

## **WORK ORGANIZATION AND PAY PRACTICES: EVIDENCE FROM FRENCH ESTABLISHMENT DATA<sup>1</sup>**

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### **ABSTRACT**

This paper aims at analysing the consistency of establishments' pay strategies with their choices in terms of work organization. Our argument is that product market constraints induce firms to adopt compatible work organizations to improve their competitiveness in, and reactivity to, the product market. However, changes in the work organization also imply changes in the extent of work control. As incentives theory predicts, this, in turn, compels firms to design compatible wage incentives strategies to improve the efficiency of the whole organization. We use French establishment data which provide us with a uniquely detailed information on the structure of wages, the characteristics of the work organization, product market as well as union activity. We conduct a Multiple Correspondence Analysis which allows us to classify establishments in five clusters according to their pay policies. We then explain the likelihood to adopt one of these pay policies by the work organization indicators available to us. Our results show that the more Taylorist is the work organization, the less likely are establishments to resort to incentives-related wage complements. But we also show that even within the category of establishments that are structured as internal labour markets, the criteria for wage careers differ according to the chosen work organisation. Likewise, among establishments paying performance bonuses, the choice of compensating individual or collective merit depends on whether product quality is the main objective of the firm.

**JEL Classification:** J33, J41, L23.

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### **INTRODUCTION**

Since the early eighties, a number of empirical studies have shown that demand-side effects play a significant role in the process of wage determination (e.g. Krueger and Summers, 1982, Gibbons and Katz, 1986). There is also French evidence showing that the increase in wage inequality in general as well as inter-industry wage differentials is partly due to employers' wage practices (e.g. Arai *et al.*, 1996, and Kramarz *et al.*, 1996).

However, a common feature of these studies is that they focus on compensation as a whole, not on its components. Yet, during the eighties, labour economists have suggested a variety of theories arguing that employers might design wages as policy instruments to reach a number of objectives such as incentives, turnover costs reduction, etc. At the same time, the empirical evidence shows that a growing number of employers resort to performance related pay schemes or to profit sharing mechanisms. This suggests that an analysis of the composition of total compensation as a policy instrument is more than a requirement for a better understanding of wage formation.

Another striking characteristic of the last two decades is the remarkable propensity of managers to reorganize their workplaces and adopt so-called high performance work organization schemes. An innovative work organization is one where decision making processes are decentralised, hierarchical coordination is reduced, functional flexibility and cooperation among workers are encouraged, while employees must be involved in firms' objectives. This obviously implies that jobs require more autonomy and skills variety than in traditional Taylorian organizations the most specific trait of which is task specialization. Labour and industrial organization economists commonly argue that the observed evolution towards a more flexible organization is mainly due to the increase in competition intensity and market uncertainty, but also to the changes in consumers behaviours and thus to product innovation requirements.

Astonishingly enough, while a large number of studies have analysed these transformations of working methods, very seldom has the issue been explicitly addressed in relation with the simultaneous evolution of remuneration policies. Yet, it is hard to believe that while adopting these organizational changes, employers did not also design compatible incentives mechanisms and, in particular, appropriate remuneration policies. There is indeed evidence that firms resorting to organizational changes are also very likely to adapt their remuneration schemes (see e.g. Osterman, 1994, Gittleman *et al.*, 1998, and Coutrot, 1994, for France).

The objective of this paper is twofold : first, it aims at proposing a taxonomy of incentives oriented pay practices in France ; next, it will identify those organizational contexts within which each of the highlighted pay policies is most likely to be implemented.

We believe that although it is not explicitly designed to explain the link between these two dimensions of firms' policies, incentives theory provides the most consistent framework within which such a link could be analysed. Any organization of the production process results in a set of behavioural rules that must simultaneously apply to all employees in a firm. Therefore, assessment of every determinant of job contents is more than a requirement if one is to understand the efficiency of a pay policy in terms of incentives. For instance, the relationship between individual wages and effort control cannot be fully understood without accounting for the

organizational context within which it takes place. Likewise, when analyzing the design of internal labour markets, one needs to know whether employers are seeking protection of specific human capital only or of workers' ability to cooperate, to be autonomous and/or to be polyvalent, as well.

Consequently, this paper's approach relies on the idea that policy instruments targeting workers' incentives are not substitutable to each other, but are rather complementary. Among the variety of organizational as well as pay-related incentives mechanisms available to them, employers choose the most powerful combination, given the technological and market constraints they face.

Thus, the paper aims at identifying the variety of such combinations that are at work in the French economy as well as providing theoretical explanations of the observed patterns, in line with incentives theory. It is organised as follows. To facilitate interpretation of our empirical results, we start by discussing in section 2 the main predictions of incentives theory in terms of labour contracts design. In section 3, the data we use as well as our testing strategy are described. We then report and interpret our results in the next two sections: section 4 proposes a taxonomy of wage practices in France whereas section 5 examines the link between the latter and work organization schemes. Section 6 concludes the paper.

## **THE LINKS BETWEEN PAY PRACTICES AND WORK ORGANIZATION**

In economic theory, incentives are thought of as the set of actions of a decision maker who is willing to influence the behaviours of other economic agents. The underlying assumption is that the objectives of the decision maker and of the other agents might diverge. This occurs in the context of work relationships where external market coordination becomes insufficient as employers lose control of their employees' behaviours. To ensure that individual and collective interests become compatible, internal coordination mechanisms must therefore be designed. These comprise new incentives rules aiming at better organising the circulation of information, the sharing of specific knowledge and the strategic decisions of the organization's members like employees' effort and involvement.

According to Holmström and Milgrom (1994), incentives objectives could be reached through three types of mechanisms. First, there is the set of rules describing the job. These comprise task definitions, work hours as well as the extent of worker autonomy and responsibility. Second, worker participation schemes, be them financial such as profit sharing and employee ownership plans (EOPs) or decisional such as quality circles, workshop meetings or problem solving groups. Third, performance related pay. Though this is probably the most direct incentives instrument, its use depends on the availability of a measure of worker's contribution to output and hence on the extent of work supervision.

Given the behavioural, organizational and technological differences across firms, cost-benefit analyses of the variety of possible incentives systems might result in a

large diversity of work relationships that are very complex from a theoretical viewpoint. It is therefore worth analysing the way firms attempt to adopt remuneration policies to their organizational constraints. In this context, some of the predictions of agency theory are likely to be at least partly helpful in interpreting the observed remuneration schemes.

### **Control, Hierarchy and Incentives Pay**

One prediction of agency theory is that the intensity of incentives related pay practices will depend on employers' ability to control their employees' behaviour. As long as work control is perfect or costless, the management of workers' effort is not necessary and payment of the competitive wage is optimal. In contrast, whenever systematic work control is impossible, it is necessary to induce workers to exert more effort and the efficient incentives instrument could be a combination of a wage-level or a wage profile, together with an employment relationship interruption threat. Eventually, when the control of effort is too costly, employers might resort to wage premia that are based on the performance of the firm, teams or individuals, although performance measures are imperfect signals of workers' effort.

New work organization systems are characterized by changes in the job tasks with a shift from specialization towards versatility, an increase in the decision-making rights delegated to execution workers and autonomy devoted to groups of workers or self managed teams. The costs of direct monitoring of the workers' actions are then increased in these new organizations in comparison with the traditional Taylorian ones. Furthermore, these organizational changes are frequently associated with layering or shortened hierarchical structures that reduce the supervision ratio and increase the loss of control (Quian, 1994).

Holmstrom and Milgrom (1994) demonstrate that the various instruments of the incentives policy of the firm should co-vary with less direct monitoring, more autonomy in the range of actions and use of explicit incentives pay mechanisms that are complementary to each other. Garen (1996) empirically confirms this view, that the use of various systems of pay is related to the extent of repetitive work, the varieties of duties included in job tasks and the consequent ease of direct monitoring. This suggests that any departure from Taylor-type work organization should result in a generalisation of incentives pay systems.

### **Time Horizons of Incentives Policies**

Firms' pay policies could rely on the level of wages and/or promotions or on the payment of individual or collective performance premia. The choice among possible combinations of these depends not only on their costs, but on the time horizon of the chosen policy.

*Long-term incentives: Efficiency Wages and Delayed Compensation*

Pay policies that are based on the level of wages could be interpreted from the viewpoint of efficiency wage theory. Indeed, all versions of the latter predict that paying workers more than the competitive wage induces higher productivity levels. It is worth noting that for efficiency wages to be an efficient incentives scheme, it is necessary that the probability of control be high enough to induce workers' effort and hence, that the period of supervision be long enough. In addition, the choice of such a strategy requires that the credibility of employers' commitment *vis-à-vis* their employees be verifiable along a reasonably long contractual period. Thus, efficiency wages imply long term employment relationships where workers are relatively more protected than if they worked in a more competitive segment of the labour market. This relative protection they benefit from is the main argument underlying the idea that efficiency wage theory could be an explanation of the existence of internal labour markets.

Nevertheless, one characteristic of internal labour markets which efficiency wage theory cannot explain is the use of promotions as an incentives instrument. Yet, given that promotions provide workers with career progressions in terms of wages and of job status, they also have an incentives power as they act like "efficiency careers".

Hence, individualised wage increases could be seen as a means of providing workers with a delayed compensation of their individual merit. According to Lazear (1979, 1981), instead of paying workers a permanently high wage or performance premia, employers simply delay the compensation of workers' actual productivity levels. As long as the employer's commitment is trusted by employees, this strengthens the loyalty of the latter *vis-à-vis* the former and seniority becomes the main criterion for wage progression.

The importance of workers' loyalty *vis-à-vis* the employer also depends on the intensity of specific competences. In their original contribution to the theory of internal labour markets, Doeringer and Piore (1971) have, indeed, insisted on the notion of firm-specific technology, which includes both firm's equipment and its chosen work organization. Depending on the type of coordination prevailing in the firm, the required competences could be either some rare skills such as the familiarity with a particular technology or, in the high performance work organizations, the ability to develop specific skills such as polyvalence, cooperation and autonomy. Clearly, the criteria upon which firms offer internal careers to their best employees are tightly connected to the work organization they have chosen, pay for skill being an efficient way to induce them to acquire various skills that are not necessarily linked to a particular job.

*Short-term incentives: Performance Premia*

Firms might choose to fix wages on the basis of some time unit or pay their workers performance premia. In contrast to efficiency wages and career progression, these

methods of pay do not require long term employment relationships. Part of workers' wages could be based on individual or team performance, but the corresponding premia are of course reversible as firms are not compelled to compensate workers' merit beyond the period over which it has been measured.

The advantages firms expect from such a compensation scheme are rather similar to those associated with career progression methods, the main difference being that workers' effort is immediately rewarded. However, to avoid remuneration decreases, workers have to persevere in exerting the required level of effort. Thus, performance premia have a permanent incentives effect, just like efficiency wages. Another advantage of performance premia is selection since they are also expected to attract high ability workers to the firm. That is, workers whose performance levels are such that they can reasonably expect immediate higher earnings from such a compensation method.

But there are disadvantages as well. First, because of reversibility, performance pay makes it difficult for the firm to gain workers' loyalty. Second, workers might prefer firms offering promising career progression schemes to employers using performance pay only. Eventually, workers might prefer smooth long run consumption patterns and hence avoid incurring the risk of income fluctuations performance pay might imply. Thus, performance pay methods might yield higher turnover levels, hence limiting the possibility of long-term employment relationships. However, promotion incentives and short-term within jobs incentives can be complementary as it has been shown by Gibbs (1995) in the context of a large firm. Short term incentives are used to "fine-tune" workers' incentives conditional on promotional motivation.

On the other hand, performance pay also implies some flexibility in terms of labour costs. Firms operating in highly competitive product markets and facing high demand-related risk might adopt cautious human resources management policies which allow them to adjust labour costs to demand fluctuations. Firms choosing reversible performance pay methods are also able to transfer some of the demand-related risk to their workers.

### **Individual versus Collective Merit**

Whether firms choose long-term or short-term incentives policies, they have to decide whether merit should be assessed at the individual or at a broader level. Individual merit could be compensated through either wage individualisation, including promotions, or the payment of individual performance premia. In contrast, collective merit could be accounted for on the basis of team, workshop or firm performance. Again, the choice of any of these options relies on firms' objectives but also on their work organizational constraints.

#### *Individual Merit Compensation and its Dangers*

Individual merit compensation requires the existence of precise criteria of workers' merit evaluation. Such criteria are often difficult to define, especially when work

organization is such that tasks are only loosely defined or implies within-team workers' cooperation in terms of task or knowledge sharing. In such organizational environments, it is obviously hard to define any objective measure of the individual's contribution on the basis of which performance premia could be paid. Of course, seniors could be given the responsibility of subjectively assessing individual merit, but this still requires that criteria for merit evaluation be defined according to the characteristics of the work organization.

Even when possible, incentives methods based on individual merit might also yield undesirable consequences. As noted by Baker *et al.* (1994), any incentives mechanism should be based on performance measures that do not induce workers to adopt undesirable behaviours. For instance, when workers have to perform different tasks, the incentives method should also induce them to optimally allocate their effort to the various components of their job. Holmström and Milgrom (1991) propose a theoretical model which allows them to show that it might be optimal to pay workers with multi-task jobs a fixed salary, including no performance related bonuses. Of course, fixed pay could also be based on individual merit but again, the criteria for merit evaluation should be compatible with the objective of an optimal allocation of workers' effort to the various components of their jobs. Yet, this type of wage individualisation might also be difficult to implement if individual merit is also difficult to measure either objectively or subjectively. Under such circumstances, firms might find it less risky to adopt compensation methods that are based on broader measures such as team or firm performance.

Another undesirable effect individual merit pay might have on workers' behaviour is sabotage, especially when worker cooperation is one of the firm's objectives. If employees are induced to compete with each other upon wage premia, information and help exchanges might turn out to be very limited (Lazear, 1989).

#### *The Advantages of Collective Merit Compensation*

The above discussion suggests that, in general, individual merit compensation methods can be used but should be less than a preferable rule whenever work organization is designed to encourage cooperation and knowledge sharing. Wherever cooperation, polyvalence, multi-tasking and / or job rotation are encouraged, the share of individual wage bonuses in the wage package is limited and the variable part of it is mainly based on collective measures of performance. For instance, both Holmström (1982) and McAfee & McMillan (1991) suggest that when the production is organised around work groups, team wage premia are a means of solving the incentives problem, but also of facilitating the revelation of workers' ability. Likewise, Itoh (1992) shows that whenever worker cooperation is encouraged, employees' remuneration should increase with both their own performance and that of their colleagues. Employees should not simultaneously be asked to share tasks and be induced to compete with each other. Finally, Yeon-Koo and Seung-Weon (2001) demonstrate the

gains from an efficient use of working teams and group incentives, enhancing individual effort and peer-monitoring and cooperation.

Within the group of collective compensation methods, profit sharing and EOP are sometimes seen as low powered incentives as the link between a worker's individual effort and the benefits s/he expects from these methods may be tight. However, various analyses of such schemes report that, beside collective incentives *per se* and labour cost flexibility, they have other advantages. In France, Cahuc and Dormont (1992) have shown how profit sharing schemes can induce all firm's employees to increase their performance. Profit sharing plans also induce an improvement of workers' involvement by significantly contributing to the reduction of absenteeism and quits.<sup>2</sup> Moreover, profit sharing policies also help promoting collective norms of effort, managed by the employees themselves (e.g. Weitzman & Kruse, 1990). On their own, EOPs have been shown to have a positive impact on employees' behaviour and performance (see e.g. Renaud *et al.*, 2004). As such, they can be an important component of workers' retention and motivation policies as they favourably complement the requirement for extensive employee involvement in high performance organizations.

Another determinant of the choice of collective merit compensation schemes is the intensity of product market competition. For example, competitiveness criteria such as product quality and firm's reactivity to consumers' demands might induce employers to prefer compensation schemes that are based on firm's performance. Indeed, when the employer's objectives include the improvement of product quality and customers' satisfaction, individual and group merit compensation schemes might induce workers to target quantitative objectives only. One way to reconcile quantitative and qualitative objectives could consist in adopting collective merit compensation methods which ensure that all workers be involved in the firm's overall objectives. This is one of the ideas underlying participation and profit sharing systems as a means of inducing workers to behave in line with firm's market competitiveness criteria. Levine & Tyson (1990) have indeed highlighted the effectiveness of financial participation schemes when firms' policies are oriented towards product quality as well as the role of decisional participation systems such as quality circles.

### **Remuneration Policies and the Complexity of Firms' Objectives**

So far, we have attempted to summarise the predictions of incentives theory in terms of labour relations. Our summary exclusively focussed on how incentives policies should be adapted to the product market and work organizational constraints firms have to face. However, the complexity and simultaneity of these constraints, together with the variety of firms' objectives imply that what employers really look for is a subtle equilibrium between various compensation policies. Of course, incentives theory only models partial aspects of the real world and the optimal compensation schemes it recommends are applicable to rather particular and simple situations.



Some of the recent extensions of incentives theory have, however, highlighted the importance of considering the existing complementarities between the various human resources management practices (e.g. Holmstrom & Milgrom, 1994 and Milgrom & Roberts, 1995)<sup>3</sup>. They suggest that the partial predictions of incentives theory should be cautiously considered and that firms' compensation policies should in fact be viewed as optimal combinations, determined by the variety of firms' constraints.

For example, Baker *et al.*, (1994) show that there might be circumstances where it is optimal that firms combine both individual and collective merit compensation schemes. In particular, they show that when teams are an important component of the work organization, firms targeting both individual performance and an optimal degree of worker cooperation should combine compensation based on an objective measure of group performance and compensation based on a subjective measure of individuals' contribution to overall output. Ichniowski *et al.*, (1997) provide evidence for the existence of such compensation methods in the US. metal industry. By simultaneously promoting cooperation and compensating the best workers for their performance, these mixed compensation strategies allow firms to avoid the well-known free-riding problem which pure group incentives methods inherently imply.

The notion of complementarity illustrates well employers' aim to optimally combine various remuneration schemes. One example discussed in details by Milgrom and Roberts (1995) is the case of the Lincoln Electric Company. This firm is a well-known management case study illustrating a well designed set of policies. The chosen pay policy induces output-directed effort through an extended use of piece rates, while implementation of EOP and subjective individual annual bonuses based on quality and cooperation act as incentives complements to insure the requirement of product quality and cooperative team work.

Another extensively discussed example of a pay policy combining a consistent set of incentives mechanisms is that of the large Japanese firm. According to Aoki (1988), the short run evolution of the Japanese worker remuneration includes the payment of bi-annual bonuses that are mainly based on firm's performance. But the best organization members are also offered attractive careers which they can access after a rather long period of extended competences learning.

These remuneration rules are of course directly linked to the work organization in the Japanese firm. The main characteristics of the latter are the limited presence of task prescription, together with team-based work organization where employees are encouraged to cooperate with each other. Accumulation of competences is also based on job rotation within and across teams. Note that limited task prescription makes it difficult to objectively assess individual performance, hence the limited role of the latter in short-run remuneration packages. In addition, delayed promotions imply that only in the long run is individual merit fully accounted for through the assessment of competences since the accumulation of these requires a long period of knowledge sharing between workers.

Though specific, these examples show that any analysis of remuneration policies should account for every characteristic of establishments' activity as well as for the variety of constraints they face and in particular, those related to work organization.

#### **DATA AND EMPIRICAL SET-UP**

The purpose of this study is not to test for the necessarily partial predictions of incentives theory, but rather to examine the main combinations of wage-based incentives policies chosen by French firms in relation with their choices in terms of work organization. Our approach relies on the observation that remunerations comprise in general a basic wage as well as a number of additional components which reflect firms' wage policy choices.

We first construct a synthetic variable, reflecting establishments' remuneration policies. As a first step, we conduct a Multiple Correspondence Analysis (MCA), based on a wide set of variables describing establishments' wage practices. Obviously, within each establishment, the observed combination of such variables is meant to reflect rational choices but only once the chosen combinations are identified will it be possible to link the underlying rationality to establishments' work organization traits, technology and product market related constraints. Actually, by exclusively focusing on wage-related variables, we aim at identifying the most discriminating ones without any conditioning on organizational choices.

The second step consists in performing a clustering analysis that allows us to classify the observed establishments into five categories, depending on their wage practices. This approach has two advantages. First, it allows us to identify the main remuneration logics, the consistency of which could be analysed in the light of personnel economics and the industrial relations literature. Second, it provides one of the main ingredients to the rest of our analysis: a synthetic variable of wage practices.

Indeed, the last part of the analysis consists in estimating multinomial logit models the left-hand side variable of which is the wage policy indicator and the right-hand side of which includes alternative sets of work organization, technology and product market related variables. This allows us to estimate the probability that an establishment chooses a given wage policy, given its technology and product market constraints as well as its work organization choices.<sup>4</sup>

To conduct the above analysis, we use two complementary data sources : the 1992 labour cost and wage structure survey (LCWSS) conducted by INSEE, the French national statistics institute and the employment relations and firm negotiations survey (ERFNS) conducted by the ministry of labour between April and October 1993.<sup>5</sup> Merging the two data sets results in a sample of 1,758 establishments, representative of the French establishments belonging to firms with at least 50 employees from the non agricultural private sector.

The variables we use could be classified into three categories : first, there is the set of variables describing establishments' pay practices and which we use in the MCA

and in the clustering analysis; second, there is the set of variables describing establishments' work organization and which we use as explanatory variables in the econometric models we estimate; finally, a number of supplementary variables reflecting establishments' general economic environment are also considered, which help us to better interpret the main results.<sup>6</sup>

To better understand firms' choices in terms of pay practices, one should raise two main questions: To what extent do firms resort to the various remuneration policies? To what extent are firms' choices based on their willingness to motivate their labour forces. Our data allow us to simultaneously capture these two dimensions as they provide us with information on actual establishments' remuneration choices as well as on employers' opinion on the effectiveness of these as incentives instruments.

More specifically, we know if the employers have offered a general wage increase in 1992 and if they often resort to wage individualisation, for white collars and other workers, distinctively. In the latter case, employers also assess the importance of a number of criteria for individualized pay increases like seniority, experience, performance or versatility of skills. Also available to us are indicators of the use of bonuses, whether linked to individual, group or firm's performance and of profit sharing plans (*Intéressement and Participation*<sup>7</sup>) and EOPs. We also know whether the underlying compensation choices are made in the framework of an explicit wage policy and hence whether they rely on well-defined written criteria of workers' evaluation and/or on formal job evaluation methods designed either at the firm- or at the industry-level.

Firms' incentives strategies can even be better assessed as we also know the opinions of the manager on which specific pay practices influence workers' motivation and if the choice of the former is in priority oriented towards incentives. In fact, employers are asked to rank five remuneration forms in terms of incentives effectiveness for different categories of workers.

Beside these two sets of variables, we also have information on the evolution of the establishment towards high performance work organization (HPWO). If there is no precise and broadly accepted definition of this concept, most practitioners agree upon the following goals. Changes are designed to obtain a more flexible work organization where information and decisions are decentralized with more autonomous working groups whose members must learn to cooperate in order to continuously improve the quality of the products and services, employee involvement systems being then necessary to make the whole organization benefit from the workers' knowledge of the best way to produce.

In line with these goals, we have defined indicators of the use of five organizational innovations: total quality management, delayering, self managed teams, multi-disciplinary work groups and quality circles.

HPWO is also characterized by a change in the definition of the tasks devoted to the workers. Our data allow us to measure the extent to which workers' personal

initiative is encouraged in case of minor incidents during the production process and if the jobs are precisely defined by a set of tasks or by overall objectives. This is important as organizational innovations are likely to require extended and less prescriptive task definitions. Also available to us are measures of job rotation within and between work groups and of the encouragement of cooperation between workers. Finally, managers declare the extent of supervision of production workers' effort and individual performance.

Because the rationale for organizational innovations is firms' willingness to improve their reactivity to market uncertainty and to changes in their customers' needs, we also account for changes in production methods such as just-in-time, inventory diminutions and delay reductions. Such changes are well-known to require higher cooperation and knowledge sharing between workers.

It is also likely that firms' situation in the product market influences their propensity to adopt remuneration policies targeting either wage cost flexibility or workers' loyalty. To account for such possible influences, we also include indicators of establishment's market width and share, of the main competition criteria as well as of the trends over time of output.

## **A TAXONOMY OF REMUNERATION POLICIES**

In this section, we first discuss the outcome of the MCA and then propose a 5-class clustering of the sampled establishments.

### **Discriminating between Remuneration Policies**

The MCA resulted in a scatterplot the first four axis of which represented 40% of the total inertia. We restrict interpretation to these four axis.

The first axis opposes establishments with a well-diversified pay policy, including a large number of wage complements to establishments where almost none of these innovations are implemented. The most discriminatory variables are the existence of an explicit wage policy as well as a number of remuneration practices such as performance bonuses, profit sharing plans and EOP. Most consistently, establishments resorting to these wage instruments use a centralised system of jobs classification as well as explicit criteria for workers' evaluation. Not astonishingly, such establishments are most likely to be of large size.

The second axis discriminates between establishments according to their incentives strategies. It opposes establishments where promotions and general wage levels are the main incentives instruments to those resorting to individual or collective performance bonuses as a means of motivating their workers be them white collars or not. The former would favour long term employment relationships to improve the loyalty of the workers while the latter would prefer an instantaneous, but flexible, reward of employees' performance.

Interestingly enough, the third axis opposes establishments according to whether remunerations and hence, incentives strategies are based on individual or collective merit. Indeed, for all categories of workers, this axis differentiates between establishments where wage increases are individualised and those paying firm or work group performance related bonuses or those having implemented *Intéressement* and EOPs.

Last but not least, the fourth axis distinguishes between establishments having offered their workers a general wage increase in 1992 and those that have not, the latter being also positioned on the same axis side as those where employers consider that general wage levels are among the most relevant incentives strategies. We believe that this axis identifies establishments willing to offer their workers wage increases when their benefits allow them to do so, in line with a gain sharing goal.

### **A Classification of Establishments According to their Wage Policies**

Using establishments' coordinates on the four axis, we were able to conduct a hierarchical clustering which yielded a 5-class taxonomy of wage practices.<sup>8</sup>

*Group 1 : « Competitive » remuneration. (391 establishments, i.e. 22.2% of the whole sample)*

In this first group of establishments, not only do employers respond they adopted no explicit wage policy, but indeed, no clear incentives strategy emerges from the data. They neither offer their employees general wage increases nor do they resort to wage individualisation or to performance related pay. Very seldom do they implement profit sharing plans or EOPs.

Remunerations seem therefore to be determined according to market wages or to some external rules. In fact, most of these establishments have no explicit criteria of workers' evaluation. Actually, the dominant pay strategy consists in paying workers fixed wages on the basis of working time and position of the job in a grade structure. Furthermore, employers in this group seldom use a formal job evaluation method and, if so, jobs are then evaluated on the basis of industry-level collective agreements.

Finally, wage determination within this group of establishments obeys to no worker incentives criterion. For all incentives related variables, the fraction of establishments positively answering the corresponding questions is systematically lower within this group of establishments than in the whole sample.

*Workers' Loyalty: Two Distinct Policies*

The next two groups of establishments are characterized by wage policies targeting workers' loyalty and long-term incentives but differ from each other in the relevant criteria for internal career and the respective importance of individual and collective incentives.

*Group 2 : individual long-term incentives: « Traditional internal markets » (327 establishments, i.e. 18.6% of the sample)*

Very few incentives wage instruments are in use in this second group of establishments. However, the wage policy of the average establishment seems to be mainly motivated by establishing workers' loyalty and hence to be driven by the logic of internal labour markets. In 1992, 88% and 95% of these establishments have given general wage increases to white-collar and non-white collar workers, respectively. At the same time, they claim that promotions are one of their preferred incentive systems. Also, wage individualisation appears to be a rather common practice, especially for executives. Clearly, this combination of high wage and internal career suggests the objective of these establishments is to ensure worker' loyalty on the long run. Indeed, beside performance increases *per se*, beneficiaries of individual wage increases are chosen on the basis of seniority, experience accumulation and replacement difficulty. These are objective criteria that reflect the primary importance of specific knowledge and could be assimilated to the administrative rules of wage management characterizing internal markets *à la* Doeringer and Piore.

*Group 3: long-term incentives and the combination of collective and individual merit: « Renovated internal markets » (302 establishments, i.e. 17.2% of the sample)*

Like Group 2, these establishments pursue the workers' loyalty objective but in contrast to the latter, the incentives instruments they use are more diversified and aim at accounting for both individual and collective merit. Indeed, beside a widespread use of general wage increases, the weight of performance-related premia, be them individual or collective, in total remuneration is very large.

Actually, the main difference with Group 2 is that wage individualisation is not mainly based on seniority but rather on polyvalence in the case of non-executive workers and on performance improvement in the case of white collar workers. Another characteristic of this group of establishments is the importance of responsibility enlargement as a criterion for individual wage progression. Thus, the latter is also determined by worker's position in the hierarchical ladder. Clearly, in these establishments, compensation of competences is not totally disconnected from the contents of job and its required skills.

On the one hand, employers seem to be willing to encourage non-executive workers to acquire more diversified skills, an objective that is compatible with modern production methods where horizontal coordination across non-executive workers is required. In particular, extended use of profit sharing plans and ESOPs in these establishments seems also to be a means of inducing non-executive workers to share their knowledge with each other in order to fulfil individual careers. On the other hand, performance increases as a criterion for executives' wage individualisation and the use of individual performance bonuses suggest that incentives are tightly linked to individual merit for this category of employees. Thus executives in these

establishments are provided with both long-term incentives via wage individualisation and short-term incentives through bonuses.

Group 3 is therefore characterised by well-diversified pay policies aiming at (i) differentiating between categories of workers, (ii) yielding short- and long-term incentives and (iii) encouraging both individual and collective merit.

*The Objective of Wage costs Flexibility: Two Different Strategies*

The two remaining groups have clearly opted for wage costs flexibility. However, they have adopted different incentives policies to achieve this goal. Group 4 has chosen to immediately compensate for individual merit whereas Group 5 gives priority to collective merit, partly through gain sharing schemes.

*Group 4: Wage Costs Flexibility and the Compensation of Individual Merit: «formal individualisation» (319 establishments, i.e. 18.2% of the sample)*

The main characteristic of this group of establishments is the importance it gives to individual merit and of performance-related bonuses. This is made clear from their observed pay practices as well as from employers' belief about the efficiency of such incentives strategies. While the scarcity of general wage increases could be due to depressed product markets, the high incidence of wage individualisation suggests that employers are mainly willing to compensate workers' own merit. Not only are individual performance-related premia most widely spread within this group but, compared to establishments compensating collective performance, those of Group 4 seldom resort to *Intéressement* and *Participation* plans. Moreover, employers in these establishments have doubts on the incentives power of general wage increases and believe incentives strategies based on collective performance are less efficient than those oriented towards individual performance.

Also consistent with this strategy is the existence of strictly defined criteria of workers' evaluation. This ensures information transparency in the sense that the criteria of individual wage progression are known to all workers. In line with this interpretation is the high propensity of the establishments in this group to regularly provide their employees with information on individualised wage increases and on promotion opportunities.

*Group 5 : Wage costs flexibility and the compensation of collective merit: « Careful gain sharing » (419 establishments, i.e. 23.8% of the sample).*

Though establishments of both Group 4 and 5 share the wage costs flexibility objective, the main distinguishing feature of the latter group is the importance of collective merit. 75% of the establishments pay firm performance related bonuses and 33% of these pay work group performance related bonuses as well. In addition, almost all establishments offered general wage increases to non-executive workers but also to executives, albeit to a lesser extent.

Consistent with this strategy is the large proportion of employers ranking collective performance bonuses among the three most efficient incentives schemes (80% within Group 5 vs. 40% in the whole sample).

It is also worth noting that it is within this group that the fraction of establishments having experienced an increasing activity during the last 5 years is the highest. This might explain the wide use of general wage increases within this group. The combination of these with collective performance premia thus suggests that establishments of Group 5 are targeting an incentive policy based on gain sharing, while sharing product market related risks with their employees. The flexibility of wage costs is thus maintained as wage increases are not systematic and occur only when product market conditions are favourable.

### **Are Observed Pay Practices Consistent with Employers' Incentives Objectives?**

One striking feature of the results discussed so far is the apparent consistency between actual pay practices and employers' views about incentives power of these. The results from the MCA have shown that remuneration strategies were systematically positioned on the same side of each axis as employers' positive opinion as to the efficiency of these strategies in terms of incentives. Likewise, the clustering analysis resulted in groups of establishments with different pay policies but where employers almost systematically judged these positively.<sup>9</sup>

Of course, it might be that this is due to employers legitimating ex post the choices that have been made in their establishments. However, the structure of our data casts doubt on this explanation. Indeed, while information on actual pay practices is drawn from the LCWSS, data on employers' opinion on incentives mechanisms come from the IRFNS.<sup>10</sup> Therefore, we believe that the message our results deliver is that pay practices and employers' opinion are really consistent.

### **HOW CONSISTENT ARE FIRMS' PAY POLICIES WITH THEIR WORK ORGANIZATION?**

The main argument in this section is that the choice of wage incentives strategies has to be consistent with production methods and work organization in the workplace. A simple means of assessing the validity of this argument could consist in estimating the probabilities that an establishment adopts each type of pay policies given the characteristics of its work organization.

### **Modern Organizations use the Most Diversified Pay Strategies**

We first conduct a global analysis by focusing on synthetic indexes of the work organization, job definition and production methods. We use factor analysis to construct these three indicators. ORG is meant to reflect changes in the work organization and combines the use of five organizational innovations: total quality management, delayering, self managed teams, multi-disciplinary work groups and



quality circles. EMPL combines measures of workers' autonomy, the degree of task prescription, within and between-team rotation and cooperation. TECH is an indicator of the use of various production methods: just-in-time, delay shortening, series shortening and inventory diminishing.

Table 5 reports multinomial logit estimates of the effect of these variables on wage practices. It clearly shows that modernisation of the work organization, enrichment of job contents and adoption of new production methods are most likely to occur in establishments where pay practices are the most diversified. To be more specific, these three variables seem to be negatively correlated with the probability of establishments to belong to Group 1 (competitive remuneration) but also to Group 2 (traditional internal markets). Moreover, the hierarchy of the three other Groups in terms of remuneration diversity (that is first renovated internal markets, then formal individualisation and, finally, careful profit sharing) is echoed by the extent of work reorganization but also in terms of job contents enrichment, albeit to a lesser extent. Note also that though no clear ranking emerges from the results, changes in production methods are also positively correlated with the probability of belonging to Groups 3, 4 and 5.

These first results confirm the original intuition of likely complementarities between changes in the work organization and the production methods and the use of new instruments in the compensation policy. In order to further investigate the rationale for establishments' choices in terms of incentives instruments, we now estimate more detailed models where, instead of the synthetic variables ORG, EMPL, and TECH, we include the detailed qualitative variables they combined. But we also control for indicators of the extent of performance control, various indicators of employees' voice, product market policy, employer size and industry affiliation. The results are reported in Table 6.

### **Competitive Remuneration in Taylorist Organizations**

We now exclusively focus on Group 1 « Competitive remuneration ». We have shown in Section 4.2.1 that this group resorts to no particular pay complements and relies mostly on conventional obligations to classify jobs and pay workers. Table 6 shows that another characteristic of this group is the very low incidence of all aspects of modern work organization and production methods.

To be more specific, this group of establishments still resorts heavily to hierarchical control. Indeed, not only is delayering significantly less likely to occur in this group than in establishments with diversified pay policies, but autonomous and multidisciplinary workgroups are also rather scarce. In addition, targeting the collective objective of total quality does not seem to be a priority either. Furthermore, introduction of quality circles is also very limited, especially in comparison with Groups 3 (renovated internal markets), 4 (formal individualisation) and 5 (careful profit sharing).

In terms of job contents, it turns out that workers in this group are individually asked to perform highly prescribed and specialised tasks. This is confirmed by the fact that neither cooperation nor job rotation is encouraged and by the high propensity of supervisors to intervene when workers face any problem during the production process.

This is consistent with just-in-time and delay shortening production methods diminishing the probability to belong to this group. Indeed, these production methods require a high degree of coordination across workers but also decentralisation of decisional processes.

By all these aspects, establishments in Group 1 seem to have adopted a rather Taylorist organization where non-executive workers are asked to perform very specific tasks and are given almost no decisional latitude. In line with predictions of incentives theory, this explains why these establishments also pay their employees fixed remunerations that are based on worked hours, not on any effort or performance measure.

#### **Traditional Internal Markets and Vertical Coordination**

We have shown above that the main objective of establishments in Group 2 being workers' loyalty, their incentives policies consist in offering workers individual careers, based on seniority and experience, not performance premia. Interestingly enough, these establishments have also chosen to preserve a hierarchy-based coordination system. In fact, shortening of the hierarchical ladder reduces the probability of belonging to both Groups 1 and 2. Existence of such hierarchical control on workers explains why the use of precise evaluation of individual performance increases significantly the probability to belong to this group.

Consistent with this vertical coordination is the absence of any encouragement of cooperation between workers and the limited incidence of participation schemes such as quality circles. Collective knowledge sharing is clearly not a priority of these establishments, an observation that is confirmed by the lack of any clear quality objective. This is consistent with the limited use of any type of profit sharing schemes. As argued by Levine & Tyson (1990), the quality objective requires that profit sharing and employees' participation devices be set up.

The main difference between Groups 1 and 2 is the largest autonomy that is given to workers in the latter. Of course, this implies that worker supervision is not permanent and hence, that wage incentives should compensate for this loss of direct control. Another distinctive feature of Groups 1 and 2 is the wider use in the latter of new production methods such as just-in-time and delay shortening. Obviously, the skill adaptation and on-the-job learning these techniques require from workers are long-run processes and this is also consistent with both the loyalty objective and the time horizon of the incentives policies adopted by these establishments

**Renovated Internal Markets and Skill Management Inspired by the Japanese Firm**

As shown in page 74, Group 3 comprises establishments resorting to a large variety of wage complements. The results in Table 6 show that these establishments have also adopted a rather wide range of organizational innovations, the main characteristic of these being the rejection of vertical coordination.

Indeed, delayering increases the probability to belong to this group at least by comparison to Groups 1, 2 and 5. At the same time, cross-worker coordination is strengthened either within or between workshops. Not surprisingly, there is no other group where multidisciplinary groups are more frequent and where cooperation and within-team worker rotation are more encouraged. It is also worth noting the importance of product quality in these organizations. Not only is it in Group 3 where quality circles are the most widely established, but total quality management is also more frequently adopted. The quality objective obviously requires that the workforce be trained and able to quickly react to consumers' needs. This probably explains the importance that is given in Group 3 to horizontal coordination.

In addition, workers have been given more autonomy while task definitions are rather less prescriptive, at least when Group 3 is compared to Groups 4 and 5 where wage complements are also diversified. Clearly, within such an organization, workers' incentives are oriented towards the achievement of global objectives.

Actually, work organization in Group 3 is very close to that of the Japanese firm as described by Aoki (1988). But there are similarities in terms of wage policies as well. Both are endowed with complex incentives systems aiming at inducing workers to acquire wide competences and compensating the best employees on the long run. Profit sharing schemes and group performance premia are means of compensating immediately collective contributions to the firm's objectives whereas wage individualisation and promotions provide workers with a delayed compensation system in which pay is linked to the mastering of new skills.

**Formal Individualisation: Balanced Policies of Workers' Incentives**

The main characteristic of Group 4 is the importance of the wage costs flexibility goal which induced these establishments to adopt individual incentives schemes based on wage individualisation and the payment of performance bonuses. The results in Table 6 show that while the average establishment of this group has clearly abandoned the Taylorian principles, its work organization is not as modern as that of Group 3 (renovated internal markets). More specifically, the two main innovations this group has adopted are the suppression of hierarchical levels and the autonomy given to employees, at least in comparison to Groups 1, 2 and 5. This is consistent with the choice by these establishments to extensively resort to incentives pay schemes.

Primary importance given to individual performance bonuses over collective performance based ones might be explained by a less extended horizontal coordination than in establishments belonging to group 3. Indeed, in comparison with

the latter, the average establishment in group 4 is less likely to encourage cooperation between workers and to implement job rotation within work groups, multidisciplinary work groups and quality circles.

However, the need for workers' cohesiveness remains high while establishments of Group 4 also encourage cooperation and develop participation devices like quality circles more than their Groups 1 and 2 counterparts. This apparent contradiction can be solved by a well-balanced compensation policy. Indeed, establishments from group 4 also more likely to implement profit sharing plans, EOPs and collective performance based bonuses than establishments from groups 1 and 2.

The choice of implementing incentives schemes based on individual merit requires a reliable system of performance evaluation. Indeed, not only is performance systematically controlled more often in group 4 than in any other group, but formal written criteria of individual merit evaluation are also most widely used.

It is often argued that unions dislike pay systems where remunerations vary with individual performance at least because they really worry about the risk of arbitrary decisions during the performance measurement process. However, some authors claim that where a cooperation climate is established with the management, unions' resistance diminishes (Levine & Tyson, 1990, Drago & Heywood, 1995). This is important as not only is unions' density high in Group 4, but employers in this group are more likely to believe that unions' play a stimulating role in their establishments. Though it is not clear whether employees are happy with individual performance related pay, it is obvious that the conditions for its success are gathered in the work organization of Group 4.

The search for wage cost flexibility can find its ground in product market competition, together with work organization choices. It is therefore worth noticing that the establishments of group 4 seem also to have an active policy of delay shortening. This is probably an indicator of their willingness to enhance their reactivity to volatile customers. In addition, they are significantly far from being dominant in terms of product market shares. These product market considerations are likely to explain the importance of the wage costs flexibility goal and hence, the use of revertible pay complements.

#### **Careful Profit Sharing: Incentives Driven by the Product Market**

Wage practices as well as the work organization of Group 5 can also be explained by product market considerations. The results suggest indeed that the main objective of establishments in this group is customers' loyalty which they attempt to achieve thanks to product quality. In comparison to Groups 1, 2 and 4, the adoption of total quality management significantly increases the probability of belonging to Group 5. In addition, quality improvement is also an important characteristic of this group. This is consistent with collective incentives being the main foundation of pay strategies, in contrast to Groups 2 (traditional internal markets) and 4 (formal individualisation).

The importance of product market considerations is also highlighted by the positive and significant impact of prices and product quality as the main competitiveness criteria. The willingness of keeping prices at a competitive level might of course explain why wage costs flexibility is so important for these establishments and therefore why collective bonuses are preferred to promotions and seniority-related wage increases. Likewise, establishments' aim to motivate workers towards the fulfilment of the quality objective might explain the use of profit sharing as the main incentives device.

Actually, the work organization in establishments of Group 5 is also oriented towards these product market related objectives. Not only have they weakened vertical coordination, but they have also established quality circles and encouraged worker cooperation and between teams rotation. Thus, workers' involvement in the quality objective is also facilitated by a work organization where knowledge sharing is made easier.

#### **CONCLUDING REMARKS.**

The variety of remuneration strategies we have highlighted in this paper suggests that the main policy instrument establishments use to achieve the incentives objective is not the level, but rather the structure of wages. Because of the simultaneous development of both wage complements and new work organization methods, it is most likely that the observed evolution of pay practices results from rational employers aiming at ensuring the compatibility of their incentives strategies with their work organization.

Indeed, the worker incentives requirement seems to underlie firms' choices of the structure of wages and of their progression. As predicted by incentives theory, higher worker autonomy or weaker hierarchical control of workers attitudes compel employers to increase the dependency of remunerations on individual or collective performance. Thus, it is important to note that the main characteristics of modern work organizations are the loss of worker control, increasing autonomy and slacker task definition.

But remuneration strategies must also be consistent with the importance of the collective dimension in the work organization. Firms willing to collectively motivate their workers are likely to encourage knowledge acquisition and sharing across workers and this is in general facilitated by the development of participation schemes as well as the payment of wage complements that are linked to collective performance.

Of course, the link we have established between the structure of remunerations and the modernisation of the work organization raises a variety of issues regarding wage formation and which we do not explicitly address. To what extent does the variety of pay policies contribute to wage dispersion? How likely is a new segmentation of the labour market to emerge from the diversity of remuneration strategies? Is the coexistence of different pay practices, together with different work

organization schemes also an indicator of the coexistence of unequally efficient production organizations? Actually, all these questions are linked to each other. For instance, Lindbeck et Snower (1996) argue that the presumably unachieved transition from the Taylorian or Fordian organization towards a flexible one will induce further segmentation of the labour market, characterised by further exclusion of low-skilled workers and an increase of inter-firm wage differentials. In their view, part of wage inequality is thus due to firms not innovating in their work organization to the same extent.

### NOTES

1. Financial support from the Commissariat Général au Plan is gratefully acknowledged. The authors would like to thank Thomas Coutrot, Denis Fougère, Jean-Pierre Laffargue, Pierre Malgrange, Edmond Malinvaud and Louis-Paul Pelé as well as participants to the 16th Journées de Microéconomie Appliquée in Marrakech for valuable comments and suggestions. The usual disclaimer applies.
2. See for instance Wadhvani & Wall (1990) and Brown *et al.* (1998).
3. According to Milgrom and Roberts (1995), policies are complementary “when doing (more of) one raises the return to doing (more of) the other”.
4. We explicitly assume that production methods and work organization are chosen prior to the pay policy instruments. This assumption is necessary to insure identification of the model. A similar assumption is adopted by McLeod and Parent (1999) and by Schnedler (2000).
5. These are the « Enquête sur le Coût de la “Main-d’oeuvre” et la Structure des Salaires » and the « Enquête sur les Relations Professionnelles et les Négociations d’Entreprise », respectively.
6. A detailed description of the two data sets we use, of the establishments samples we consider as well as of the variables entering the analysis, is given in appendix 1.
7. Intéressement and Participation are two French systems of profit sharing. The former has been legally introduced in 1959 and requires a signed agreement between the firm and its workforce on a voluntary basis. The agreement defines an annual payment of a premium based on an agreed measure of firm performance. The second scheme, Participation, introduced in 1967, is compulsory for firms with more than 50 employees and voluntary for the others. This system implies the distribution of an annual premium linked to the firm’s profit.
8. Interpretation of the resulting five categories of establishments is based on the descriptive statistics reported in Table 1.
9. See Tables 2, 3 and 4 where correlations between compensation components and employers opinion are reported.
10. It should also be noted that while the LCWSS has been collected through a written questionnaire, the data in the IRFNS have been collected through a face-to-face interview run a few months later.
11. All variables taken from LCWSS in italic.
12. The term collective refers to any level of group performance, that is performance of the team, the establishment or the firm.

**Table 1**  
**Frequencies of Specific Pay Practices within each Cluster of Pay Policies**

	<i>All sample</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Group 4</i>	<i>Group 5</i>
Pay Practices						
General pay increase:						
White collar workers,	67.8	51	87.5	79.1	31.3	88.2
Other workers.	79.1	59.1	94.8	93.7	50.5	97.3
Bonuses linked to performance						
of the firm,	55.2	38.6	26.3	74.3	62.0	74.9
of the working group,	23	13.9	10.4	30.1	33	28.7
of the individual employee.	53.2	35.9	43.4	62.3	76.0	33.0
Individualisation of wages:						
White collar workers,	62.5	11.9	74.6	69.2	82.0	81.4
Other workers.	55.4	10.9	64.2	52.3	82.0	72.5
Company-wide plans:						
Intéressement,	43.1	19.9	12.8	73.5	45	65.2
Participation,	21.8	9.1	12.5	30.8	26	31.6
EOPs.	30.3	16.7	6.7	61.9	37.9	32.9
Written criteria of workers' evaluation	56.5	38.9	34.9	70.2	77.5	64.5
Job evaluation system						
designed at the industry level	59.8	55.3	70.6	50.7	58.6	63.0
designed at the firm level	23.2	21.5	23.2	42.7	25.7	19.0
Main incentives mechanisms						
General level of wages						
White collar workers,	39.9	39.6	62.4	54.3	10.7	34.5
Other workers	56.5	51.3	76.8	81.1	22.6	53.6
Individual pay raises						
White collar workers,	65.2	23	87.5	83.1	80.6	63.0
Other workers	69	35.6	92	78.5	85.9	62.8
Promotions						
White collar workers,	60.9	48.2	70.6	89.4	72	36.0
Other workers.	61.5	55.8	64.2	85.1	74	37.9
Bonuses linked to worker's performance						
White collar workers,	47.7	33.8	37.3	36.4	80.6	52
Other workers	40	42.7	37.3	15.2	69.3	35
Bonuses linked to collective performance						
White collar workers,	39.7	38.9	14.7	17.5	34.5	80
Other workers	38.3	35.6	10.7	25.2	27.6	80
Criteria for wage individualisation:						
Seniority (white collars),						
Average importance	30.9	30.6	32.7	36.4	28.2	28.0
Major importance.	4.4	4.4	6.1	3.6	2.8	2.7
Seniority (other workers),						
Average importance	38.6	37.6	34.6	48	38.2	36.7
Major importance.	7.1	8	12.1	7.9	3.8	3.6
Performance (white collars),						
Average importance	21.9	21.7	26.6	23.2	15.0	22.7
Major importance.	55.9	38.9	48.6	68.9	69.0	59.2
Performance (other workers),						
Average importance	28.8	29.3	32.7	31.2	21.3	26.1
Major importance.	55.3	39.1	48	63.2	68	60.9

*contd.*

	<i>All sample</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Group 4</i>	<i>Group 5</i>
Training effort (white collars),						
Average importance	55.3	38.1	51.7	72.5	62.1	56.8
Major importance.	12.7	12.4	14.7	8.6	12.2	14.7
Training (other workers),						
Average importance	60.2	47	56.6	73.8	68.8	60.6
Major importance.	14.3	12.6	15.3	12.3	14.4	16.4
Experience (white collars),						
Average importance	52.2	37.6	50.8	65.2	56.4	54.6
Major importance.	22.5	19.7	23.2	23.5	25.1	14.7
Experience (other workers),						
Average importance	58	47	56	66.8	63	59.9
Major importance.	22.5	19.2	23.2	25.8	22.9	22.5
Versatility (white collars),						
Average importance	48.2	35.6	44.6	63.9	53.9	47.3
Major importance.	17.7	12.6	18.0	16.6	20.4	21.0
Versatility (other workers),						
Average importance	48.4	41.7	46.2	57.3	53.3	46.1
Major importance.	29	18.9	28.1	34.1	31.7	33.7
Increased responsibilities (white collars),						
Average importance	21.0	23.2	22.0	17.9	21.0	19.8
Major importance.	57.7	38.9	34.4	73.8	63.6	62.1
Increased responsibilities (other workers),						
Average importance	30.9	32.3	30.3	28.8	33.9	28
Major importance.	52.5	37.1	50.5	64.9	54.9	58
Difficulty of worker's replacement (white collars),						
Average importance	35.0	21.5	37.9	42.1	40.4	36.2
Major importance	11.1	9.8	12.5	7.3	10.7	14.5
Difficulty of worker's replacement (other workers),						
Average importance	40.2	28.8	44.6	41.1	45.5	43
Major importance.	7.1	6.3	6.1	6	6.3	9.9

*Note:* Each cell contains the frequency of pay practices in each group. Bold figures indicate a significant influence of pay practice on the probability to adopt a given pay policy.

**Table 2**  
**Cross-Correlation Between General Pay Raises and their use as an Incentive Mechanism**

	<i>1</i>	<i>2</i>	<i>3</i>
1. General pay raise is among the main incentive mechanisms for white-collar workers			
2. General pay raise is among the main incentive mechanisms for other workers.	0.46***		
3. The employer has given general pay increases for white collar workers.	0.15***	0.08***	
4. The employer has given general pay increases for other workers.	0.06***	0.13***	0.60***



**Table 3**  
**Cross-Correlation between Individual Pay Raises and their use as an Incentive Mechanism**

	1	2	3
1. Individual pay raise is among the main incentive mechanisms for white-collar workers			
2. Individual pay raise is among the main incentive mechanisms for other workers.	0.46***		
3. The employer uses wage individualization for white collar workers.	0.29***	0.18***	
4. The employer uses wage individualization for other workers.	0.18***	0.24***	0.63***

**Table 4**  
**Cross-Correlation between Collective Performance Bonuses and their use as an Incentive Mechanism**

	1	2	3	4	5
1. Bonuses linked to collective performance is among the main incentive mechanisms for white-collar workers					
2. Bonuses linked to collective performance is among the main incentive mechanisms for other workers	0.43***				
3. Bonuses linked to team or workshop performance	0.11***	0.15***			
4. Bonuses linked to firm performance	0.10***	ns	0.14***		
5. Intéressement system of profit sharing	0.10***	0.17***	0.42***	0.09***	
6. Participation system of profit sharing	ns	0.07***	0.15***	0.08***	0.23***

\*\*\* p<0.01 ; ns : non significantly correlated.

**Table 5**  
**Influence of Index of Work Organization, Job Contents and Production Methods on the Choice of Synthetic Compensation Policy**

	Group 1: Competitive remuneration	Group 2: Traditional internal labour markets	Group 3: Renovated internal labour markets	Group 4: Formal individualisation
ORG	-0.36***	-0.20*	0.64***	0.41***
EMPL	-0.29***	-0.18*	0.45***	0.09
TECH	-0.61***	-0.20***	-0.04	-0.03

The reference group is group 5 « careful gain sharing ». \* p < 0.10 ; \*\* p < 0.05 ; \*\*\* p < 0.01.

**Table 6**  
**Multinomial Logit Estimates of Probability of Pay Policy Conditional on Work Organization,**  
**Methods of Production, Product Market Characteristics and Other Controls of**  
**Establishment Specific Traits**

<i>Main characteristics of the establishment</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Group 4</i>
Organizational innovations:				
Delaying	-0.40**	-0.43**	0.31**	0.36**
Total Quality Management	-0.92***	-0.35**	0.04	-0.34**
Pluri-disciplinary work groups	-0.01	0.01	0.87***	0.30*
Self-managed teams	-0.28*	0.19*	0.24*	0.28*
Quality Circles	-0.44***	-0.43***	0.60***	0.24
Rules describing the tasks:				
Autonomy of decision	-0.30**	-0.04	0.32*	0.38**
Cooperation	-0.50***	-0.34**	0.87***	-0.02
Rotation within teams	0.18	0.18	0.65***	0.36*
Rotation across teams	-0.16	-0.32*	-0.40**	-0.33**
No prescription of duties	0.01	0.15	0.30*	-0.18
Methods of Production:				
Just-in-Time	-0.54***	-0.12	-0.24	-0.01
Shortening production delays	-0.32**	0.27	0.45**	0.88***
Diminution of stocks and inventories	-0.51***	-0.40*	-0.26	-0.43***
Quality Improvement	-0.58**	-0.75*	0.06	0.31
Employee Collective Voice:				
Wage bargaining in 1992	-0.89***	-0.80***	-0.10	-0.69***
employees representatives	0.37**	0.22	1.50***	0.37**
union representatives	-0.23	-0.10	0.66***	-0.06
Union action is stimulating	0.69***	0.05	0.79***	0.60**
Performance evaluation:				
Systematic control	-1.20***	-0.74***	0.44	0.73**
Occasional control	-0.72***	-0.50*	0.40	0.24
Activity:				
Raising	-0.54***	-0.43***	-0.29**	-0.21
Criteria for competitiveness:				
Product prices	-0.68***	-0.36*	-0.09	-0.07
Product quality	-1.10***	-0.91***	-1.00***	-0.72**
Adaptation to customer	0.10	-0.01	0.28	0.24
Particular technology	0.17	0.17	0.53***	0.33*
Market shares:				
(reference: less than 3%)				
Greater than 50%	0.36	-0.03	0.02	-0.59**
Between 25 and 50%	-0.34	-0.79**	-0.11	-0.50*
Between 3 and 25%	-0.12	-0.52*	0.15	-0.34
Unknown	0.81***	0.48	-0.17	-0.34
Market horizon:				
(reference : local or regional)				
World	-0.32*	0.49***	0.55***	0.29
Europe	-0.42	0.54**	0.69***	0.44*
France	-0.91***	0.25	1.30***	0.49**
Unknown	1.38***	1.25***	1.18**	0.95**

*contd.*

Main characteristics of the establishment	Group 1	Group 2	Group 3	Group 4
Size of the firm: (référence class: 1 to 19 workers)				
20 to 49 workers,	-.51**	0.13	0.17	-0.36
50 to 99 workers,	-.67***	0.40	0.54	-0.45*
100 à 199 workers,	-.68***	0.05	0.73*	-0.46
200 à 499 workers,	-.78***	0.13	1.60***	-0.29
500 à 999 workers,	-1.04***	-0.19	2.14***	-0.33
more than 1.000 workers	-.28	0.83	3.25***	0.77

The reference group is group 5 « careful gain sharing ». Interpretation of the coefficients is the effect of independent dummy variables on the probability of choosing a pay policy relative to the careful gain sharing group. Also included as independent variables dummy variables for industry classification.

\*  $p < 0.10$  ; \*\*  $p < 0.05$  ; \*\*\*  $p < 0.01$ .

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### Appendix 1: Datasets and variables

This statistical appendix describes our two data sources, how the matching was done and the list of the variables used in this article. Our first source, the 1992 Labour Cost and Wage Structure Survey (*Enquête sur le Coût de la Main-d'Oeuvre et la Structure des Salaires*, LCWSS) is a nationally representative cross-section of 15,858 establishments with more than ten employees in manufacturing, construction and service industries. The second source, the employment relations and firm negotiations survey (ERFNS) conducted between April and October 1993, was drawn from a subset of the ECMOSS population consisting of 12,293 establishments from firms with at least 50 employees. Our original merged sample of 1,983 establishments can be seen as a representative sample of the French establishments belonging to firms with at least 50 employees from the non agricultural private sector.

The 1992 LCWSS Survey is organized in four parts. The first describes the structure of the workforce. The second collects establishments' information about wage levels and pay policy. The third consists on an employer-reported description of individual characteristics of a sample of their employees. Finally, the fourth part contains information on organizational and human resources practices together with details about the product market.

The ERFNS includes two questionnaires: the first filled in by the employer, the second by the employees' delegates. We use the management interview in this study. Most of the questioning concerned workplace information as a whole with special emphasis on personnel's voice, systems of decisional and financial participation of the workforce, organizational and technological innovations, wage policy, bargaining and conflicts.

In the following, we present the set of selected variables from these two surveys. We mainly distinguish the variables linked with compensation methods, organizational choices and the position of the establishment in the product market<sup>11</sup>.

#### Binary indicators of pay practices (used in the Multiple Correspondance Analysis):

- The employer has given general pay increases in 1992  
for white collar workers,  
for other workers.
- The employer uses wage individualization:  
for white collar workers,  
for other workers.
- Importance (null, average, strong) given to the following criteria to decide individual raise of wage levels?
  - tenure,*
  - experience,*
  - improvement of performance,*
  - versatility,*
  - training effort,*
  - increase in responsibilities,*
  - internal mobility in the firm,*
  - difficulty of worker's replacement,*
  - for white collar workers,*
  - for other workers.*

- *The employer gives bonuses linked to:  
the firm's performance,  
the team or the workshop's performance,  
worker's performance.*
- *The employer uses the following pay supplement:  
"Intéressement" system of profit sharing  
"Participation", system of profit sharing  
Employee Ownership Plan.*
- *What are the 3 main incentives mechanisms among:  
the general level of wages,  
individual pay raises,  
promotions,  
bonuses linked to individual worker's performance,  
bonuses linked to collective performance<sup>12</sup>.*
- *Does the employer follow an explicit wage policy?*
- *Existence of written criteria of workers' evaluation?*
- *To evaluate the base wage of blue-collar workers, do you use:  
a local (or centralized) job evaluation method or  
a decentralized job evaluation bargained at the industry level?*

**binary indicators of work organization :**

- *organizational innovations:  
Total Quality Management,  
delaying,  
self managed teams,  
multi-disciplinary work groups,  
quality circles*
- *Does the employer organizes:  
workshop meetings,  
workers' participation groups.*
- *Within work groups, workers rotate between tasks during the course of their usual work: Is this the case in your establishment? YES or NO.*
- *Some multi-skilled workers rotate between certain tasks (independently of team organisation): Is this the case in your establishment? YES or NO*
- *In the establishment, work is mainly defined as:  
a precise description of tasks to perform,  
a range of global objectives.*
- *In case of minor incident in the production process, does the employer:  
induce the workers to take charge of the problem by themselves,  
require that they refer to their managers before anything.*
- *Is direct cooperation between workers in different sections encouraged?*
- *Is the control of individual performances for execution workers:  
systematic  
occasional  
absent ?*

- Production methods:
  - Just-in-Time,
  - Shortening production runs
  - Shortening production delays
  - Diminution of stocks and inventories

**Supplementary Variables:**

***Industrial Relations***

- Presence of:
  - employees representatives*
  - union representatives?*
- For the production, does the employer consider the unions as,
  - an embarrassment,
  - a stimulation?

***Situation on the Product Market***

*Was the activity of the establishment in the last three years:*

*Increasing,*  
*stable,*  
*diminishing?*

- *The most important factors of competitiveness are*
  - the price,*
  - the quality,*
  - adaptation to specific clients,*
  - the use of a special technology.*
- *Would you consider your product market as:*
  - local or regional,*
  - national,*
  - European,*
  - World wide,*
  - unknown ?*
- *Market share:*
  - unknowns,*
  - less than 3%,*
  - between 3 and 25%,*
  - between 25 and 50%,*
  - more than 50%.*



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