extent as the demand for qualified labour has increased (i.e. the demand for low-qualified labour has fallen), then there is no need for the low-qualified to struggle in the labour market. Since their supply has fallen as much as the demand for their services, there is no surplus of low-qualified labour and so no downward pressure on their wages or on the likelihood of them finding employment.

Of course, the policy suggestion of 'raising the supply of qualified (skilled) workers' leaves a lot of detail to be decided, such as who should be involved in the extra learning and what form it

should take. If the idea is that the increase in the supply of skills matches the increase in the demand for skills in terms of quantity, then they should match in terms of quality too. In other words, the type of skills being demanded should be the skills where an increase in supply is targeted. If the demand for higher-qualified workers has increased, then one place to start efforts to meet this demand is in higher education. How far to expand higher education is difficult to predict. One approach could be to expand higher education as much as the market will allow. If by chance higher education was expanded too far, and more graduates were produced than were required by the labour market, then there would be an excess supply of graduates, all trying to obtain one of the relatively scarce graduate jobs. In such a situation they would be expected to undercut each other and to offer to work for lower wages than their rivals in order to get a job. In this way, the excess supply of graduates would reduce relative graduate wages. Therefore a sign that higher education is being expanded too far and that too many graduates are being produced would be a decline in the wage returns to a degree (that is, a reduction in the gap between graduate and non-graduate wages). However, in most OECD countries there is no evidence of such a decline in the graduate wage premium. Even in a country such as the UK, which has increased participation in higher education to over 40 per cent of the most recent cohorts, data on the most recent graduates do not provide any evidence to suggest that the wage returns to a degree in the UK are falling (Elias and Purcell, 2004).

It therefore appears that there is still room to increase the supply of graduates further, following the increase in demand for skilled labour. However, the dominant explanation for the rise in demand for skilled labour – skill-biased technological change – must be kept in mind. Thus, if a key reason for the increase in demand for highly-qualified labour has been due to technological reasons, then the increased supply of graduates should be able to fill high-skill, technology-intensive jobs. It is not therefore the case that an increase in the supply of graduates in any field can be easily accommodated in the labour market. Given the nature of the increase in demand, then the increase in the supply of graduates should be in the fields of science, engineering, mathematics, computing, and related subjects, with the demand for business- and management-related subjects also

likely to be large.²² If this is the case, it would be expected that the wages offered to graduates in such subjects would be high to attract more young people to study these subjects in order to increase supply in line with demand, and so that firms can attract the scarce number of existing graduates in such subjects to work for them. This is exactly what is observed in a range of countries. O'Leary and Sloane (2005) estimate the wage gap between graduates in different subjects relative to individuals with, at best, upper secondary education in the UK. They find that this wage gap is lowest at just 2 per cent for graduates in arts subjects. The highest wage gaps are observed for maths and computing, medicine, engineering and technology, and business and financial studies, with wage gaps that are respectively 32, 29, 27 and 24 per cent higher than the arts wage gap. Similar results were observed for Germany by Ammermüller and Weber (2005), who estimate that the annual wage return to a degree by subject area for males is above 10 per cent per year of study in law, business and economics, medicine, chemistry, pharmacy, physics, informatics, and veterinary medicine. On the other hand, degrees in subjects such as arts and music, agricultural science and theology attract annual wage returns of around 6 per cent or lower per year of study.

Given that such differences in wage returns to degrees exist across subjects, one might have thought that potential students would be influenced by them and apply to courses that have the largest impact on wages. With the exception of computing and ICT, where the number of graduates is increasing, there does not seem to have been much increase in the supply of skilled graduate labour in the fields of science and engineering.²³ It may be that knowledge of the differential wage returns is not widespread, in which case an important policy conclusion is that young people should be provided with as much information as possible when making decisions about their future education.

22. Of course, traditional professions to which a degree can lead, such as medicine, law, accountancy, etc., have continued, and will continue, to demand graduate labour. However, the *increase* in the demand for skilled labour will not have come from these subjects to any great extent.

23. This is actually a matter of concern for several OECD countries who wish to increase their investment in research and development.

Thus, there appears to be much room in the OECD labour markets for further expansions of higher education, particularly if targeted at particular fields where the demand is highest. Of course, if higher education were to be continually expanded, then a point could be reached where a country would have too many graduates. In addition, not all individuals have an interest in academic study or want to continue in formal education even if encouraged to do so by an availability of places. Finally, most of this booklet has been concerned with the position of the low-qualified, and if the policy is to raise their qualification level, then it is unrealistic to expect them to acquire higher level academic qualifications. For all of these reasons, educational planners therefore need to focus on more than just higher education. Vocational qualifications seem to be a more appropriate means of upgrading the skills of the low-qualified. McCrone and Morris (2004) describe the impact of providing vocational training on the motivation of previously disengaged youngsters in the UK.²⁴ Their results suggest that the attraction of vocational learning for such individuals is that it takes place in a different setting to academic study (i.e. not in a classroom), involves more individual contact with teachers, consists of more 'doing' than 'thinking', and seems more relevant to the sort of jobs that such individuals want. It also has the effect of increasing the students' self-confidence, motivation and aspirations. McIntosh (2004) explicitly considers the advantages to the labour market when young people in the UK, who had no or low qualifications after full-time higher education, acquire intermediate level vocational qualifications. He shows that this can have a substantial effect, such that an individual leaving school with no qualifications at all but subsequently obtains a vocational qualification at Level 3²⁵ is as likely to be employed as an individual who remained in full-time education and completed the upper secondary level (which is the academic route to a Level 3 qualification). Thus the vocational qualification completely removes the employment disadvantage to an individual of leaving school with no qualifications.

24. Their research actually focuses on 14-16 year olds, though similar effects are likely to be observed for the over-16s.

25. Recall from the definitions in *Chapter I* that Level 3 is an intermediate level qualification, equivalent to the completion of upper secondary schooling.

If vocational qualifications have this effect on the likelihood of employment, then the obvious question to ask is why more young people do not acquire qualifications. The problem could be that in many countries vocational qualifications do not attract a very large wage premium. In other words, the wages received by individuals who acquire such qualifications do not differ substantially from the wages of individuals with no qualifications. This in turn will obviously reduce the motivation of people to acquire such qualifications. The fact that the wage premium is low suggests that employers do not value such qualifications very highly, and if employers place little value on them, then individuals will not be motivated to acquire them. So the key to developing a successful vocational qualification system seems to be to ensure that the qualifications are valued by employers and individuals.

One aspect that will provide value is if the qualification is at least at Level 3. Throughout this booklet, an individual with a Level 2 qualification or below on the ISCED framework (that is, who has completed lower secondary education or equivalent) has been referred to as low-qualified. Any vocational qualification that is awarded at Level 2 or below will not therefore allow its holder to escape the low-qualified group, and so it is not surprising that it will be of little value. Recall from *Table 1.1* that there was a large increase in the employment-population ratio when moving from the completion of lower secondary to upper secondary education or equivalent (that is, from Level 2 to Level 3). Reaching Level 3 therefore seems to make a big difference to individuals in terms of their labour market outcomes, and essentially protects such individuals from many of the problems facing the low-qualified that have been described in detail in this booklet.

A key aspect of a successful vocational qualification framework should therefore be that it does not have too many exit points before Level 3. This is not to say that there should be no vocational education provision below Level 3. Clearly some (perhaps most) school leavers who have dropped out of full-time general (academic) education will not be immediately prepared for vocational study at Level 3, and so will require provision below this level. Any achievement below Level 3, however, should not be seen as an end in itself, but as mere preparation for entry to a Level 3 vocational qualification.

In this way, individuals, rather than leaving the system when they have reached a certain level that they consider sufficient, are more likely to realize that this achievement allows them to progress to higher levels.

Another way in which vocational education can become more valuable to employers is if they provide input to the content of the education and training. It is therefore crucial that employer representatives (for example, employer associations, local chambers of commerce, etc.) be involved in the design of the curriculum for vocational qualifications. In this way employers can ensure that the specific skills that are relevant to them and yet are currently not being fully supplied in the labour market are taught to trainees and so will eventually be available to firms. Employers are also likely to value vocational qualifications more if they contain some core general, academic skills that all employees should possess, for example mathematics, the national language, and in some cases a foreign language.

Of course, the employers are not the only economic agents with a vested interest in the content and outcomes of vocational education, and it is important for the individuals themselves to value the qualifications on offer if significant numbers are to be persuaded to apply. Since individual workers will not have the influence necessary to affect the content of vocational education, this suggests a role for the social partners, with trade unions representing workers' interests in the design of a vocational curriculum. The type of vocational education that individuals want will typically provide general, transferable occupational knowledge. If the training is very specific to one particular firm or group of firms, then workers will be tied to such employers, who in turn will know that their workers have little market power with which to extract higher wages. If the acquired skills are transferable, however, then individuals can use the threat of taking these skills to another firm to extract higher wages, and so be paid the full value of their new skills.

Another factor that can increase the value that individuals place on vocational qualifications is whether they can be placed in a hierarchy of attainment and lead directly to the next level of attainment, rather than leading to a dead-end in terms of further progression. For

example, students pursuing a vocational qualification at Level 2 will want to know that there is a qualification in a similar field and type available at Level 3 to which they can naturally progress, rather than having to go back and start a new course when they discover that this is not the case. Ultimately one would hope that vocational qualifications lead to higher education should the participant wish to progress in this way. Many degree courses offered at universities are actually vocational in nature, and so progression from intermediate vocational education to higher education can in some cases actually be quite natural, but this is not always made clear. The proportion of intermediate vocational education participants who actually progress to higher education will probably be quite low, but it is important that this progression be possible and that the position of vocational qualifications in the hierarchy of attainment be clear in order to increase the value of such qualifications.

For vocational qualifications to be valued by learners, firms, and society in general, it is crucial that such people recognize the qualification attained and have faith in its verification of attainment. If someone is unsure about what is actually involved in obtaining a particular qualification or what level of attainment it signifies, that person is unlikely to attach much value to that qualification. Academic qualifications in most countries possess this property of being a widely recognizable and understood indicator of achievement. Vocational qualifications too often do not have this property, however, and a plethora of awarding bodies and different vocational fields often mean that individuals are unclear about the standard required to obtain any particular qualification (or, in the worst case scenario, have not even heard of a particular qualification). In such a situation, the value of these qualifications is necessarily going to be reduced, and therefore the demand to acquire them will also fall. It is therefore important that vocational qualifications can be placed within a nationally recognized framework of attainment, with the requirements that are necessary to reach each level being clearly established by an authorized and respected body that is widely known by economic agents and common to the various vocational fields.

Annual recommendations for vocational education to be made here returns to the reason why such education was being recommended

in the first place – namely to improve the qualifications of the low-qualified. It is important, however, that this is not seen as its sole purpose. It therefore specifically must not be seen as a dumping ground for failures, where young people who do not have the aptitude or ability to obtain academic qualifications go to acquire some sort of qualification. Vocational education must not be presented as second rate compared to academic education, but merely as an alternative to academic education, which is followed by different people with different characteristics for different reasons – but not inferior because of that – and having its own role to play in the development of skills. If such a description of vocational education represents a society's general view, then its value will rise.

Therefore, there is a long list of factors that can, when present in vocational education, increase its value to learners and employers, and so increase the number of individuals wishing to acquire such qualifications. An example of vocational education that does satisfy many of these criteria is the apprenticeship system in Germany. This is a highly respected qualification in Germany and is followed by a majority of each cohort of young people. It includes aspects of general learning, vocational skills and on-the-job learning of occupational-specific skills. It leads to a Level 3 qualification, and can also provide access to higher education. Given that all of these factors are in place, one might expect German apprenticeships to be highly valued, and so attract good levels of pay. This is exactly what was observed, for example, by Clark and Fahr (2002), who estimate the gain in wages that results from each year spent doing an apprenticeship in Germany to be 8.2 per cent on average. This is very similar to the estimated wage return to a year of general education in Germany, which suggests that well designed vocational learning can be as highly valued as general academic education.

Another comment to be made about the upgrading of the workforce's skills to match the increase in demand for skills is that much of the above discussion was implicitly or explicitly concerned with young people. Recalling again, however, that the main cause of the rise in demand for skills has been technological progress, this was not a one-off increase in technological progress to a new higher level, but is a continuous process of development. If the demand for skills is going to continue rising, or at the very least changing to

adapt to the latest technology, then the supply of skills is similarly going to have to continuously increase or adapt. The acquired skills provided by new entrants to the labour market cannot be relied upon to fully adapt the skills of the workforce to be in line with changes in technology, since new entrants are only a small proportion of the total workforce. It is therefore important that existing workers, who may be many years out of formal education, continue to develop their skills in a process of lifelong learning. In order to participate in lifelong learning, individuals must have the necessary skills on which to build and the 'ability to learn'. The possibility of lifelong learning therefore again comes down to well-educated young people being produced by a country's education system, with a good grounding of general skills and abilities, and the adaptability to react to changes in demand through future training and learning.

Job creation for the low-qualified

Thus, upskilling of individuals is an effective tool for reducing low-qualified unemployment, both at an aggregate level and at the level of the individual's probability of unemployment. However, some individuals do not have the ability, aptitude or desire to increase their qualifications or skills up to intermediate level (i.e. Level 3, end of upper secondary schooling or equivalent), and so it would prove very difficult to upgrade all low-qualified individuals, even if a country thought it desirable to have no individuals with a minimum level of education. What, then, can be done to help the unemployment situation of those low-qualified individuals for whom upskilling is not a viable alternative? Some possibilities are outlined by Glyn (1995). These basically revolve around attempting to increase the demand for low-qualified labour. This could be done, for example, through subsidising the employment of such workers by lowering the social security contributions of the firms who employ them, or offering a subsidy in some other way. Clearly, the shortfall in the social security contributions, or the funds required to offer some other sort of subsidy to firms, will require higher social security contributions or taxes from elsewhere in society. Thus, such a policy requires that society accept that the costs of the labour market moving against the low-qualified need not be borne exclusively by the low-qualified themselves in terms of lower

wages or a lower probability of being employed, but could be shared across society. To the extent that the labour market problems of the low-qualified are caused by international trade and outsourcing, then the justification for such cost-sharing is apparent. Standard economic theory suggests that there are mutual gains from trade. If two economic agents trade (in this case the international trade between two countries), then both must be happy with the outcomes of the trade (assuming the trade was entered into voluntarily), and so both can be assumed to be better off. Thus, the developed country as a whole is better off through international trade, although it has harmed one group of the population, namely the low-qualified. In a sense, the low-qualified have therefore been sacrificed for the greater good, and so the justification for the redistribution of some of the gains from trade to this group is apparent. If such an agreement could be reached, then evidence has shown that employers are quite responsive to changes in social security contributions at the lower end of the labour market, and so such a policy would be effective in creating low-skilled employment.²⁶ The success of the policy does of course depend upon the overall labour costs to the firm, and therefore where minimum wages are relatively high, for example in France, it may require a large reduction in employer taxes and social security contributions to price low-qualified workers into jobs.

The national policy alternative is not to persuade private firms to employ low-qualified individuals, but for the state to directly employ such workers through public sector job-creation schemes. Sectors of the economy such as construction would be ideal for such schemes, given that they can employ relatively low-skilled workers in reasonable numbers and produce an output that can have significant public benefit. The advantage of such schemes is that they directly create jobs for low-qualified workers, rather than indirectly relying upon the response of private sector firms to various incentives. The potential impact of a public job creation scheme is therefore easier to predict. Of course, such a scheme still requires substantial outlay from the public purse, and therefore an acceptance amongst the general population that the low-qualified should be helped in this way.

26. The Commission of the EC (1993) provides some evidence on this issue.

In summary, therefore, the most appropriate response to an increase in the demand for well-qualified labour and a corresponding fall in demand for low-qualified labour is to reduce the supply of low-qualified labour to the same extent. As far as this is not possible for certain individuals, however, policies will need to be introduced to stimulate demand for such labour, either by directly creating jobs for them in the public sector, or by indirectly persuading private firms to employ them. Either way, the general public must be convinced of the need to use public money to help the low-qualified in this way.

Conclusion

The review of the economic literature on the relationship between education and employment presented above has shown that in developed countries, individuals with a low level of education, defined as being educated only up to the end of lower secondary schooling or equivalent, are significantly less likely to be employed than their more highly-educated counterparts. This difference in employability is partly due to the unlikelihood of finding a job if in the labour force, and partly due to the unqualified being less likely to even participate in the labour force in the first place. The evidence also shows that this situation is deteriorating over time for the low-qualified, particularly in terms of the likelihood of even participating in the labour force. Some consolation can be found in the fact that this deterioration is not occurring at an ever faster rate, with the largest declines in the relative position of the low-qualified actually occurring in the late 1970s and 1980s.

It has been found that this declining relative position for the low-qualified was caused by a shift in the relative demand for labour away from those individuals with a low level of education and towards those with a higher level. All of the evidence reviewed above suggests that the primary cause of this relative shift in labour demand has been so-called 'skill-biased technological change'. This process is largely associated with the advent of computers – both personal computers and computer-controlled machinery – which have replaced some lower-skilled jobs while at the same time requiring more skilled labour to operate and programme them. The largest increase in the use of computer technology actually occurred in most developed countries in the 1980s, which is also one of the periods that saw the labour market position of the low-qualified decline the most.

Another explanation for the fall in demand for low-qualified workers that is growing in relevance, particularly in the 1990s and 2000s, is globalization, and in particular the outsourcing of the low-skilled elements of OECD firms' activity to newly-industrialized countries that have the comparative advantage of lower labour costs

Conclusion

and larger supplies of low-qualified labour. With the increasing importance of India and China in global markets, it may well be that the outsourcing arguments come to be the dominant explanation for the fall in demand for low-qualified labour in the OECD.

Clearly neither the computer revolution nor the globalization process is going to be reversed, but they will in fact continue to develop further. However, it must be remembered that this does not mean that low-skilled jobs are on the point of extinction in developed countries. For the foreseeable future, some of the least skilled jobs – often service sector jobs such as cleaning or in the retail and hospitality sectors – are not susceptible to computerization because of their non-routine nature, meaning that computers cannot, as yet, be programmed to perform such tasks because they cannot react to particular circumstances. Such jobs are also largely safe from the threat of being outsourced to newly-industrialized countries, given the requirement for the physical presence of the service purchaser. These jobs will therefore remain for now, and could even increase in number if the rise in demand for skilled labour increases incomes at the top end of the labour market, thus increasing the demand for such services.

Despite this, if these low-skilled jobs that remain are insufficient in number to offer the prospect of employment to all low-qualified individuals, then policies must still be pursued in order to avoid problems of large-scale low-qualified unemployment and inactivity. The most appropriate policy to pursue is to attempt to raise the supply of well-educated and skilled workers as fast as the demand for their services is rising. Higher education has a role to play here, and evidence from many OECD countries on the wage premiums earned by graduates reveals that such premiums are not falling, which suggests that their labour markets still have more room for more graduates and further expansions of higher education. It is important that the increased supply of graduates actually have the skills that are being demanded by firms, and have followed fields of study that are relevant to the modern labour market.

As far as the low-qualified are concerned, the process of skill upgrading mainly involves raising individuals from low to intermediate education levels. Evidence from a range of countries suggests that the most successful means of doing this is through

vocational training leading to vocational qualifications, either provided in suitable colleges of further education, or through on-the-job training within firms (or often most successfully a combination of the two). It seems that vocational education and training often have a greater impact on the motivation, and ultimately the achievement, of previous low-achievers who perhaps grew disengaged from formal education, compared to an academic route to higher level qualifications. The added bonus of such a policy is that it is precisely intermediate level vocational and technical skills that many firms are saying are in short supply.

The vocational education provided should lead to at least a Level 3 qualification and provide access to higher levels in higher education if desired by the individual involved. It should comprise various components of key general (academic) subjects such as maths and the national language, of general work-related vocational skills, and of specific occupational knowledge. It should lead to a well-known, respected qualification, so that all interested parties can be confident of the standard of knowledge and skills obtained, and finally it must be viewed as important in its own right, rather than a poor substitute for academic education designed for the incapable.

Of course, skill upgrading is not appropriate for all individuals, and as discussed above, some low-skilled jobs will remain in developed economies anyway. In order to avoid low-qualified unemployment it is therefore necessary to ensure that sufficient jobs are created for those who do not upgrade their skills. The more individuals that remain low-qualified, the greater the number of jobs that must be created. If this number exceeds the number of jobs created naturally in low-skill positions, then governments can intervene to

fill the shortfall, for example by offering subsidies to private firms who offer jobs to low-qualified workers, or by directly employing them through public sector job-creation schemes, for example in construction, where society will benefit from the output.

Thus, labour markets have moved, and will continue to move to a certain extent, against those with only a low level of education, and the challenge facing governments and policy-makers is to ensure that there are not large numbers of such individuals who become disengaged from the labour market and then from society itself.

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