Job-Related Training in Europe

Do Institutions Matter ?
(Preliminary Version: Please do not quote).

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1 Introduction

The resurgence of interest in recent years in the importance of education and training in furthering the goals of economic progress, fuller employment and social integration coincides with a new emphasis on the need for "life long learning" , both to respond to current changes in the organisation and technology of production and service delivery and to counter the socially disruptive effects of increased labour market flexibility. The European Commission emphasises in its Social Policy Agenda life-long learning and its crucial role in the knowledge based society. The agenda describes life-long learning as a core factor for the improvement of people's employability, entrepreneurship, for reducing skill gaps and developing quality jobs (CEDEFOP 2001, Commission 2000).

Opportunities for continuing training are particularly crucial for low-skilled workers as the fall in demand for low-skilled labour and the shift to more knowledge intensive jobs (Maurin and Thesmar 2003) has left them in a precarious labour market situation they may be trapped in low-paid jobs with poor employment conditions, or stuck in unemployment. Likewise, opportunities for training are very important to older workers whose skills obtained through schooling or initial training are likely to have become outmoded. Both groups of workers run the risk of social exclusion, and opportunities for life-long learning are believed to alleviate this risk (Bishop 1997). Life-long learning could thus be an essential policy for social cohesion (European Council 2000). More generally, continuing job-related training is believed to be highly influential in determining both corporate or organisational performance as well as individual earnings and career development.

While there has been a great deal of research on initial education, prior to labour market entry, the empirical research on continuing training is much more limited. Given that the impact of initial educational attainment on both labour market entry and on subsequent career development is already well established in the research literature (see e.g. Allmendinger 1989; Shavit and Müller 1998(eds.); cf. Ryan 2001 for an overview of the cross-national literature on the transition from school-to-work), we focus in this paper on continuing education and training of employed workers.

There is a substantial body of evidence indicating that in-career training is stratified, with the result that those with higher skills, or educational attainment are more likely to participate in training, and in training sponsored by their employers (Lynch, 1994; Gatter 1999; OECD, 1999; O'Connell, 2002b; Schömann, 1998; Blundell et al. 1996; Bellmann and Düll, 1999). The employed receive more training than the unemployed, who in turn receive more training than those not economically active (O'Connell, 1999). Older workers are also less likely to participate in job-related training (Gelderblom and de Koning, 2003). Part-time workers and those on temporary contracts are less likely to receive training (Arulampalam and Booth, 1998). Likewise

firm characteristics matter: larger firms and those that pay above average wages are more likely to train their employees than smaller firms (O'Connell, 2002).

These patterns of participation would suggest that current allocation principles are in inverse relation to need and training is more likely to exacerbate rather than mitigate existing labour market inequalities. The stratification of continuing training opportunities has often been explained by human capital theory (Becker1964). The employer is the most common financial sponsor of continuing training, and it seems logical to assume that an employer's decision to invest in training for his employees is made based on expectations about benefits in the form of raised post-training productivity. Based on the assumptions of human capital theory one would predict that an employer believes the training cost of a lower-skilled worker to be higher than for higher skilled workers. This is because low educational credentials may signal lower ability and may therefore suggest that the worker is a slow learner requiring more training hours than his higher-skilled counterparts, which in turn would imply higher training costs. Likewise human capital theory might explain why older workers are less likely to receive training than their younger colleagues. Skill investments in younger workers can be recouped for a longer period of time. Moreover, it is often assumed that older workers' skills have already become somewhat outmoded which would increase their training cost. In this chapter we predominantly focus on the skills gap in participation in job-related training, although we recognise that there are other important dimensions to stratification in access to training. The skills gap in participation in continuing job-related training is a near universal pattern: in virtually all European countries, indeed if not all developed industrial or post industrial societies, the low skilled are less likely to participate in job-related training than those with higher skills (Bassanini et al 2005).

Research on the impact of training is also growing. One strand of the literature on training impact focuses on firm productivity (e.g. Barret and O'Connel 1999); while another assesses the effects of training on individual wages (e.g. Gerfin 2004). The research on training and firm-productivity has shown that different forms of continuing training can have very different effects (Barret and O'Connel 1999; Black and Lynch 1997). Barrett and O'Connell (1999), for example, show a clear positive effect of general training on firm productivity. They could not, however, detect a positive impact of specific continuing training. The numerous studies assessing wage effects of training have obtained very different results, and the impact of continuing training on wages is still very much debated. Goux and Maurin (2000) analyse wage returns to employer-provided training for France. While their OLS estimations suggest positive and significant effects, training effects become insignificant and negative once selectivity is controlled for. While most studies have only assessed the impact of training on wage levels,

Pischke (2001) estimates fixed effects growth regressions using the German Socio-Economic Panel (GSOEP). His estimates suggest that one year of full-time work-related training does not result in significant wage growth. Booth (1993) studies returns to training that has taken place in the first year in a new job using the British National Survey of Graduates and Diplomats (BNSG). The estimates of her fixed effects estimates show no wage returns for men, and an increase in wage level of one per cent per week of training for women. Finally, Bassanini et al. (2005) assess the effect of training stock on log hourly wages across a range of European countries using the ECHP and find that their OLS estimates range between 3.7 and 21.6 per cent. When they estimate fixed effects models, however, their coefficients become insignificant for most countries. Generally, their results suggest there might be a negative relationship between training incidence and training returns (ibid.).

Comparative research on continuing training is still somewhat scant. We also find that until very recently cross-national research has focused more on similarities across countries than the differences. While comparative research on this topic frequently points out the common pattern that access to continuing training is highly stratified, attempts to assess the different degrees of this stratification across countries and possible explanations thereof are still scarce. In the recent literature, however, we find an increasing awareness that institutions may play a crucial role in explaining differences in the distribution and impact of training. This strand of research, however, is still very much developing. Thus far there is little consensus as to which institutions are conducive to continuing training provision and quality of training. Booth, Francesconi and Zoega (2003), provide an overview of the different channels through which unions can affect the provision of continuing training. Labor Unions may directly negotiate better training opportunities for covered workers. This would imply that union-covered workers receive more training and higher training returns relative to uncovered workers. In countries with high union density and where unions effectively represent both high-skilled and low-skilled workers, we could expect that the high-low skilled training gap would be reduced. However, if unions are more effective in representing the interests of the high rather than low skilled in access to training, unions could increase the training gap between the low- and high- skilled. Another channel through which unions may influence training provision is wage compression (Booth et al 2003): by flattening wage profiles and reducing wage dispersion unions may distort workers' incentives to invest in training. In this scenario one would predict a negative correlation between presence of unions and training incidence. Training returns would be expected to be lower for unioncovered than non-union covered workers. While wage compression may reduce workers' incentives to invest in training, it may provide an incentive for employers to pay for continuing training. Bassanini and Brunello (2003) in an analysis of ECHP data for 7 countries,

find that the incidence of general training (proxied by off site training) is higher in clusters with a lower differential in wage growth of trained versus untrained workers. They find no evidence of a relationship between firm-specific training and the training wage premium. More detailed information on the importance of labor market institutions comes from Brunello (2001), who finds that institutions influence training incidence: countries with higher union density, stronger employment protection, and lower minimum wages (relative to the average wage), tend to show higher incidences of training. His findings further suggest that training is higher in countries with more comprehensive school systems (e.g. Ireland or the UK) than in countries with highly stratified school systems (e.g. Germany) suggesting that continuing training after labor market entry is used to compensate for lack of specialisation in initial education. Others, however, treat the question as to which school systems are more conducive to continuing training provision as an open one (Bassanini 2005).

This brief overview demonstrates that the role of institutions has become a focal point of recent research on continuing training. Their actual importance in understanding crosscountry differences in training as well as the directions in which they influence training provision, distribution and efficacy are still very much debated. The aim of the chapter to compare the incidence, the distribution as well as the impact of continuing vocational training and employer-sponsored continuing vocational training across a number of European countries. We are predominantly focusing on the following six countries: Britain, Ireland, Germany, France, Finland, and Spain. The aim of this chapter is to assess whether continuing training alleviates or exacerbates existing inequalities of worklife chances in our six countries. To answer this question we assess the distribution of continuing training opportunities. We also examine the actual impact of training participation on wages - does training affect wage levels or is it largely cosmetic in nature? Particular emphasis is on differences across countries: Do we find larger inequalities in the allocation of training in some countries than in others? What are the determinants of such differences? If there are differences in the quality of training what are the institutional dynamics behind them?

The chapter begins by looking at human capital and segmented labor market theory and discusses their explanatory power regarding allocation principles of training. It then provides an overview of the typology of coordinated versus liberal production regimes developed in the political economy literature (Estevez-Abe et al. 2001; Hall and Soskice 2001; Soskice 1999). This dichotomous typology differentiates institutional systems of coordination and governance and provides a fruitful explanation of the different logics driving capitalist societies, and the ways in which this has led to distinct regimes of skill production. We will discuss how far the general versus specific skill regime dichotomy can help us understand cross-national differences in the provision of continuing training. While this typology is valuable in

sensitising us to institutional differences across countries, it is a very broad categorisation. In a next step we take a closer look at the country-specific arrangements for continuing training provision. The empirical part of this chapter begins with a brief discussion of the data used, the ECHP, and our definition and measurement of continuing training. The empirical investigation divides into two sections: the first is concerned with the distribution and determinants of training, the second assess the impact of continuing training on wage progression.

2 Theoretical Foundations on Human Capital Investments

2.1 Human Capital Theory

Activities affecting future well being, contrary to consumption, which is contemporaneous, are called investments. The magnitude of returns on investments usually influence the decision to renounce consumption for the sake of future well being. Physical capital investments are made when expected returns on investment are high under the condition that the risk of loosing ones stake is low. Investments in human capital follow the same reasoning (Becker 1962). The factors influencing the investment decision are though the expected returns and the probability that the returns on investment will happen in the future. This expectation crucially depends on the calculability of future events. Long-term relationsships are favouring trust relationships while increased unexpectability favour mistrust and risk-averse behaviour on both sides of the employment relationship.

Investments in human capital are most prominent investments in education and skills, and prehaps the most impressive piece of evidence is that more highly educated and skilled people tend to earn more than others. On-the-job Training has been a central concern since the first investigations into human capital investments. The merit of human capital theory is its ability to handle the heterogeneity of labour and the time consuming process to create it (Mincer 1994, p.111). Training is expected to increase the productivity of the workers and increase their abilities to do other tasks increasing their usability. In early investigations about human capital, training was thought to be skills acquired on the job and though measured by years of experience. One of the results of the work was the now classical earnings function (Mincer 1974) and the analysis by Ben-Porath (1967) on the omptimal allocation of investments over time. Growth of earnings over the working life is due largely to subsequent labor market investments in formal and in formal job training and in labor mobility. The discounted difference between future earnings represents the gain or loss on investment.

Human capital theory distinguishes between general and specific educa-

tion. Becker (1962) makes this important distinction and states

> General training is useful in many firms besides those providing it; [...] Completely general training increases the marginal productivity of trainees by exactly the same amount in the firms providing the training as in other firms. Training that increases productivity more in firms providing it will be called specific training.

Specific training, though has not much utility for the worker if he is not shure to recoup his investments in the future, because of layoff or a change in employment. The workers will conversely be much more interested in general skills as these improve their situation on the labor market. On the other hand, employers are not prone to invest in general training of their workers because of the possibility of subsequent quit. If a firm has paid for training of a worker who leaves then to take a job with another employer, investments made would be sunk costs for the training firm. The more so as the worker's incentive to leave for another employer willing to pay a higher wage (in relation with the increased productivity) while getting the returns from the earlier training investment could be regarded as high. This problem is known of as the *poaching problem*. All these circumstances naturally lead to market failure. However, there are mechanisms preventing this failure by stabilizing the employment relationship. Permanent work contracts, employment and/or unemployment protection, contract clauses concerning company pension schemes with incomplete vesting help to overcome the contingency of the employment relationship. Long-term contracts insure firms against quits, just as they insure employees against layoffs. Firms would be more willing to pay for all kinds of training – assuming future wages were set at an appropriate level – since a contract, in effect, converts all training in to completely specific training (Becker 1962). There is however some evidence, that under certain circumstances, employers are willing to invest in general training, especially in non-competitive labor markets or in the case of occupational labour markets like in some continental European countries (Acemoglu and Pischke 1999ab, Estevez-Abe et al. 2001).

Training as observable was included in wage regressions by Barron and Lowenstein (1989), Booth (1991), Brown (1989), Duncan and Hoffman (1978), Hübler (1994 1998), Pfeiffer and Reize (2001)among many others. Trainees tend to have steeper wage trajectories over their working lives, and not merely within a particular firm. Mincer (1994) estimated the effect of training on wage growth by an average of 4 to 5 percent for the United States using PSID data. He also stressed that there is a positive correlation between school education and training and concludes that

> traing is complementary with education, that better educated workers are more efficient in learning on the job, as they were in

> school. An implication of this conclusion is that training cannot be viewed simply as an alternative to schooling. Without appropriate schooling the training process is inefficient – the existence of and complaints about remedial education on the job offers a case in point (Mincer 1994, p.121) .

Complementary to the Human capital theory, the market signalling approach tries to explain how education works as a screeing device for non observable abilities. The theory on market signalling was first elaborated by Spence (1974ab) and Stiglitz (1975) to show that individuals who can be labelled as "more productive" are able thereby to obtain higher wage, more training and better career chances, often at the expense of others (Stiglitz 1975, p.283). Stiglitz (1975) describes the screening mechanism in the light of grading systems obtained in schooling: a) educational systems do (and they must) sort individuals for their own purposes; b) (standardized) performance tests convey information on the learning experiences of individuals; c) Self-selection mechanisms by which individuals sort themselves provide information on the self-assessed abilities:

> on average individuals with more of the given characteristic [more brains or mechnical ability] will do better under one reward-penalty structure than under the other, and conversely. If individuals are asked to choose among these reward-penelaty structures, and if they are rational, they will sort *themselves* out into those who are more of the characteristic and those who have less (Stiglitz 1975, p.293).

It is widely accepted, that besides their principle activities of providing knowledge (skills) and guiding individuals into the right occupation, educational credentials from educational institutions inform on the ability of students. Because employers only possess incomplete information about their (future but also actual) workers, they use education and labor market experience among other signals (such as gender, race, place of residence) as screening factors to estimate future potential productivity and the potential returns to their trainig investments.

> In attaching probabilities to [these] outcomes, the employer has two resources. One is [the worker's] past experience in the market (. . .), since [the employer] will have a sense for the frequency with which different outcomes have occured in the past. (. . .) [Second, Workers] come with various types of education (. . .). Instead of estimating unconditional probability that an applicant, drawn randomly from the applicant pool, will be compentent, he can estimate the *conditional* probability of competence, given the observable characteristics of the individual who is applying (. . .)

> Both types of estimates are made on the basis of past experience (Spence 1974a, p.8).

Spence refers to Schools as the most prominent screening Institution delivering grades to students, which represent a complete surrogate for ability. The classical human capital approach and the screening hypothesis are however competing. The key difference between human capital and sorting models (the process of applicants' signalling by way of educational achievements and employers' screening for signals of unobserved characteristics) is that even after correcting for all traits that are observed by the firm, the coefficient on education may be a very biased measure of the effects of either schooling or experience on productivity (Weiss 1995). If the sorting approach is correct, the outcome of the market is inefficient (Weiss 1995, p.136). Nevertheless, the screenist position is that education both enhances individuals' productivity levels and provide a mechanism for sorting out differneces in these levels. Riley (1976, p.259) concludes that one of the crucial roles of educational prescreening is to allow employers to select the more talented for jobs which involve considerable on-the-job training.

Initial education – highest level of education completed – and past work experience are signals which influence the employers decision to hire applicants and to provide them with training. Recent research has shown, that there is a complementarity between initial education and training incidence (Arulampalam et al. 2003, Bartel and Sicherman 1995, Booth 1991, Brunello 2001ab, Oosterbeek 1998). There is a widely established contention that higher educated workers get more training and also longer spells of training (see also OECD 2003, p.241ff) which could indicate that the initial educational level functions as a signalling device for ability and though trainability.

Another important question related to the human capital theory is whether inequality of opportunity or ability dominates the observed inequality in training participation. In liberal market economies the latter tends to be stronger than the former and vice versa in coordinated market economies. One explanation for this can be found in the policy context (see 3.1 and 3.2) and the structure of labour makets (see 2.2). The selection mechanism for training of workers depends on the context of the employment relationship. Labor unions via their bargaining power can influence the training decision of employesr as well as by informing their members on the training opportunities within their workplace. This can happen at the expense of outsiders and non unionized workers (see 2.2). In these circumstances, there is a high probability that inequality of opportunity occurs. Conversely if the decision to train is the responsability of the employer, there is reason to believe, that inequality of ability occurs. These issues will be treated in deph in the next section.

2.2 Internal Labor Markets

From the beginning of social sciences and in particular economics as a discipline, the question was raised if labour markets followed the same rules as other markets and if labor could be considered like goods. Adam Smith as the forerunner of the neoclassical school, provided the argument for wage differentials as based on "compensating" differentials but still upholds the perfect working of the labor market. On the other hand, John Stuart Mill empasized that nonagricultural labor markets were better described as composed by "noncompeting groups". Such factors as guilds and local laws and customs had a great impact on the workings of labor markets. The segmented labor market (SLM) approach argues that the neoclassical apparatus provides an inadequate or incomplete description of the labor market and leaves unexplained most of the major labor market policy issues (Taubman and Wachter 2002, p.1183). The central empirical hypothesis of the SLM approach is that labor markets are segmented and that there exists no clear nexus between skill differentials in the labor market. The consequences of the existence of SLM are:

- Internal labor makets (ILM) in the primary labor market do not function along profit-maximizing lines;
- Labor unions play a positive role in the primary sector and create "positive feedbacks" which improve workers' productivity;
- Reward and incentive systems are different in the two segments of the labor market so that comparable individuals achieve different outcomes;
- Bad dead-end jobs create negative feedback and workers in the secondary sector are "scarred" by working.

The core of SLM Theory is the assumption that there are two distinct labor markets linked by "ports of entry" (Kerr 1954, Osterman 1994) and job ladders (Dunlop 1966) do only exist in the internal market. Doeringer and Piore (1971) describe the rules of blue-collar ILM as well as the trade-offs among the rules and how specific capital helps cement employee attachment to firms. Turnover costs for employers are high when skilled and experienced workers leave their job and though ILM's represent an efficiency response to externalities.

The central idea of internal labor markets (ILMs) was set forth by Clark Kerr in his description of institutional labour markets:

> Institutional rules take the place of individual preferences in setting the boundaries. Such institutional rules are established by employers' associations, by the informal understanding of employers among each other (the "gentlemen's agreement"), by

> companies when they set up their personnel policies, by trade unions, by collective agreements, and by actions of government (Kerr 1954).

The labor market is thus divided (to simplify) into a *primary* and a *secondary* market. Jobs in the primary market possess several of the following characteristics: high wages, good working conditions, employment stability, chances of advancement, equity, and due process in the administration and work rules. Jobs in the secondary market, in contrast, tend to have low wages and fringe benefits, poor working conditions, high labor turnover, little chance of advancement, and often arbitrary and capricious supervision (Kerr 1954). The primary sector is composed of firms with "good jobs" and internal labor markets with "entry level jobs" inside which the workers do not compete with each other and applicants from the secondary labour market queuing to joint the primary market. Other firms–those in the secondary market–hire from the external or spot markets and have only "bad jobs" to offer, turnover is usually high and job prospects are poor. Secondary jobs are mainly (though not exclusively) filled by minorities, women, and youth.

Reich et al. (1973) see the origin of SLM's in the formation of oligopolistic corporations, released from short-run competitive pressure, and turned to the capture of *control* over product and factor markets. Those companies

> actively and consciously fostered labor market segmentation in order to "divide and conquer" the labor force (Reich et al. 1973, p.361).

Not surprisingly, ILM's do play a major role in large size firms with bureaucratic organization, usually with work councils and union representation. Unions traditionally sought to gain freedom from the arbitrary discretionary power of supervisors by demanding a seniority criterion for promotion (Mincer 1983). Primary sector firms also initially attempted to raise the cost to workers of leaving the company by restricting certain benefits to continued employment in the company which led to the establishment of "welfare capitalism". The existence of a bilateral monopoly problem between the firm and individual workers yields to suboptimal outcomes. ILM's neutralize this by encouaging joint maximization minimizing bargaining and turnover costs, encouraging workers to exercise their specific knowledge, ensuring that investments are made without risk of exploitation by either side, hence ILM's have an important feature that encourages efficency.

Unions play a major role in the classical view of employment relations in the primary sector. Through bargaining and wage determination, they create both existence and scarcity of good jobs. By artificially raising wages, they are said to restrict the number of jobs that would otherwise exist. In addition, by restricting the number of jobs in the unionized sector, unions are thought to increase labor supply in the nonunion sector resulting in a

secondary sector wage that is both below the high union wage as well as below the equilibrium wage. But unions also increase skill formation thru stable employment relations in the primary sector and often, via sectoral bargaining, for all workers. In absence of institutional arrangements, workers and fimrs will invest too little in firm-specific training for fear of not realizing their investments. Freeman and Medoff (1984) argue that, unions organize communication channels within the workplaces, encourage workers to accumulate longer job tenure and give higher within-firm carreer commitment to wokers leading to employers increased willingness to train workers. In the same vein, managers also respond to the more formal environment that prevails in unionized workplaces to set up more formal procedures to identify training needs. Elias (1994), Green (1993), Green et al. (1996) come to the same conclusions concerning the role of labor unions for training in Britain. Pischke (2004) gives a good explanation comparing the US and Germany. European firms, contrary to US firms will invest in the low-skilled labor force because minimum wages are higher than their marginal productivity. Employers though always benefit from training their low skilled workers in Europe. In the US, low-skilled worker tend to be less skilled than their counterparts in Europe and because of the very low minimun wage their marginal productivity lies above their wage and training to improve their productivity is thus not necessary. Because of credit constraints, these workers cannot afford to pay for the own training in the US and thus will have no chance escaping from their poverty trap.

3 The Institutional Context of Continuing Training

3.1 Varieties of Capitalism

Relatively recent contributions in the political economy literature (see e.g. Soskice 1999,: Estevez-Abe et al. 2001; Hall and Soskice 2001) have emphasised how differences in institutional contexts of advanced capitalist economies can help explain the significant differences in strategies of skill formation found across countries. Soskice (1999) distinguishes between coordinated (represented in our study by Germany, Finland, France) and liberal production regimes (represented here by the UK and Ireland). Coordinated market economies are generally characterised by a significant degree of non-market coordination directly and indirectly between companies. Unions play a crucial role in the industrial relation system relation systems which tend to be cooperative in nature, and inter-company systems that promote standard setting cooperation (Soskice 1999). In liberal market economies, on the other hand, we find little non-market coordination between companies and the industrial relations in these economies are characterised by weak

unions. The competitive climate in these economies deters cooperation and coordinated standard-setting across companies (Soskice 1999). While liberal market economies tend to be accompanied by residual welfare states, coordinated market economies tend to be matched with social-democratic or conservative models of welfare with high employment protection.

The framework developed by Estevez-Abe et al. (2001) and Soskice (1999) emphasises the importance of institutions in shaping firms' (and workers') incentives to invest in training. A competitive industrial relations system where it is easy to poach training workers discourages employers to provide their workers with portable vocational skills, while cooperative industrial relations provide an economic climate where such investments are feasible. Liberal market economies tend to bring forward "geneneral skill regimes" where most firms pursue production strategies relying on a small elite of workers with high general skills (i.e. university or other third level qualification) and unand semi-skilled workers. Consequently early school-leavers tend to have few valuable career opportunities. In specific skill regimes, on the other hand, production strategies are complex and therefore reliant on a skilled workforce leading to high incidence of high quality vocational training. Estevez-Abe et al.'s theory suggests that specific skill systems which tend to be found in coordinated production regimes would offer more equal access to training opportunities than general skill systems in liberal production regimes where access to vocational skills is scarce leading to a polarised skill distribution in the workforce. Whilst in their work Estevez-Abe et al (2001) emphasise the importance of the production regimes for the development of different systems of initial skill formation, we believe that institutions that impact the incidence and quality of initial training provision may also be of importance to understanding differences in continuing training provision across countries.

Table 1 below, presents some figures on union density, collective bargaining coverage and employment protection in our six countries:

The figures show in line with the typologies that coordinated economies tend have higher level of employment protection than the liberal market economies. The table further demonstrates that union density is highest in Finland, our representative of the Scandinavian coordinated economy, while union density levels in Germany are closer and even below those found in UK and Ireland, our representatives of the liberal production regime. Union density is lowest in Spain and France, our Mediterranean coordinated regimes. Union density, i. e. union membership, is of course only one measure of union power. Arguably, the collective bargaining coverage, i.e. the extent to which salaried workers are subject to union-negotiated terms and conditions of employment, is a stronger indicator of the importance of unions within the industrial relations system. We find that the collective bargaining coverage is by far the lowest in the UK, Germany takes up an intermediate position, while Finland and the two Mediterranean countries have the highest cov-

	Index of overall strictness of protection against dismissals	Union Density (%)	Collective Bargaining Coverage (%)
Germany	2.8	25	68
Finland	2.1	76	90
France	2.3	10	90
Spain	2.6	15	80
UK	0.8	31	30
Ireland	1.6	38	n.a.

Table 1: Employment Protection and Union Strength

Notes: employment protection index: higher values represent higher legislation

Sources: employment protection index: OECD Employment Outlook 1999 (figures refer to late 1990a); union density and collective bargaining coverage: OECD Employment Outlook 2004 (figures refer to 2000)

erage rates. In sum, these figures suggest that there may exist substantial variation amongst the coordinated market economies. While the skill typologies developed by Estevez-Abe et al (2001) give a valuable insight into the different logic of production regimes which promote the development of different systems of skill creation, they are very broad categories which may obscure important differences across countries. The category of liberal market economies contains countries which are quite homogenous and all liberal market economies are complemented by liberal welfare regimes. Countries within the coordinated category, on the other hand, reveal substantial differences. There exist, for example, substantial differences between Germany and Finland which may lead to differences in the organisation of continuing training. First, the former is a conservative welfares state while the latter is an example of the socialdemocratic model of welfare (Esping-Andersen 1990). Second, as documented in table 1, union bargaining coverage appears to be much larger in Finland which is characteristic of the Scandinavian countries. Finally, in Finland collective bargaining is more centralised than in Germany. In Finland central-level agreements are of overriding importance, while in Germany industry-level wage-setting is predominant (OECD 2004). These differences could potentially be indicative of greater equality in access to opportunities to life-long learning opportunities across different industrial sectors and occupations, as well as a higher incidence of continuing training in Finland compared to Germany. Arguable, differences in the welfare regimes between the two countries may be reflected in how training opportunities are distributed and how training returns differ between male and female workers. More importantly, our Mediterranean countries, France and Spain, may not fit into the skill classification systems as neatly as the other countries. In these two countries we find strong internal labour markets (Maurice et al. 1986; Marsden 1999) with high employment pro-

tection for "insiders" which may lead to a pattern of polarisation in labour market opportunities between the "core" workers and those in "peripheral" jobs (see DiPrete et al 2001 for France; Polavieja 2001 for Spain). Access to training in these countries may be highly stratified between those in permanent employment and those who are employed on non-standard contracts, i.e. workers in temporary or part-time employment. We would therefore expect the horizontal axis of polarisation to be more pronounced than in the other countries. Given that women are overrepresented in such non-standard employment (Petrongolo 2004), we expect female workers to be particularly disadvantaged in access to life-long learning opportunities in these countries. Additionally on may argue, that Southern European welfare states, such as Spain, are still driven by patriarchal legacies where neither welfare states nor labour markets offer much to for women.

In sum, it seems likely that institutional differences between coordinated and liberal market economies lead to different skill formation regimes. The strong employment protection and strong unions as found in the coordinated regimes may arguably provide more incentives (and pressure) for employers to invest in training and reduce polarisation of labour market opportunities as it is more difficult for employers to get rid of lowskilled workers. Amongst the coordinated economies, on the other hand, we expect further significant differences and different dimensions of polarisation.

3.2 Continuing Training Systems

In the following, we present brief country portraits which outline how training is organised and the role collective bargaining plays in life-long learning.

United Kingdom

In the United Kingdom there exists no statutory rights or obligation to train and provision of continuing training for adults continues to be at the employer's discretion (Eurofound 2001). Whilst unions have tried to incorporate training into the collective bargaining agenda, the Confederation of British Industry (CBI) has been in strongly in favour of keeping the voluntary system of training. Given the objection of the CBI to the inclusion of training on the bargaining agenda, it seems unlikely to find contractual and statutory rights to training in the British labour market in the near future (Rainbird 1998). Public Policy efforts to provide continuing training are predominantly targeted at the very low-skilled: the goal of the Skills for Life programme is to achieve that 1.5 million adults in England should have achieved national literacy and numeracy certificates (OECD 2004).

Ireland

To date there exist few collective agreements at company level focusing on continuing training (Eurofound 2001). Employers essentially provide training on the basis of their own needs and requirements. The state plays an important role in developing life-long learning policies (ibid). In 2002 the Department of enterprise, trade and employment initiated a new in-company training measure to promote training and up-skilling of people in employment for which European Social Fund co-financing was available.

France

In France collective bargaining plays a central role in the development of in-career continuing training, and vocational training is regulated through interaction between government legislation and agreements signed by management and labour (Eurofound 2001). Employees have a right to continuing training during working hours. Firms with 10 employees and more are obliged to spend 1.5 per cent of the wage bill on further training (Schoemann 2002). Nevertheless, company level bargaining on training has remained limited and as a result one finds disparities regarding access to training opportunities at company level – a problem which has been addressed in the White paper on training in 1999 (Eurofound 2001).

Spain

Like in France, life-long learning forms part of collective bargaining arrangements. Continuing training is regulated through the National Continuing Training Agreement signed in 1992 by the social partners as well as by the social partners and the government. Since the early nineties employees have jointly managed and negotiated public funds devoted to employee training in Spanish firms (Eurofound 2001). The 1998-2002 "National Vocational Training Programme" defines training as a set actions carried out by companies, workers or their respective organisations which are aimed at improving skills or re-qualifying employed workers, and thereby enabling the complementarity between greater competitiveness of companies and the professional and personal development of workers. The framework qualification and re-qualification of adult workers is set by the tripartite Foundation for Training at Work, with the participation of Administration, Trade Union and Employer representatives (OECD 2001).

Germany

In Germany continuing training provision has traditionally been provided at the discretion of individual employers. In contrast to its dual system of initial vocational training, which is highly regulated, few binding agreements

exist regarding adult in-career training provision at the company level. To date, employers develop rules for eligibility unilaterally. Furthermore, there exist no clear guidelines concerning the financing of continuing in-career training (Eurofound 2001). It should be noted, however, that in certain sectors collective agreements on adult training have been concluded. Generally, though, these do not comprise detailed regulation concerning its provision. The role of the social partners in the organisation of continuing training remains weak (Schulten 1998).

Finland

Traditionally training used to be the responsibility of the state with the involvement of the social partners at different stages. Since the 1970s, adult vocational education has become one of the central issues of labour market negotiations (OECD 2001). In 1997, the Trade Union Confederation and the Confederation of Finnish Employers and Industry have formed a general collective agreement including a chapter concerning vocational training (Eurofound 2001). Ensuring skill development of workers' throughout working life is a responsibility shared by workers, employers and the government as stated in the Annex entitled Lifelong Learning as Part of Working Life of the 2000 tripartite agreement (OECD 2001). The law prescribes that an annual in-service training plan must be debated with the personnel in companies with more than 30 employees (ibid). There furthermore exists an obligatory financial contribution by companies to a fund managed by the social partners financing individual educational leave in conjuction with state aid (Eurofound 2002). The "training guarantee scheme", a scheme providing funding for vocational training courses is one example of recent issues on the collective bargaining agenda.

4 Basic Descriptives on training participation

We based our analysis on the European Community Household Panel (ECHP) user data base. The ECHP is a longitudinal survey based on a standardised questionnaire that involves annual interviewing of household representatives and their members in EU member countries and covering a wide range of topics: income, health, education, housing, demographics and employment characteristics. The data collection was done yearly from 1994 to 2001. The firs wave started in 1994, when a sample of some 60,500 nationally represented households summing up to about 130000 adults aged 16 years and over - were interviewed in 12 Member States. Austria joined in 1995 and Finland in 1996. Data for Sweden is only available from 1997 on and derived from the Swedish Living Conditions Survey. Unfortunately training information is completely missing from the Swedish data, so we opted for Denmark and Finland instead. The ECHP has a broader and integrative character as

other surveys done in the EU especially due to the longitudinal design of the survey which makes it possible to follow up and interview the same set of private households and persons over several consecutive years. In contrast to a cross-sectional survey, it supplies data on EU social dynamics i.e. it provides information on relationships and transitions over time at the micro level. The ECHP data are collected by "National Data Collection Units" which are either National Statistical Institutes (NSIs) or research centres depending on the country. For the fourth wave in 1997, the original ECHP surveys were stopped in three countries, namely Germany, Luxembourg and in the United Kingdom. In these countries, existing national panels were then used and comparable data were derived from the German and UK survey back to 1994. We use the original German ECHP from the German Central Statistical Office, because the SOEP does not include information on the sector of industry.

We only use information for individuals aged 25 at the first interview in 1994 and at most 59 in the last survey to be shure to exclude all those individuals in apprenticee programs. This choice is motivated by the fact that in some countries (Germany for instance) there is a dual system where youth are still in part-time schooling while working for an employer to become a skilled worker. Including these workers would give biased estimates for those countries offering such a possibility to their young labor market entrants. We have also excluded family workers and self-employed from our sample as well as all persons working as farmers or in agriculture.

The ECHP variable pt001 measures training incidence and pt002 measures the kind of training course. To measure training (Barron et al. 1997, give a good overview on difficulties to measure training), we opted for job-related training, excluding courses such as adult language courses or general courses taking only account of courses that were "vocational" in nature. Table 2 gives the descriptives of training incidences for Germany, Denmark, France, United Kingdom, Ireland and Spain and the share of courses that were financed by employers over the whole time period 1994 to 1999. The incidences of training range from a very low incidence of 17% in France to 77% for Denmark. There is however evidence for the French exceptionalism here, because most training activities in France seem to be of a more general nature. We thus underestimate training in France using the vocational/general distinction.

Table 3 shows the comparison between formal and informal training measuring training incidence differently. We used the ECHP questions about starting and ending of a trainnig spell with the distinction "general course" and "vocational course". For the figures in tables 2 and 3 we only recorded training spells that occured between two consecutive interviews to avoid double counting of training. As we can see, French employees get a lot more general training than vocational training. In almost all other countries, training of general type is rather an exception. The training counts are yearly for

Country	Incidence	Financed by the Employer
Germany	32%	85%
Denmark	77%	91%
France	17%	85%
United Kingdom	65%	92%
Ireland	26%	82%
Spain	32%	75%

Table 2: Vocational Training incidence of employees by country. Incidences indicate the training participation on the observation level (Person Years). In Germany, 32% of the observed Person Years had training spells between 1994 and 1999. 85% of the Training was paid for by the employer.

1996 and 1999, therefore, these figures are not comparable to the figures in table 2 with traing incidence by workers over time.

Before we analyse traing as a dependent variable, we characterize the context of the employment relationship first. We describe the relationship between skill regime and employment stability, the relation between union representation and wage dispersion, employment protection and contingent work. Next we will show how the training participation is distributed in countries and sectors of industry. As explained in the theoretical part of the paper, especially 2.1 and 2.2, one of the main reasons why employers offer permanent jobs to some of their employees is to avoid high costs from turnover. We measured the level of skill of the workforce using information from ECHP variables pe021 and pe022 respectively on the reception of formal traing and the importance of the training for the current job. We then compute odds of workers having had training on the job and importance of that training versus all others (Skill Regime). Figure 1 shows the correlation between Skill regime and the odds of permanent (or at least a 5 year contract) jobs to fixed-term contracts (Employment stability). Due to the the lag of technological development and the prevalence of fordist economies of scale productions and/or low-tech small size manufacturing, mediterranean Countries have the least skilled labor force and very few permanently employed. In Greece, one worker out of five has a permanent job and only one sixth of the employed had adequate training for their job. On the other extreme, the Netherlands and Denmark stand out as having a highly skilled labor force and almost half of the employed in permanent jobs. Most countries in continental Europe (Austria, Belgium, Germany, France) have a fair trade-off between skills and permanent employment. The poor performance of Britain is partly due to missing information on the importance of training for the current job. Concluding on these findings, there seems to be a high correlation between High-skill regimes and Employment stability.

Next, we try to find if there is a relation between Union density and

1996

	Any Training	General Education	Vocational Training	Both	N
Denmark	43.0%	4.7%	36.2%	2.2%	2827
Netherlands	10.3%	2.2%	6.5%	1.6%	4329
Belgium	13.2%	1.3%	11.4%	0.5%	2655
France	32.7%	18.2%	14.5%	–	7384
Ireland	14.9%	4.2%	10.5%	0.2%	2830
Italy	5.9%	1.2%	4.5%	0.2%	5678
Spain	11.8%	2.1%	9.3%	0.4%	4570
Austria	20.0%	6.1%	12.9%	1.0%	3291
Finland	42.0%	4.8%	36.4%	0.8%	3559
UK (BHPS)	44.3%	2.9%	41.4%	–	5076

1999

	Any Training	General Education	Vocational Training	Both	N
Denmark	44.7%	4.5%	38.5%	1.8%	2394
Netherlands	10.0%	2.0%	6.1%	1.9%	4433
Belgium	13.3%	1.2%	11.6%	0.6%	2251
France	25.5%	17.1%	8.3%	–	5952
Ireland	16.3%	6.8%	8.9%	0.6%	2333
Italy	5.0%	1.1%	3.7%	0.2%	5023
Spain	11.7%	2.2%	8.9%	0.6%	4337
Austria	19.7%	6.5%	12.5%	0.7%	2833
Finland	34.7%	5.0%	28.8%	0.9%	3408
UK (BHPS)	47.2%	4.2%	42.1%	0.8%	5226

Table 3: Training Systems: General Education (formal) versus Vocational Training (non-formal, on-the-job) by country.
Source: EU-ECHP panel waves 3 & 7.

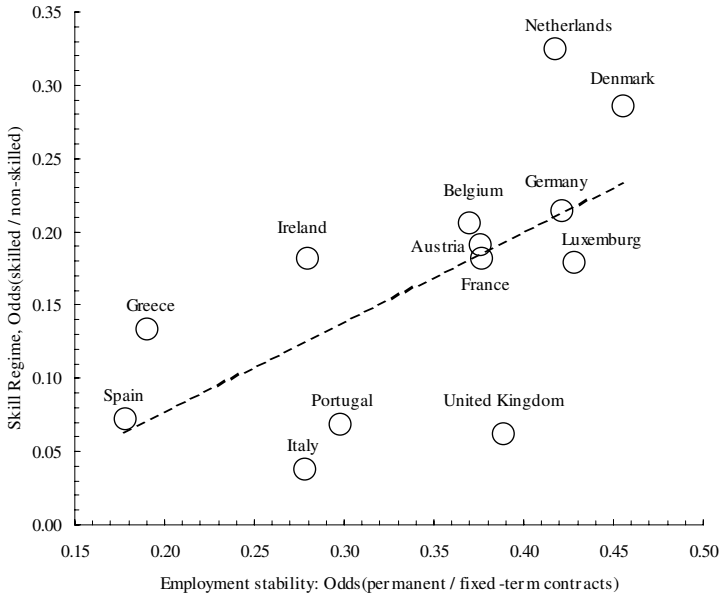

Figure 1: Relationship of Employment Contracts and Skill Investment in EU countries compared.
Source: ECHP, wave 2 (1995) variables pe021, pe022 (high skilled jobs) and pe024, pe025 (employment contracts).

wage dispersion. We have taken information from the Eurepean Social Survey (ESS) on the country and sector of industry level to compute figures of union membership of the work force. Union density is then computed as the quotient of the number of unionized workers to the number of workers in each sector by country. We matched this information to the ECHP data using country and sectors as matching variables. We also computed Median wages by country and sector and took the 5th percentile of the wage distribution as a reference for minimum wage in the sectors within countries. Wages represent hourly wages taking into account the total person income reported in (t+1)divided by the amount of time each individual has worked in the year the income was reported for(t). The wage dispersion is computed as the median wage divided by the 5th percentile among each sector for each country. Figure 2 shows the plot of Wage dispersion by Union density for the countries of our later analysis only. There seem to be much variance but nevertheless, there is a tendency that high union density corresponds to low wage dispersion. The lowest wage dispersion is found in Denmark, the country with the highest union density among sectors. France has also a very

moderate wage dispersion, although having only a very low union density (about 10% of the workforce), but as indicated in table 1 collective bargaining coverage is as high as in Finland and even higher then in Denmark. As one effect of Unions on training is wage setting and thus reducing wage spread in companies of sectors especially thru increasing minimum wage, their probably have a positive effect on training participation of low-skilled workers.

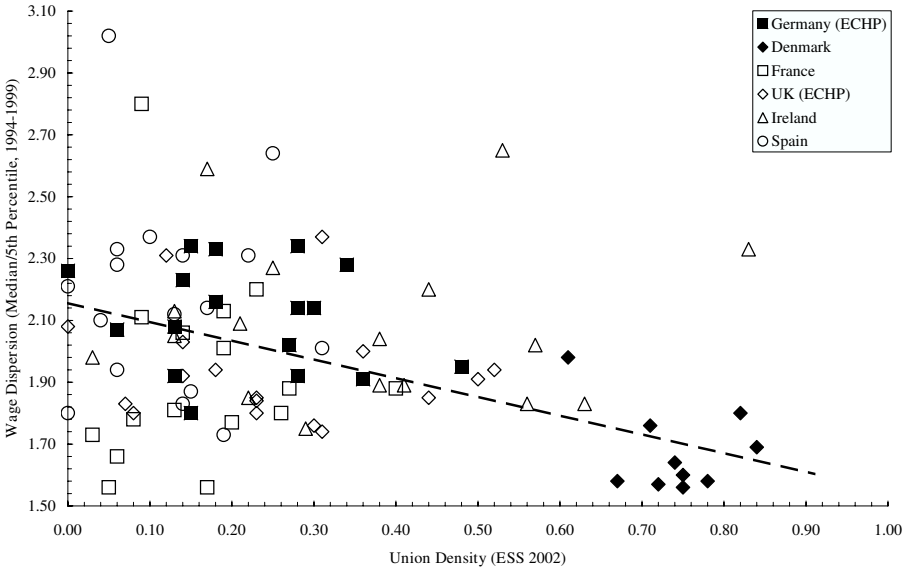

Figure 2: Union density and wage dispersion for selected EU Member countries.
Source: ECHP, wave 1 to 6 for wage information at the sectoral level and European Social Survey estimates for Union Density by country and sector of industry from 2003.

Another topic of primary concern was employment protection legislation (EPL). We plotted the OECD EPL indicator against the share of contingent worker in each country included in the ECHP. Work contingency in our definition is related to the concept of Polivka (1996), Polivka and Nardone (1989) although not measured in an objective way due to shortcommings in the data we use. Polivka and Nardone (1989, p.13f.) relate the concept of contingent work to dual labor market theory and especially the secondary labor market [1]. We use ECHP variables pe031 to pe036 which deal about satisfaction with different aspects of the current job which come close to the definition given by Polivka and Nardone (1989): Satisfaction wigh earnings, job security, type of work, work hours, times of days worked and work conditions. We computed a scale of most extreme values (1=not at all satisfied; 2=largely unsatisfied out of a scale ranging from 1 to 6) for each item

[1] The author think that contingent work and secondary labor market are distinct though very close concepts, but these differneces will not be of any importnace for our purpose.

coding the most negative response to 1 (else=0) and summing up the items to a scale ranging from a minimum of 0 to a maximum of 6. Taking into account non responses, we than procede to identify those individuals which rated at least half of the dimensions to be "largely unsatisfied" or "not at all statisfied" with. In fact, these measurment indicates workers that are rather unsatisfied with their current job because of several items rated very negatively but there is reason to think that subjectively perceived negative aspects of jobs correspond to inadequate employment situations. Figure 3 plots the EPL from the OECD against the share of "contingent workers" in each country. We see a curvilinear relation between the two dimensions with the UK as beeing the most 'flexible' economy and a rather high amount (4 to 5 %) of contingent workers on one extreme and France, Spain, Italy and Greece (5.3% ,5.2% ,6% and over 8%).

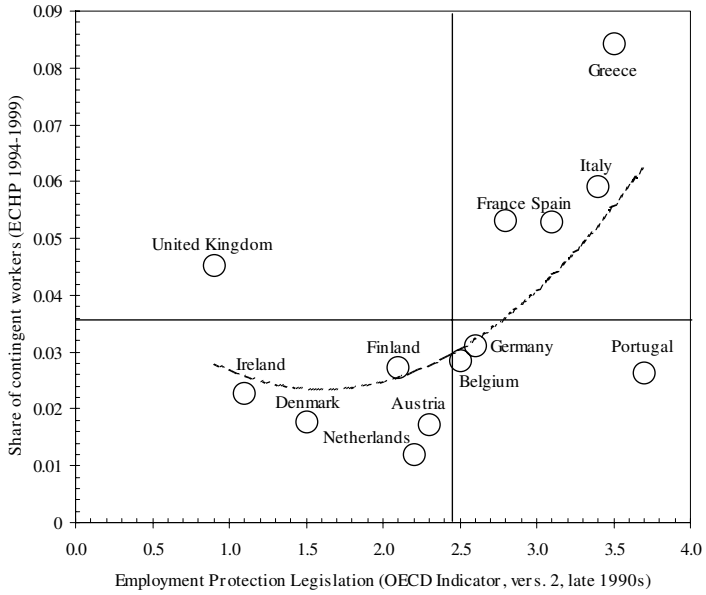

Figure 3: Employment Protection Legislation and share of contingent workers in the Labor Market.
Source: ECHP, pooled cross-sections from 1994 to 1999 variables pe031 to pe036 (extreme values indicator), OECD (2004, p.66) EPL strictness Indicator, version 2 for the late nineties.

Refering to table 3, countries with low employment protection seem be the countries with high training rates (United Kindom, Finland, Austria, Denmark) while countries with high employment protection are countries

with low training rates (Mediterranean countries, but also Belgium and the Netherlands). Countries in the upper right corner having both, a significant amount of contingent workers (a proxy for the amount of workers in "bad jobs") and high employment protection represent countries with high levels of labor market segmentation while countries in the lower left corner of the plot are more "flexible" countries with less clearcut segments. Movement of employees from one sector to the other is not hampered by labor market institutions. There is evidence from these facts, that 'sclerotic' labor markets are very unfavorable for both, upward movement of workers to accede the primary labor market and to participate in training offered by their employers and thus insiders have better access to training than outsiders. Even worth, in times of adverse economic shocks, it seems that employers – especially in countries with high EPL – substitute high (over-) qualified youth for their elderly workers.

Training participation is not only heterogenous between countries but also within countries between sectors. Figure 4 show the variability of training participation between sectors among countries and among sectors across countries.

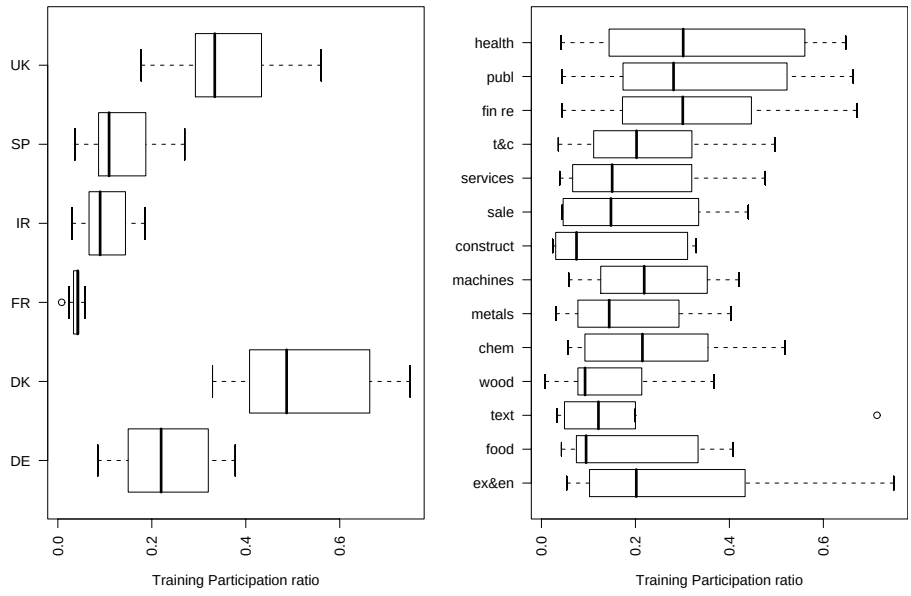

Figure 4: Training participation in sectors of industry within countries and by sectors of industry across countries.

Training participation varies between 0% and almost 70% within countries between sectors. The highest levels are discovered in Denmark and UK and the lowest levels are found in Spain, Ireland and France. Training is

not equally distributed between sectors: Health and Social Work (health), public administration (publ) and Banking, Finance and Real Estate (fin re) are the sectors with the highest training participation, followed by Machinery, Vehicles (machines), chemical industry (chem) and mining, extraction, quarrying and energy supply (ex&en). The sectors with least training incidence are food and bewerages (food), wood, paper and leather industries (wood) and construction (construct).

In the next part of the chapter, we will analyze the distinct training participation patterns of the six countries we have chosen for our study. We will show, that training participation is not random and that cetrain individual characteristics do influence training, then we will se what are the effects of different contextual factors, namingly Employment protection legislation and union density. Then we will see what are the outcomes of training in monetary terms. We will then conclude with a brief summary of our findings.

5 Training Incidence

5.1 Who gets trained?

One of the major concerns about training incidence is the non randomly assignment of participants to training. Recent findings (Arulampalam et al. 2003, Booth 1991, Brunello 2001ab, Lynch 1994) show significant evidence for the fact that training participation is most probable for a man with at least tertiary education, working in the public sector, having a skilled high-wage job, a permanent contract and working as a supervisor in a company that employs more than 100 employees. He has never experienced unemployment and his work experience is less than 10 years. Conversely, the lowest probability to get training would affect an elderly woman with less than lower secondary education, working in a low-wage job in a small sweat shop in the textile branch. She had experienced unemployment more than once and is the mother of one or more children. These findigs do not say anything about individual characteristics such as the personal motivation or ability.

In deed, one problem for the analyst is to make a distinction between observed herterogeneity and non oberveble factors like motivation, ability, social competence, usually subsumed under the term unobserved herterogeneity. Fortunately, as we are using longitudinal data with repeated observations over individuals, there is a possibility to take account of unobserved individual herterogeneity. The best way to control for unobserved heterogeneity is usually to use fixed-effects models, controling for individual characteristics. Unfortunately our main covariates are time-invariant and we cannot use fixed effects and opted for random effects models instead. We included most of the relevant variables described in the theoretical sections in our models: human capital variables such as education (ISCED 0-2, 3 and

5+) the reference group being those with only basic education (ISCED 0-2), work experience (computed as the years since the respondent has completed his highest educational level using ECHP variable pt023, 94% of the interviewed had completed their education by 26 years of age). We also control for working hours and, public service workers.

We use several dummy variables for job characteristics like overskilled (individuals responding that they have skills for a more demanding job), skilled job (using ECHP variables pe021 and pe022: respondents received fromal training for their current job and the importance of that training for the job). Further we include a dummy for permanent work contract and we also used a dummy for contingent work (see section 4). In the light of the SLM theory, we controlled for firm size and unemployment experience, defined as unemployment experience before the current job (ECHP variable pe014). Finaly, we also controled for job tenure measured as the time working for the current employer and hourly wages and dummies for sectors of industry. The models can be represented by the following formula:

$$y_{ij} = \mu + \xi_j + \beta_1 x + \epsilon_{ij}; \tag{1}$$

where i denotes the observation and j the Individual we have observations for and $\xi_j \sim N(0, \sigma_1^2)$ and $\epsilon \sim N(0, \sigma^2)$. ξ_j stands for the individual unobserved heterogeneity.

Results from logistic regressions on training participation with random effects for each country are showed in table 4 for women and table 5 for men. We find clear evidence for the human capital theory with highly significant positive effects for tertiary eduction and higher secondary education for both men and women. The only exceptions are women with higher secondary education in Ireland and men with higher secondary education in Germany. In Ireland, men with tertiary education are almost 7 times as likely to get training as adults with only basic education. All other countries show effects above 2. These findings are in line with what is expected by human capital theory. Only French men with tertiary education are 52% more likely to get traing than their low educated counterparts while French women are 94% more likely to get trained. Education though, does not play an as important role in France as in most other countries where the coefficients are higher for whomen as well as for men. The French exceptionalism points to the fact that the French training system leads to more equal distribution of traing opportunities and thus decreases the role of initial education for training selection. Another indication for this fact is the most equal distribution of training incidences between sectors of industry in France as shown in figure 4. Further, the training participation is linearly declining with work experience in each of the countries observed, a finding that also corresponds to expectations from human capital theory. Exceptions are women in Germany and Denmark (not significant) and men in Ireland (not significant). The effect of job tenure is very weak and no significance is observed.

Estimates for working hours are small but significant for women and men working in Germany and Denmark but only for women in the UK. For each additional working hour, the probability to be selected for training is increased by 2 to 3%. Coefficients for public service employees are significant for men in Denmark and France and for women in France, Spain and UK. Women working in skilled jobs are significantly more likely to get training in Denmark as well as in Ireland but not elsewhere. Only French men in skilled positions are more likely to get trained than the non-skilled, effects in all other countries being non significant. Inadequate job-skill match (overskilled) leads to a higher traing probability only in Germany and Spain for men and in France and Spain for women. This indicates that in these countries, as youth unemployment is high, employers prefer to hire those applicants with the highest grades and to train them afterwards. This finding is a confirmation of the screenign hypothesis, that 'education' is a signal for ability as well as for the presence of 'ports of entry' indicative for segemted labor markets. Employers reduce risks by engaging applicants with the highest education – counting on their learnability and increased productivity level and usability – and at the same time, they minimize costs because applicants know that they got a chance to join the primary labor market.

The nexus between high employment protection leading to an advantage of insiders is shown by the odds ratios (high and significant) for male employees in with permanent contracts in Spain and France, the two countries with high levels of employment protection. This is indicative of the segmentation of labor markets where insiders get more training than outsiders. Even though the French and Spanish employers are obliged to invest in the skills of their workers, they can decide on the nature of training and who is going to be trained on their own. Hence, they seem to prefer investments in their core workforce. Germany, where the permanently employed get less training, seems to be an exception to the case of SLM's because the German apprenticeeship system already provides the economy with well educated and trained workers and the need for training is therefore reduced afterwards. On the other side less skilled workers with fixed-term contracts seem therefore to get more training. Permanent contract for women have positive and significant effects in all countries exept in Germany where women with permanent contracts are 26% less likely to be selected for training. Again in France, women with permanent work contracts are almost 5 times as likely to be trained and Spain has an 40% increased probability for women to be selected for traing. Most strikingly, the permanent employment has absolutely no significant effect in countries with low employment protection (Ireland, United Kingdom and Denmark except for Danish women).

A contingent work situation has negative effects on the training probability for men in Denmark, Spain and the UK but not significant except for the UK. British men 'trapped' in bad jobs in the UK are 24% less likely to be trained than other workers. Contingent work is also very bad for

women in Denmark, where they have a training probability decreased by 46%. This is indicative of the fact that employers in Britain and Denmark choose who needs training. France is the only country where women in contingent work situation get significantly more training (54%). Probably an effect of the training regulations in France where every worker (fixed and permanent contracts as well as full-time and part-time workers) has a right to get trainig – under the condition, that the person works in an establishment falling under the training regulation[2]. Unfortunately, the findings for France are incomplete, because of the fact that most training in France is training outside the company, financed by a joint fund system. As we decided to measure only work-related vocational training, we do not get have clear evidence for France. Summing up, a contingent work situation only leads to significatntly less training in those countries where employment protection is very low (male workers in the UK and female workers in Denmark but in countries where trainig is regulated or prescribed by the state, the effects tend to be positive (France and Ireland). In all other countries, the evidence is not so conclusive.

[2]In France, enterprises with less than 10 employees are asked to contribute 'only' 0.25% of their personnel costs – instead of 1.5% – to continous education and training for their employees.

	DE	DK	FR	IRL	ESP	UK
Married	0.942	0.906	0.818	1.310	1.068	1.048
	(0.30)	(0.79)	(1.75)	(1.28)	(0.52)	(0.50)
Tert. Ed.	4.271**	2.716**	1.941**	2.277**	2.244**	1.964**
	(4.20)	(5.48)	(3.96)	(2.60)	(4.41)	(7.12)
Secnd. Ed.	2.735**	1.740**	1.428*	1.203	1.983**	1.540**
	(3.62)	(3.24)	(2.24)	(0.72)	(3.80)	(3.81)
Working hrs.	1.021*	1.025**	1.004	1.003	1.000	1.039**
	(2.13)	(3.34)	(0.58)	(0.33)	(0.05)	(10.81)
Public serv.	0.717	1.445	2.614**	0.751	1.437*	1.796**
	(0.69)	(1.62)	(5.33)	(0.99)	(2.07)	(4.40)
Overskilled	1.398	0.851	1.250*	1.119	1.278*	n.a.
	(1.76)	(1.44)	(2.02)	(0.71)	(2.28)	n.a.
Skilled Job	0.977	1.401**	1.203	1.429*	1.236	n.a.
	(0.13)	(3.27)	(1.61)	(2.07)	(1.76)	n.a.
Perm. contract	0.734*	1.392**	4.967**	1.418*	1.400**	1.099
	(2.14)	(3.46)	(8.44)	(2.13)	(3.15)	(1.16)
Contingent Work	0.733	0.537*	1.544*	1.159	0.884	0.846
	(0.71)	(2.12)	(2.39)	(0.37)	(0.68)	(1.53)
Firm size (<100)	0.316**	0.837	0.445**	1.163	0.724*	0.643**
	(3.41)	(0.85)	(3.66)	(0.53)	(2.04)	(4.52)
Frim size (100-499)	0.524	1.525	0.691	1.713	0.972	0.480**
	(1.65)	(1.66)	(1.44)	(1.75)	(0.15)	(4.95)
Unempl. exper.	0.797	0.782	0.977	1.257	1.026	1.016
	(0.93)	(1.86)	(0.16)	(0.96)	(0.20)	(0.09)
Work exper.	0.985	0.997	0.972**	0.968**	0.984*	0.990*
	(1.20)	(0.45)	(4.06)	(2.94)	(2.21)	(2.05)
Job Tenure	0.998	1.010	1.017	0.996	0.990	0.975*
	(0.10)	(1.09)	(1.85)	(0.22)	(0.99)	(2.42)
Hourly wages	1.000	0.994	0.999	1.001	1.001	0.996
	(0.00)	(0.96)	(0.20)	(0.31)	(0.13)	(1.94)
N	1995	4021	8374	3059	4574	7725
ID's	1099	1031	2070	853	1309	1816
ρ	0.74	0.61	0.00	0.73	0.57	0.62
Log Likelyhood	-907.47	-2405.22	-1439.98	-1052.97	-1974.10	-4151.02

Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

Table 4: Odds-ratios from logistic random-effects models of training incidence for employed women by country.
Source: ECHP waves 1 to 7 except Germany waves 1 to 3. Own calculations.

	DE	DK	FR	IRL	ESP	UK
Married	1.091	1.243	1.006	1.237	1.679**	1.170
	(0.49)	(1.83)	(0.05)	(1.13)	(3.97)	(1.64)
Tert. Ed.	2.811**	2.903**	1.529**	6.743**	2.934**	1.853**
	(3.70)	(5.92)	(2.80)	(7.18)	(8.17)	(6.42)
Secnd. Ed.	1.413	1.571**	1.340*	4.050**	1.829**	1.421**
	(1.41)	(2.79)	(2.24)	(6.58)	(4.63)	(2.76)
Working hrs.	1.022**	1.013*	1.009	1.008	0.997	1.006
	(2.71)	(2.30)	(1.33)	(1.11)	(0.57)	(1.69)
Public serv.	1.202	2.158**	4.573**	1.617	1.456*	0.860
	(0.33)	(2.92)	(8.45)	(1.93)	(2.26)	(0.90)
Overskilled	1.558*	0.855	1.038	0.990	1.214*	n.a.
	(2.41)	(1.40)	(0.36)	(0.07)	(2.28)	n.a.
Skilled Job	1.208	1.134	1.537**	0.993	1.161	n.a.
	(1.32)	(1.29)	(4.20)	(0.05)	(1.57)	n.a.
Perm. contract	0.876	1.126	4.886**	0.932	1.506**	0.987
	(1.12)	(1.31)	(9.46)	(0.51)	(4.74)	(0.16)
Contingent work	1.205	0.744	1.115	1.425	0.798	0.759**
	(0.62)	(1.14)	(0.65)	(1.24)	(1.54)	(2.83)
Firm size (<100)	0.358**	0.622**	0.515**	0.889	0.620**	0.624**
	(4.05)	(2.77)	(3.84)	(0.51)	(4.19)	(5.16)
Firm size (100-499)	0.593	1.100	0.980	1.020	0.805	0.873
	(1.93)	(0.47)	(0.11)	(0.08)	(1.57)	(1.10)
Unempl. exper.	0.562*	0.592**	0.816	1.113	0.682**	0.928
	(2.33)	(4.04)	(1.42)	(0.54)	(3.49)	(0.60)
Work exper.	0.962**	0.974**	0.965**	0.985	0.968**	0.978**
	(3.17)	(3.74)	(5.63)	(1.66)	(6.09)	(4.32)
Job tenure	1.006	1.000	1.019*	0.993	1.017*	0.980*
	(0.46)	(0.00)	(2.27)	(0.63)	(2.56)	(2.41)
Hourly wages	1.020*	1.009	0.990	0.991	1.012	1.002
	(2.08)	(1.16)	(1.39)	(1.01)	(1.91)	(0.47)
N	3111	4184	10402	4250	8774	7098
ID's	1615	1080	2425	1053	2316	1672
ρ	0.80	0.61	0.00	0.70	0.63	0.63
Log Likelyhood	-1470.52	-2586.50	-1689.86	-1444.18	-3287.54	-4278.50

Absolute value of z statistics in parentheses
significant at 5%; significant at 1%

Table 5: Odds-ratios from logistic random-effects models of training incidence for employed men by country.
Source: ECHP waves 1 to 7 except Germany waves 1 to 3. Own calculations.

The size of the company is important to predict training probability. Especially small size enterprises (<100 employees), compared to companies with more than 500 employees, are significantly less likely to be trained in almost all the countries (Denmark and especially Ireland are exeptions because of no significant effects). Employees working in small companies are about half as likely to be trained than workers in large firms. Effects for medium sized companies are not significantly different from large companies. Unemployment experience before the current job has significantly negative effects for male workers in all countries except France and Ireland leading to the conclusion that government programs and training legislation have positive effects for outsiders of the labour market. On the other side, it seems that there are no significantly negative effects for the UK either but a strong and negative effect in Spain an Germany.

Another striking fact from our findings are the low ρ values for France (0.00) and Spain (0.57) for women and comparable values 0.00 and 0.63 for men, which signifies that individual effects are rather weak, especially in France – where they are non existent. This leads to the conclusion, that unobserved heterogeneity – and thereby the effect of employers selectivity – does not play such an important role in France and Spain (esp. whomen) with the consequence, that training participation is rather equally distributed among all kinds of workers. This could indicate, that the French law on vocational training from 1971 and the Spanish bargaining arrangements and the national agreement from 1992 leads to more training equity.

5.2 Contextual Factors determining training participation

To investigate our hypotheseses about institutional contexts, we use a collapsed file taking only account of the core effects discovered in the random effects models. The model used is best described as follows:

$$y_{ij} = \eta_{0j} + \beta_1 x_{ij} + \epsilon_{ij}; \tag{2}$$

where

$$\eta_{0j} = \gamma_{00} + \gamma_{01}\omega_j + \zeta_j^{(2)}. \tag{3}$$

In this model for y_{ij}, x_{ij} is a vector off covariates with 'fixed' regression coefficients β_1 for level 1 and η_{0j} is a random intercept with mean γ_{00} and γ_{01} coefficients on level two covariates ω_j (union density and EPL) with residuals $\zeta_j^{(2)}$ on level 2 (clusters: sectors of industry nested within (/%/) countries). We opted to include only one level because of the restricted number of countries available for our analysis. For the reduced form equation we obtain:

$$y_{ij} = \gamma_{00} + \gamma_{01}\omega_j + \zeta_{0j} + \beta_1 x_{ij} + \epsilon_{ij}; \tag{4}$$

We begin with an empty model including only a constant for the fixed effects and a random intercept for the cluster of sectors of industry within countries.

After dropping the constant, the random intercept is more than doubled and highly significant, giving evidence for the importance of unobserved heterogeneity on the cluster level. Model 2 also introduces covariates at the higher level suseptible to explain variation on level 1. Union density has a strong and positive impact on training paticipation while employment protection has significantly negative impact.

Taking into account the typical human capital covariates (education and work experience) included in the fixed part of the model, the effects for union density are somewhat diminished while the effect for employment protection is more or less unchanged, giving evidence that the positive effects of union density is partly explained by microlevel factors of the HC covariates. Model 4 includes the covariates for work context, job quality ranging from -1 for contingent work or skill mismatch with fixed contracts ("bad jobs"), 0 for non skilled jobs with either fixed term contracts or not ("regular employment") and 1 for high skilled jobs with at least 5 year work contracts ("good jobs"), small firms (<100 employees) and a measure for job quit the same year as the training took place. Job quality correlates positively with training participation, small firms decrease training incidence and the job change has a positive effect on training. The latter effect can be explained by the presence of introductory training to the new job. When controlling for job quality, the effect of education on training incidence is dropping while the effect of work experience increases. So part of the educational effect is explained by the quality of work. Model 4 also adds somethin new to the explanation as the log-likelihood changed significantly. The effect of secondary education is reduced by almost 2.4% while the effect for basic education is even reduced by 3.2% compared to employees having tertiary education completed. The effect of work experience however increases when controlling for work quality, firm size and job quit. Meaning, that if all other factors in the model are controled for, the net negative effect of every year in the labor market increases by 1.7% for those with labor market experience of 15 to 25 years and 1.6% for those with labor market experience over 25 years. On the macro level, union impact has decreased and the effect of employment protection reached a maximum for the models considered. We interpret these findings as evidence in favor of the positive but decreasing impact once controlling for individual characteristics of labor unions and the increased negative effect of employment protection legislation, leading to segmented and sclerotic labor markets hindering training participation of those in the secondary labor market.

	Mod 1	Mod 2	Mod 3	Mod 4
fixed effects				
Tertiary Ed.			ref.	ref.
Secondary			0.698**	0.722**
			(0.025)	(0.026)
Basic Ed.			0.428**	0.460**
			(0.017)	(0.018)
Exp. <15 yrs.			ref.	ref.
Exp. 15−25 yrs.			0.874**	0.857**
			(0.028)	(0.028)
Exp. >25 yrs.			0.718**	0.702**
			(0.028)	(0.027)
Job quality				1.311**
				(0.04)
Small firms				0.726**
				(0.023)
Job quit				1.140*
				(0.059)
Constant	−1.804**	(dropped)		
	(0.027)			
random effects				
variance at level 2				
$\sigma^2_{(sectors\ within\ countries)}$	0.386	0.866	0.740	0.781
	(0.014)	(0.142)	(0.123)	(0.13)
Random coefficients				
constant		−1.618	−1.102	−1.044
		(0.104)	(0.100)	(0.103)
Union density		2.692	2.568	2.460
		(0.504)	(0.468)	(0.481)
EPL		−0.290	−0.294	−0.337
		(0.146)	(0.135)	(0.139)
Observations	40548	40548	39976	39976
Loglikelihood	−16939.7	−16841.25	−16320.28	−16208.45

Standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 6: Models using aggregate data of all countries with random effects and mixed effectsmodels of observations within industry sectors and countries. Fixed Effects are given in exponential form while random effects are β-coefficients

6 Training Outcomes

6.1 Monetary Effects of Training Participation

When measuring the impact of training on earnings, there is always the risk that selection bias might alter the results. Individuals with more productive characteristics (such as motivation) might be more likely to receive training while at the same time being more likely to experience higher wage progression in the absence of training. To eliminate selection bias and estimate the causal effect of vocational training participation on workers' earnings, we estimate average treatment effects based on propensity scores. We use the nearest neighbourhood estimator to adjust for background differences between trained and non-trained workers.

The longitudinal design of the ECHP[3] allows us to control for (observed) pre-training differences between those workers experiencing training and those who do not experience training within a given time period (t). The following variables are included in the probit model estimating the propensity score (i.e. likelihood of a training spell in survey year t): age, age squared, education, sex, sector (public/private), tenure, tenure squared, log real hourly wages (deflated to 2000 national currency units), occupation at $t-1$ as well as a variable measuring whether the respondent experienced any unemployment during the five years prior to joining the survey. We only count training spells that have started and finished during survey year t and we distinguish between all continuing vocational training and employer-provided vocational training [4]. Our sample consists of individuals between the ages of 25 and 54 who were working at least 15 hours a week and who were not self-employed, observed in at least three consecutive waves (pre-treatment measures $t-1$, training incidence t, training outcome $t+1$), with valid observations on all the variables used in the estimation of the average treatment effect of training. By also including previous earnings, we are able to (at least to some degree) achieve matches on unobserved covariates. The analyses exclude apprentices and those on special employment-related schemes. The analysis is conditioned on workers who were not in training during $t-1$ in order to receive conservative estimates of the causal effect of the training spell in

[3] We use data from the first seven waves of the ECHP. We use six waves for Austria and five for Finland as they joined the survey after 1994. The analyses for Germany are constrained to the first three waves as we had to use the data from the original three-wave ECHP data set. The GSOEP-based ECHP which would cover all seven waves excludes many shorter training spells.

[4] It would have also been interesting to differentiate between on and off-site training. The ECHP contains a variable which allows to differentiate between off- (general) and on-site (specific) vocational training. This information, however, is missing for a number of countries we are analysing. For other countries there exists no category for on-site training. Given the problems with the variable distinguishing between on-site and off-site training, we chose to differentiate between the effects of all vocational training, and employer-provided training instead.

question. [5]

The dependent variable in our analysis is the log real hourly earnings at $t + 1$. As has already been mentioned in the introduction, the effect of training on wages is still very much debated. Depending on the econometric techniques employed and the data used, research has suggested very different conclusions concerning the financial returns to the training investment. When techniques that effectively account for selection bias were applied, wage returns to continuing training have often been found to be insignificant (cf. Bassanini 2005). Some work, however, has identified significant effects for training even after selectivity has been controlled for: amongst them Fougere et al 2001 who find significant returns to training for job-switchers in France as well as Arulampalam and Booth 2001 who find for the UK that wage growth is positively affected by training.

Before turning to our estimations of the average treatment effects, however, we present simple OLS estimates of the training effect. Lagged values of the time-varying covariates have been recorded into the data. Only individuals who started and finished training in the previous years are considered to have received training to prevent double-counting of training events. In line with previous research (Bassanini 2005), the OLS estimates shown in table 7 suggest significant returns to vocational training in all our six countries. Interestingly, though, the OLS analyses which exclusively assess employer-provided vocational training suggest that such training does not lead to significant returns in Finland and the UK. The coefficients do not reveal systematic patterns across country clusters, which is somewhat against what we had expected. Finally, it is noteworthy that the analyses suggest that returns to training are substantially higher in all countries if training is employer-provided. This gradient seems to be least pronounced in Germany. Arguably, this could be explained by the fact that Germany (together with Finland) is the only country in our study where occupational labour markets prevail.

In a next step we present separate analyses for men and women. In view of previous research, it seems likely that we find gender inequality in returns to training. Previous research suggested men have better promotion opportunities than women with similar qualifications (e.g. Granqist and Persson: 1999; Winter-Elmer and Zweimuller: 1997). Booth et al. (2003), on the other hand, have shown British women have the same odds to be promoted as men, but that they are more likely to be "stuck" at the bottom of the wage scale of the new grade. We may therefore find that women who receive training may be rewarded less than their male counterparts.

Our data suggests that indeed in some of our countries male workers' training investments receive greater financial rewards than that of their fe-

[5] The downside of this strategy is of course that in some cases we lose workers with very frequent training incidences.

country	Vocational Training	Employer provided Vocational Training
Germany	0.069 ***	0.075 ***
Finland	0.005 n.s.	0.008 n.s.
France	0.019 **	0.051 ***
Spain	0.042 **	0.065 ***
UK	0.046 ***	0.01 n.s.
Ireland	0.086 ***	0.121 ***

Table 7: OLS Estimates of Returns to Vocational Training Vocational Training Employer-provided Vocational Training.
Note: Each regression includes age, age squared, tenure, tenure squared, occupation, sex, a variable measuring previous unemployment, sector (public/private), as well as a dichotomous variable measuring whether the respondent worked full-time or part-time.
Significance levels: (*) <.1, *<.05, **<.01, ***<.001.
Source: European Community Household Panel, UDB waves 1-7.

	Vocational Training		Employer-provided Vocational Training	
country	MEN	WOMEN	MEN	WOMEN
Germany	0.055 **	0.085 ***	0.059 **	0.093 ***
Finland	0.012 n.s.	-0.005 n.s.	0.013 n.s	-0.001 n.s.
France	0.049 ***	-0.023 n.s.	0.071 ***	0.017 n.s.
Spain	0.094 **	0.032 (*)	0.071 ***	0.052 *
UK	0.056 ***	0.023 ***	0.017 n.s.	0.018 n.s.
Ireland	0.094 ***	0.059 n.s.	0.148 ***	0.062 n.s.

Table 8: OLS Estimates of Returns to Vocational Training for MEN and WOMEN
Note: Each regression includes age, age squared, tenure, tenure squared, occupation, sex, a variable measuring previous unemployment, sector (public/private), as well as a dichotomous variable measuring whether the respondent worked full-time or part-time.
Significance levels: (*) <.1, *<.05, **<.01, ***<.001.
Source: European Community Household Panel, UDB waves 1-7.

male counterparts (cf. table 8). In line with our predictions we find particularly notable gender gaps in the Mediterranean countries, in France somewhat more so than in Spain. The Irish data also suggests a substantial gender difference. This result should be interpreted with some caution, however, given that number of women receiving training is rather low (80 in the case of vocational training; and even less than 80 in the case of employer-funded training). The UK data suggests a gender gap in returns to training, though far less pronounced than in the case of France and Spain. Interestingly, we find that in Germany female training investment seems to be more highly rewarded than that of male workers.

As discussed earlier, the OLS estimates of returns to training may be biased as they do not account for potential selectivity. Table 9 shows the average treatment effects of training based on propensity scores. We find that only in one of our six countries vocational training has a marginally signifi-

	ATE of continuing vocational training on workers' wage level (measured at $t+1$)	ATE of *employer provided* continuing vocational training on workers' wage level (measured at $t+1$)
Germany	-.000 n.s.	.042 n.s.
Finland	-.001 n.s.	-.013 n.s.
France	-.007 n.s.	.040 n.s.
Spain	.049 (*)	.037 n.s
United Kingdom	.004 n.s.	.020 n.s.
Ireland	.037 n.s.	-.014 n.s.

Table 9: Average Treatment Effects – training experience and workers' Wage level (measured at $t+1$)
Notes: workers aged 25-54. The estimates are based on nearest neighbourhood matching of trained and non-trained workers (using a caliper of .001); (*)<.1, *<.05, **<.01, ***<.001. The following variables are included in the probit model estimating the propensity score (i.e. likelihood of a training spell in survey year (t): age, age squared, education, sex, sector (public/private), tenure, tenure squared, log real hourly wage, occupation at $t-1$ as well as a variable measuring whether the respondent experienced any unemployment during the five years before joining the survey. Number of matched treated (T) and controls (C) in each country: Vocational Training: Germany – T:217, C:194; Finland – T: 316, C:306; France – T:677; C: 613; Spain – T: 604, C: 565; UK – T: 1586, C: 1235; Ireland – T: 102; C:96. Employer-provided Vocational Training: Germany – T:202, C:181; Finland – T: 290, C:265; France – T:621; C: 574; Spain – T:504, C:482,: UK – T: 1009, C: 830; Ireland – T: 92; C:88).

cant effect on workers' wage levels: in Spain a worker with a recent continuing training investment has a wage that is five per cent higher than that of an otherwise very similar worker who did not receive training. This effect is only significant when all continuing training is measured. In the analyses that assess the impact of training which has been employer-provided the coefficient is not significant anymore. Note that when we conducted separate analyses (which are not presented here) for men and women to assess the average treatment effect of training, we found that male German worker's wages are significantly and positively affected by training participation. Apart from this exception, all training effects in the separate analyses came out insignificant, too. Even though, these results are somewhat disappointing, they are in line with some previous work that has found that wage returns to training often become negligible or non-significant when potential selectivity is taken into account (e.g. Goux and Maurin: 2000 for France, Pischke: 2001 for Germany, Leuven and Oosterbeek 2000 for Norway).

7 Conclusion

In this chapter we have sought to explore the determinants and impact of vocational training among employed workers. We have focussed mainly on six European countries and have taken advantage of the differences within

and between these countries to examine the influence of labour market institutions on training.

In the context of an virtually universal pattern across all advanced societies in which those who are already well-endowed with human capital, and those in privileged employment situations, are likely to receive more training, we argue that institutional factors in the labour market may play a role in shaping the extent of the training gap between the low and the high skilled, and between different segments of the labour market. Important institutions in this regard include union density, wage compression, the strength of employment protection legislation, and coordinated versus liberal labour market regimes.

We base our analyses on the European Community Household Panel Survey which provides longitudinal data from 1994 to 2001. The data show considerable variation between countries in the incidence of training: from a low if 17% per person year in France to a high of 77% in Denmark.

Our results from logistic regression on training participation shows clear evidence in support of the human capital approach, with positive effects of education at both secondary and tertiary levels in most countries and for both men and women. We also find evidence for the importance of institutions: in France and Spain, both of which have high levels of employment protection, those with permanent contracts are more likely to participate in training - this effect is particularly marked among women. Firm size is also important: employees in larger firms are significantly more likely to participate in training. In most countries, public servants are also more likely to receive training.

Moving to a multi-level modelling strategy, in which national differences are subsumed by institutional characteristics, entails an attempt to increase the level of generalisability of our findings. These models show that union density, at the sectoral level is associated with increased training incidence. On the other hand, employment protection at the national level rather mitigares training and becomes very significant when adding other covariates at the observation level. Adding individual characteristics to these models reduces the estimated effects of human capital variables, such as education, suggesting that we need to take account of both human capital as well as institutional variation in order to understand the distribution of training opportunities. In particular, we found that union density has a positive effect on training.

We also conducted a careful analysis of the impact of training on subsequent wages. When we controlled for a range of variables expected to affect wages we found that both vocational training does have a positive effect on wages in France, Germany, Ireland, Spain, and the United Kingdom, but not in Finland. In those countries where training does have such positive effect, the wage-returns are higher in respect of employer-provided training than other training, except in the UK, where the impact of employer-provided

training is not statistically significant. We also found, as anticipated, that the returns to training are generally lower for women than men, although not in Germany.

However, these findings on the impact of training come with an important caveat. The results hold only if we ignore the important issue of selection. When we correct for unobserved variables that could simultaneously affect training and wages, using a propensity score matching approach, we discover that these effects are reduced to non-significance in all countries with the exception of vocational training in Spain. These findings have important implications for those promoting the life-long learning agenda, and it should be noted that they are consistent with the findings of other rigorous analyses of the impact of training in Europe.

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