

**Organisational Innovation, Governance Structure and Innovative Capacity
In British and French Industry**

Edward Lorenz

Communication to

European Meeting on Applied Evolutionary Economics

7 - 9 June 1999, Grenoble, France

Organised by the Institute for Energy Politics and Economics
Organisé par l'Institut d'Economie et de Politique de l'Energie /
IEPE, BP 47, 38040 Grenoble Cedex 9, France

And the INRA-Unit of Sociology and Economics of Research and Development
Et l'unité Sociologie et Economie de la Recherche Développement de l'INRA
INRA/SERD, BP 47, 38040 Grenoble Cedex 9, France

Organisational Innovation, Governance Structure and Innovative Capacity In British and French Industry¹

Edward Lorenz

University of Technology of Compiègne and

IDHE - Ecole Normale Supérieure-Cachan

e-mail: Lorenz@idhe.ens-cachan.fr

This study makes use of the results of a postal questionnaire sent to a sample of large private sector companies in Britain and France to address two key issues in the new institutional analysis of the firm. The first is the way the institutional environment supports and constrains the design of firm-level organisational devices and governance mechanisms. The second concerns the relation between the introduction of new organisational methods and the firm's innovative capacity. Multiple correspondence analysis is used to describe the relation between the use of innovative work methods and pay policies. The analysis shows that the policies of the British sample of firms display greater 'coherence' than those of the French sample, in the sense that a more intensive use of the new organisational methods is more consistently associated with a more intensive use of the new pay policies. Ordered logit and multinomial regression analysis shows that UK firms with positive expenditures on R&D are more likely to introduce new organisational methods than those not undertaking such expenditures. This relation between the use of new organisational methods and investments in innovative capacity is not confirmed for the French case.

Introduction

This paper draws on the results of an on-going comparative study of the work organisation and pay policies of large private sector British and French enterprises to address two key issues in the new institutional analysis of the firm. The first concerns the relation between the firm's capacity to innovate new products and processes and the nature of the organisational devices it uses to manage its competencies and internal knowledge flows. A basic aim of the

¹ Preliminary versions of this paper were presented at the Department of Business Studies, University of Aalborg, at the Copenhagen Business School, at the Department of Economics, University of Siena, and at the University of Paris 1. I would like to thank Francesca Bettio, Benjamin Coriat, Peter Maskell, Bengt-Aake

paper is to contribute to a body of literature seeking to extend the established focus of new institutional economics on the relation between governance structure and transaction costs to include a consideration of the way organisational design is shaped by the firm's interest in developing and making efficient use of its knowledge base².

The second issue concerns the way the wider institutional environment may support and constrain the design of firm level organisational devices and governance mechanisms. This part of the analysis pertains to the question of market selection dynamics and to possible limits to the diffusion of 'best-practice' organisational forms. It can be seen as fitting within a tradition in comparative analysis of focusing on problems of institutional inertia and differential competitive performance.³

The starting point for the analysis is the widely held view that increasing international competition based on such non-price factors as quality, design and innovation is encouraging firms to adopt a variety of new work practices which serve to involve employees more fully in production related decision-making. These new practices typically include the use of quality circles or other forms of employee participation groups, the use of self-managed work teams, the creation of project teams involving personnel from different services and multiple levels of the hierarchy, and the enhanced use of job rotation and job enlargement. A major objectives in adopting these practices is to increase employees' responsibility for quality and to more fully draw on the entire in-house stock of knowledge in an effort to increase the organisation's capacity for product and process innovation (see, for example, Clegg, et al., 1996; Dertouzos, et. al. 1989; Gittleman et al. 1998; Lawler et. al, 1992; Osterman, 1994; Levine and Tyson, 1990; Lay et al. 1996; Taddé and Coriat, 1993; Womack et al. 1990).

It can be argued that such high involvement work practices are more likely to be effective if they are supported by forms of pay linking employees' compensation to their effort and to company performance. The quite plausible hypothesis is that employees are more likely to commit themselves to the goal of improving product quality and the firm's innovative capacity if they are promised a share of the quasi-rents which derive from their enhanced

Lundvall and Luis Miotti for their useful comments on earlier drafts. Research support from the Commissariat Général du Plan, Appel d'Offre 1995 : Comité: "Emploi, Travail, Redistribution" is gratefully acknowledged.

² See, for example, Foss, 1993; Langlois and Foss, 1997; Teece, 1986.

³ See, for example, Elbaum and Lazonic, 1982; Lorenz, 1994; Robertson and Langlois, 1994.

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 policies are more likely to be effective if they are complemented by the following three arrangements: job security in order to increase time horizons and encourage employees to invest in firm-specific skills; compressed wage differentials in order to encourage group cohesiveness and a sense of community; and some system of representation (works council or local union) 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 ; Streeck, 1994).⁴

The introduction of these complementary human resource and personnel policies may be supported and constrained by the institutional setting in which the firm operates. Factors impacting on company policies include the character of union policy on matters of pay and job content, the content of collective bargaining agreements and the extent of their coverage, and the nature of national labour legislation prescribing certain forms of remuneration and employee representation. Unconstrained competition does not necessarily provide an ideal environment for the diffusion of new work and pay practices. It can plausibly be argued that employers left to their own devices will under-invest in potentially superior forms of work organisation. Levine and Tyson (1992), for example, have argued that externalities transmitted through the labour market may impact on the effectiveness of various personnel policies that support high involvement work organisation. For example, the use of compressed wage differentials may make it difficult for companies to recruit and retain qualified personnel. The provision of employment guarantees combined with the use of group payment schemes may create a problem of adverse selection in the form of attracting the least motivated and the most opportunistic workers on the labour market. Such considerations provide the economic foundation for an argument in favour of legislation to promote the widespread adoption of new forms of work organisation.⁵

⁴ For a discussion of the relation of these governance mechanisms to the build-up of trust between employers and employees, see Lorenz (forthcoming).

⁵ See Lorenz (1995) for a discussion of the issues.

In order to gather information pertinent to these key issues in the changing nature of company work and pay policies, identical postal questionnaires were addressed to the managing directors of a sample of private sector firms in Britain and France.⁶ The target population was the 2000 largest enterprises in Britain and in France⁷. This choice was based on a desire to investigate a population of firms well integrated into the international economy, facing the kinds of competitive pressures that the literature has argued are encouraging firms to restructure their work systems.

A core section of the questionnaire was devoted to asking for detailed information on the extent to which different occupational groups were implicated in various new work and pay practices. These questions asked for information similar to that provided by Oliver and Wilkinson (1992) in their survey of Times 1000 firms, and by two broad coverage surveys based on on-site interviews: the 'Enquête Réponse' undertaken by DARES (1994) at the French Ministry of Labour, and the Workplace Industrial Relations Survey in Britain co-ordinated by Milward et. al. (1994).⁸

Our survey design differs in an important respect from these surveys in that it not only asks whether a particular practice is used, but also what percentage of various occupational categories are actively implicated in its use.⁹ The failure to ask for this information has arguably generated exaggerated estimates of the degree to which firms in Britain and France have transformed their work and pay practices. The figures presented in Tables 1.2 through 1.5 below indicate that a sizeable proportion of the firms which report having introduced new work and pay practices involve less than 33 percent of their employees in their use. This suggests a conclusion comparable to that of Applebaum and Batt (1994) for the US based on their review of the literature. A large proportion of the firms that are introducing high involvement practices in Britain and France are doing so on an experimental or incremental basis rather than engaging in a wholesale transformation of their human resource system.

⁶ The British survey was undertaken with the assistance of Frank Wilkinson of the Cambridge Business Research Centre in the UK. Bruno Sire of LIRHE, University of Toulouse took responsibility for co-ordinating the French survey. The author express his gratitude to the French research team for allowing results based on their survey to be printed in this working paper.

⁷ Dunn and Bradstreet's Marketing Service provided the company names and addresses for the British study.

⁸ The coverage of these surveys is considerably wider than ours, the DARES survey being addressed to a sample of firms with 25 or more employees and the WIRS in Britain being addressed to a sample of firms with 25 or more employees.

⁹ In this respect our design is comparable to that developed by Lawler et al. (1992) in their survey of Fortune 1000 companies.

Perhaps the most significant contribution of the survey to the state of our knowledge of organisational change in Europe is the light it sheds on differences between Britain and France. Despite the large number of surveys undertaken on these issues in both countries,¹⁰ differences in methodology and objectives preclude making reliable cross-country comparisons.¹¹ The use of identical questionnaires in two countries provides a more reliable basis for identifying international differences and for making plausible conjunctures concerning the impact of the national institutional setting on company organisational design and governance.

The remainder of the paper is divided into three sections. The first contrasts the extent to which manual, clerical and administrative employees in the sample of British and French firms are involved in a set of key new work and pay practices. The second section uses a simple data reduction to identify associations in the use of high involvement work and pay policies. The theoretical considerations briefly laid out above suggest that firms actively introducing high involvement work practices would have an interest in adopting appropriate incentive and governance mechanisms. The analysis presented in this section provides a means of determining whether this ‘institutional coherence’ can be observed in the case of the firms’ pay policies. It provides a further basis for interpreting the impact of the institutional setting on the firm’s organisational design. The third section turns to the relation between the use of innovative work practices and investments in innovative capacity. It presents the estimates of ordered logit and multinomial logit models relating the use of new work practices to levels of expenditure on R&D.

The Use of High Involvement Work and Pay Practices

The figures on the use of high involvement work and pay policies presented in this section are based on the information provided by the 90 British and 86 French companies or divisions of companies which provided complete responses to the postal questionnaire.¹² The

¹⁰ Lhuillery (1997) cites 12 French surveys with information pertinent to the question of organisational change. For a general discussion of European survey evidence, see Coriat (1998).

¹¹ For example, the recent ESRC sponsored study of new work practices in manufacturing undertaken by Clegg et al. (1996) seeks to determine the extent of utilisation within the firm by means of a four point subjective scale ranging from ‘a little’ to ‘entirely’. The meaning of such subjective judgements is difficult to interpret and provide a poor basis for solid international comparisons.

¹² The initial response rate to the questionnaire was approximately 5 percent for the British sample and 10 percent for the French, providing 114 British responses and 220 French responses. Respondents was asked to indicate whether their response pertained to the company, division or single establishment level of the

size of the British sample of firms in terms of employment ranged from a low of 77 employees to a high of 87000, with a mean of 4339. Approximately 90 percent of the British sample employed more than 500 employees. For the French sample of firms, the size ranged from a low of 41 employees to a high of 190,600, with a mean of 7710. Approximately 83 percent of the French firms employed more than 500 employees.¹³

As Table 1.1 below indicates, the distribution of the British firms across broad industrial sectors is more weighted towards services and consumer goods.

Table 1
Distribution of Enterprises by Industrial Sector

Sector	Britain	France
Consumer Goods	14.3%	12.8%
Industrial Equipment	14.3%	16.2%
Intermediate Goods	17.6%	22.1%
Services	38.5%	32.6%
Other ¹	15.3%	16.3%

1. Other refers to agriculture and food processing, energy, gas and electricity, and construction and public works.

A majority of the firms in each country indicated that they had experienced an increase in the intensity of international competition. Slightly over 60 percent of the British sample of firms and 70 percent of the French sample responded that the competition they face from overseas producers in their domestic market had increased over the last three years. Amongst those British firms that exported, 75 percent reported that competitive pressures in their export markets had increased over the last three years. The comparable figure for the French firms is 80 percent. Approximately 50 percent of the British sample ranked quality as being of high or very high importance in the competition they face in the domestic market, and 30 percent rated

enterprise. Approximately 40 percent of the French responses concerned a single establishment, while in the British case only 5 percent concerned this level of the enterprise. In order to avoid introducing a potential bias into the results of the analysis, all those responses which pertain to individual establishments only have been eliminated. This, as well as the elimination of questionnaires which were not adequately completed, resulted in 90 useable British responses and 86 useable French responses.

¹³ The tail of firms in each country reporting employment levels of under 500 employees concern those respondents which answered on behalf of a company division rather than on behalf of the company as a whole.

design as being of high or very high importance. The comparable figures for the French firms are 70 percent and 50 percent.

Tables 2 and 3 show the extent to which manual, clerical and administrative employees are involved in four work practices that are often identified in the literature as forming the heart of the new high involvement employment system.¹⁴ These include the work practices of job rotation, self-managing teams, quality circles and multi-disciplinary project teams.

Table 2
Britain: Use of High Involvement Work Practices

Percentage of manual and clerical employees implicated in practice:	0%	1-33%	33-66%	66-100%
Practice:	Percentage of firms reporting each level of use:			
Job Rotation	13%	67%	13%	7%
Self-Managing Teams	8%	65%	16%	11%
Quality Circles	7%	64%	20%	9%
Multi-disciplinary Project Teams	8%	67%	16%	9%
Number of respondents: 90				

The percent of the British firms using self-managing team organisation is close to the figure reported by Oliver and Wilkinson (1992), who found that 85 percent of TIMES 1000 firms were making some use of such methods. The percent reporting that they use quality circles is higher, as Oliver and Wilkinson (1992) reported that 68 percent of Times 1000 firms make use of this practice. The percentage figures for France for these two practices are close to those reported in the 1993 DARES survey, which found that for firms employing over 1000 employees 67 percent were making use of quality circles and that 51 percent were making use of team organisation.

¹⁴ See, for example Florida (1995) and Osterman (1994).

Table 3
France: Use of High Involvement Work Practices

Percentage of manual and clerical employees implicated in practice:	0%	1-33%	33-66%	66-100%
Practice:	Percentage of firms reporting each level of use:			
Job Rotation	36%	22%	20%	22%
Self-Managing Teams	58%	23%	10%	8%
Quality Circles	43%	23%	20%	14%
Multi-disciplinary Project Teams	40%	49%	8%	2%

Number of respondents: 86

The most striking comparative observation concerns the relatively low percentage of British firms reporting non-use of the various work practices. The evident conclusion that British firms are more innovative than their French counterparts should be qualified, however, by noting that for those British firms making any use of the work practices, the majority report that they involve less than 33 percent of their manual and clerical employees in their operation. This suggests that the majority of British firms are introducing high involvement work practices on an experimental or piecemeal basis rather than attempting a wholesale transformation of their production system.¹⁵ If we focus our attention on the highest level of utilisation, the contrast favours France for two of the practices: job rotation and quality circles. The percentage of French firms reporting that they involve over 66 percent of their workers in job rotation is approximately three times the British figure.

The use of job rotation in France not only stands out relative to its use in Britain but also relative to the use of other practices in France. A possible explanation for the relatively intensive use of job rotation in France relates to the limited scope for horizontal mobility on the French labour market, associated with the existence of highly structured internal labour markets in large firms.¹⁶ Such institutionally grounded restrictions on horizontal mobility are

¹⁵ This observation provides an important corrective to Oliver and Wilkinson's (1992) thesis concerning a

¹⁶ For a discussion of these features of the French labour market, see Eustace (1998) and Marsden (1998).

reinforced by legal regulations, which add costs to laying off employees who are classified as ‘permanent’. Job rotation may offer needed flexibility, given the limits on French employers’ ability to varying operating costs in response to changes in demand through shedding labour. If this interpretation is correct, then the high use of job rotation in France should be seen as a response to distinctive features of the institutional setting rather than as indicating a commitment to increasing employee skills as part of a strategy of heightened employee involvement.

Table 4
Britain: Use of High Involvement Pay Policies

Percentage of manual and clerical employees implicated in policy:	0%	1-33%	33-66%	66-100%
Policy:	Percentage of firms reporting each level of use:			
Profit Sharing	29%	38%	3%	30%
Gain Sharing	48%	49%	1%	2%
Skill-based Pay	31%	33%	10%	26%
Compensation for Suggestions	41%	43%	2%	14%

Number of Respondents: 90

Tables 4 and 5 present comparable percentage figures for the use of four types of contingent pay: profit sharing, gain sharing, skill-based pay and compensation for suggestions. As in the case of the work practices, British firms appear more innovative in the sense that a larger percentage report some use of the policies. As regards profit and gain sharing, French firms can be classed as more innovative in the sense that the percentage of them reporting utilisation at over the 66 percent level is greater than it is for Britain. Gain sharing and profit sharing are also distinctive relative to other practices in France for the extremely small percentages of firms reporting low or medium intensity of use.

Table 5
France: Use of High Involvement Pay Policies

Percentage of manual and clerical employees implicated in policy:	0%	1-33%	33-66%	66-100%
Policy:	Percentage of firms reporting each level of use:			
Profit Sharing	39%	2%	2%	57%
Gain Sharing	70%	1%	2%	27%
Skill-based Pay	78%	16%	0%	6%
Compensation for Suggestions	41%	35%	11%	13%

Number of respondents: 86

The explanation for these features of French pay policy is no doubt legislation which provides fiscal advantages to firms that negotiate agreements with a local union or with the *comité d'entreprise* for the universal coverage of employees in profit or gain sharing plans.¹⁷ The contrast with the relatively low use of other new pay policies by French firms brings out in a striking manner how government intervention can impact on company pay policies.

Coherence in Company Work and Pay Policies

The theoretical considerations briefly outlined in the introduction suggest that firms introducing high involvement work practices will have an incentive to adopt pay and incentive devices designed to assure their employees that they will have a fair share of organisational quasi-rents. In this section I consider to what extent the work and pay policies of the samples of British and French firms exhibit this 'coherence' in sense that those firms making high use of the four high involvement work practices also tend to make high use of the four performance related pay policies.

In order to do this multiple correspondence analysis, a factor analysis technique, has been applied using the data on the levels of penetration of the four work and four pay policies

¹⁷ The ordinance of 4 January 1959 provided financial incentives for firms to link employee compensation to company profits while the ordinance of 17 August 1967 made such pay system obligatory. See Reynaud (1975, p. 252).

summarised above. Multiple correspondence analysis, which is similar in spirit to principal components analysis, is designed for the analysis of categorical variables that can be presented in multi-way contingency tables.¹⁸ As with principal components, it has the objectives of reducing the dimensionality of a data set and identifying new underlying factors or components which are uncorrelated.¹⁹ The results of the analysis can be presented in easy-to-interpret two dimensional scatter plot diagrams which show which variables contribute to the construction of the factors. Figures 1 and 2 below present such scatter plot diagrams for the first two factors resulting from the correspondence analyses undertaken on British and French work and pay practices variables. In order to simplify the visual displays, the work and pay variables have been categorised so as to have three levels, with the value label 1 corresponding to non-use of the practice, the value label 2 corresponding to a penetration level of between 0 and 33 percent, and the value label 3 corresponding to a situation where over 33 percent of manual, clerical and administrative employees are involved in the practice.²⁰

Appendix 1 provides an interpretation of the results of the analyses based in part on the conventional factor analytic technique of examining the ‘factor loadings’ of the response variables. For the purposes of the discussion here, there are two things the reader needs to take into account in order to interpret the scatter plots. The first is that distance counts. If the coordinate positions of two variables are close they will tend to concern the same cases or firms. For example, in the results for the British analysis presented in Figure 1, the coordinate position of QC3 corresponding to the use of quality circles at over the 33 percent level is close to the coordinate position of PRJ3, corresponding to the use of project teams at over the 33 percent level. This means that firms which make use of quality circles at this level of intensity will also tend to make use of project team organisation at the same level of intensity.

Figure 1

¹⁸ For an introduction to correspondence analysis, see Greenacre (1993) or Lebart et al. (1995).

¹⁹ While in principal components analysis 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 Greenacre (1993, pp. 24-31).

Factor Analysis for British Firms



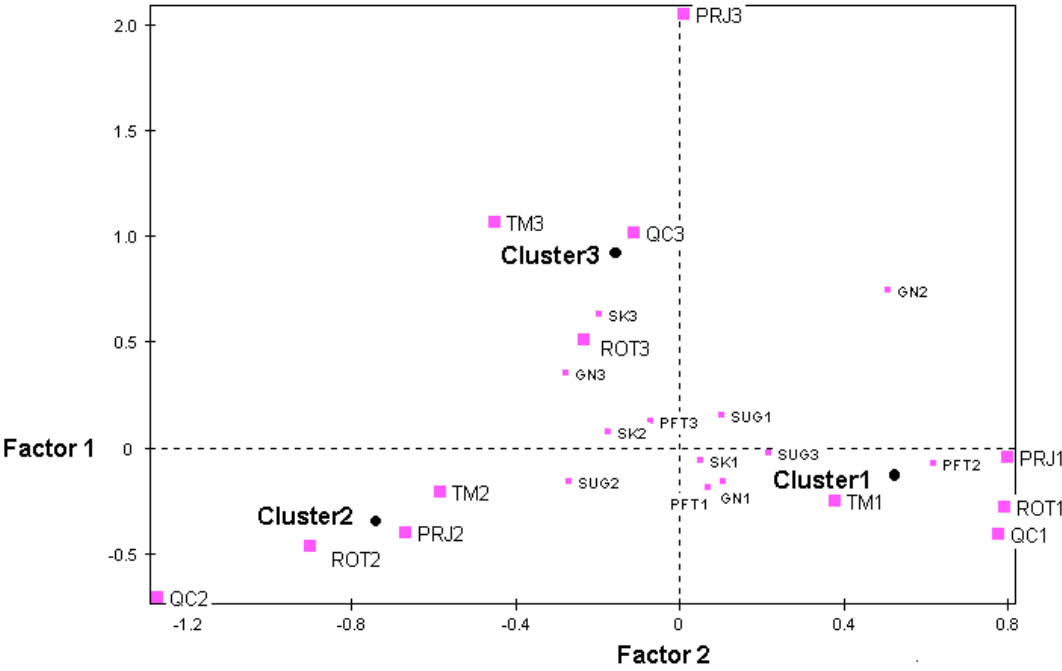
1. For the active points, ROT refers to job rotation, TM refers to self-managing team organisation, OC refers to quality circles, and PRJ refers to multi-disciplinary project teams. For the supplementary points, PFT refers to profit sharing, GN refers to gain sharing, SG refers to compensation for suggestions, and SK refers to skill-based pay. The value label 1 refers to a 0 percent penetration rate. The value label 2 refers to a utilisation rate between 1 and 33 percent. The value label 3 refers to a penetration rate over 33 percent.

In the two analyses, the work practice variables are the ‘active’ ones which determine the positioning of the axes, while the pay practice variables, printed out in a smaller sized font, have been introduced as ‘supplementary’ variables. The distinction between ‘active’ and ‘supplementary’ variables is the other important thing the reader needs to keep in mind to understand the results. In general, active variables are the ones on which the analysis is performed and which determine the construction of the principal factors. Supplementary variables are variables which have meaning in terms of the active ones and whose coordinate positions can be projected on to the scatter plot diagrams as an aide in interpreting the results. These supplementary variables have a position but, unlike the active ones, have no influence on the positioning of the principal factors.

²⁰ In the case of the British analysis, the first two factors account for 60 and 28 percent respectively of the total variation of the original data matrix as measured by the chi-squared statistic. In the case of the French analysis, the first two factors account for 33 and 24 percent respectively of the total variation of the original data matrix.

In the scatter plot diagram showing the results of the analysis of the British data, the active variables which contribute most to the construction of the second factor are the four variables corresponding to a high-level use of the work practices: ROT3, QC3, PRJ3 and TM3. The supplementary variable GN3, corresponding to the use of gain sharing at a high level, is positioned close to these four variables. This means that high-level use of gain sharing is more likely to be characteristic of British firms which make intensive use of the work practices than it is of firms which use these work practices at low levels or not at all.

Figure 2
Factor Analysis for French Firms



1. For the definitions of the variables, see Figure 1 above.

With these remarks in mind, we can turn to a more general and comparative interpretation of the results. Examining the work practice variables first, in the British case the clustering of the variables corresponding to a particular level of penetration of the practices into distinct groups means that if a firm makes use any one work practice at a particular level or intensity it tends to make use of all of them at that level. While the results for the French

firms show a similar tendency, the clustering of the variables corresponding to low and high level utilisation rates is not as tight as it is in the British case. In particular, the positioning of ROT3, the profile corresponding to a high-level use of job rotation, close to the origin means that a sizeable proportion of the firms characterised by this trait either do not make any use of the other practices or use them at a low level. This result is consistent with my remarks above concerning the way the distinctive features of the French labour market may encourage the adoption of job rotation.

As regards the pay variables, which have been introduced as supplementary points, in the British case their relative positioning along the two factors tends to mirror the relative positioning of the work practice variables. This indicates that British manpower and pay policies are characterised by a certain coherence in the sense that a particular level of utilisation of the work practices tends to go along with the same level of utilisation of the pay policies.²¹ The relative coherence of the British situation is brought out by comparing it with the French case. In the French analysis, the positioning of the variables corresponding to a high-level use of compensation for suggestions and to a low-level use of profit sharing and gain sharing make it clear that firms characterised by these traits tend to make no use of the work practices. The positioning of the profiles representing several of the pay variables quite close to the origin means that the population of firms characterised by them are distributed fairly evenly amongst the firms characterised by various levels of use of the work practices. This relative lack of association between work and pay practices displayed by the French sample of firms is consistent with the view developed above that political and institutional factors have a considerable bearing on company pay policy in France.

The Relation between Innovative Capacity and the Adoption of High Involvement Work Practices

In this section of the paper I take the analysis one step further and consider to what extent investments in innovative capacity, as measured by expenditures on research and development,

²¹ In the British firm analysis, the positioning of the four variables corresponding to non-use of the pay policies well to the left on the first factor of the variables corresponding to non-use of the work practices means that there is a very high probability that a firm not using the work practices will not use the pay policies, while the reverse is not necessarily true.

can predict the use of high involvement work practices. The rationale for this model specification is that expanding employees' skills and involving them in such arrangements as quality circles and project teams can increase the value added from R&D expenditures by promoting the kinds of synergy and exchanges of information between the firm's R&D, production engineering and production services that contribute to successful innovation.

The estimation results presented below also show the predictive power of a market strategy variable: taking financial risks in order to expand market share. The justification for this is similar to that for the R&D variable. If competition based on such non-price factors as quality and innovation has increased, then it can be argued that firms seeking to expand their market share will have an interest in adopting organisational devices which increase their capacity to improve product quality and design.

In estimating models of the adoption of high involvement work practices, at least three different approaches can be found in the literature. One approach is to rank firms on the basis of a simple count of the number of practices they have adopted and then to use an ordered logit estimation. (See, for example, Gittleman et al. 1998). The disadvantage of this approach is that firms which have only introduced practices marginally or on an experimental basis will be placed on an equal footing with those which have undertaken a significant transformation of their work methods. A second method, which is sensitive to variations in the depth of workplace transformation, is to estimate an ordered logit model based on a ranking of firms according to the number of practice for which the proportion of employees affected is above some threshold percentage level (See Osterman, 1994). A third way, which also can take into account differences in the depth of workplace transformation, is to construct an index or a ranking of firms using the factor scores resulting from a factor analysis of data representing their work organisation characteristics. (See Greenam, 1997 and Osterman, 1994).

Of these three possible approaches, the latter two are applied in this study. The reason for excluding the first pertains to its potential weakness noted above. Slightly over 85 percent of the British sample of firms made at least some use of all four of the work practices, and as a result ranking the firms on the basis of a simple count of the number of practices used did not provide an adequate basis for discriminating amongst them.

In the case of the first of the two methods used, the value of the dependent variable ranges between 0 and 3. It takes on the maximum value if the firm has introduced three or four practices at over the 33 percent level of penetration. If the number of practices for which the penetration level is over 33 percent level is less than three, the value of the dependent variable equals the number used at that level of penetration.

As regards the second of the two methods used, a hierarchical clustering technique²² has been applied using the coordinate positions or the 'factor scores' of the firms along the first three factors resulting from the multiple correspondence analyses.²³ For both country cases, this allowed for the grouping of the firms into three clusters, referred to as Cluster 1, Cluster 2 and Cluster 3. The centres of gravity of these clusters are indicated on Figures 1 and 2 above. It is evident from their positions relative to the coordinates for the four work practice variables that the clusters tend to group firms according to different levels of penetration of the four work practices.

The means and definitions for the variables used in the multivariate analysis are presented in Table 6 and the results of the estimations are presented in Tables 7. The most striking result concerns the difference between the coefficient estimates on the R&D expenditure variables for Britain and France. While they are positive and statistically significant for the case of Britain, they are not statistically significant nor are they uniformly positive for the case of France.²⁴ Similarly, the coefficient on the market share variable is positive and statistically significant for the Britain case while it is not significant for the case of France.

²² A single link hierarchical clustering method known as the nearest neighbour method has been used. For a description of this technique, see Johnson (1998, pp. 323-26).

²³ An alternative method would be to use the coordinate positions of firms along the first principal axis to construct a continuous dependent variable and then to estimate the model with ordinary least squares. See Osterman, (1994) for this method based on a principal components analysis.

²⁴ The positive coefficient of 1.55 for R&D expenditures over 5 percent of operating costs in the ordered logit estimation for Britain should be read as saying that a firm characterised by this level of R&D expenditure will tend to be characterised by a higher level of penetration of the work practices relative to a firm which does not spend on R&D, other characteristics being equal. The coefficient of 4.13 for R&D expenditures over 5 percent of operating costs in the multinomial logit estimation for Britain should be read as saying that the relative risk of being categorised in Cluster 3 over Cluster 2 is greater than 1 for a firm characterised by a 5 percent R&D expenditure level relative to a firm characterised by a 0 percent R&D expenditure.

Table 6
Means of Variables Used in Logit Estimations

Variable Name	Definition	British Enterprises	French Enterprises
Dependent Variables			
Number of practices over 33%	0 = no practices used by the firm > 33% level; 1 = one practice used >33%; 2 = two practices used > 33%; 3 = three or four practices used > 33%	1.95	1.99
Cluster analysis; four practices	The number, ranging between 1 and 3, of the cluster to which the firm belongs. (see Figures 1 and 2, pp. 12-13)		1.93
Predictor Variables			
<i>Research and Development:</i>			
R&D2	1 = R&D expenditures between 1 and 2.5% of operating costs	.24	.14
R&D3	1 = R&D expenditures between 2.6 and 5% of operating costs	.29	.28
R&D4	1 = R&D expenditures between > 5% of operating costs	.15	.28
<i>Market Strategy Variables:</i>			
Market share2	1 = The respondent neither agrees nor disagrees that the firm takes financial risks to expand its market share	.178	.12
Market share3	1 = The respondent agrees or strongly agrees that the firm takes financial risks to expand its market share	.341	.37
<i>Size Classes:</i>			
Size2	1 = Enterprise has 1000 to 2500 employees	.363	.36
Size3	1 = Enterprise has 2501 to 5000 employees	.143	.13
Size4	1 = Enterprise has over 5000 employees	.14	.20
<i>Industrial Sectors:</i>			
Consumer	1 = Enterprise is in consumer goods sector	.14	.13
Equipment	1 = Enterprise is in industrial equipment sector	.14	.17
Intermediate	1 = Enterprise is in intermediate goods sector	.18	.22
Other	1 = Enterprise is in agriculture and food processing, electricity, gas and water, or construction and public works sectors	.15	.16

Table 7

Estimates of Ordered Logit and Multinomial Logit Models:

Independent Variable:	Ordered logit; No. of practices Over 33%	Multinomial logit ¹ ; Based on cluster analysis of four practices	Ordered logit; No. of practices over 33%	Multinomial logit ¹ ; Based on cluster analysis of Four practices
	British Firms		French Firms	
R&D2	1.67** (2.43)	2.46** (2.17)	-.30 (-.41)	.32 (.28)
R&D3	1.41** (2.21)	2.45** (2.14)	.08 (.14)	-.71 (-.86)
R&D4	1.55** (2.10)	4.13*** (2.65)	.23 (.35)	-.15 (-.17)
Market share2	.55 (.97)	-1.24 (-1.28)	.95 (1.25)	.75 (.76)
Market share3	.92* (1.72)	2.86*** (2.98)	.53 (1.12)	.77 (1.11)
Consumer	-.57 (-.80)	-2.72** (-2.21)	-.38 (-.45)	-.30 (-.28)
Equipment	1.72** (2.44)	1.60 (1.58)	2.03*** (2.82)	1.35 (1.38)
Intermediate	1.23** (1.90)	1.76* (1.87)	1.93*** (3.01)	.61 (.65)
Other	-.62 (-.81)	-1.07 (-.90)	.04 (.06)	.72 (.65)
Size2	-1.2** (-2.31)	-1.14 (-1.49)	-.63 (-1.19)	.42 (.60)
Size3	.21 (.33)	1.26 (1.13)	-.85 (-1.21)	-.02 (-.02)
Size4	-1.56** (-1.86)	-1.58 (-1.30)	-.52 (-.83)	.19 (.21)
Pseudo R-squared	.18	.43	.13	.19
N	90	90	86	86

Notes

1. The multinomial logit coefficient estimates are for Cluster 3 relative to Cluster 2.
2. *** = significant at the .01 level; ** = significant at the .05 level; * = significant at the .10 level.
3. The value of the t-statistic is in parentheses.

Another striking feature of the results concerns how robust they are in the British case across the two estimation techniques. The only notable difference between the estimation methods concerns the sign of the coefficient for the variable corresponding to the ambiguous response of neither agreeing nor disagreeing that the firm takes financial risks in order to expand its market share.

Turning to the control variables, the results for the British sample indicate that relative to the smallest size category British firms in the largest size are less likely to be characterised by a high-level use of the work practices. This can be interpreted as supporting the view that very large corporations tend to be marked by greater inertia in their methods. As might be anticipated, the intermediate good sector is likely to be a favourable terrain for the introduction of high involvement work practices relative to the service sector. The results of the ordered logit regression for the French sample support this conclusion, while also indicating that firms in the industrial equipment sector are more likely to be characterised by an intensive use of the work practices. The fact that the multinomial logit analysis for the French case does not give the same results can probably best be accounted for by the relatively loose clustering in the multiple correspondence analysis of the variables corresponding to particular levels of penetration of the work practices. Compared to the British case, this increases the probability that the cluster analysis performed on the factor scores has created groups composed of firms using the practices at different levels of intensity.

Discussion

The descriptive statistics presented in the second section of this paper indicate that a greater proportion of large British companies have adopted high performance work and pay practices as compared to large companies in France. Diffusion is less deep amongst the British companies, however, in the sense that for a number of key practices or policies the sample of French firms report involving a larger proportion of their production employees at over the 66 percent level of penetration.

The factor analysis presented in the third section of the paper can be interpreted as providing evidence of greater coherence in British pay and manpower policies, in the sense that more intensive use of the new work practices is more consistently associated with more intensive use of the new pay policies. An explanation for this is that considerable variation in

the use of the pay and work practices in France can be attributed to the way the institutional environment and legislative regulation impinges on managerial choice. This conclusion is consistent with the results of the regression analysis which indicate that the use of high performance work practices in Britain responds more clearly to two key dimensions of corporate strategy: the level of expenditures on R&D and the aggressive pursuit of market share.

It is a commonplace that the impact of labour market regulation on the behaviour of employers is more pronounced in France than it is in Britain. French employers, regardless of whether they are affiliated to an employers' association, are obliged to respect minimum pay levels for occupational categories negotiated with the unions at the branch level. They are obliged to negotiate pay at the plant or enterprise-level with a local union or unions on an annual basis. They have multiple obligations in the area of employee representation, including the requirement to establish *comité d'entreprise*, to hold elections for the appointment of *délégués du personnel*, the obligation establish employee direct expression groups via negotiations with local union representatives. None of these requirements exist for firms operating on British soil.

Given this contrast, it is tempting to interpret the results of this paper as providing support for the view that employers, if left to their own devices, will respond to market selection pressures by adopting the kinds of work and pay policies that enhance their ability to compete. Any such conclusion has to be qualified by noting that for the majority of British firms the use of high involvement practices does not go very deep. This can be interpreted as supporting the thesis that externalities on the labour market may penalise firms adopting a participatory organisation relative to their more hierarchical competitors. (See, notably, Levine and Tyson, 1990).

A deeper understanding of the contrast between Britain and France can be achieved by examining the differences in an historical perspective. The declining performance of British manufacturers in such sectors as autos, machine tools and other branches of mechanical engineering during the 1970s and 1980s provoked charges of a 'British disease' The severity of the competitive problems faced by British manufacturers at this time arguably made them more receptive to changing notions of best practice, and in particular more receptive to Japanese management technique.

The decision of a number of major Japanese auto and electronic plants to establish affiliates in Japan in the 1970s, and the rapid increase of Japanese direct investment in the

1980s served to popularise such methods as quality circles and autonomous team organisation. With export market shares declining, and long-term employment prospects increasingly dim, both managers and employees and their unions alike tended to embrace new solutions, and in the process they transformed many customary practices based on a long tradition of craft-based organisation.

It is also important to take into account the different starting points of British and French producers in interpreting the results of this study. While the traditional British craft system is a far cry from Japanese methods of total quality management based on autonomous team organisation, it does share one distinctive feature with the Japanese approach. The traditional British craft system delegated responsibility to groups of skilled craft workers on the shop floor, who retained considerable autonomy in the way they organised their daily production activities. The traditional French system of work organisation, based on Taylor's principles of scientific management, arguably situated skills at a higher level in the organisational hierarchy. Given these different starting points, it is not unreasonable to argue that French producers face a more lengthy learning process in order to master the new methods.

Finally, although the analysis in this text has argued that British producers display a greater coherence in the way they have adopted high involvement work and pay practices, it cannot necessarily be concluded that only the British are reaping advantages in the market place. Even if French employers use of such policies as profit sharing or job rotation are not motivated in a consistent manner by the imperatives of increasing international competition, one cannot preclude that increases in productivity and performance are being achieved as an unintended by-product of their choices. This question, however, goes beyond the scope of this paper, which has primarily sought to explore the links between the institutional setting and the firm's organisation design and governance structure. This will form the focus of a follow-up study aiming to more directly explore the relation between high involvement work practices and various measures of performance.

References

- Applebaum, E. and R. Batt (1994) *The New American Workplace*, Ithica, NY, ILR Press.
- Cam, P. (1990) 'Le Droit à la Lumière ou les Ambivalences du Savoir,' *Travail et Emploi*, No. 43.
- Clegg, C., C. Axtell, L. Damodaran, B. Farby, R. Hull, R. Lloyd-Jones, J. Nicholls, R. Sell, C. Tomlinson, A. Ainger and T. Stewart, (1996) 'The performance of Information Technology and the Role of Human and organisational Factors,' Report to the ESRC, UK.
- Cooke, William 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.
- Coriat, B. (1998) L'Innovation Organisationnelle dans les Firmes Européennes,' Rapport Final pour le DGIII, Commission Européenne,
- DARES, 'Le Développement Récent des Politiques de Motivation des Salariés', *Premières Synthèses*, Paris, Ministère du Travail
- Deutouzos, M., R. Lester, and R. Solow, *Made in America*, Cambridge, MA., the MIT Press.
- 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.
- Elbaum, B. and W. Lazonic (1986) *The Decline of the British Economy*, Oxford, Oxford University Press.
- Eustace, D. 'Les Nouvelles Politiques de Rémunération des Entreprises et les Réactions des Salariés', CEREP No. 69, April.
- Florida, R. (1995) 'The Japanese Transplant Project,' Final Report to the Alfred P. Sloan Foundation.
- Foss, N. (1993) 'Theories of the Firm: Contractual and Competence Perspectives,' *Journal of Evolutionary Economics*, 3.
- Freeman, R. and E. Lazear, 'An Economic Analysis of Works Councils,' in Rogers, J. and W. Streeck (eds.), *Works Councils*
- Gittleman, M., M. Horrigan and M. Joyce (1998) "'Flexible" Workplace Practices: Evidence from a nationally Representative Survey' *Industrial and Labour Relations Review*, Vol. 52, No. 1.
- Greenacre, M.J. (1993) *Correspondence Analysis in Practice*, New York, Academic Press.
- Greenam, N. (1996) 'Innovation technologique, changements organisationnels et évolution des compétences' *Economie et Statistique*, No. 298.
- Harff, Y. and B. Henriot (1988) 'Evolution du Rôle et des Interventions Economiques des Comités Entreprises,' *Droit Social*, No. 2.
- 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.

Appendix 1

Multiple correspondence analysis is a mathematical technique similar in spirit to principal components analysis in that it similarly transforms a set of correlated response variables into a smaller set of uncorrelated variables called principal factors or axes. It is suitable for analysing the associations between more than two categorical variables that can be presented in multi-way contingency tables. The actual input for the analysis is an indicator matrix or matrix of dummy variables where the rows correspond to individual cases and the columns correspond to different levels or categories of the categorical variables.²⁵ From this matrix two clouds of points in multidimensional space can be defined and the analysis consists in identifying a lower dimensional space which come closest to these points. The criterion for measuring closeness is the weighted sum of squared chi-squared distances between the points and the lower dimensional subspace, where the weights are proportional to the column sums in the original indicator matrix. One can then project the column points onto the factors or axes of the lower dimensional space and look at the projected positions as an approximation of their true higher dimensional positions.

While in principal components analysis the total variance is decomposed along the principal factors or components, in 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.²⁶ Some information is usually lost in the data reduction process the accuracy of the display is measured by the percentage of the chi-squared statistic or inertia of the original data matrix which principal factors account for.

Three types of information are typically used in interpreting the results of a multiple correspondence analysis. The first is the coordinate positions of the variables along the

²⁵ An equivalent method is to perform a correspondence analysis on the Burt matrix. This is a square symmetric matrix which groups all the two-way contingency tables for a set of n categorical variables. Along the diagonal of the matrix are 'blocks' composed of the cross tabulations of each categorical variable with itself. The off-diagonal blocks are formed by the cross tabulations of each variable with the others. The matrix is symmetric since each entry on one side of the main diagonal is identical to the entry on the other side. See Greenacre (1993, p. 142).

²⁶ 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.

principal factors. The second is the squared correlations of the variables with the factors, which correspond to ‘factor loadings’ in principal components analysis. They measure the contribution of the factors to the response variables. The third is the percentage contributions of the variables to the part of the total inertia or chi-squared statistic accounted for by a factor. This shows which variables contribute to the construction of the factors

These three types of information are presented in Tables 1 and 2 below for the first five factors resulting from the multiple correspondence analyses of the data matrices representing the work practices of the sample of British and French firms. In the British case, only the first two factors, both illustrated in the scatter plot diagram in Figure 1 above, are of real interest, since they account for 60 and 28 percent respectively of the value of the chi-squared statistic or inertia of the original data matrix. The contributions for the third, fourth and fifth factors are relatively minor: 5, 3 and 1 percent respectively. In the case of the French analysis, the two-dimensional display in Figure 2 above provides a much less accurate representation of the true positions of the variables in multidimensional space, since these factors account for only 33 and 24 percent of the value of the chi-squared statistic or inertia respectively. The third, fourth and fifth factors resulting from the French analysis account for 12, 8 and 8 percent of the value of the chi-squared statistic respectively.

Examining the squared correlations or ‘factor loadings’ for the British analysis first, one notes that the third, fourth and fifth factors contribute very little to the response variables, with the notable exception of the variables corresponding to a low and high level utilisation of job rotation which load positively on the third factor. The third factor can be interpreted as measuring job task flexibility. As the scatter plot diagram on page 12 shows, the variables corresponding to the non-use of the work practices load positively on the first factor. It can be interpreted as a measuring organisational inertia or conservatism. The variables corresponding to an intermediate and high level of use of project teams, quality circles and self-managing teams load positively on the second factor. It can be interpreted as measuring organisational innovativeness.

An analysis of the contributions of the variables to the inertia accounted for by the factors leads to the same interpretation. Although this need not necessarily be the case, the

Multiple Correspondence Analysis of British Firm Work Practices: First Five Factors¹

VARIABLE	COORDINATES					CONTRIBUTIONS					FACTOR LOADINGS				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
ROT1	2.36	0.20	-0.23	0.13	-0.12	22.8	0.2	0.7	0.3	0.4	0.77	0.01	0.01	0.00	0.00
ROT2	-0.39	0.24	-0.46	0.09	0.06	3.4	1.9	15.8	0.8	0.5	0.32	0.12	0.45	0.02	0.01
ROT3	-0.12	-0.95	1.72	-0.39	-0.12	0.1	8.8	64.7	4.2	0.6	0.00	0.22	0.73	0.04	0.00
COMBINED CONTRIBUTION =						26.3	10.9	81.3	5.3	1.5					
TM1	3.10	0.85	-0.04	-0.33	-0.49	25.0	2.7	0.0	1.2	3.9	0.80	0.06	0.00	0.01	0.02
TM2	-0.40	0.47	0.08	0.11	-0.01	3.6	7.1	0.5	1.2	0.0	0.31	0.42	0.01	0.02	0.00
TM3	0.10	-1.41	-0.20	-0.18	0.16	0.1	26.0	1.1	1.3	1.4	0.00	0.71	0.01	0.01	0.01
COMBINED CONTRIBUTION =						28.7	35.8	1.7	3.6	5.3					
QC1	2.93	1.11	-0.13	-1.26	-0.78	19.1	4.0	0.1	15.0	8.4	0.61	0.09	0.00	0.11	0.04
QC2	-0.44	0.37	0.06	-0.30	0.27	4.3	4.4	0.2	8.0	9.9	0.36	0.26	0.01	0.16	0.13
QC3	0.33	-1.10	-0.10	0.96	-0.43	1.0	17.1	0.3	37.6	11.2	0.04	0.48	0.00	0.37	0.07
COMBINED CONTRIBUTION =						24.4	25.6	0.7	60.6	29.5					
PRJ1	2.85	0.41	0.69	1.13	1.94	18.0	0.6	3.5	11.9	52.8	0.57	0.01	0.03	0.09	0.27
PRJ2	-0.33	0.45	0.17	0.15	-0.26	2.4	6.7	2.2	2.1	9.4	0.22	0.41	0.06	0.05	0.13
PRJ3	0.12	-1.25	-0.61	-0.66	0.17	0.1	20.4	10.7	16.5	1.5	0.01	0.56	0.13	0.16	0.01
COMBINED CONTRIBUTION =						20.6	27.6	16.4	30.5	63.7					

1. ROT refers to job rotation; TM refers to self-managing team organisation; QC refers to quality circles; and PRJ refers to multi-disciplinary project teams. Value label 1 refers to a 0 percent utilisation rate. Value label 2 refers to a penetration rate between 1 and 33 percent. Value label 3 refers to a utilisation rate over 33 percent.

Multiple Correspondence Analysis of French Firm Work Practices:
First Five Factors¹

VARIABLE	COORDINATES					CONTRIBUTIONS					FACTOR LOADINGS				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
ROT1	0.79	-0.28	0.42	0.25	-0.24	13.2	2.0	6.2	2.5	2.4	0.37	0.05	0.10	0.04	0.03
ROT2	-0.90	-0.47	0.28	1.15	0.52	10.2	3.2	1.7	30.3	6.9	0.23	0.06	0.02	0.37	0.08
ROT3	-0.23	0.51	-0.53	-0.85	-0.07	1.3	7.1	11.2	31.0	0.2	0.04	0.18	0.20	0.50	0.00
COMBINED CONTRIBUTION =						24.7	12.3	19.1	63.8	9.5					
TM1	0.38	-0.26	-0.34	0.12	-0.51	4.7	2.5	6.5	0.8	17.0	0.20	0.09	0.16	0.02	0.36
TM2	-0.59	-0.21	1.48	-0.65	0.29	4.5	0.7	49.0	10.1	2.2	0.10	0.01	0.66	0.13	0.03
TM3	-0.45	1.06	-0.78	0.44	1.22	2.2	14.0	10.9	3.7	31.4	0.05	0.26	0.14	0.04	0.34
COMBINED CONTRIBUTION =						11.4	17.2	66.5	14.7	50.7					
QC1	0.78	-0.41	-0.21	0.13	0.23	14.8	4.8	1.8	0.8	2.6	0.46	0.13	0.03	0.01	0.04
QC2	-1.28	-0.71	-0.13	-0.53	-0.24	21.5	7.9	0.4	6.9	1.5	0.49	0.15	0.01	0.09	0.02
QC3	-0.11	1.01	0.36	0.20	-0.13	0.2	23.0	4.2	1.4	0.7	0.01	0.52	0.07	0.02	0.01
COMBINED CONTRIBUTION =						36.5	35.7	6.4	9.0	4.8					
PRJ1	0.80	-0.04	0.16	-0.40	0.59	14.9	0.1	1.0	6.7	15.9	0.44	0.00	0.02	0.11	0.24
PRJ2	-0.67	-0.40	-0.26	0.21	-0.24	12.5	5.3	3.2	2.2	3.2	0.43	0.15	0.07	0.04	0.06
PRJ3	0.01	2.05	0.61	0.57	-1.16	0.0	29.4	3.7	3.6	16.0	0.00	0.49	0.04	0.04	0.16
COMBINED CONTRIBUTION =						27.3	34.7	8.0	12.5	35.1					

1. ROT refers to job rotation; TM refers to self-managing team organisation; QC refers to quality circles; and PRJ refers to multi-disciplinary project teams. Value label 1 refers to a 0 percent utilisation rate. Value label 2 refers to a penetration rate between 1 and 33 percent. Value label 3 refers to a utilisation rate over 33 percent.

variables which load positively on a factor also explain most of the inertia accounted for by the factor.

Turning to the results of the French analysis, the variables corresponding to non-use and intermediate-level use of quality circles and project teams load positively on the first factor. To a lesser extent this is the case for the variables corresponding to non-use and intermediate-level use of job rotation. This first factor seems to measure incremental or experimental innovativeness. Observe, however, that intermediate level use of job rotation also loads positively on the fourth factor as does high-level use of job rotation. Further, these two variables account for most of the inertia of the fourth factor. The fourth factor, in a manner comparable to the third factor for the British case, is measuring job task flexibility.

The variables corresponding to high-level use of self-managing teams, project teams and quality circles load positively on the second factor. The second factor can be interpreted as measuring organisational innovativeness. The only variable which is highly correlated with the trivial third factor is the one corresponding to intermediate level-use of self-managing team organisation. This factor seems to measure the tendency to experiment with this practice. Finally, the variables corresponding to non-use and high-use of self-managing team organisation load positively on the fifth factor. It is difficult to give any meaning to what this factor is measuring.

By way of conclusion, of the two scatter plot diagrams presented in Figures 1 and 2 above, the display for the British analysis provides a much more accurate picture of the true positioning of the work practice variables than does the French display. On the basis of the British display we can conclude that a firm which uses any one practice at a certain level tends to use the others at the same level. In the case of the French analysis, this conclusion, which the scatter plot diagram in Figure 2 suggests, has to be qualified. The analysis above has shown that the variables corresponding to the various levels of utilisation of self-organising teams and to intermediate and high-level use of job rotation are to varying degrees off the two-dimensional plane defined by the first two factors, and thus not as close to variables corresponding to the use of the other practices at the same level as the display suggests.