Workplace Training and Labour Market Institutions in Europe*

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Introduction

Compared to training in general, workplace training is received while in employment, and is usually but not exclusively provided by the employer. Figure 1 shows the differences in average training incidence across European countries, Anglo-Saxon countries and some countries of Eastern Europe. The figure plots both average training participation and average annual hours of training per employee. We notice that the US does not perform "better" than all European countries, because the UK, France and Scandinavian countries have both higher participation and higher annual hours of training. The rest of Europe, including the countries in the "olive belt" (Greece, Italy, Portugal and Spain), does "worse" than the US, and is somewhat closer to the new entries from Eastern Europe.[1] While these indicators need to be considered with care, due to the measurement problems which reduce comparability, they reveal that Europe is very heterogeneous when it comes to training outcomes.

On average, the entire cost of three-quarters of training courses is directly paid by employers, and there is little evidence that employees indirectly pay through lower wages. Large and innovative firms train more than small and non-innovative firms, with the UK being the only European country where this does not hold. Cross-country variation among large and innovative firms is, however, small. Therefore, the lower average training incidence in countries located in the Southern "olive belt" is correlated both to their larger share of small firms and to the fact that these firms train relatively less than firms of similar size in Northern Europe.
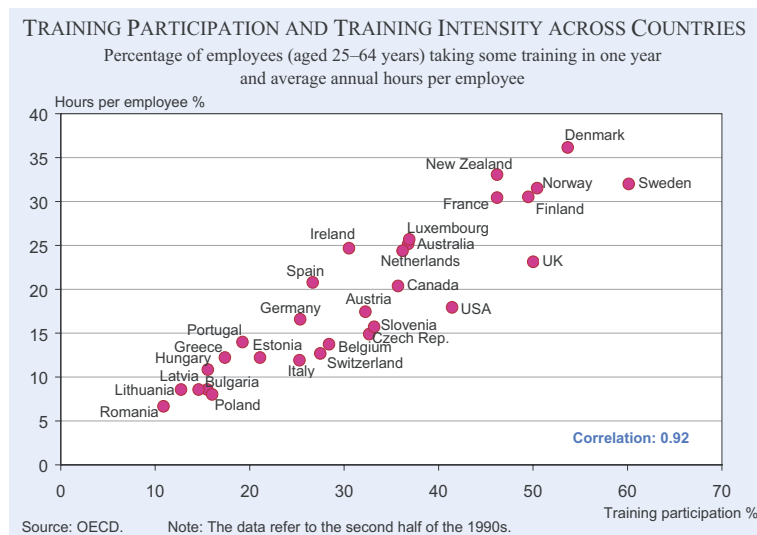
In Europe, as in the US, training increases with educational attainment and the skill-intensity of occupations, and decreases with age. The age-training gap is negatively correlated with the employment rate of older workers, reflecting either the impact of training on older workers' employability or their incentive to stay on rather than retire, and invest in their skills. Women take more training than men, but essentially because they pay for their own training more often, while firms do not appear to accommodate their greater demand for training. Importantly, women tend to receive less employer-sponsored training than men when they are young and have more frequent career interruptions due to childrearing. On average, temporary workers are trained less often.

After netting out observable individual characteristics, country effects account for almost one-half of the explained variation in training participation across Europe – net of Germany.[2] Without doubt, part of this variation reflects measurement error and cross-country differences in definitions and perceptions of training. For instance, since training registered in employer and employee surveys is typically formal, significant episodes of informal training are not counted, which is especially problematic for small firms, where a lot of informal training arguably takes place. However, this residual cross-country variation also includes differences in

[1] The somewhat surprising relative position of Germany in this diagram can be explained by the fact that we are considering only individuals aged 25–64; by so doing, we exclude most apprenticeship training.

[2] Germany is excluded because of the quality of the data.

TRAINING PARTICIPATION AND TRAINING INTENSITY ACROSS COUNTRIES

Percentage of employees (aged 25–64 years) taking some training in one year and average annual hours per employee

Source: OECD. Note: The data refer to the second half of the 1990s.

the institutional and social framework, in government policies and in the macroeconomic conditions.

In this essay, I investigate the relationship between labour and product market institutions and training outcomes. It has been widely recognized that institutions have an impact on unemployment and productivity. I ask whether they also have an impact on training outcomes. I start by reviewing the theoretical and empirical literature and move on to describe the main features of my empirical investigation. I then discuss the results and draw my main conclusions.[3]

Training and labour market institutions: what does the theory have to say?

Institutions play an important role in the theory of training, because minimum wages and trade unions – inter alia – can affect the wedge between wages and marginal productivity. I consider in turn the effects of trade unions, minimum wages, product market regulation and school design. All of these institutions are likely to vary across OECD countries.

Unions

The channels through which union collective bargaining can affect training and pay are potentially quite complex, and it is not immediately obvious that unionism will be associated with positive or negative returns to training. The implications of unionism for training and pay depend, *inter alia,* on the degree of competition in the labour market and on whether the union effect on training is indirect (through the wage structure) or direct (through the negotiation of training).

Some studies argue that, where wages are set collectively by trade unions in an otherwise competitive labour market, wage dispersion is reduced and incentives to invest in general training at the workplace are distorted. This is because union wages cannot be lowered during training and increased after training to allow workers to bear the costs and benefits of general training. In imperfectly competitive labour markets, unions have ambiguous effects on the pay returns to training. In Acemoglu and Pischke (1999), for instance, unions set wages and the firm determines training. Their model predicts that unionism is associated with increased firm-financed transferable training.

When union utility increases with respect to wages and job security or the employment of its members, unions may ensure that covered workers receive higher wages and greater job security by directly intervening in training provision, for example, by making sure that workers' skills are enhanced through more training. Strong unions might therefore be more willing to negotiate better training opportunities for covered workers, especially in non-competitive product markets in which the available surplus is larger.

Where unions improve worker morale and organisation at the workplace, labour turnover may be reduced (Freeman and Medoff 1984). Union-covered firms may therefore have greater incentives to provide training because they are less likely to lose highly productive trained workers. Through this mechanism, unionism may be associated with increased training and productivity, and consequently wages.

Finally, in firms that become unionised, management may respond to higher union wages by more carefully vetting new hires to obtain a better quality workforce. This vetting might also involve induction training. From the supply side, better quality or more motivated workers might self-select into unions jobs if the training opportunities and returns are higher in the union-covered sector. If unions bargain directly over training as well as wages, only workers able to benefit from such training will wish to queue for union jobs, or will be offered such jobs.

Minimum wages

With competitive labour markets, human capital theory predicts that the introduction of a minimum wage reduces investment in training by covered workers, who can no longer contribute to training costs through lower wages. But if the labour market for the low paid is imperfectly competitive or workers are credit-constrained, a minimum wage can increase investment in the general component of training. Why is this the case? The basic rationale is provided by oligopsonistic models, which predict that firms may pay for general training. The oligopsonistic labour market introduces a "wedge" between wages and marginal product. And it can be shown that the introduction of a minimum wage also acts as a type of wedge between wages and marginal productivity. Thus it can actually increase general training over a range of human capital and induce employers to train their unskilled workers (Acemoglu and Pischke 2003).

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[3] I refer the reader to Bassanini et al. (2005) for a more detailed presentation of the material used in this essay.

Product market competition and deregulation

Deregulation increases competition in the product market and can affect training in a number of ways. First, deregulation influences real wages and profits after training, and reduces rents. Second, the higher competition induced by deregulation increases productivity by forcing firms to improve efficiency and to innovate. If innovation and skills are complements – see Acemoglu (1997) – firms have a higher incentive to train. By affecting the entry of firms, deregulation also contributes to local agglomeration effects, which might discourage the investment in training by strengthening the risk of poaching.[4] Third, the relative bargaining power of workers can fall because of the higher risk of involuntary turnover and plant closure associated with more product market competition.[5] Rents increase, and training can rise as well.

Schooling institutions

The variation in school design – especially of secondary schools – can affect training outcomes, given the complementarity between education and training. Countries differ in the degree of stratification of secondary education and in the importance of tracking. The design of secondary schooling systems varies considerably across European countries, and an important dimension of such variation is the relative importance of vocational and general education. While comprehensive schooling systems which mix general and vocational education are typical of the UK and Scandinavia, stratified systems, with a much more marked separation of the vocational and general track, are used in Austria and Germany. The rest of the major European countries lie somewhere in between.[6] It is an open question as to whether a more stratified schooling system is conducive to higher training outcomes than a more comprehensive system. If vocational schools in stratified educational systems produce very specialized skills that become rapidly obsolete in the presence of technical progress, more training might be required to update existing skills to match the new technical blueprints. On the other hand, comprehensive schools could produce skills that are too general, and which require additional training to become operational.

Previous empirical literature

The empirical papers investigating the different aspects of the relationship between unions and training provide mixed results. Among the first studies in the US, Barron and co-authors (1987) use data from a survey of US employers and find that the proportion of non-supervisory workers covered by collective bargaining has a significant negative effect on total training. On the contrary, Lynch (1992) finds evidence of a positive effect of unions on training in the US National Longitudinal Survey of Youth (NLSY).

Beside the Lynch's study, additional evidence of a positive union effect is provided among others by Veum (1995), Arulampalam and Booth (1998), and Booth Francesconi and Zoega (2003). The latter study investigates the impact of union coverage on work-related training and finds that union-covered British men are more likely to receive training and also receive more days of training than workers with no coverage. A positive union effect is also the key result of a recent investigation of unions and training in German data by Dustmann and Schonberg (2004). On the other hand, Black and Lynch (1998) find no link between unions and training.

The available empirical evidence on the effects of minimum wages on training is also rather inconclusive, with recent studies in the United States and the United Kingdom reporting contradictory findings. Recall that in perfectly competitive labour markets, the introduction of a minimum wage reduces training, because some workers are not capable of financing training by accepting lower wages. Conversely, when labour markets are characterized by monopsonistic power, minimum wages may increase employer-provided training of low paid workers.

Early research by Leighton and Mincer (1981) finds that age-earnings profiles are significantly flatter among workers whose wages are bound by the minimum wage, which is interpreted as suggesting that an increase in the minimum wage significantly reduces on-the-job training. In sharp contrast, Lazear and Miller (1981) find no statistically significant relationship between the slope of age-earnings profiles and an indicator of whether the minimum wage is binding or not. However, more recent research by Grossberg and Sicilian (1999) shows that the effect of minimum wages on wage growth could be unrelated to the effect produced on training. As suggested by Acemoglu

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[4] See Brunello and Gambarotto (2007) and Brunello and De Paola (2004).
[5] See Bassanini and Brunello (2006) for more details.
[6] See Brunello and Giannini (2004) and Brunello, Giannini and Ariga (2004) for a discussion of these issues.

and Pischke (2003) minimum wages eliminate the lower tail of the wage distribution and by so doing flatten the slope of the age-earning profile. This effect is independent of the impact of minimum wages on training. Leighton and Mincer (1981) and Neumark and Wascher (2001), using data on individual workers, consider the relationship between the variation of minimum wages across the US states and the investment in training and find that the more binding the minimum wage is, the less likely a worker is to receive on-the-job training.

A widespread concern with the recent diffusion of flexible employment practices, such as temporary labour contracts is that these contracts may be detrimental to economic performance because temporary workers are less likely to be trained. Arulampalam and Booth (1998) investigate the relationship between employment flexibility and training using UK data, and find that workers on temporary contracts are less likely to receive work-related training. Quite in contrast, recent work by Autor (2004) on temporary help firms in the US shows that almost one quarter of temporary help supply firms have received skills training as temporaries. Training in this context not only provides skills but also operates as a screening and a self-sorting device.

The relationship between product market competition and training is significantly less studied in both the theoretical and empirical literature. In the only empirical investigation we are aware of Autor (2004) presents evidence of a negative and statistically significant correlation between the Herfindahl index, a measure of product market concentration, and the training provided by temporary help firms in the US. The evidence on the relationship between firing costs, employment protection and training is also rather limited. Bishop (1991) is one study in the area, which reports that the likelihood and amount of formal training are higher at firms where firing a worker is more difficult. Acemoglu and Pischke (2000) argue that there are complementarities between regulation regimes and training systems, and that reducing firing costs and increasing employment flexibility could reduce the incentives to train.

There is substantial evidence that the *quantity* of education and training are complements (Leuven [2005] for a review), and there is also evidence that the strength of this complementarity depends on whether training is provided on-the-job or off-the-

job (Ariga and Brunello 2006). To our knowledge, no empirical research has been done so far on the relationship between the *quality* of education and training. Since quality depends on the design of schooling institutions, an important empirical question is which institutions are more conducive to work-related training.

The traditional way of looking at the relationship between pension benefits and training is that deferred payments – such as pensions – reduce turnover, increase incentives, and therefore allow firms to recoup the costs of their investments in training (Lazear 1979). This view suggests that there is a positive relationship between employer-provided training and the generosity of the pension plans designed by firms. If we focus on workers approaching retirement age, however, we notice that these employees face the choice of retiring versus continuing work and investing in further training. The incentive to stay and train is likely to be higher in countries were the implicit tax on continuing work is lower. This tax is defined as minus the change in pension wealth from remaining in the labour market during a given period of time (Duval 2004).

Many European countries have recently changed or are considering reforming the pension system, with a view to increasing its sustainability in the face of persistent ageing. One concern raised by these policies is that a postponement of retirement age might increase the unemployment rate of older workers, who are unlikely to receive the training needed to stay longer in the labour market. To cope with this, some countries in Europe have in place early retirement schemes, which facilitate the transition of older dismissed workers from work to retirement. These systems are expensive for the taxpayer and do not contribute to increasing the participation rate of older workers. In principle, however, the expectation of less generous retirement benefits should positively affect the training of senior workers – both employer- and employee-provided – by increasing the expected length of working life after the investment, and the time available to recoup the costs of the investment.

As in the case of the relationship between school design and training, I am not aware of any empirical research which has investigated whether the generosity of mainly public pension schemes has a significant effect on the training incidence of senior workers.

Empirical investigation: the data

My data on individual training events are drawn from the European Community Household Panel (ECHP),[7] Waves II to VIII (1995 to 2001). The ECHP is an attractive source of information because it covers a significant number of European countries with a commonly designed questionnaire. I only consider individuals (i) aged between 25 and 60 years and working at least 15 hours per week; (ii) not employed in agriculture; (iii) present in at least two consecutive waves; (iv) not in apprenticeships or in special employment training schemes.

Since the reference period of each wave may overlap with the period of the previous wave, I run the risk of double counting training spells twice. Rather than losing information or adjusting counts in an ad-hoc way, I prefer to ignore double counting. There is also the problem of omitted spells, which appears to be particularly serious for Germany. Since the data for Germany also miss important information on employer-provided training, as well as on industry affiliation, I have dropped this country from the sample.[8]

I consider all training, independently of whether it is defined as general or as firm-specific, or as paid by the employer or by the employee. As documented in Bassanini et al. (2005) average training incidence is higher in countries with a higher percentage of the population having at least a high school diploma. Not only the quantity but also the quality of education matters. One important area where European secondary schools differ is the degree of stratification or tracking. Compared to the US, where tracking consists of ability grouping within the same comprehensive schooling system, stratification in Europe occurs mainly by separating students into vocational and general tracks, with different degrees of osmosis between tracks. Hannah, Raffe and Smyth (1996) and OECD (2004) classify countries into three groups, depending on the degree of stratification of school curricula: a high stratification group, which includes Germany, Austria, Belgium and the Netherlands; a low stratification group, with the UK, Spain and Scandinavian countries (Sweden, Denmark and Finland); an intermediate group, with the rest of Europe, including France and Italy, which lies between these two extremes. In systems with high stratification, students are divided relatively early into separate tracks, and develop specific and relatively narrow skills in the vocational track. In systems with low stratification, tracking takes place later, if ever, and students receive a broader and more versatile education.

The data on labour and product market institutions come from a variety of sources. Time-varying union density is from the OECD database. This variable has been used in the literature as a proxy of union influence, mainly because of the availability of time-varying data. An important drawback, however, is that the variable of interest in the empirical analysis is union coverage, which might be poorly related to union density. Only in half a dozen OECD economies with predominantly company bargaining do the two go closely together. France, where coverage is high but density low, is a clear example of poor correlation. It follows that, when the extension of union agreements is high, changes in union density are not as informative of union influence on wages, employment and training decisions as when extension is low.

The OECD has developed a measure of the legal or administrative extension of union agreements. Extension makes a collective agreement generally binding within an industrial sector, covering all employees who are not members of its signatory parties. This measure is a dummy equal to one for countries where extension is low (Denmark, the UK and Sweden), two for countries with medium extension (Netherlands, Ireland, Italy, Greece, Finland) and three for countries with high extension (Belgium, France, Spain, Portugal and Austria).[9] Since variations of union density are a good measure of union influence and coverage when extension is low, we define a new variable – the interaction of density with a dummy equal to one for the countries with low extension, and to zero for the remaining countries. This is equivalent to restricting the analysis of the relationship between training and union density to these countries.

I characterize the flexibility of the employment relationship in Europe with three variables – the index of stringency of employment protection legislation (EPL) for regular and temporary workers and the share of temporary workers in the labour force.[10]

The data for these variables are also from the OECD database. I use the index of product market regulation developed by Nicoletti and Scarpetta (2003), which measures the stringency of anti-competitive product market regulation – varying between 0 and 6 from the least to the most stringent. Since the indicator covers the period from the late eighties to 1998, I minimize the loss of information by associating product market regulation in year t_{-3} to training between year t_{-1} and year t.

I capture the institutions affecting the retirement decision with the implicit tax rate on continued work. This indicator measures the change in pension or social wealth from remaining in the labour market during the five years from age 60 to age 64 and is defined as minus this change divided by length of the interval. Unfortunately, it has been estimated by the OECD only for the year 2003 and does not include Greece (Duval 2004). For the purposes of this study, I shall assume hereafter that the indicator proxies in a satisfactory way expected pension benefits during the second part of the 1990.

The table summarizes the data on time-varying institutions by classifying countries according to whether the relevant variable has increased, remained constant or increased between 1995 and 2001. Union density has declined in all the countries with low extension of union contracts; the share of temporary workers has increased in all countries, with the notable exceptions of Denmark, Ireland and Finland, where it has declined. The index of employment protection of regular employees has remained constant in the large majority of countries, increased

in Portugal and declined in Denmark, Spain and Finland; the same index for temporary workers has declined in half of the sample and remained constant in the rest; product market regulation has declined across the board; finally, the expenditure on R&D as a share of GDP has increased in most countries but declined in France, Italy and the UK.

The empirical results

I group individual data by country, year, education (college versus less than college) and age (24 to 49 and 50 to 59) and estimate by weighted least squares an empirical specification where the dependent variable is the logistic transformation of the proportion of trained employees in each subgroup. I estimate this specification on ECHP data for 13 countries[11] and the period 1995-2001. Compared to estimates which use individual data, aggregation over groups has the advantage of reducing individual heterogeneity and measurement error in the dependent variable.

Given the host of country and time specific factors which potentially affect training, I need to control for country and time effects with country and time dummies. This implies that I can estimate the relationship between training and labour market institutions only if the latter vary both across countries and over the available time span. Notice that the variation of training across countries and over time can also be due to confounding factors, which operate at the same level of aggregation of the selected institutional variables. Failure to control for these factors could seriously bias my results. To illustrate, suppose that training incidence is affected by country-specific technical progress, and let this variable change over time. By excluding measures of technical progress from the regression, I run the risk of attributing its effects on training to time-varying institutions.

The set of time-varying institutions I consider includes union density interacted with a dummy

Changes of institutional and other indicators between 1995 and 2001, by country			
	Decreased	Constant	Increased
Union density	DK, UK, SW	–	–
Employment protection of regulars	DK, SP, FL	AU, BE, FR, IR, IT, UK, SW, NL	PT
Employment protection of temporaries	DK, BE, IT, SP, PT, SW	NL, FR, UK, IR, GR, AU, FL	–
Share of temporary workers	DK, IR, FL	–	BE, NL, FR, UK, GR, IT, SP, PT, AU, SW
Product market regulation	All countries	–	–
R&D expenditure on GDP	FR, UK, IT	–	DK, NL, BE, IR, GR, SP, PT, FL, SW, AU

[11] These countries are: Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Greece, the Netherlands, Portugal, Spain, Sweden and the UK.

equal to 1 if the extension of union contracts is low, the index of employment protection for regular and temporary employees, the index of product market regulation,[12] the interaction between age in the range 50 to 59 and the implicit tax on continued work and the interactions between the share of R&D expenditure on GDP, no college education – a dummy equal to 1 for individuals with less than college education – and no tracking – a dummy equal to zero for countries with a comprehensive secondary school system. These two dummies are interacted both separately and jointly with R&D expenditure.

The first interaction is expected to capture the disincentive effects on training of higher expected returns from retirement. The second set of interactions investigates whether the effects of technical innovations – captured by the share of R&D expenditure on GDP – vary with the level of educational attainment and with the degree of tracking in secondary schools. Technical change is likely to make narrowly specialized skills obsolete, and it might be necessary as a consequence to re-train more individuals with a less versatile and narrower education than individuals with general skills. If this is the case, I expect the relationship between technical progress and training to be positive and stronger in countries where schooling is more stratified.

There is substantial literature on skill-biased technical change (Katz and Autor [1999] for a review), showing that new technological developments and higher education are complements. Complementarities between innovations and educational attainment imply that new innovations increase the relative demand for college graduates. If training and education are also complements, an implication is that the effect of technical progress, captured by R&D expenditure, is likely to be stronger for individuals with higher education.

Confounding factors include the country and time specific unemployment rate, the share of temporary workers in the labour force and the share of R&D expenditure on GDP. The first two variables are expected to capture cyclical effects and changes in the composition of labour contracts, and the latter variable to proxy technical progress. Ideally, we would also like to include indicators which capture changes

in training policy, but the only closely related indicator – the share of expenditure on active labour market policies on GDP – includes almost entirely training subsidies paid out to the unemployed.

Given these premises, my key findings are:

- Training incidence increases with the unemployment rate, which supports the view that firms and individuals engage more frequently in training activities when the opportunity cost of training – in terms of foregone production – is lower (Hall 2000). Training participation also increases with total expenditure on R&D – measured as share of GDP – and this effect is significantly lower for college graduates, which suggests that the latter require less training when innovations occur.

- The effect of union density on training – limited to the countries with low extension of union contracts – is very small and imprecisely estimated. Training turns out to be lower when the share of temporary workers in total employment increases. Therefore, an increase in the flexibility of the employment relationship associated with the introduction and diffusion of temporary labour contracts reduces the incentives of both parties to train. This effect, however, is imprecisely estimated.

- Training incidence is lower when the degree of employment protection of both regular workers and temporary workers increases, although this effect is statistically different from zero at the five percent level of confidence only for the former. How do I explain this? It is well known that employment protection is associated with firing costs, and that these costs have both a transfer and a tax component. While the transfer part could be undone by properly designed labour contracts, the tax component is difficult to undo (Garibaldi and Violante 2002). A common view in this literature is that firing costs increase wages. According to Lindbeck and Snower (1988), these costs increase the bargaining power of insiders by sheltering them from the competition of outsiders. How could this affect training? By raising wages and reducing profits.
An alternative explanation is selection. When firing costs are high, employers cannot easily dismiss less able or less suitable regular employees and therefore end up with a more heterogeneous regular labour force than employers who can more easily dismiss unsuitable employees. If training and ability are complements, or if labour force heterogeneity imposes a negative firm-specific external-

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[12] This index ranges from 0 to 6 and measures the intensity of regulation with respect to: economic and administrative regulation, tariff and other barriers, state control and public ownership, barriers to entrepreneurship, impediments to trade and investment. See Nicoletti and Scarpetta (2002).

ity on individual productivity, employers with a more homogeneous regular labour force should train more.

- Conditional on employment protection, training incidence is lower when product market regulation is higher. Therefore, liberalizing product markets do not damage training incentives, quite the contrary. This evidence does not support the view expressed by Gersbach and Schmutzler (2004) that training should be higher when industrial concentration is high and/or competitive intensity is comparatively low, but is in line with the finding by Autor (2004) that temporary help firms operating in more concentrated markets train more.
- I find that the interaction of age and the implicit tax on continued work is negative and statistically significant. Therefore, the age-training profile of workers in the 50–59 age group is reduced by the expectation of better retirement benefits. An implication of this finding is that pension reforms which reduce the implicit tax on continuing work for those between 60 and 64 are likely to increase the training of senior employees. Thus, the concerns about the labour market prospects for senior workers which often accompany these reforms might be exaggerated to the extent that these workers receive further training. As shown by Bassanini (2006) additional training of senior workers increases their employability.
- Finally, the interaction between R&D expenditure on GDP and lack of secondary school tracking yields a negative and statistically significant coefficient for individuals with less than college education, suggesting that technical progress has for these individuals a positive effect on training where schooling is stratified and a negative effect where schooling is comprehensive. This result points to the possibility that the vocational skills developed in stratified schools require more training and updating in the face of technical innovations. Therefore, countries with less stratified schooling systems have workers endowed with more versatile skills and that need less training to match newly developed techniques than countries with more stratified education systems.

How big are the effects discussed above? It turns out that a 10 percent increase in the share of R&D expenditure is expected to raise the probability of training for college graduates by 8.99 percent. The Lisbon strategy sets at 3 percent the target share of R&D expenditure on GDP, to be attained by 2010. According to my estimates, this would require an increase from the current European average of 1.4 percentage points, close to 87 percent from the baseline. If such an increase could be attained, I expect training participation to increase by 78.6 percent, a substantial amount. The expected increase in the probability of training is even higher for individuals without a college degree, and depends on the nature of the secondary school.

When evaluated at the sample mean values of employment protection, my estimates suggest that a 10 percent increase in the degree of product market regulation would reduce the probability of training by 13.1 percent. Conversely, a 10 percent increase in employment protection would reduce training incidence by 4.91 percent in the case of regular workers and by 1.05 percent in the case of temporary workers.

Conclusions

This essay started by asking whether product and labour market institutions affect training. My empirical investigation conclude that they do. In particular, I find that

- Product market regulation affects training negatively and significantly. Therefore, more competition in the product market is conducive to higher investment in training;
- Labour market flexibility affects training in a less straightforward manner: on the one hand, the diffusion of temporary contracts reduces the investment in training; on the other hand, the reduction in the degree of employment protection increases the provision of training, especially for regular workers. Therefore, labour market reforms that accelerate the diffusion of temporary contracts and at the same time increase the protection of a limited core of permanent employees produce negative effects on the accumulation of human capital taking place mainly in firms;
- Training incidence declines with age and is lower than average for workers who have reached age fifty. The decline is higher, ceteris paribus, in countries with a more generous pension system, because the higher implicit tax on continuing work at age 60 to 64 reduces the expected time horizon required to recoup the costs of the investment. Therefore, pension reforms which reduce the implicit tax are likely to have as a by-product an increase in the training of senior workers;

- There is little evidence that union density matters significantly for training. One reason could be that our measure of unionism does not allow us to fully capture the complexity of this relationship. We have restricted union density to affect training only in those countries where the extension of union contracts is low, and cannot say much on the effects of unions on training in the remaining countries;

- Training and investment in research and development are complements, but the degree of complementarity is lower for college graduates, possibly because the latter have sufficient skills and do not need to be trained or re-trained to be able to cope with innovations;

- Secondary school design has an impact on the relationship between innovative activity and training: when schooling is more comprehensive, high school graduates require less training to adapt to technical progress.

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