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June 2005

Online at <http://mpra.ub.uni-muenchen.de/1099/>  
MPRA Paper No. 1099, posted 07. November 2007 / 01:31

## CHAPTER 9

# Education and Wage Inequality in Portugal

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*This article summarises the recent literature on the relationship between inequality in wages and education for Portugal. The main conclusions are the following. First, Portugal is one of the OECD countries with lowest educational level. At the same time, returns to education are large, and suggest that skills are particularly valuable in the Portuguese labour market. Second, over the last two decades returns to education increased steadily, which suggests that skill-biased technological change is partly responsible for the observed pattern. Analysis of the returns across educational levels and the dispersion of returns over the wage distribution reveals that education may have helped to increase both between-group and within-group inequality. Third, the recent evolution of average years of education has lead to a considerable increase in the standard measures of over-education, particularly among younger cohorts. Since schooling mis-matches are associated with lower wages, recent changes in the educational composition of the workforce may have consequences for the wage distribution. Fourth, some conclusions can also be established on the interaction between formal education and acquired skills. Most forms of training are associated with higher wages and appear to act as remedial education. Less educated individuals are less likely to get trained. However, once trained, they obtain larger returns. Finally, analysis of employment opportunities and school-to-work transitions suggests that more educated individuals benefit from better job opportunities and receive more job offers.*

## 1 Introduction<sup>1</sup>

This article explores the connection between education and economic inequality in Portugal. First, it describes the data sets that are frequently used in the literature. Then, it briefly describes the Portuguese education system with particular attention being paid to its recent evolution. Measures of enrolment and drop-out rates as well as average schooling are reported and compared to those for other countries. Moreover, it draws on the existing literature to analyse the efficiency of the education system in terms of the schooling performance of Portuguese students. Third, it examines recent changes in the wage distribution, and presents candidate explanations for the observed pattern. The evidence suggests that education is partially responsible for the increased wage inequality experienced by the Portuguese economy over the last years. Therefore, the remainder of the article is devoted to explicitly exploring the links between education and wage inequality. Hence, in a fourth step, it attempts to shed some light on the link between educational attainment and social background. Unfortunately, this analysis is strongly limited by the lack of studies on this topic. Fifth, the focus is turned to the impact of education on wages, and a discussion of the connection between education and between-group as well as within-group inequality. The consequences of signalling effects, education mis-matches, and training participation are also discussed. Sixth, one non-pecuniary benefit of education is security of employment. Some recent studies allow us to explore the connection between educational attainment and school-to-work transitions and job stability.

## 2 Data sets

In this section we provide a short description of the data sets that have been used most frequently in the literature. The *Personnel Records* (QP, Quadros de Pessoal) is an employer-based data set collected by the Portuguese Ministry of Employment since 1982 on an annual basis from all business firms with more than one employee. Public administration, domestic work, and agricultural occupations are not included. A law makes it compulsory for firms to report on worker characteristics such as gen-

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<sup>1</sup> We gratefully acknowledge financial support from the European Commission within the framework of the EDWIN project (HPSE-CT-2002-00108).

der, age, education, qualification level, occupation, years in the firm, firm size, hours worked, and earnings. The forms are prepared by the Ministry of Employment and are filled in by the employers. This procedure, together with a large number of observations (more than 60,000 workers each year), guarantees a higher degree of quality, as well as comparability of the data across years.

The *Employment Enquiry* (IE, Inquerito do Emprego) is a quarterly survey of a representative sample of households in Portugal. Carried out since 1992 by the National Institute of Statistics, it has a sample size of about 45,000 individuals, and a rotating structure in which 1/5 of the sample is dropped randomly each quarter. The IE asks individuals about their monthly net wage, age, educational level, training activities, time when the first job contract was obtained, sector of employment, type of contract, professional activity, hours worked, tenure, and region, among other variables.

The *Enquiry of Actions of Professional Formation* (IAFP, Inquerito à Acções de Formação Profissional) has been carried out by the Portuguese Ministry of Employment since 1992 on a yearly basis, with the exception of 1993, 1995 and 1999. Firms with more than 10 employees are asked to report on their training schemes, including the number, duration, content and costs of their training activities and the individuals participating in such activities (number, age, gender and type of contract). The sample size in 2000 was 5,500 firms.

Finally, the *European Community Household Panel* (ECHP) was conducted for the first time in 1994 and presents a panel structure that extends over all subsequent years. It has a sample size of about 4,500 households and 11,000 individuals that report information regarding family and personal characteristics such as educational background, occupational status, monthly wages, worked hours, and sector of employment, among other variables.

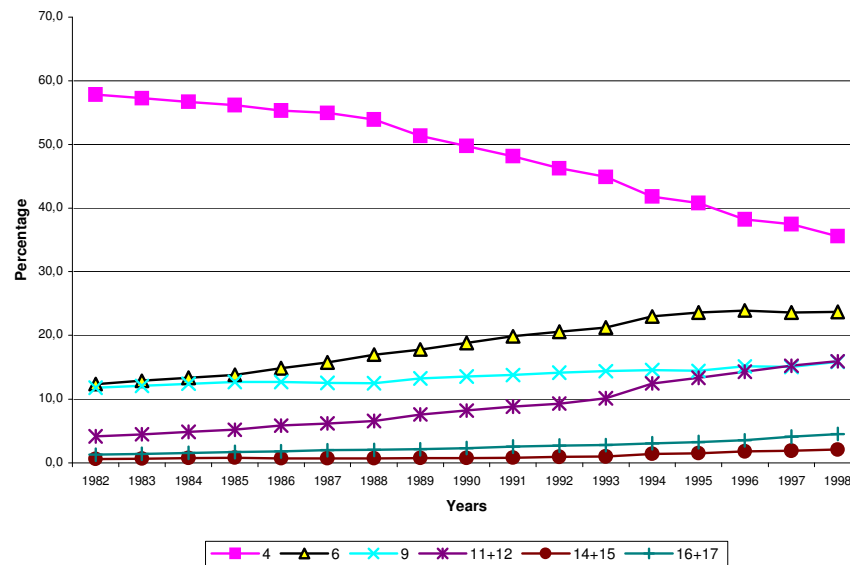
### 3 The Portuguese education system

Today's Portuguese education system is regulated by the 1986 reform. It ranks a basic level of 9 years, a new compulsory minimum from then on, a secondary level of 3 years (including the technical branch), and a superior level which comprises both universities (which award 4-, 5-, and 6-year degrees) and polytechnic institutes (which confer 3-year, usually more technically-minded degrees). This law allowed private universities

to operate and expand in an attempt to decrease the state's involvement in the higher education system. This reform, together with the 1983 reform, helped to consolidate the Portuguese education system after a period of instability.<sup>2</sup>

As displayed in Figure 1, the Portuguese labour force has experienced a significant educational upgrade over the last years. In 1982, almost 60 per cent of the workforce belonged to the lowest educational attainment level (4 years of schooling or less), while in 1998 this share had fallen to 35 per cent. Eurostat (2004) provides internationally comparable information about the educational attainment of the Portuguese labour force.

**Figure 1. Schooling attainment of the Portuguese labour force, 1982 to 1998**



Source: Pereira and Martins (2002a).

<sup>2</sup> A period of consolidation was launched with the 1983 reform. As stated in Pereira and Martins (1999), “its most relevant achievement was to reorganise the technical branch at the upper secondary level. Students who wished to focus on a more job-related type of learning would take a three-year course, after having completed 9 years of academic-oriented education. As a novelty, students graduating from these technical courses could move on to university. However, this branch turned out not to be too successful since the academic path was overwhelming preferred by retrospective pupils” (p. 11).

The number of students enrolled in tertiary education more than duplicated over the last decade, going from 186,000 in 1991 to 396,600 in 2002. From 1990 to 1996, the growth rate of tertiary education enrolment was the highest among EU countries, or about 144 per cent. From 1993 to 2002, the percentage of all 18-year-olds who were still in any kind of school (all ISCED levels) went from 52.7 to 60.5, while the percentage of the adult population (25 to 64 year-olds) that had completed at least upper secondary education increased from 19.9 to 20.6. These numbers are, however, far from the EU averages (74.7 and 64.6 per cent, respectively, in 2002). Male and female enrolment rates in tertiary education are, respectively, 22 and 30 per cent in the 18 to 21 age bracket, 17 and 23 per cent in the 22 to 24 age bracket, and 8 and 10 per cent in the 25 to 28 age bracket. As compared to other European countries, these numbers indicate that enrolment rates are relatively low in Portugal, as well as less evenly distributed across age groups. In line with other European countries, women tend to participate more than men in higher education.

Illiteracy in Portugal still raises serious concerns. In 2002, some 7 per cent of the total population were illiterate. Moreover, as illiteracy is concentrated to older individuals, higher enrolment rates among younger individuals have helped only partially to reduce this problem. The sharp decrease of the illiteracy rate observed during very recent years, falling from 11.1 per cent in 1995 to 7.1 per cent in 2002, is nevertheless remarkable.

The number of drop-outs is still substantial, with a 45 per cent rate for the 18–24 age group (52 per cent for men) in 2001, which is far away from the 19 per cent EU average. This places Portugal as the country with the highest drop-out rate in the EU, more than 10 percentage points above the country with the second highest rate (Spain). Moreover, drop-outs are rather uniformly distributed across educational levels.

Total public expenditure on education – direct expenditure for educational institutions, scholarships, public loans, and public subsidies for educational activities to private firms or non-profit organisations (transfers to private households and firms) – is relatively high in Portugal. In 2001, public expenditure on primary, secondary and tertiary education accounted for, respectively, 1.8, 2.5 and 1.1 per cent of GDP, while the corresponding EU averages were 1.1, 2.4 and 1.1 per cent. Public funds for education account for about 13.5 per cent of total public expenditure. From 1990 to 1999, public funds devoted to education experienced an average growth rate of 12.4 per cent, representing 5.4 per cent of GDP in 1995, 5.7 per cent in 1998 and reaching 6.9 per cent in 1999, which ranked Portugal as the country with the third largest GDP share

in the EU. The growth of expenditure on education has been accompanied by growth in public employment in education. According to Branco (2000), private financing of the Portuguese education system is of a residual nature; it is almost exclusively financed by taxation.

A variety of studies has analysed the efficiency of the Portuguese education system along several dimensions. Neves and Rebelo (2001) investigate the academic performance of Portuguese students. Their results warn that average scores are rather low by international standards, and that more funds are required, as the expenditure per student is low relative to other OECD countries. Martins (2000) warns that schooling attainment levels are worrying low even for the youngest cohorts. Público (2001) uses students' examination results from secondary schools to analyse the academic performance of Portuguese students. The study presents several findings. First, average scores are low, particularly in mathematics. Second, regional disparities are large, with regions in the interior part of the country yielding poorer results. Third, private schools are over-represented both in the top and in the bottom of the distribution of results. Clements (1999) investigates the efficiency of expenditures on education. The presented evidence suggests that, despite substantial recent investments in education, the academic performance of Portuguese students is still low. Since public expenditures appear to be rather inefficient, Clements (1999) proposes a set of reforms, such as the establishment of a minimum student-teacher ratio, setting targets for performance by school, and easing employment and work rules governing public school teachers.

## 4 Wage inequality

Cantó *et al.* (2000) consider changes in the Portuguese wage structure between 1985 and 1995. By running standard wage regressions for both years, they explore how the remuneration of observable individual and job characteristics has evolved. The authors conclude that wage inequality increased steadily in Portugal from 1985 to 1995, mostly due to an increase in the dispersion at the upper tail of the distribution. The Gini coefficient increased from 0.31 in 1985 to 0.36 in 1995. To assess the robustness of this pattern, additional measures are reported as well. The Theil index increased from 0.20 to 0.26, the wage ratio P90/P10 increased from 3.37 to 4.09, the P50/P10 ratio from 1.50 to 1.58, and the P90/P50 ratio from 2.26 to 2.59.

The increased wage inequality in Portugal seems to have arisen mainly from changes taking place within industrial sectors rather than changes across industrial sectors. Indeed, the inter-industrial wage structure changed only slightly between 1985 and 1995, with the fall in the wage premium of the finance sector being the most conspicuous change. Instead, the main causes can be traced to increasing returns to schooling and a huge decrease in the relative wage of production workers. This is also in line with the results reported in Hartog *et al.* (2001), who provide evidence in support of education being a major source of wage inequality. Returns to education have increased over time, thus increasing between-group inequality. Moreover, based on quintile regression, they find that education tends to increase within-group inequality as well.

In the next section, we investigate the link between education and wage inequality more explicitly. There are, however, additional factors that help explain the observed pattern. Apart from education and skills, labour market institutions (like the impact of collective bargaining at the intermediate level) and regional factors (increasing wage premiums in Lisbon and the Algarve region) have also shaped the wage distribution. Lima and Pereira (1999) find that different rewards for individual attributes are more important for explaining higher male wages than are individual differences in the endowments of the attributes. They conclude that specific pay policies of the employers are one of the explanations for the rise in wage inequality. Cardoso (1991) studied Portuguese wage inequality from a regional perspective. The study is conclusive about the regional imbalances. She finds that regional components of wage inequality are weak when compared to other contributions, but strong when compared with other European, as well as Latin American countries and the USA. According to Cantó *et al.* (2000), the Portuguese labour market is characterised by sharp regional contrasts. The differences have fallen slightly over time, however. Regions accounted for 13.6 per cent of overall earnings inequality in 1985 and for 11.0 per cent in 1995. There is evidence that between-region inequality is higher in terms of wages than in terms of income. The structure of within-region inequality, in turn, appears to be determined by the employment dimension of the region. The larger the manufacturing labour force relative to other regions, the more sensitive are the market and wage determination processes to human capital variables. Regions with a small share of total manufacturing employment reveal a stronger contribution of industrial variables to wage inequality.

## 5 Determinants of educational attainment

Before turning to the labour market prospects of individuals with different educational background, it is convenient to explore the factors that more primarily govern the educational attainment of individuals. To our knowledge, there are no studies that explicitly analyse socio-economic determinants of the demand for further education in Portugal. This is unfortunate, and contrasts with the situation in most other European countries, where the relationship between the youngsters' demand for education and parental education, occupation, professional category, and region has been extensively explored.

Some conclusions can nevertheless be established. Simple cross-tabulations reveal that individuals living in interior regions and in the region of Madeira tend to demand less education. This might respond to a labour market signal insofar as the return to education is significantly lower in those regions (Saraiva, 1999). Modesto (2000) has analysed the choice between to study more or to go to the labour market at the end of two different stages of the education system: the 9<sup>th</sup> grade and the 12<sup>th</sup> grade. Choices are modelled from the point-of-view of the student as well as the employer. The student's choice consists in whether or not to participate in more schooling; the employer's in whether or not to make a job offer. The estimations are based on data from two surveys of the Portuguese Ministry of Education, one conducted among individuals with only the 9<sup>th</sup> grade completed and another among those that finished the 12<sup>th</sup> grade, both in 1993.<sup>3</sup>

Basically, the model considers the two kinds of choices (students and employers) as being dependent of the wages, which in turn depend on personal and job characteristics. The earnings functions were estimated using maximum likelihood techniques instead of conventional linear regression (it may be inconsistent) and the 'Heckit' two-step method (which may become heavy and awkward in this case, where more than one selection rule exists). As the decision to study and the earnings function were assumed to be independent, two likelihood functions were considered: one for the decision to study and another for the remaining aspects. The main results tell us that (i) gender has a significant influence only in the 9<sup>th</sup> grade, with girls tending to continue more often than

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<sup>3</sup> The questions of the surveys were asked in December 1994, more or less one and a half years after graduation.

boys; (ii) the older the student, the more likely he or she is to drop out, both at the 9<sup>th</sup> and the 12<sup>th</sup> level; (iii) higher parental education tends to lower the probability of exiting from school; and (iv) unemployment of the parents may promote earlier drop-outs.

## 6 Returns to education

### 6.1 Basic results

Compared to other topics, the amount of research on returns to schooling has been considerable. These analyses have been conducted on the basis of alternative data sets, population groups, and econometric specifications, and, therefore, provide complementary information on the private value of schooling.

A common conclusion is that the returns to formal schooling are considerable. The most comprehensive work is due to Pereira and Martins (2002a). They use the QP and the ECHP to estimate the impact of formal education on wages. They differentiate between the private sector and the public sector, and between men and women. They find that, on average, an additional year of education increases wages by 11 per cent. As compared to other OECD countries, Portugal exhibits the largest returns to education. Given the low levels of human capital, this evidence suggests that skills are particularly valuable in the Portuguese labour market.

Their findings also show that the returns to education differ substantially across educational levels. Thus, for example, the average increase associated with an extra year of schooling for the transition between secondary and university education ranges from 12 to 18 per cent, while an extra year of schooling for the transition between the second cycle (7<sup>th</sup> to 9<sup>th</sup> grade) and the third cycle (10<sup>th</sup> to 12<sup>th</sup> grade) of compulsory education raises wages by only 7 per cent. There are also differences across fields of study at the tertiary level. Engineering degrees are particularly highly rewarded, while human and social sciences attract the lowest returns. Furthermore, returns to education are nearly 2 percentage points higher in the private sector as compared to the public sector. No substantial differences in returns can be found across genders. Gross returns are higher than net returns, which can be attributed to the progressive nature of the tax system. As an extension, the authors explore the returns to education under a variety of specifications. They find that for a large number of covariates, the estimated return can drop to half of its original size.

An important issue in the literature is that education might be endogenously determined and depend positively on the individual's ability. If this is the case, simple OLS estimation may yield biased estimates. To address this problem, Vieira (1999) and Pereira and Martins (2002a) use law changes in compulsory school attainment as an instrument for education, and find that the returns under IV can be nearly 3 percentage points lower than those obtained under OLS. In an alternative model, Pereira and Martins (2002a) use parental education as an instrument, and find that the IV estimates are 2 percentage points higher than the OLS estimates. This leads them to conclude that the results under IV are inconclusive, and that further investigation on the quality of the instruments is needed.

Concerning the evolution of returns to education, an era of stability can be found for the 1982 to 1986 period. However, from 1986 to 1992 returns to education increased sharply, and contributed to increased between-group inequality. This expansion occurred among both men and women, although it was more pronounced in the latter group. In this catching-up process, the changes that occurred in the return to tertiary education for women deserve to be highlighted. A candidate explanation for this phenomenon can be found in Hartog *et al.* (2001). In their words, "skill-biased technological change seems to be the chief explanation for a shift in the demand towards educated labour. This is primarily based on the fact that the shift in the use of more-educated labour is due to changes taking place within industries (consistent with technological change) rather than to a reallocation of employment between industries towards sectors requiring high-educated labour (e.g., due to changes in international trade or de-industrialisation). Indeed, after 1986 the employment composition shifted towards sectors that traditionally require low educated rather than high-educated labour such as retail, restaurants and hotels (tourism), construction, textiles, and social services, so this cannot explain the facts. The relevance of forces operating within industries naturally reflects a process of modernisation and may not be independent of joining EU in 1986. First, structural funds from the EU in combination with specific financial aids to industrial investment for modernisation of the productive structure have contributed to the introduction of new technologies. Second, the liberalisation of trade with more developed countries producing capital goods likely encouraged the importation of technology requiring skilled labour" (p. 23–24).

## 6.2 Signalling

Some authors have suggested that there is an interaction between human capital and signalling effects in the determination of wages. Pereira and Martins (2000, 2002a) have explored the existence of signalling effects in Portuguese education. For that purpose, they compare the returns to education of wage-earners and self-employed. The hypothesis is that the self-employed need not signal their ability, so their educational pay-off must capture returns to human capital. The authors find that the returns to education for the self-employed are at least as high as those for employees. According to this test, no clear evidence of signalling effects can be established. These results, together with the lack of studies in this field, suggest that further investigation is needed in order to uncover the presence and size of signalling effects.

## 6.3 Over-education

In the literature, there are several methods to classify workers according to whether they are over-educated, adequately educated, or under-educated for their jobs. For a description of these measures and a meta-analysis of existing evidence, see Groot and Van den Brink (2000).

The first relevant work covering educational inequality in Portugal was Kiker *et al.* (1997). This paper brought up some empirical evidence about how earnings and returns to education are influenced by over- and under-education. Operationally, over- and under-education was measured by comparing the educational attainment of workers and the skill requirements of their jobs. The authors use three alternative measures of educational mis-match, including Verdugo and Verdugo's (1989) definition, and find the results to be surprisingly heterogeneous. The proportion of over-educated workers ranges from 9.4 to 33.1 per cent (from 6.9 to 40.0 per cent in the case of women, and from 10.9 to 28.8 per cent in the case of men), while the proportion of under-educated workers ranges from 5.0 to 37.5 per cent (between 4.7 and 25.9 per cent for females, and 5.3 and 44.2 per cent for males). Despite this heterogeneity, it is reasonable to conclude from these results that there occur substantial schooling mis-matches in the Portuguese labour market.

The effects of over- and under-education on earnings were estimated from two different models, presented by Verdugo and Verdugo (1989) and by Duncan and Hoffman (1981). Both models brought up some evidence suggesting that over-educated workers receive more (and un-

dereducated less) than their colleagues with adequate educational attainment. The results also suggest that over-educated workers earn less (and under-educated more) compared to workers having the same education but holding jobs for which they are adequately educated.<sup>4</sup>

Oliveira and Santos (2002) and Martins (2001) use the QP to investigate the extent and consequences of over-education. They classify as adequately educated those workers whose completed schooling is equal to the modal value of employees holding identical jobs, and as over-educated (under-educated) those workers whose completed schooling is above (below) the modal value in each occupation. They use an ORU specification to estimate returns to over-education, adequate education, and under-education. Oliveira and Santos (2002) explore, using a 3-digit level, the evolution of over- and under-education measures from 1980 to 1997. They find evidence of a persistent and growing misadjustment between school-provided skills and those required in the labour market. The proportion of workers with a very low level of educational attainment decreased markedly between 1985 and 1997. Symmetrically, the proportion of workers with 6 and more years of schooling increased substantially. Notwithstanding this, the average level of educational attainment among the Portuguese workers was only 7 years in 1997. On average, nearly 35 per cent of the workers are over-educated, and about 16 per cent are under-educated. Nearly 70 per cent of job entrants take jobs for which they are over-educated. Over-education is negatively correlated with potential experience, and cohorts of younger and more educated people joining the labour force tend to be over-educated. Nevertheless, the authors warn that these classifications may generate misleading results, insofar as the low educational level in Portugal may lead the researcher to identify situations of over-education that, in reality, reflect under-education.

According to the reported estimates, required education increases wages by some 8 per cent, while the returns to over-education remain at 4 per cent. In contrast, under-education carries a pay penalty that ranges from 3 to 7 per cent. These results suggest that over-educated workers would obtain wage gains from changing to a job where their qualifications are commensurate with those needed for the job, while under-educated workers would benefit from catching up with the educational level of their co-workers.

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<sup>4</sup> The comparison is undertaken not only with colleagues having completed the same number of schooling years, but who have also identical remaining characteristics.

Martins (2001) uses data from the chemical sector, and reports that approximately 33 per cent of the workers are over-educated and 17 per cent are under-educated. Overeducated workers tend to be younger, more educated, less experienced, and have less tenure. Using the ORU specification, Martins (2001) estimates both a random effects and a fixed effects model. His estimates are somewhat larger than those obtained by Oliveira and Santos (2002). He finds that over-education raises wages by some 9 per cent while under-education decreases wages by about 7 per cent. Required schooling pays an 11 per cent premium. Drawing on the panel structure of his data, Martins (2001) also presents results showing a significant positive correlation between the level of a worker's over-(under-)education and the probability of the worker experiencing a decrease over time in his or her over-(under-)education level. As far as over-education is concerned, this provides some support for the stepping-stone perspective of schooling mis-matches.

To sum up, educational attainment levels exceeding the job requirement yield a positive return, though lower than the return to years of required education, while an education below that intended for the job is penalised. This pattern is in line with international evidence on the subject.

In an interesting experiment, Hartog *et al.* (2001) use quintile regression techniques to explore how the returns to these three types of education change over the conditional wage distribution. They find that the gap between the returns to over-education and the returns to under-education increases as one moves up the conditional distribution. This feature is overlooked when using standard OLS estimation.

## 6.4 Quantile regression

Recently, a large number of studies have used quantile regression techniques to explore the impact of education on wages along the conditional wage distribution. For the Portuguese case, some examples are Pereira and Martins (2002a, 2002b, 2004), Hartog *et al.* (2001) and Machado and Mata (1997), all of which also provide evidence on OLS returns to education along the lines indicated above. These studies find significant differences in average returns across workers with similar (observable) characteristics. In particular, returns to education among workers who have high wages are much higher than those earned by workers with similar characteristics but who have low wages. This phenomenon, which is particularly evident in the case of male workers, suggests that the dispersion of earnings increases with the workers' average level of education.

Moreover, the return differential between conditional quantiles has increased over the last 20 years. Following the lines of Buchinsky (1994), this can be interpreted as evidence that education has helped to increase within-group wage dispersion over the last two decades. To put it differently, education may be partially responsible of the increase in wage inequality documented in Cardoso (1998) and Pereira and Martins (2000).

The dispersion of returns to education across the wage distribution can be seen as a measure of education risk. Using the spread between returns at the upper and lower conditional quantiles, the reviewed studies find that Portugal exhibits the highest wage risk among European countries.

## 6.5 Training

According to the available literature, there are important interactions between formal education and acquired skills. OECD (1999) shows that Portugal is one of the countries with the lowest incidence and the most unequal distribution of training, as it is mostly concentrated on younger and more educated workers. At the same time, the returns to formal education in Portugal are the highest in Europe, and the wage gap between high- and low-skilled workers is substantial. In this scenario, low training participation raises equity concerns. If training increases wages, and is concentrated to individuals with more favourable labour market characteristics, lower training participation among specific groups of workers may deteriorate the labour market position of already disadvantaged individuals.

Moreover, different forms of training may be associated with different returns. This drives an additional wedge between groups of workers that typically participate in different training schemes. Furthermore, individuals that differ in gender, education, and professional background may obtain different benefits from training activities, thus warning policy-makers that equality of provision does not assure equality of outcome.

Low training coverage raises also efficiency concerns, since it may lead to substantial costs in terms of labour productivity, skill deterioration and unemployment. This might be of particular importance in an economy that over the last two years, and after a decade of convergence to OECD levels, has seen a deterioration of its relative labour productivity.<sup>5</sup>

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<sup>5</sup> See EUROSTAT (2004).

Up to date, the evidence for Portugal is scarce. At the employer level, the main source of information is the Enquiry for Professional Formation. In 2000, 13.5 per cent of all firms offered some training schemes to their employees. Finance (46.3 per cent) and Electricity, gas and water distribution (36.6 per cent) were the activity sectors with the highest coverage. In terms of average hours of formation by participant, the intensity of training was highest in Education (396,2 hours) and lowest in Financial activities (17,5 hours). Concerning training content, Personal development, Finance, banking and insurance, and Business and administration were the most common fields. The dispersion across regions is not large, ranging from 15.3 per cent in Lisbon and Vale do Tejo to 7.1 per cent in Algarve. Finally, the average cost of the formation actions per participant was 424 Euro.<sup>6</sup>

Studies that analyse both the determinants and the effects of training participation at an international level typically report little evidence on the Portuguese case. At the national level, Saraiva (1999) finds that more educated individuals are more prone to undertake training activities. His estimates suggest that training activities that take place in the firm have a positive impact on wages, while those provided by other institutions, such as training centres, do not increase wages significantly. Hartog *et al.* (2000) use the European Community Household Panel to explore the impact on wages of different types of training. They find that only some types of vocational training seem to increase wages. A weakness of earlier analyses is that the estimated returns are averages across all training participants.

Budria and Pereira (2004) use the Employment Enquiry 1998–2000 to provide new evidence on the link between education, training and wages. First, they use logit regressions to show that there are major differences in training participation across groups, with older low-educated workers participating substantially less. Second, they find evidence that returns to training are large and significant. The estimated coefficients point to about 24 per cent in the case of men and 35 per cent in the case of women. Discriminating between gender, educational level, experience, the public and the private sector, and industrial activity reveals important differences across categories of workers. Workers with low qualifications and long professional experience earn larger returns. On average, women receive higher returns than men, though they are subject to greater variation across education and experience levels. The average effect of train-

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<sup>6</sup> For further evidence, see MTS (2000).

ing is similar in the private sector and in the public sector. However, less qualified workers and workers with short professional experience obtain larger wage gains in the public sector than in the private sector.

Hence, an important conclusion from Budria and Pereira (2004) is that training appears to be remedial. Workers with low education levels are less likely to get trained. However, once trained, they earn larger returns than trained individuals with more education. Consequently, policies promoting and investing in the training participation of workers who seldom get trained may be desirable.

## 7 Employment opportunities and school-to-work transition

There is a module called “School-to-active life transition” in INE (2000) which belongs to a broader plan of modules at the EU level. It provides information about the school-to-work transition in the period from 1990 to 2000. The sample constitutes of 28.6 per cent of the individuals who were asked to answer the Employment Enquiry of the second quarter of 2000 and who had dropped out or interrupted their studies for more than one year at some point during the previous 10 years. Of this population, 44.1 per cent are aged 20 to 24, while an additional 24.5 per cent are aged 25. The individuals were asked to report on the number of paid employment relationships that they had obtained after leaving school. Nearly 10 per cent of the individuals had not found a job by the time of the survey, and some 54 per cent reported one job only. Interestingly, the average educational background of this group was found to be lower than that of the remaining individuals (those reporting two or more jobs). The delay between leaving the educational path and the first employment was less than 2 months for almost one-third of the individuals, but more than one year for more than one-fourth of them. No evidence could be established on the link between education and the duration of the job search.

One non-pecuniary benefit of education is security of employment. Cardoso and Ferreira (2002) use the QP data set to analyse job creation and destruction at the firm level for university graduates, as compared to other groups of workers. Unemployment rates for university graduates rose sharply over the last two decades, from 1 per cent in 1981 to nearly 4 per cent two decades later. This evidence may suggest that tertiary educated individuals have faced increasing difficulties in finding a job and in

retaining it. However, the authors conclude that job creation took place at a much faster pace for university graduates than for the rest of the labour force. Moreover, more educated individuals benefit from better job opportunities, since they have the capacity to adapt more smoothly to a changing work environment in response to new employment opportunities.

Varejão (2002) analyses the use of fixed-term contracts in the Portuguese labour market, the impact it has on employers' strategies, and the effects on workers recruited on temporary contracts. It is assumed that the consequences of fixed-term contracts on growth depend crucially on the use that employers make of them. Three possibilities are considered: fixed-term contracts may be used to deal with fluctuations in the workload; to screen workers for permanent positions; or to churn workers at continuing positions. Using firm-level data on the proportion of fixed-term contracts and the number of fixed-term contracts converted into permanent ones, it was found that the major reason for firms to use these contracts is to screen. What firms actually do is to hire new workers on temporary contracts, and offer them training thereby eliciting the information they need about the quality of the match. When this information arrives, employers decide either to destroy the match or to convert it into a permanent one.

Consistent with fixed-term contracts being used as screening devices, the rates of transitions of individuals from temporary to permanent contracts also indicate that fixed-term contracts are stepping-stones into a permanent job rather than representing dead-end jobs. This result is particularly strong for young workers, who use fixed-term contracts as ports-of-entry into the labour market. In this context, the observed magnitude of the rates of transitions from fixed-term to open-ended contracts becomes an indicator of the success of this joint process of search and screening. When comparing the age-earnings profiles of workers with temporary and permanent contracts, temporary workers tend to receive lower returns to experience. This occurs either because they receive less training due to the very nature of their employment contracts, or because frequent spells of unemployment or inactivity imply serious depreciation of whatever human capital they may have accumulated. These results should not, however, obscure the fact that employer and employee data alike indicate that fixed-term contracts are predominantly used as screening/searching devices that eventually lead to the formation of better, therefore more stable, matches.

Traça (2002) addresses the evolution of the Portuguese labour market over the last thirty years. It is concluded that, compared to the develop-

ment in Europe and the USA, the Portuguese labour market has shown a very distinct pattern. On the one hand, flexible wage negotiation institutions and relatively low price disincentives to job search have ensured a relatively low rate of unemployment. On the other hand, rigid employment protection legislation and ineffective labour market policies have produced a very sclerotic and lifeless labour market, with very low turnover and a high proportion of long-term unemployed.

It is further argued that, for the next thirty years, an expansion in the volatility of labour demand is likely to be the key transformation in the labour markets of industrialised countries, such as Portugal, due to the development in international trade and capital flows, the technological and institutional change in product and capital markets, and the implementation of the Euro. Thus, the ability to respond to the increased volatility of labour demand will be determined by the flexibility and adaptability of labour market institutions and of the labour force. The study identifies three main determinants of adaptability. Apart from the ease of hiring and firing restrictions, it highlights the role that the level of educational attainment of the labour force and the effectiveness of active labour market policies aimed at increasing training provision functions must play in the process of adaptability.

This is in line with the recommendations indicated by the OECD (2003). According to this report, reforms in the Portuguese labour market “should be accompanied by a stronger emphasis on vocational training, to ease the school-to-work transition. New rules permitting employment of unqualified youths on condition that training is provided by the employer may help, but it would be better if the schools themselves were better able to provide school-leavers with qualifications useful to employers [...]. These reforms should be accompanied by the training and re-training of existing workers. The government’s aim to provide employment-related training to all youths that are registered in employment centres and a renewed emphasis on life-long training are welcome. If successful, these incentives would increase the productivity and earnings capacity of those who might otherwise exit the labour force”.

## 8 Conclusions

This review summarises the recent Portuguese literature on the relationship between inequality in wages and education. The main conclusions are as follows. Despite spectacular increases in enrolment rates, Portugal is still one of the OECD countries with the lowest educational level. At

the same time, returns to education are highest in Portugal, thus suggesting that skills are particularly valuable in the Portuguese labour market. Over the last two decades, returns to education increased steadily, which indicates that skill-biased technological change is partially responsible for the observed pattern. Analysis of the returns across educational levels and the dispersion of returns over the wage distribution revealed that education may have helped to increase both between-group and within-group inequality.

The increase in average years of education has led to a considerable increase in the standard measures of over-education, particularly among younger cohorts. Since schooling mis-matches are associated with lower returns, recent changes in the educational composition of the workforce may have consequences for the wage distribution in Portugal.

Some conclusions can also be established concerning the interaction between formal education and acquired skills. Some forms of training are associated with higher wage increases and appear to act as remedial education. Less educated individuals are less likely to get trained. However, once trained, they obtain higher returns than their more educated counterparts.

Furthermore, analysis of employment opportunities and school-to-work transitions indicates that the job opportunities are better for graduated workers than for workers with low qualifications. In particular, more educated individuals receive more job offers, and are also able to adapt more smoothly to a changing work environment in response to new employment opportunities.

A notable shortcoming is that our conclusions are limited by a relatively small number of studies on each topic. We have found that, in Portugal, there are striking gaps in the literature on education and inequality and that further research must be carried out. A blatant example is the scarce evidence on the connection between educational attainment and socio-economic background. Understanding this relationship may help shed more light on the factors that most primarily govern inequality of opportunities. Addressing this topic is a task for further research.

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