

**D**ANISH **R**ESearch **U**NIT FOR **I**NDUSTRIAL **D**YNAMICS

DRUID Working Paper No 04-04

**Organisational Change in Europe:  
National Models or the Diffusion  
of a New “One Best Way”?**

by

Edward Lorenz and Antoine Valeyre

# Organisational Change in Europe: National Models or the Diffusion of a New “One Best Way”?

**Edward Lorenz**

University of Nice Sophia Antipolis  
[Lorenz@idefi.cnrs.fr](mailto:Lorenz@idefi.cnrs.fr)

And

**Antoine Valeyre**

Centre d'Etudes de l'Emploi  
[Valeyre@mail.enpc.fr](mailto:Valeyre@mail.enpc.fr)

Paper prepared for the 15<sup>th</sup> Annual Meeting on Socio-Economics  
LEST, Aix-en-Provence, June 26-28, 2003

## **Abstract:**

Drawing on the results of the third European Survey on Working Conditions undertaken in the 15 member nations of the European Union in 2000, this paper offers one of the first systematic comparisons of the adoption of new organisation forms across Europe. The paper is divided into five sections. The first describe the variables used to characterise work organisation in the 15 countries of the European Union and presents the results of the factor analysis and hierarchical clustering used to construct a 4-way typology of organisational forms, labelled the ‘learning’, ‘lean’, ‘taylorist’ and ‘traditional’ forms. The second section examines how the relative importance of the different organisational forms varies according to sector, firm size, occupational category, and certain demographic characteristics of the survey population. The third section makes use of multinomial logit analysis to assess the importance of national effects in the adoption of the different organisational forms. The results demonstrate significant international differences in the adoption of organisational forms characterised by strong learning dynamics and high problem-solving activity. The fourth section takes up the issue of HRM complementarities by examining the relation between organisation forms and the use of particular pay and training policies. The concluding section explores the relation between national differences in the use of the four organisational forms and differences in the way labour markets are regulated and in such research and technology measures as patenting and R&D expenditures. The results show that the relative importance of the learning form of organisation is both positively correlated with the extent of labour market regulation, as measured by the OECD’s overall employment protection legislation index, and with innovative performance, as measured by the number of EPO patent application per million inhabitants.

**Key words:** Firm organisation, Learning, Europe

**JEL Codes:** L23, O33

**ISBN 87-7873-154-2**

**Acknowledgement:**

We would like to express our gratitude to the European Foundation for the Improvement of Living and Working Conditions for allowing us to use the results of the Third European Working Conditions Survey. We also would like to thank the DARES, Ministry of Employment, France for providing financial support for the research upon which this paper is based.

## ***Introduction***

There is an on-going international debate over the way globalisation and intensified international competition are leading to a restructuring of management practices in Europe in order to achieve greater flexibility and cooperation at the workplace. A key focus in this debate has been on the diffusion of the 'lean' or 'high performance' model, which is often presented as a new 'one best way' destined to replace fordism which emerged as the dominant organisational paradigm in the decades after the Second World War. (See, Womack, John and Roos, 1990; MacDuffie and Pil, 1997, Osterman, 1994). For example, MacDuffie and Pil (1997, p. 24-25), in their international comparison of the auto industry, argue that intensified international competition associated with the globalisation of product markets has resulted in greater awareness on the part of manufacturers of the performance-related advantages of lean production relative to fordist techniques. Foreign direct investments and international joint ventures work in the same direction, by providing producers with greater insight into the operating principles of the lean model.

The diffusion of the lean model is often seen as one aspect of a more general convergence in industrial relations systems among advanced industrialised nations (Eaton, 2000). As Thelen (2001, pp. 75-77) has observed, the globalisation literature, implicitly or explicitly, sees the observed trend towards greater decentralisation of bargaining as a general weakening of labour, because it undermines unions' ability to enforce uniform standards. Decentralisation is understood as being driven by employers' uniform interest in withdrawing from the collective regulation of labour markets in order to secure the conditions necessary for achieving greater flexibility at the plant level. Thus flexibility at the plant level and higher-level coordination are seen in zero-sum terms.

Of course sophisticated proponents of the convergence thesis recognise that lean production, much as the fordist model it is thought to be replacing, will not display identical features in all the enterprises that adopt it. The impact of local institutional conditions on enterprise HRM policies, especially in the areas of training and representation, as well as differences in individual managerial style, inevitably result in a variety of hybrid arrangements.<sup>1</sup>

In this paper we provide evidence on the diversity of organisational forms to be found in the 15 member nations of the European Union. One way of reading the evidence we present on

---

<sup>1</sup> For a discussion of the literature on the hybridisation of Japanese management practices in the west, see Doeringer, Lorenz and Terkla, 2002)

organisational diversity is that hybridisation is a pervasive phenomenon across European nations. The hybridisation thesis may be overly simple, though, if it is to be understood as saying that all the observed organisational variety has resulted from the way employers, in their efforts to transcend the fordist paradigm, have modified the operating principles of the lean model in response to the requirements of the local institutional context. An alternative reading would be that a significant part of the variety across Europe has resulted from way employers have built on local traditions in work organisation that offer alternative routes forward to achieving flexibility and cooperation at the workplace. For example, the forms of autonomy in work that our evidence shows to be especially characteristic of the Nordic countries and the Netherlands would appear to have more in common with the socio-technical principles of participatory work organisation, developed notably in Sweden in the 1970s and 1980s, than with the Japanese principles of lean production.

A definitive answer to this question clearly goes beyond the scope of this study, since it would require detailed historical evidence on the processes of diffusion and institutional borrowing that have resulted in contemporary organisational practice. Nonetheless, our evidence does clearly demonstrate that the dichotomous distinction between taylorism and lean production is inadequate for capturing the organisational variety that exists across European nations. First, our evidence shows that the organisational forms associated with strong learning dynamics and high problem-solving activity on the part of employees display widely different degrees of employee autonomy in decision making. Much in keeping with the remarks of Applebaum and Batt (1994), our evidence points to the existence of two models with these organisational characteristics: a relatively decentralised model corresponding to the Swedish socio-technical principles (what we call the ‘learning’ model), and a more hierarchical model which places emphasis on regulating individual or group work pace by setting tight quantitative production norms and precise quality standards (referred to as the ‘lean’ model).

Secondly, our evidence indicates that on-line teams and job rotation are highly imperfect measures for building an index of the adoption of the lean or high performance work system. While these practices are characteristic of lean production, they may also be found in traditional taylorist organisational settings, where problem-solving activity is virtually absent and learning dynamics are relatively slow. Our evidence does indicate, though, that decentralising the responsibility for quality control is a defining characteristic of the lean production model.

Thirdly, a significant percentage of employees in Europe work in conditions that cannot be adequately captured or characterised by any of the three basic models we have identified. This residual category presumably covers craft and other traditional forms of work organisation.

The discussion that follows is divided into five sections. In the first section we describe the variables used to characterise work organisation in the 15 countries of the European Union and we present the results of the factor analysis and hierarchical clustering used to construct a typology of organisational forms. The second section examines how the relative importance of the different organisational forms varies according to sector, firm size, occupational category, and certain demographic characteristics of the survey population. The third section makes use of multinomial logit analysis to assess the importance of national effects in the adoption of the different organisational forms. The fourth section takes up the issue of HRM complementarities by examining the relation between organisation forms and the use of particular pay and training policies. The concluding section considers to what extent the observed difference in organisational forms across European nations may be associated with differences in the way labour markets are regulated and in such research and technology measures as patenting and R&D expenditures.

### ***1. Measuring forms of work organisation in the European Union***

The research is based on the results of the third European survey on Working Conditions undertaken by the European Foundation for the Improvement of Living and Working Conditions<sup>2</sup>. The survey was carried out in each of the 15 member States of the European Union in March 2000. The survey questionnaire was directed to approximately 1500 active persons in each country with the exception of Luxembourg with only 500 respondents. The total survey population is 21703 persons, of which 17910 are salaried employees. The survey methodology is based on a multi-stage random sampling method called ‘random walk’ involving face-to-face interviews undertaken at the respondent’s principal residence. The analysis of forms of work organisation developed here is based on the responses of the 8081 salaried employees working in establishments with at least 10 persons in both industry and services, but excluding agriculture and fishing; public administration and social security; education; health and social work; and private domestic employees.

---

<sup>2</sup> The initial findings of the survey are presented in a European Foundation report by D. Merllié and P. Paoli [2001].

In order to describe the principal forms of work organisation across the 15 nations of the European Union, a factor analysis and hierarchical clustering method<sup>3</sup> have been used on the basis of the following 15 organisational variables<sup>4</sup>.

- a binary variable measuring the use of team work<sup>5</sup> (team)
- a binary variable measuring job rotation<sup>6</sup> (rot)
- two binary variables measuring autonomy in work: autonomy in the methods used (autm) and autonomy in the pace or rate at which work is carried out (autp).
- four binary variables measuring the factors or constraints which determine the pace or rate of work: ‘automatic’ constraints linked to the rate as which equipment is operated or a product is displaced in the production flow (caut); norm-based constraints linked to the setting of quantitative production norms (cnorm); ‘hierarchical’ constraints linked to the direct control which is exercised by ones immediate superiors (chier); and ‘horizontal’ constraints linked to way one person’s work rate is dependent on the work of his or her colleagues (chor);
- a binary variable measuring repetitiveness of tasks<sup>7</sup> (rep);
- a binary variable measuring the perceived task monotony (mono);
- two binary variables measuring the way quality is controlled: (qn) which corresponds to the use of precise quality norms; and (qc) which corresponds to individual responsibility for the control of quality;
- a binary variable measuring the complexity of tasks (cmplx);
- and two binary variables measuring learning dynamics in work: (learn) which corresponds to whether the individual learns new things in his or her work; and (pbsolv) which corresponds to whether the work requires problem-solving activity.

---

<sup>3</sup> The factor analysis method used here is multiple correspondence analysis, which is especially suitable for the analysis of categorical variables. Unlike principal components analysis where the total variance is decomposed along the principal factors or components, in multiple correspondence analysis the total variation of the data matrix is measured by the usual chi-squared statistic for row-column independence, and it is the chi-squared statistic which is decomposed along the principal factors. It is common to refer to the percentage of the ‘inertia’ accounted for by a factor. Inertia is defined as the value of the chi-squared statistic of the original data matrix divided by the grand total of the number of observations. See Benzecri, J.P. (1973); Greenacre (1993, pp. 24-31).

<sup>4</sup> Certain of the organisational variables produced by the survey have not been included in the statistical analysis. For example, the cooperative nature of work which is measured by a question concerning whether one rely on colleagues for assistance in work has been left out of the analysis because it basically distinguishes between employees working in isolation from those that do not. The question on whether the employee exercises autonomy in the order that his or her work is carried out has been excluded because it is highly correlated with the other questions focusing on the issue of autonomy.

<sup>5</sup> Team work is measured by the following question: “Does your job involve, or not, doing all or part of your work in a team?”

<sup>6</sup> This question does not allow an assessment of the skill requirements of the job rotation involved, which vary considerably as our discussion will show.

<sup>7</sup> The variable is coded ‘yes’ if the repeated task requires less than a minute to accomplish and ‘no’ otherwise.

### *1.1 The mains dimensions of work organisation*

As figure 1 below presents graphically the first two axes or factors of the multiple correspondence analysis (MCA). The first factor, accounting for 18% of the inertia or chi-squared statistic, distinguishes between taylorist and ‘post-taylorist’ organisational forms. Thus on one side of the axis we find the variables measuring autonomy, learning, problem-solving and task complexity and to a lesser degree quality management, while on the other side we find the variables measuring monotony and the various factors constraining work pace, notably those linked to the automatic speed of equipment or flow of products, and to the use of quantitative production norms. The second axis, accounting for 15% of the chi-squared statistic, is structured by two groups of variables characteristic of the lean production model: first, the use of teams and job rotation which are associated with the importance of horizontal constraints on work pace; and secondly those variables measuring the use of quality management techniques which are associated with what we have called ‘automatic’ and ‘norm-based’ constraints. The third factor, which accounts for 8 percent of the chi-squared statistic, is also structured by these two groups of variables. However, it brings into relief the distinction between on the one hand those organisational setting characterised by team work, job rotation and horizontal interdependence in work, and on the other hand those organisational settings where the use of quality norms, automatic and quantitative norm-based constraints on work pace are important. The second and third axes of the analysis demonstrate that the simple dichotomy between taylorist and lean organisational methods is not sufficient for capturing the organisational variety that exists across European nations.

### *1.2 A typology of organisational forms*

The various distinctions brought out by the MCA can for the most part be observed in the results of the hierarchical cluster analysis that has been carried out on the factor scores of all 15 factors resulting from the MCA. The cluster analysis results in a grouping of individuals into three basic organisational forms plus a residual category which is poorly described by the organisational variables used in the analysis and which presumably groups craft or traditional forms of work organisation:

- ‘learning’ forms of work organisation;
- ‘lean’ forms of work organisation;
- ‘taylorist’ forms of work organisation;
- and ‘traditional’ forms of work organisation

As Table 1 below shows, the four clusters or classes can be differentiated by the variables which contributed the most to the structure of the first two axes of the MCA: firstly, the variables

measuring work autonomy, learning, problem-solving and task complexity which can be opposed to those measuring the importance of constraints on work rhythm; secondly the importance of teams, job rotation and quality management.

The first cluster, which we refer to as the ‘learning’ model groups 39 percent of the employees. It is characterised by the over-representation of the variables measuring autonomy and task complexity, learning and problem-solving and to a lesser degree by an overrepresentation of the variable measuring individual responsibility for quality management. The variables reflecting monotony, repetitiveness and work rate constraints are under-represented. This cluster would appear to correspond to the Swedish socio-technical model of work organisation or to what Freyssenet (1995) has referred to as ‘reflexive production’. It would also appear to have much in common with what Applebaum and Batt in their 1994 volume referred to as the ‘American team production’ model which combines the Swedish socio-technical principles with a contemporary emphasis on individual responsibility for quality control. A somewhat surprising result, though, is that neither team work nor job rotation are defining characteristics of this model of work organisation, suggesting that the emphasis on the importance of these practices as a condition for promoting learning and problem-solving on the part of employees is probably exaggerated in the literature.

**Table 1**  
**Work Organisation Clusters**

	(percent of employees in each cluster)				
	Learning organisation	Lean production	Taylorism	Traditional organisation	All
Autonomy fixing work methods	89,1	51,8	17,7	46,5	61,7
Autonomy setting work rate	87,5	52,2	27,3	52,7	63,6
Learning new things in work	93,9	81,7	42,0	29,7	71,4
Problem solving activities	95,4	98,0	5,7	68,7	79,3
Complexity of tasks	79,8	64,7	23,8	19,2	56,7
Responsibility for quality control	86,4	88,7	46,7	38,9	72,6
Quality norms	78,1	94,0	81,1	36,1	74,4
Team work	64,3	84,2	70,1	33,4	64,2
Job rotation	44,0	70,5	53,2	27,5	48,9
Monotony of tasks	19,5	65,8	65,6	43,9	42,4
Repetitiveness of tasks	12,8	41,9	37,1	19,2	24,9
Horizontal constraints on work rate	43,6	80,3	66,1	27,8	53,1
Hierarchical constraints on work rate	19,6	64,4	66,5	26,7	38,9
Norm-based constraints on work rate	21,2	75,5	56,3	14,7	38,7
Automatic constraints on work rate	5,4	59,8	56,9	7,2	26,7

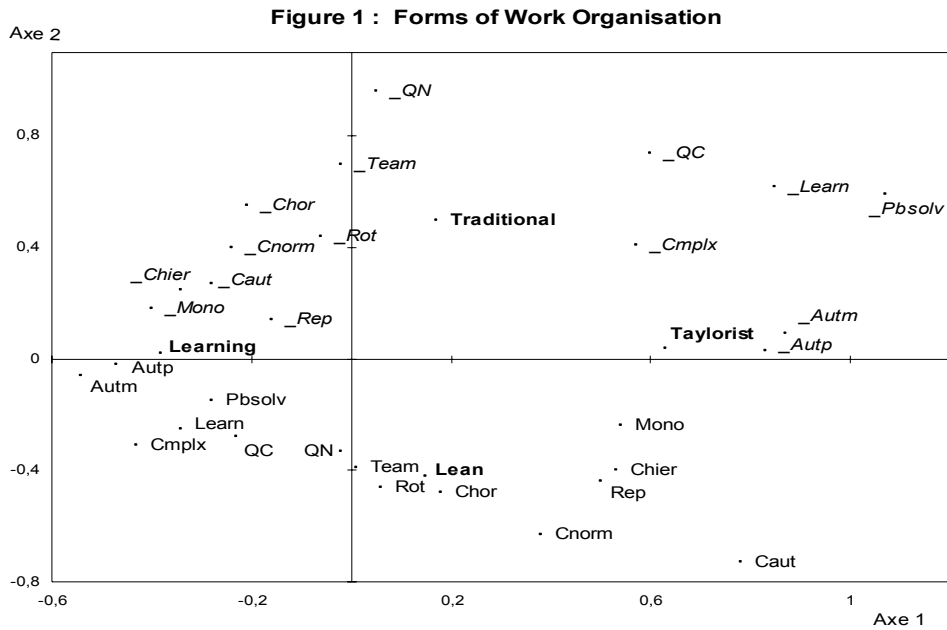
Source: Third Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

The second cluster, which accounts for 28 percent of the population, is characterised by an overrepresentation of team work and job rotation, the quality management variables and the various factors constraining work pace. This cluster, like the first, displays strong learning dynamics and relies on employees' contribution to problem-solving. Yet, compared to the first cluster autonomy in work is relatively low and tight quantitative production norms are used to control employee effort. One easily recognises here the classic attributes of the 'lean' or 'high performance work' model (MacDuffie and Krafcik, 1992; Womack et al. 1990). Compared to classic forms of taylorism autonomy in work is relatively high. However worker autonomy is bracketed by the importance of work pace constraints linked to the collective nature of the work and to the requirement of respecting strict quantitative production norms. This class has much in common with what Coutrot (1998) has described as a 'controlled' autonomy in work.

The third class, which groups 14 percent of the employees, corresponds in most respects to a classic characterisation of taylorism. The work situation is in most respects the opposite of that found in first cluster, with minimal learning dynamics, low complexity, low autonomy and an overrepresentation of the variables measuring constraints on the pace of work. Interestingly, teams and job rotation are somewhat overrepresented in this cluster, confirming the importance of what some authors refer to as 'flexible taylorism' (Boyer and Durand, 1993; Cézard, Dussert and Gollac, 1992; Linhart, 1994).

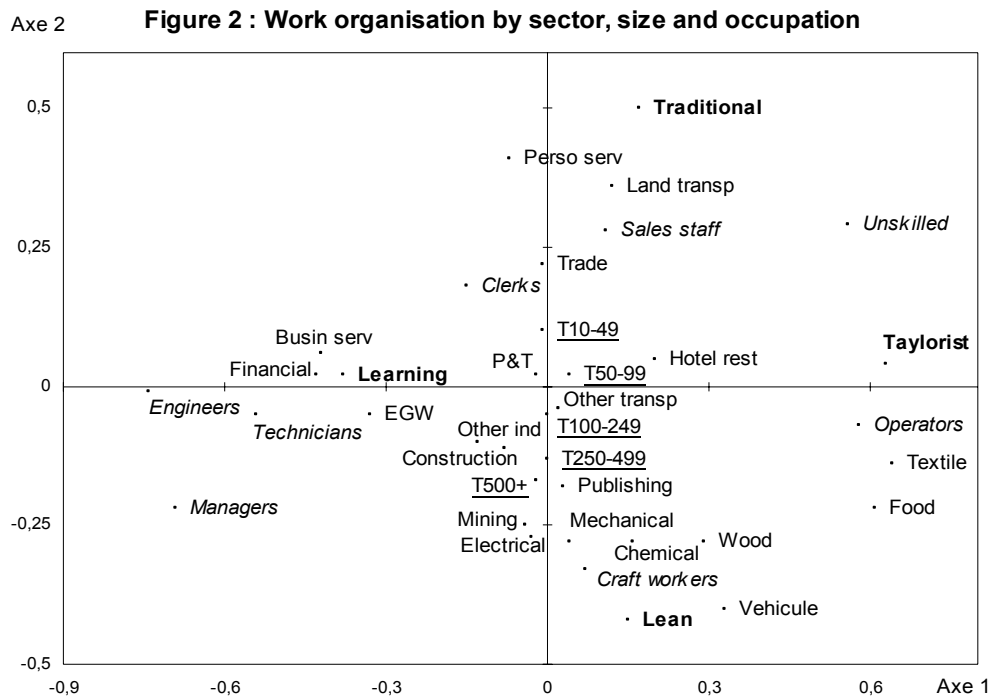
The fourth cluster groups 19 percent of the employees. It is poorly described by the work organisation variables which, with the exception of monotony in work, are all under represented. This class presumably groups traditional forms of work organisation where methods are for the most part informal and non-codified.

Finally, as the projection of the centre of gravity of the clusters onto the graphic representation of the first two factors of the MCA suggests, the four clusters correspond to the quite different working conditions (see Figure 1 below). The learning cluster is located to the east of the graph, the lean cluster to the south, the taylorist cluster to the west and the traditional cluster to the north.



## ***2. Differences in forms of work organisation according to structural, occupational and demographic characteristics***

Forms of work organisation vary considerably across sectors, firm sizes and occupational category, as the projection of these variables onto the graph representing the first two axes of the MCA shows (see Figure 2). The figures in Table 2 below show more precisely that learning forms of work organisation are especially developed in certain of the service sectors, notably banks and insurance, business services, and gas, electricity and water. The lean model of production is more present in the manufacturing sector, notably in the production of transport equipment, electronics and electrical production, the wood and paper products, and printing and publishing. The taylorist forms of work organisation are notably present in textiles, clothing and leather products, food processing, wood and paper products and transport equipment. The residual forms of work organisation grouped in the fourth cluster are to be found principally in the services, notably land transport, personal services, hotels and restaurants, post and telecommunications, wholesale and retail trade.



**Table 2**  
**Forms of Work Organisation by Sector of Activity**

(percent of employees by organisational class)

	Learning organisation	Lean production	Taylorism	Traditional organisation
Mining and quarrying	42,4	41,5	3,4	12,7
Food processing	18,4	34,9	24,6	22,1
Textiles, garments, leather	27,2	25,9	30,2	16,8
Wood and paper products	27,6	40,7	23,9	7,8
Publishing and printing	31,1	43,8	14,1	11,0
Chemicals and plastics	34,7	34,1	21,9	9,2
Metal products and mechanical	31,8	35,7	19,8	12,7
Electrical engineering and	41,5	38,5	8,6	11,4
Transport Equipment	28,1	38,7	23,2	10,0
Other industrial production	50,9	22,1	18,4	8,5
Electricity, gas and water	58,5	19,4	6,2	15,8
Construction	40,9	31,4	10,6	17,1
Wholesale and retail trade	41,5	20,4	11,7	26,4
Hotels and restaurants	29,7	25,8	16,6	27,9
Land transport	26,3	24,0	10,2	39,5
Other transport	39,2	36,1	5,0	19,7
Post and telecommunications	38,1	27,1	7,7	27,1
Financial services	58,1	21,5	3,4	16,9
Business services	57,6	18,7	6,9	16,7
Personal services	39,7	18,9	7,6	33,8
Total	39,1	28,2	13,6	19,1

Source: Third Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

Table 3 provides evidence on variations in forms of work organisation according to occupational category. As one would anticipate, the ‘learning’ forms of work organisation are especially characteristics of the work of managers, professionals and technicians, while the lean forms of work organisation primarily characterise the work of blue collar employees. The taylorist forms are most present amongst machine operators and the unskilled trades. Finally, the traditional forms of work organisation grouped in the fourth cluster are especially characteristics of the work of service workers and shop and market sales persons.

**Table 3**  
**Forms of Work Organisation according to Occupational Category**

(percent of employees by organisational class)

	Learning organisation	Lean production	Taylorism	Traditional organisation
Managers	69,1	24,7	0,2	6,0
Engineers and professionals	75,9	14,0	5,2	4,9
Technicians	61,0	24,6	2,4	12,0
Clerks	43,2	21,9	9,4	25,5
Service and shop and market sales persons	30,3	21,4	12,4	35,9
Craft and related trades	34,2	38,5	16,5	10,8
Machine operators and assemblers	15,7	37,7	24,3	22,3
Unskilled trades	14,8	23,9	26,7	34,5
Total	39,1	28,2	13,6	19,1

Source: Third Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

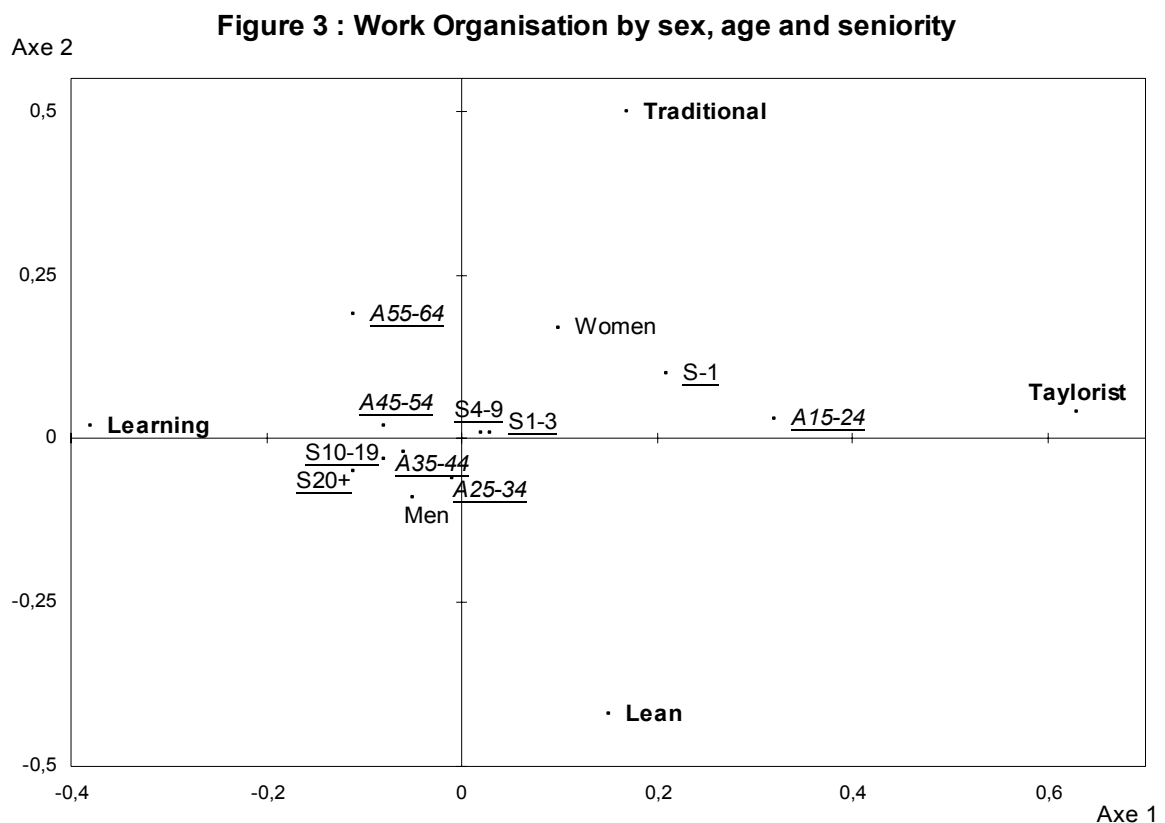
Establishment size constitutes a relatively unimportant factor in the use of different organisational models. As Table 4 shows, establishments in the 100 to 249 employee range are less likely to be characterised by learning forms of work organisation. The lean and taylorism forms increase somewhat with establishment size while the reverse tendency can be observed for the use of traditional forms of work organisation.

**Table 4****Forms of Work Organisation according to Establishment Size**

(percent of employees by organisational class)

Establishment size of (number employees)	Learning organisation	Lean production	Taylorism	Traditional organisation
10 to 49	42,7	24,6	11,2	21,5
50 to 99	36,4	29,0	15,2	19,5
100 to 249	33,8	31,5	16,0	18,6
250 to 499	37,9	28,4	17,6	16,1
500 and over	38,7	32,6	13,2	15,5
Total	39,1	28,2	13,6	19,1

Source: Third Working Condition survey. European Foundation for the Improvement of Living and Working Conditions



Organisational forms also depend on the demographic characteristics of employees. The way these characteristics are associated with the first two axes of the factor analysis is shown in Figure 3

above. Table 5 above provides a more precise presentation or their relation to the four models of work organisation. The figures in the table show that learning forms of work organisation tend to be more characteristic of older employees and those with greater seniority. The reverse tendency can be observed for the Taylorist forms. In the case of the lean forms of organisation, this tends to be more characteristic of younger employees while no relation to seniority can be observed. Gender differences are especially apparent for the lean model of work organisation, which tend to be male dominated, and for the traditional forms of work organisation, where women are more present.

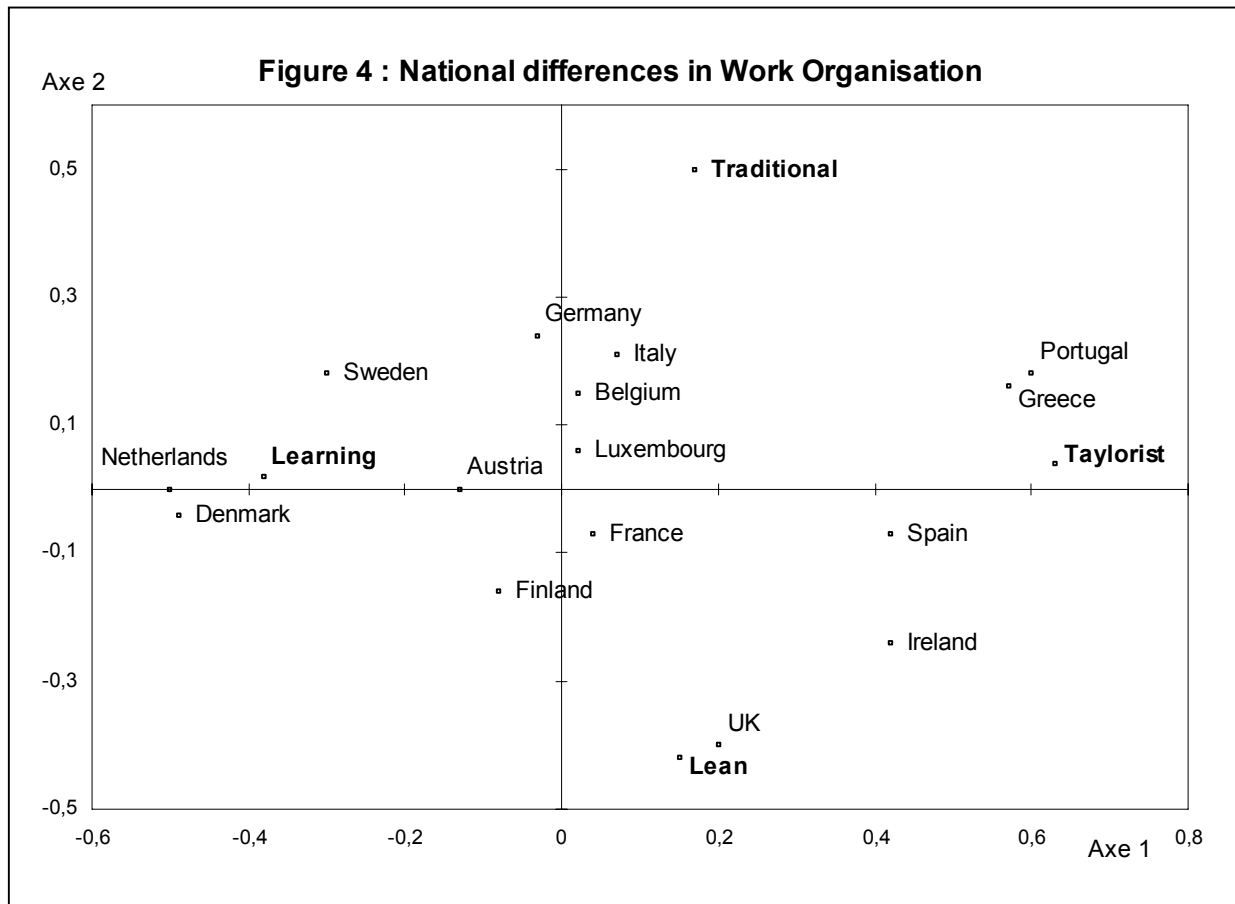
**Table 5**  
**Forms of Work Organisation according to Employees Demographic Characteristics**  
 (percent of employees by organisational class)

		Learning organisation	Lean production	Taylorism	Traditional organisation
Age	15 to 24 years	27,7	32,8	18,5	21,0
	25 to 34 years	38,6	29,3	13,7	18,4
	35 to 44 years	41,2	29,9	12,9	16,1
	45 to 54 years	43,5	25,4	12,0	19,1
	55 years and over	42,0	18,8	11,3	27,9
Seniority	Less than 1 year	31,1	28,9	19,5	20,6
	1 to 3 years	37,9	28,8	12,6	20,6
	4 to 9 years	38,1	27,9	14,2	19,7
	10 to 19 years	42,2	28,0	11,6	18,2
	20 years and over	43,9	27,4	12,3	16,4
Sex	Women	35,9	22,9	16,2	25,0
	Men	40,5	30,5	12,4	16,5
Total		39,1	28,2	13,6	19,1

Source: Third Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

### ***3. National effects on Work Organisation***

Table 6 and Figure 4 show that there are wide differences in the importance of the four forms of work organisation across European nations. The learning forms of work organisation are most widely diffused in the Netherlands, the Nordic countries and to a lesser extent Germany and Austria, while they are little diffused in Ireland and the southern European nations. The lean model is most in evidence in the UK, Ireland, and Spain and to a lesser extent in France, while it is little developed in the Nordic countries as well as in Germany, Austria and the Netherlands. The Taylorist



**Table 6**  
**National Differences in Organisational Models**

(percent of employees by organisational class)

	Learning organisation	Lean production	Taylorism	Traditional organisation
Belgium	38,9	25,1	13,9	22,1
Denmark	60,0	21,9	6,8	11,3
Germany	44,3	19,6	14,3	21,9
Greece	18,7	25,6	28,0	27,7
Italy	30,0	23,6	20,9	25,4
Spain	20,1	38,8	18,5	22,5
France	38,0	33,3	11,1	17,7
Ireland	24,0	37,8	20,7	17,6
Luxembourg	42,8	25,4	11,9	20,0
Netherlands	64,0	17,2	5,3	13,5
Portugal	26,1	28,1	23,0	22,8
United Kingdom	34,8	40,6	10,9	13,7
Finland	47,8	27,6	12,5	12,1
Sweden	52,6	18,5	7,1	21,7
Austria	47,5	21,5	13,1	18,0
EU-15	39,1	28,2	13,6	19,1

Source: Third Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

forms of work organisation show almost the reverse trend compared to the learning forms, being most developed in the southern European nations, Ireland and Italy. Finally, the traditional forms of work organisation are most in evidence in Greece and Italy and to a lesser extent in Germany, Sweden, Belgium Spain and Portugal.

The discussion in Section 2 above has shown how each form of work organisation tends to be associated with particular sectors, establishments sizes and occupational categories. This raises the question of what part of the variation in the importance of these forms across EU nations can be accounted for by the nation's specific structural characteristics. In order to address this question we make use of multinomial logit regression analysis to provide estimates of the impact of national effects on the relative likelihood of adopting the different work models (See Table 7). Taylorism is the base category for these estimates and Germany, the most populous nation within the EU, is the reference case for the estimates of national effects. The dependent variable is a categorical variable with four classes, corresponding to the four work organisation models. The independent variable for the column 1 and 2 results is a categorical variable with 15 classes corresponding to country. Column 1 shows the estimates of the relative likelihood of adopting the 'learning' forms of work organisation over the taylorist forms without structural controls.<sup>8</sup> Column 2 presents the estimates of the relative likelihood of adopting the 'lean' forms over taylorism without structural controls.

Columns 3 and 4 present estimates, respectively, of the relative likelihood of adopting the learning and lean forms of work organisation over taylorism with structural controls. In a stepwise manner, we have introduced three control variables, corresponding to sector, establishment size and occupational category. The reference cases for the estimates are the vehicle sector, the 10 to 49 employee establishment size category, and occupational category of machine operator and assembler.

As the column 1 results show, the country the employee works in has a significant impact on the relative likelihood of using the learning forms over taylorist forms. Compared to the German case, for which the use of the learning and taylorist forms of work organisation are near the 15-country weighted average (see Table 6 above), there are three countries where the learning model is more extensively used: Sweden, the Netherlands and Denmark. There are no significant differences in its

---

<sup>8</sup> The coefficients should be interpreted in the following manner. A positive and significant coefficient for a nation, say Sweden, would imply that the likelihood of a Swedish employee working in conditions characterised by the 'learning' model as opposed to 'flexible taylorism' are high when compared to likely working conditions of a German employee.

use in six countries: Belgium, France, Luxembourg, the UK, Finland and Austria. The learning model is less in evidence in the remaining six countries.

**Table 7**  
**Multinomial Regression Estimates of National Effects<sup>1</sup>**

	<i>Relative likelihood of learning model</i>	<i>Relative likelihood of lean model</i>	<i>Relative likelihood of learning model</i>	<i>Relative likelihood of lean model</i>
	<i>(without structural controls)</i>		<i>(with structural controls)</i>	
Belgium	-.1041	.272	-.061	.394
Denmark	1.040**	.847**	1.256**	1.039**
Greece	-1.534**	-.402	-1.706**	-.393
Italy	-.770**	-.195	-.617**	-.139
Spain	-1.050**	.424**	-.934**	.642**
France	.097	.781**	.069	.864**
Ireland	-.984**	.286	-1.240**	.347
Luxembourg	.151	.444	-.123	.295
Netherlands	1.365**	.869**	1.321**	.919**
Portugal	-1.006**	-.114	-.925**	-.022
UK	.033	1.001**	-.261*	1.072**
Finland	.208	.475	.042	.523
Sweden	.862**	.636*	.751**	.644*
Austria	.158	.180	.443	.339
Pseudo R <sup>2</sup>	.0309	.0309	.151	.151
No.	8081	8081	8081	8081

1. The base category for these estimated is 'taylorism' and the reference country is Germany.

\* = significant at the .05 level; \*\* = significant at the .01 level

When the three structural control variables are added (column 3) the pseudo R<sup>2</sup> increases from 3 percent to 15 percent, with sector, and occupational category accounting for 39 and 58 percent of the increase respectively. Regarding national effects on the relative likelihood of adopting the learning model, the results show that the column 1 results are robust with the exception of the UK, for which the coefficient estimate becomes negative and significant. Overall, the results provide support for the importance of national effects in the use of the learning model of work organisation, with a block of high users composed of the Netherlands and the Nordic countries, a block of low users composed of the UK, Ireland and the southern European nations, and an intermediate block composed of the remaining countries.

Concerning the sector effects, as the discussion based on the factor analysis above suggested, there are no significant differences in the relative likelihood of using the learning model over Taylorism across the different manufacturing sectors, with the exception of electrical machinery and electronics, where the positive coefficient can be explained by the relative weakness of Taylorism in this sector compared to the vehicle sector, rather than by the relative strength of the learning model. Moreover, compared to vehicles, the learning model is relatively more likely to be found in all the service sectors with the exception of hotels and restaurants. In the case of land transport and post and telecommunications, however, this result can be explained by the unusual weakness of Taylorism rather than by the particular strength of the learning model. The virtual absence of Taylorism in mining also explains the positive and significant coefficient for that sector. The analysis of size effects show that the learning model is relatively more likely in smaller establishments, while the estimates for occupation category show, as expected, that Taylorism is relatively more likely to characterise the working conditions of the operators and the unskilled occupations compared to the other occupational groups.

Column 2 of Table 7 presents the estimates of national effects on the relative likelihood of using the lean model over Taylorism without controls. Compared to Germany, where the use of the lean model is relatively low compared to the 15-country weighted average (see Table 6), Denmark, Spain, France, the Netherlands, the UK and Sweden display a relatively high propensity to use lean production methods over Taylorism. The explanation for this differs between the Netherlands and the Nordic countries on the one hand, and the UK, Spain and France on the other. For the former set of countries the result can be explained by the unusual weakness of Taylorism, while for the latter three countries the explanation lies in the relative strength of the lean production model. The positive coefficient for Ireland is not significant although the level of utilisation of the lean model is amongst the highest in Europe. This can be explained by the relative strength of the Taylorist forms of work organisation in Ireland relative to the German reference case. The results suggest that efforts to transform work organisation towards more flexible forms in the UK, France, Ireland and Spain have for the most part been in the direction of the lean production principles, characterised by a low degree of employee autonomy.

Regarding the sector effects, the positive coefficients for water and air transport, post and telecommunications and banking and financial services, these can be explained by the weakness of

the taylorist forms of work organisation in these sectors compared to vehicles, rather than by the relative strength of the lean production model.

#### ***4. HRM Complementarities***

There is a growing literature focussing on the nature and performance effects of HRM complementarities. A basic idea in this literature is that forms of work organisation requiring considerable discretion and problem-solving activity on the part of employees are more likely to be effective if they are supported by particular systems of pay, training and employee representation. For example, work in 'learning organisations' is characterised by a high degree of task complexity. Learning is continuous as employees are expected to take initiative and to exercise autonomy in resolving the production and service related problems they confront. In the 'lean production' model, while work requires problem-solving skills and involves continuous learning, these dynamics are embedded in a more formal structure based on codified protocols (e.g. team work and job rotation practices) often associated with tight quantitative production norms. Autonomy is relatively low compared to the learning model.

Since learning and problem-solving capabilities are central to both of these models, it can be expected that firms adopting them will invest more in the training of their employees than those using more traditional taylorist methods, characterised by low task complexity and high repetition. It can also be argued that firms characterised by the former two models will have an interest in adopting forms of pay linking employees' compensation to their effort and to company performance. The quite plausible hypothesis is that employees will be more likely to commit themselves to the goal of improving the firm's capacity for problem-solving and product development if they are promised a share of the quasi-rents which derive from their enhanced commitment and effort. (Cooke, 1994; Ichniowski et. al., 1997; Freeman and Lazear, 1995; Levine and Tyson, 1990; Osterman, 1994).

Pay practices which support employee involvement in this manner include such collective incentive schemes as profit sharing and gaining sharing, and such individual incentive schemes as skill-based pay and compensation for suggestions. It has also been argued that such complementary compensation policies are more likely to be effective if they are embedded in some system of employee representation that assures employees that their interests will be represented in the design

and operation of the pay system (Eaton and Voos, 1992; Freeman and Lazear, 1995; Levine and Tyson, 1990; Lorenz, 1995).

**Table 8**

	Relative likelihood of learning model	Relative likelihood of lean model
	(with country and structural controls)	
Training <sup>1</sup>	.223**	.178**
Piece-rate pay	-.440**	.114
Profit sharing	1.083**	1.132**
Representation <sup>2</sup>	.344**	.679**
<u>Age</u>		
15-24 years	-.431**	-.007
35-44 years	.202	.064
45-54 years	.459**	-.096
55 years and over	.565**	-.204
<u>Seniority</u>		
Less than 1 year	-.453**	-.454**
4 to 9 years	-.032	-.119
10 to 19 years	.028	.058
20 years and over	-.123	-.150
Male	-.781**	-.613**

1. The variable is coded 1 if any training has been provided and 0 otherwise.
2. The variable is coded 1 if there are opportunities for discussing working conditions and organisational changes with an employee representative and 0 otherwise.

In order to test for the presence of HRM complementarities, we have extended the regression analysis in order to estimate the effects on the use of the various organisational forms of the following: an indicator of the existence of some system of workplace representation; a indicator of the importance of the training that the employers has paid for or offered, and two indicators of the nature of the pay system, whether the individual pay includes a piece rate of productivity bonus component, and whether it includes a component based on the overall performance of the enterprise. Various demographic characteristics that might be expected to have an impact on these HRM characteristics are controlled for, including age, seniority and sex.

The results presented in Table 8 provide support for view that, independently of country, sector, firm size and occupational category different organisational models tend to be associated with particular HRM policies. The results, which are robust to the demographic controls referred to

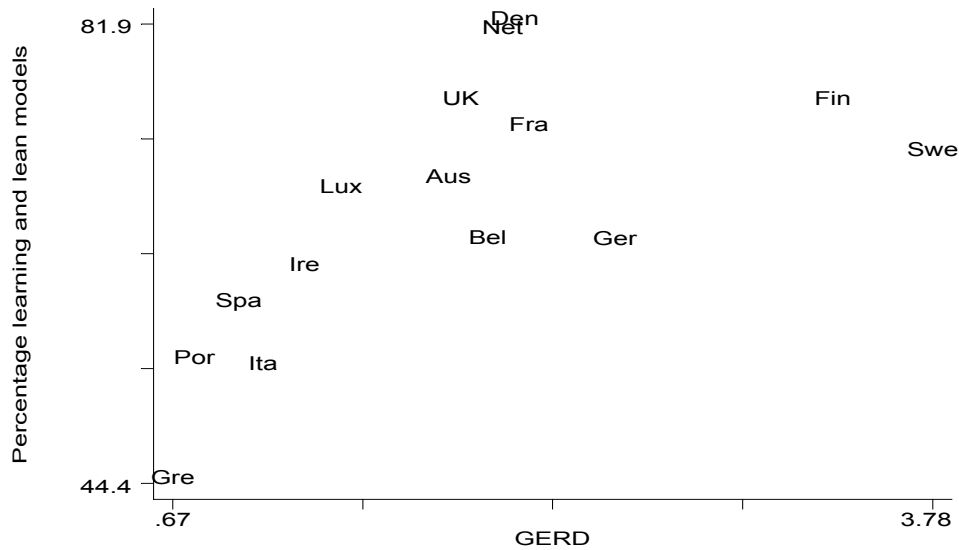
above, show that the use of compensation systems linking pay to company performance, high expenditures on training, and the presence of workplace representatives are all positive predictors of a relatively high use of the learning and lean models relative to Taylorism. Pay systems with a piece rate or productivity bonus component, however, are negative predictors of a relatively high use of the learning model compared to Taylorism while this is not the case for the lean production model.

### ***Conclusion***

The evidence presented in this paper on national differences in the forms of work organisation should not be taken as a flat denial of the importance of hybridisation linked to the international attractions of the lean production model. However, it does call for a more sophisticated analysis that recognises not only the continued importance of Taylorism in some national settings, but also the existence of multiple traditions and sources of inspiration for the development of more flexible work systems that depend on high levels of employee involvement in problem-solving and operational decision making. This more nuanced view is in keeping with the 'varieties of capitalism' literature (See notably Hall and Soskice, 2001) and with work in the tradition of the regulationist school (Amable, Barré and Boyer, 1997), which argue that the pressures associated with globalisation will tend to work themselves out differently in different national contexts, resulting in some respects in greater specialisation.

One possible explanation for international difference in the relative importance of the lean and learning forms of work organisation, both of which draw on employees' capacity for continuous learning and problem-solving, is simply the different degrees to which national producers are positioned on the high-technology or high quality end of product markets. Competition in these product market segments requires at a minimum a capacity for continuous upgrading of quality for existing products and increasingly it requires a capacity for innovating new products and services. Correspondingly work tends to be more demanding in terms of its problem-solving requirements and learning attributes.

Some support for this hypothesis can be derived from Figure 5 below. It shows a positive relation between the percentage of employees in a nation whose work is characterised either by the learning or by the lean models, and a standard measure of innovative effort, research and development expenditures as a percent of GDP.

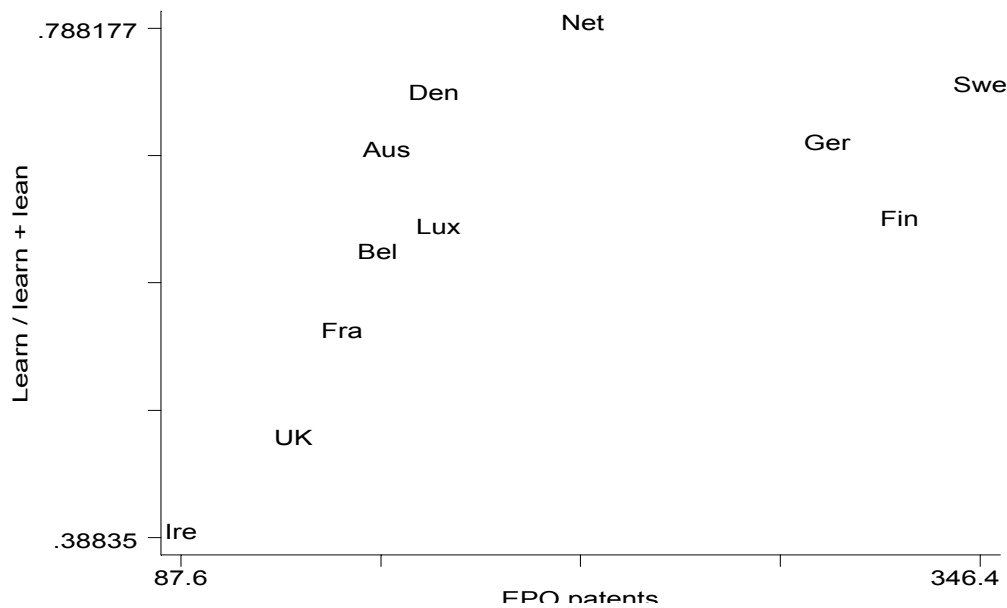
**Figure 5**

Note: Pearson's correlation coefficient = .6517. Significant at 1 percent level.  
Source: Eurostat Structural Indicators

Close inspection of the figure suggests, however, that the negative correlation can be explained by the presence of the 4 southern European nations and that if we restrict our attention to the Nordic and central and western European nations, which on average have much higher levels of R&D expenditures, there is no obvious relation between the two variables.<sup>9</sup> This suggests that the figure is basically capturing an organisational distinction between high and low R&D spending nations.

This leaves unexplained, however, the basis for the different organisational choices among the high R&D spending nations and in particular the reasons for the relatively intensive use of the lean model in the two liberal market countries, the UK and Ireland. Their tendency to use the lean model over the learning model needs to be accounted for, since our evidence suggests that those high R&D spending nations that emphasise the learning model better in terms of technological innovation, as measured by patent applications to the European Patents office (EPO) per million inhabitants (see Table 6).

<sup>9</sup> The Pearson correlation coefficient recalculated without the four southern European nations, although positive is not significant at the 10 percent level.

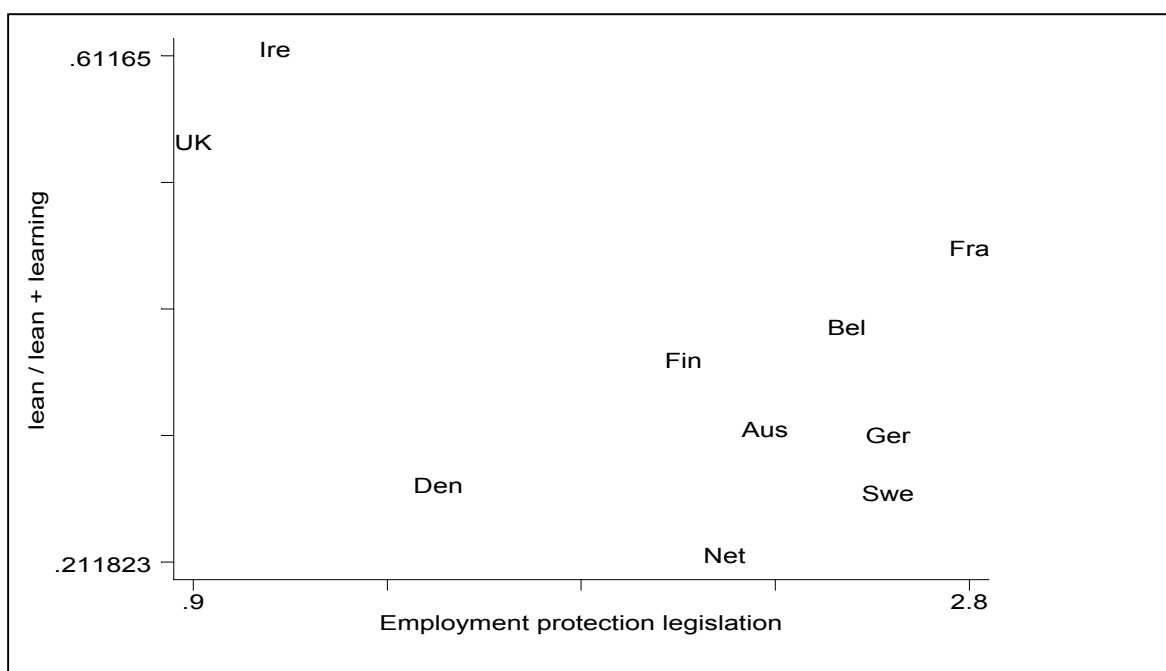
**Figure 6**

Source : Eurostat, data: EPO

One possible explanation for the limited use of the learning forms of work organisation in the UK and Ireland is that the deregulated labour market context in these nations fails to provide necessary institutional support for establishing substantial forms of autonomy in work. Table 7 below shows a clear distinction among nations in the relative importance of the lean model of work organisation according to the degree which the labour market is deregulated, as measured by the OECD's overall index of employment protection legislation<sup>10</sup>.

<sup>10</sup> Denmark is clearly somewhat of an outlier in terms of the relation we are proposing between employment protection and the relative importance of the lean model of work organisation. A distinctive feature of the Danish institutional set-up is that while employment protection is relatively low, unemployment protection is amongst the highest in Europe. See Lundvall, 2002; and Hall and Soskice, 2001, pp. 167-69.

Figure 7



A key argument developed in the varieties of capitalism literature (see notably Thelen, 2001) that may help to account for the observed relation is that the current trend towards decentralised bargaining across European nations has different consequences in liberal market economies, such as the UK and Ireland, as compared with coordinated market economies, such as Germany, the Nordic countries and the Netherlands. In the latter countries, despite the importance attached to plant and shop-level bargaining, employers have demonstrated a continued interest in maintaining higher-level forms of coordination, notably around issues of wage determination and the provision of training

The collective coordination of the labour in market in these countries has arguably played an important role in supporting local bargaining designed to secure more flexibility and greater cooperation of labour at the shop level for two central reasons. First, it serves to buffer the establishment from distributional conflict which can easily spill-over into areas of labour/management cooperation that are vital for competing through strategies of incremental innovation. Secondly, it provides a more solid foundation upon which to make the extensive investments in training and skills that are a precondition for adopting such strategies.

In deregulated institutional settings, where employers' capacity for coordinated action around wage and skill provision is weak, success in establishing the forms of employee involvement and cooperation vital to the goal of incremental innovation will depend on the firm's capacity to put in place adequate in-house training linked to firm-specific internal labour markets that serve to structure careers and provide incentives for skill acquisition. The risk is that in the absence of supporting external coordinating mechanisms such firm-specific governance mechanisms will prove to be unstable. Distributional conflict may prove inimical to securing labour's commitment to progressive improvements in product quality, while the risk of loss of skilled labour to competitors will encourage firms to under-invest in the provision of training. Where these pressures do not simply dictate a reversion to low-skill strategies based on Taylorism, they may lead to preference for relatively hierarchical modes of work organisation, characterised by lower degrees of worker autonomy and the use of tight quantitative production norms to fix the pace of work. From this perspective, the exceptional attractions of the lean model for employers in the UK and Ireland may be directly linked to the relatively deregulated labour market context in these countries, while the collective regulation of the labour market in Germany, the Netherlands and the Scandinavian countries helps account for the relative importance of the learning model there.

## References

- Amable, B. R. Barré and R. Boyer, 199, *Les systèmes d'innovation à l'ère de la globalisation*, Economica, Paris.
- Appelbaum E. and Batt R., 1994, *The new American workplace*, Ithaca, New York, ILR Press
- Benzecri J.-P., 1973, *L'analyse des données*, 2 vol., Paris, Dunod.
- Cooke, W. N. (1994) 'Employee Participation Programs, Group-Based Incentives, and Company Performance: A Union-Nonunion Comparison,' *Industrial and Labor relations Review*, Vol. 47, No. 4, pp. 594-609.
- Coutrot Th., 1998, *L'entreprise néolibérale, nouvelle utopie capitaliste?*, Paris, La Découverte.
- Boyer R. and Durand J.-P., 1993, *L'après fordisme*, Paris, Syros.
- Cézard M., Dussert F. and Gollac M., 1992, " Taylor va au marché. Organisation du travail et informatique ", *Travail et Emploi*, n°54, 4/92, pp. 4-19.
- Doeringer, P., E. Lorenz and D. Terkla, 2003, "National Hybrids: How Japanese Multinationals Transfer Workplace Practices to Other Countries", *Cambridge Journal of Economics*, March, pp. 265-286.
- Eaton, A. and P. Voos (1992) 'Unions and Contemporary Innovation in Work Organisation, Compensation and Employee participation, ' in L. Mishel and P. Voos, (eds.) *Unions and Economic Competitiveness*, Armonk, M.E. Sharpe.
- Eaton, J. (2000) *Comparative Industrial Relations*, Polity Press.
- Freeman, R. and E. Lazear (1995) "An Economic Analysis of Works Councils," in Rogers, J. and W. Streeck (eds.), *Works Councils*, Oxford, Oxford University Press
- Freyssenet M., 1995, "La 'production réflexive' : une alternative à la 'production de masse' et à la production au plus juste' ? ", *Sociologie du Travail*, 3/95, pp. 365-389.
- Greenacre, M.J. (1993) *Correspondence Analysis in Practice*, New York, Academic Press.
- Hall, P. and D. Soskice, 2001, *Varieties of Capitalism*, Oxford, Oxford University Press.
- Ichiniowski, C., K. Shaw and G. Prennushi, "The Effects of Human Resource Management Policies on Productivity: A Study of Steel Finishing Lines", *American Economic Review*, June 1997.
- Levine, D. and L. Tyson (1990) "Participation, Productivity and the Firm's Environment," in A. Blinder (ed.) *Paying for Productivity*, Washington D.C., Brookings Institute.
- Linhart D., 1994, *La modernisation des entreprises*, Paris, La Découverte.
- Lorenz, E. (1995) "Policies for Participation: Lesson from France and Germany", *The German Journal of Industrial Relations*, Vol. 2, No. 1, pp. 46-63.
- MacDuffie, John Paul and John Krafcik (1992), "Interacting Technology and Human Resources For High Performance Manufacturing: Evidence From the International Auto Industry", in Thomas Kochan and Michael Useem (Eds.), *Transforming Organisations*, (New York: Oxford University Press).
- Macduffie, John Paul and Fritz Pil, 1997, 'Changes in Auto Industry Employment Practices : An International Overview' in Thomas, K. Lansbury, R. and J.-P. MacDuffie (eds.) *After Lean Production*, Cornell University Press, pp. 9-42.
- Merllié D. and Paoli P., 2001, *Third European Survey on Working Conditions (2000)*, Luxembourg: Office for official publications of the European communities, 2001. Osterman, P. (1993) 'How

Common is Workplace Transformation and Who Adopts It ? *Industrial and Labor Relations Review*, Vol. 47.

Osterman, P. (1994) 'How Common is Workplace Transformation and Who Adopts It ? *Industrial and Labor Relations Review*, Vol. 47.

Thelen, K. 2001, 'Varieties of Labour Politics in Developed Democracies' in Hall, P. and D. Soskice, 2001, *Varieties of Capitalism*, Oxford, Oxford University Press, pp. 71-103.

Womack J.P., Jones D.T. and Roos D., 1990, *The Machine that changed the World*, New York, Rawson Associates.