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The Influence of Employee Involvement on Productivity: A Review of Research

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by
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Major innovations in production management and work organization have occurred in recent decades, including a greater involvement of employees in workplace decisions. Research indicates that greater employee involvement has a positive impact on workplace productivity and firm performance generally. This paper presents a qualitative assessment of this research, with a focus on understanding how employee involvement can improve productivity.

The paper also discusses the conditions that are necessary for sustaining and stimulating productivity-enhancing workplace innovations. The paper concludes that social arrangements that are more conductive to trust between management and employees and to mutual gains and lead to further organizational innovation and economic growth.

Au cours des dernières décennies, d'importantes innovations ont été introduites dans le domaine de la gestion de la production et de l'organisation du travail, y compris une participation accrue des employés aux décisions relatives au milieu de travail. Selon la recherche, la participation accrue des employés influe de façon positive sur la productivité du milieu de travail et, de façon générale, sur le rendement de l'entreprise. Le présent article présente une évaluation qualitative de cette recherche et vise tout particulièrement à comprendre comment la participation des employés peut améliorer la productivité.

L'article traite également des conditions qui sont nécessaires pour soutenir et stimuler les innovations qui améliorent la productivité. Il conclut que les dispositions sociales qui contribuent à l'établissement d'un climat de confiance entre la direction et les employés et qui permettent aux parties de faire des gains, peuvent encourager d'autres innovations organisationnelles ainsi que la croissance économique.

In recent years, it has become a central tenet of management to involve workers in more of the decisions concerning their work. This research review analyzes these developments and assesses what we know about their impact on productivity.

There are at least two reasons for looking at this connection between employee involvement and productivity. First, major innovations in the management of labour have occurred in recent decades. Secondly, while previous generations of work reforms were instigated in the name of more humanistic patterns of work or of the quality of working life, the current generation is more openly driven by objectives of productivity and economic performance. In this context, an ongoing stream of research, on which we draw, seeks to establish the extent to which employee involvement really contributes to workplace productivity.

The first section introduces the research. The second section seeks to establish the link between discretionary effort and productivity. It consists mainly in a conceptual framework by which the question of co-operation is related to the specific nature of the employment relationship. The third section studies at some length the development of innovative work systems in recent years. The purpose is to explain the rationale for ongoing developments in the spheres of production management and work organization. Teamwork is considered as a key example of new patterns of work. The fourth section assesses what is known about productivity outcomes and then looks at the issue of workers' welfare. Finally, the fifth section and the Conclusion consider possible directions for research and public policy.

The key starting point in studying the link between workplace relations and productivity is the indeterminate, or open-ended, nature of the employment relationship. While compensation and general working conditions are agreed in some way at the time of employment, the employee's actual contribution, in terms of volume and quality of output, remains largely unspecified. Much depends on employees' willingness to invest their skills and know-how in the production process. In turn, such commitment is built on organizational arrangements, well-accepted

working conditions and co-operative relations more generally. In short, employee involvement is crucial because, to a large extent, effort remains discretionary.

Hence, it is important to identify the objective conditions under which co-operation actually develops. The development of a modus vivendi between agents is necessary if the production system is to be efficient enough to produce value added and ensure the reproduction of the employment relationship in the context of market competition. There is no doubt that, independently of technological evolution, co-operation is crucial if acceptable levels of productivity growth are to be generated at the point of production.

Recent technological developments resulted in a major change in the nature of work and productivity. The evolution toward more abstract labour, not only in the sectors most closely associated with information technology, has many implications for the way management can monitor the use of labour power. In more knowledge-based production, the intangibility of output has increased so much that the whole notion of productivity (largely defined on the basis of manual work in the Taylorist tradition) may have to be reconsidered. In such situations, productivity depends even more on the application of knowledge and skills and less on work pace or on giving the impression of "working hard." Appraisal of the contribution of an employee or of a group of employees to the firm's performance then becomes a key issue for management.

Measuring the effects of employee involvement on productivity is extremely difficult. Hence the focus of this paper is not on the question of "how much" but rather on the understanding of "how" and by which process new workplace practices can make a difference and improve productivity. This paper defines the nature and rationale of ongoing workplace changes and emphasizes how such practices may stimulate employees' willingness to use their formal and tacit skills efficiently. Much of the focus is on the meaning of innovations in the spheres of production and work organization and on their potential for enhancing productivity.

To explain the evolution in recent years, it is useful to make the distinction between the technical and the social division of labour. The technical division of labour refers to the way work is

fragmented and subdivided into limited operations performed by separate workers. The description of a pin-making factory by Adam Smith sheds light on the traditional idea of specialization as a major source of productivity. The simplification of a specific operation, repeated according to a very short cycle, was meant to increase a worker's dexterity on a given task. Frederick Taylor is rightly seen as the one who developed this idea most systematically, an approach that was well adapted to the industrial production of standardized goods. The Fordist era of production, and particularly the system of rules associated with a large number of job classifications, then brought this conception of production to its utmost possibilities. Over time, however, its limitations as regards efficiency became increasingly obvious.

For more than three decades, the tendency has been to decrease the technical division of labour and give workers a wider scope of activities. In the 1960s, experts in organizational behaviour thought that job enlargement and job enrichment would help to reduce alienation and tackle the "motivation problem." But the reduction of task fragmentation was often minimal. Over the last ten years or so, there has been a clear trend to reduce the number of job classifications, foster job rotation and internal mobility, and make the work group or team responsible for a degree of horizontal coordination. While workers used to be assigned individually, often for long periods, to a given job made up of well-specified tasks, the ongoing trend is to make workers more versatile and work organization more flexible.

The social division of labour, that is, the structural division between management and labour, is a general feature of the employment relationship. But major developments have been observed in the forms of control and supervision. Clearly, the tendency is to reduce direct supervision, a key element of the traditional hierarchical structure and of the taylorist vision of work organization. For several decades the tendency was to "soften" direct control, to make it more subtle. But, many workplaces are doing more than changing the style of supervision. As the conception of work organization evolves from the individual to the immediate work group, the sphere of self-regulation in which employees manage their contribution to production is growing.

The task of disentangling the effects of workplace change on productivity is highly demanding, even using the most sophisticated research techniques. The usual difficulty of dissociating the

impact of labour from that of other factors of production remains. Furthermore, the possible impact of any given workplace practice, or of any given bundle of such practices, on productivity and other performance outcomes is mediated by many structural and organizational variables. In short, the chain of reactions is complex. Nevertheless, research is progressing and this review presents a qualitative assessment of what we know about the impact of new ways of fostering employee involvement.

A considerable body of research indicates that new work systems have a positive impact on productivity and firm performance. However, this general proposition must be qualified in many ways. In particular, because of a lack of conceptual clarification, research is not really additive, or cumulative. Also, the difficulty of quantifying these effects remains, and probably will always remain, considerable. To date, the most accurate calculations seem to have been made in firms using continuous process technology, where productivity increases in the order of 6 or 7% are reported. This is already considerable. In less capital-intensive production, as is generally the case in batch production and assembly work, variations in productivity are often much more pronounced because output depends less directly on technology and more on workers' contribution and on organizational arrangements.

So far, researchers have paid less attention to the effects of innovative work systems on quality than to their impact on productivity. But current knowledge suggests that productivity improvements are not achieved at the expense of quality; innovative work systems can have a positive influence on both.

While there is growing evidence that innovative work systems are good for organizational performance, the picture is not so clear as regards the effects of these developments on the workers involved. Although the empirical evidence remains limited, it is reasonable to expect that the drive to rationalize work and the greater involvement of non-managerial employees in the organization and coordination of work may have led to a degree of work intensification. Some evidence suggests that workers are not only working "smarter," in many workplaces they are also working "harder."

Given the current state of knowledge, there are at least two ways in which public policy could support workplace innovation. One is to encourage research on the conditions in which innovative work systems flourish and generate more positive-sum arrangements between management and labour. Another is to foster institutional developments that would incite employers and unions to work on a social compromise which would be more attuned to recent and ongoing developments in the sphere of production.

The paper concludes that innovative work systems can have positive results for productivity and firm performance more generally. Considering the growing evidence that the effects on performance are positive, there is much speculation about the reasons why so many employers stick to more traditional work systems. Besides "switching costs" associated with the transformation of work arrangements, some consideration must certainly be given to issues of power. Many employers are still worried that by making their production system too dependent upon employee involvement, it would become more vulnerable and their decisions would be more open to discussion.

This research review indicates that clear patterns are taking shape in the spheres of production management and work organization. The general principles of flexible production and workers' self-regulation can now be discerned clearly. In contrast, it is still unclear which institutional framework could usefully support these developments in the sphere of production. By this we refer to institutional arrangements at both the macro and micro levels. In spite of much discussion in Canada about the limitations of the system of labour regulation associated with the New Deal compromise in the current economic era, only adjustments have so far been considered. In the workplace, in spite of considerable experimentation in many sectors, the system of rules that could preserve workers' rights and foster more involvement in production is only slowly taking shape. Of course, a precondition of more decisive progress in this regard is the development by the economic agents of a new compromise regarding the regulation of the employment relationship. In the absence of such a compromise, market forces prevail over jointly-agreed arrangements and institutions.

In sum, this research review shows that non-managerial employees are increasingly involved in workplace decisions. In our view, these changes, which are not limited to a specific economic context but are structural, have a real potential for enhancing productivity. But this paper seeks to put these developments in perspective and indicates some of the conditions that are necessary for sustaining and stimulating workplace innovation. In particular, unless innovative work systems are supported by arrangements that foster mutual gains and good working conditions, they may lead to economic inequality and social tension. In contrast, social arrangements which are more conducive to trust and social capital will lead to further organizational innovation and economic growth.

In *Industrial Democracy*, Sidney and Beatrice Webb observed that: “it is the supreme paradox of democracy that every man is a servant in respect of the matters of which he possesses the most intimate knowledge, and for which he shows the most expert proficiency, namely, the professional craft to which he devotes his working hours; and he is a master over that on which he knows no more than anybody else, namely, the general interests of the community as a whole” (1997: 844). This is no place to discuss how economic democracy and efficiency have evolved since the Webbs wrote this classic work one century ago. Nevertheless, in recent years, it has become a central tenet of management to involve workers in more of the decisions concerning their work. This research review analyzes these developments and assesses what we know about their impact on productivity.

There are at least two reasons for looking at this connection between employee involvement and productivity. First, major innovations in the management of labour have occurred in recent decades. Workplace change mostly consists of programs and practices through which management seeks to increase discretionary effort, and which have both substantive and ideological meanings. “New ways” are being found to manage the firm’s “most important asset”, the discourse says. Secondly, while previous generations of work reforms were instigated in the name of more humanistic patterns of work or of the quality of working life, the current generation is more openly driven by objectives of productivity and economic performance. Indeed, reforms seem better accepted by workers when there is more clarity in this regard on the part of management. In this context, an ongoing stream of research, on which we draw, seeks to establish the extent to which employee involvement really contributes to workplace productivity.

It follows that our area of study is the micro level. Although the emphasis is on the links between workplace practices and productivity outcomes, the impact of these developments on workers’ welfare is also discussed. In later sections, some attention is also given to the linkages between organizational arrangements and institutional features. The review of literature is far from comprehensive but builds instead on some of the key contributions. Attention is placed mostly on empirical research on Canada and the United States.

The second section seeks to establish the link between discretionary effort and productivity. It consists mainly in a conceptual framework by which the question of co-operation is related to the specific nature of the employment relationship. The third section studies at some length the development of innovative work systems in recent years. The purpose is to explain the rationale for ongoing developments in the spheres of production management and work organization. Teamwork is considered as a key example of new patterns of work. The fourth section assesses what is known about productivity outcomes and then looks at the issue of workers' welfare. Finally, the fifth section and the Conclusion consider possible directions for research and public policy.

Social scientists who are interested in looking into the "black box of production" like to stress that the process of production is "relatively autonomous" from the working of the economy as a whole. This means that the transformation process that occurs at the point of production is conditioned very much by the structures and institutions of the wider society, but that local actors still have a great deal of autonomy, which will determine whether or not the workplace is innovative and efficient. Much depends on the social arrangements they are able to construct.

The key starting point in studying the link between workplace relations and productivity is the indeterminate, or open-ended, nature of the employment relationship. While compensation and general working conditions are agreed in some way at the time of employment, the employee's actual contribution, in terms of volume and quality of output, remains largely unspecified. Much depends on employees' willingness to invest their skills and know-how in the production process. In turn, such commitment is built on organizational arrangements, well-accepted working conditions and co-operative relations more generally. In short, employee involvement is crucial because, to a large extent, effort remains discretionary. The term employee involvement refers to the various means and processes by which workers take part in decisions concerning the use of their skills and resources in the production process.

This indeterminacy of the "level of effort" is neither a mere technical problem, nor a matter of measurement that can be resolved by the application of industrial engineering principles. Of course, Frederick W. Taylor's objective was to reduce uncertainty in this regard by reinforcing management control and taking away what he saw as excessive autonomy on the part of labour. Henry Ford also had this problem in mind when he first introduced the moving assembly line in Detroit in 1913. But addressing the "problem" and solving it are two different matters.

In spite of such advances in the rationalization of work, the question of the "effort bargain," that is, the social arrangement regarding the "normal" or "fair" contribution expected for a given wage, remained on the agenda throughout the 20th century. A key factor which makes the determination of output levels a complex matter is that the conversion of mental and physical

resources into productive activities occurs in the context of an employment relationship characterized by relations of subordination, a notion that has economic, social, and legal dimensions. Indeed, the division between management and labour was institutionalized in a very clear way in the labour laws defined in the United States and Canada as part of the New Deal social compromise (Sabel, 1997).

Productivity levels are influenced by this structural division between management and labour. The willingness of workers to "give their very best" is conditioned by this characteristic feature of the employment relationship, which means that workers do not have control over the organization of their work and do not necessarily receive more wage compensation, at least in the short term, if they produce more. This makes motivation a considerable problem. From the 1940s, Georges Friedmann, the leading figure in the development of sociology of work in France, insisted that this social dividing line between management and subordinates was at the origin of alienation and non-co-operation.

In spite of the structural division just described, social scientists carrying out field research at the point of production observe much more co-operation than conflict. The development of a modus vivendi between agents is necessary if the production system is to be efficient enough to produce value added and ensure the reproduction of the employment relationship in the context of market competition. There is no doubt that, independently of technological evolution, co-operation is crucial if acceptable levels of productivity growth are to be generated at the point of production.

Thus, if we examine the "human side" of the organization, it is evident that success does not depend only on skills and know-how, but also on the shared will to use these. This is the basis of the distinction between human capital and social capital. The latter is portrayed by Fukuyama as "a capability that arises from the prevalence of trust in a society or in certain parts of it" (1995: 26) and which greatly influences the relative success of national economies. The notion of trust, which refers to an expectation of reliability in the pursuit of exchange relations, has to do with the sharing of norms and values. Although trust has to do with the culture of the wider society, it is also greatly conditioned by social arrangements at the micro level. Paradoxically, trust can develop further between management and labour once they have acknowledged their different interests. This makes it possible to consider fruitful arrangements which are based on the distinct

rationales of management and labour but which, at the same time, offer prospects for competing successfully over time. This is the essence of joint regulation (Bélanger and Thuderoz, 1998). Interestingly, the indeterminate duration of the employment contract, which often extends over long periods, helps foster trust and co-operation, whereas short-term contracts give rise to more opportunistic behaviour. When studying the social foundation of productive behaviour, it is important not to think of productivity only in the short term but also to consider the capacity of a given production unit (and of the economy as a whole) to renew the skills and resources for innovation over time.

The above analysis suggests that the effects of workplace relations on productivity are largely underestimated in the academic literature.[1] Too much discussion is based on the false assumption that one hour of work simply corresponds to one hour of production. In reality, unless work is routinized by a technical device such as a moving conveyor belt or assembly line,[2] the conversion of labour power is quite variable. Our observation in a subway car factory in Quebec, where production levels had stabilized at a high level and profitability was high, illustrates these complex issues. The practice of early finishing was well established and accepted as part of the social convention between management and unionized labour. Indeed, it was instrumental in generating consent and co-operation at work (Bélanger, 1989). Both in theory and in practice, a *variable* reserve of productivity is built into any system of production and depends on a complex set of technical and social factors. The point is that the actual level of productivity per employee is not the maximum level possible. A social compromise has to be established in any workplace about the actual level of output. Indeed, industrial sociology shows that any attempt by management to "completely eliminate" the reserve of productivity is likely to fail and be counterproductive. It is nevertheless widely accepted that in the current phase of globalization

[1] Although we use the term productivity in the sense of labour productivity, that is, an amount of output produced per unit of labour input, it follows from our analysis that it would be difficult to establish a measure that reflects the impact of labour as distinct from other factors of production. In fact, productivity measures provide a useful indication of the extent to which labour performs in transforming the various resources and factors of production. It follows that an increase in capital intensity does not reduce the importance of labour cooperation on productivity; in most cases, it only makes it more crucial.

[2] In such a case, the pace of the assembly line will nevertheless be influenced by "social forces." But it is more important to recall that the prevalence of such a technical device is exaggerated. On the basis of a major national survey covering all sectors of employment in Britain, Duncan Gallie and his colleagues stress "how exceptional it is for individuals to be controlled by a machine-paced or assembly-line system. *Only 6 per cent of employees said a machine or assembly line was important for their work effort, and only 4 per cent for their work quality*" (1998: 65; their emphasis).

and competitive pressure, such reserves have been shrinking. This has been achieved mostly by increasing the proportion of working time actually devoted to productive activities. But as the following sections will illustrate, new developments are also pushing the possibilities of production systems even further.

In almost every workplace, there is a standard or norm with regard to the expected performance on a given job. This has been well documented in the industrial sociology literature. Although norms may be only indicative, in many workplaces they are known by all participants and correspond to the actual output on a given job. In spite of Taylor's influence, these norms (which usually relate to daily production in the manufacturing environment) often have more to do with custom and practice than with sophisticated work study.

What is changing, though, is the nature of work as we move from a manufacturing-based to a "knowledge-based economy." The evolution toward more abstract labour, not only in the sectors most closely associated with information technology, has many implications for the way management can monitor the use of labour power. As Peter Drucker stressed recently (1999), in more knowledge-based production, the intangibility of output has increased so much that the whole notion of productivity (largely defined on the basis of manual work in the Taylorist tradition) may have to be reconsidered. In such situations, productivity depends even more on the application of knowledge and skills and less on work pace or on giving the impression of "working hard." Appraisal of the contribution of an employee or of a group of employees to the firm's performance then becomes a key issue for management.

It should be clear by now that the innovations we have in mind include, but are by no means limited to, union-management relations and collective bargaining. Considering our focus on productivity, this paper deals mainly with the social arrangements that must be made at the point and in the course of production. This is not to underestimate the importance of the set of rules enshrined in the collective agreement. In particular, the rules governing the internal labour market, such as job classifications and stipulations concerning temporary transfers and internal mobility more generally, have much to do with productivity. New ways developed jointly by unions and employers to regulate conflict and stabilize relations have been well documented in industrial relations research. In the Canadian context, such developments have been observed

mostly in large private sector firms (Chaykowski and Verma, 1992; Verma and Chaykowski, 1999). But changes in the spheres of production management and work organization, to be discussed in the following section, appear to have been even more pronounced recently in Canadian workplaces.

This paper will not dwell on the complex set of factors fostering these major changes in the organization of work and production more generally. Suffice it to stress that the impetus for workplace innovation has enough to do with structural changes—in the global economy, in the way multinationals monitor production internationally, and in the way we are moving beyond the production of standard goods and services—to suggest that we are unlikely to return to the post-war patterns of production and workplace relations.

It follows from the preceding discussion on the social dynamics of production that measuring the effects of employee involvement on productivity is extremely difficult. Hence the focus of this paper is not on the question of "how much" but rather on the understanding of "how" and by which process new workplace practices can make a difference and improve productivity. Having explored at some length why social relations affect discretionary effort in Section 2, this section defines the nature and rationale of ongoing workplace changes and emphasizes how such practices may stimulate employees' willingness to use their formal and tacit skills efficiently. In short, the focus is on the meaning of innovations in the spheres of production and work organization and on their potential for enhancing productivity.

The section is structured according to a distinction between the spheres of production management and work organization, the latter deserving more attention. In a third sub-section, the diffusion of innovative work systems is estimated.

In many sectors of the economy, demand has gradually evolved toward less standardized products and services. The need for flexibility and speed in production adjustments is imperative in the race to produce less standardized and more varied products. But placing all the emphasis on flexibility would make production systems highly vulnerable. To make production efficient, some form of standardization has to be achieved "somewhere" in the production chain. Hence, in the current period, standardization is being gradually transferred from product to processes.

There are essentially two ways in which production processes can be standardized, namely through technology and production management. In contrast to robust and single-purpose equipment typical of the previous generation, information technology is relatively flexible. Production management, as distinct from hardware or equipment, is made up of programs, procedures and rules regulating the transformation of resources to respond to market demand (Bélanger et al., 1999). The main impetus is to develop production systems that are leaner and more fluid. In the search for a more continuous flow of production, two dominant principles underlie the various production management programs, which are referred to in a variety of ways

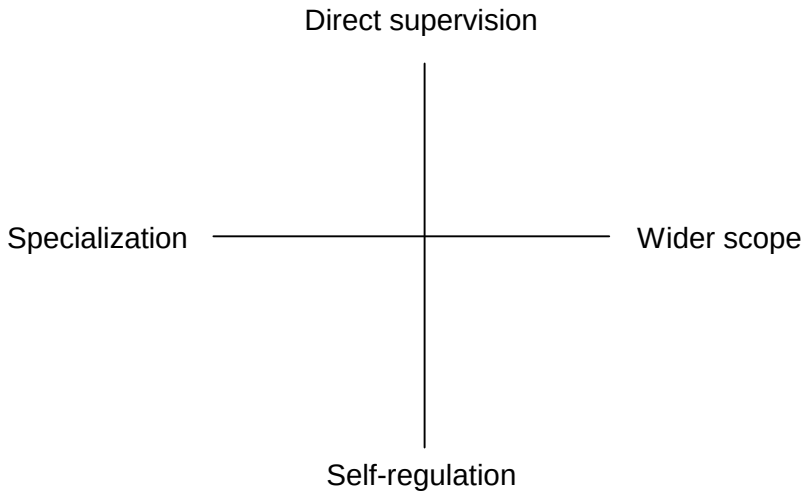
(e.g., reengineering, just-in-time production systems, etc.) and are promoted by consulting firms. These principles are (1) process management, in which production is conceived as a global process and not as a succession of different activities organized into separate departments, and (2) customer focus, according to which operations should be driven, or "pulled," by demand specifications. The "theory" holds that, once these principles are established and shared as much as possible by participants, major progress can be achieved in reducing "non-value-added activities."

This phase of standardization was first observed in the sphere of quality management, where it remains quite important. It is worth noting here that contrary to what is often suggested, total quality management (TQM), which is a core dimension of production management, is not intrinsically promoting worker participation. As conceived by Deming and other leading figures, the idea was to use statistical tools to analyze variance from tolerance margins at every stage in the process and to monitor production activities in order to increase consistency and reduce variability. A good example of this orientation is the Six Sigma program, a sophisticated tool of statistical quality control which was first implemented in large corporations such as Motorola, Asea Brown Boveri (ABB) and General Electric (Björkman, 1999: 51-52) and is currently being introduced in Canadian corporations such as Bombardier and Noranda. In the minds of industrial engineers who design these systems, the objective is to standardize operations and procedures, an approach that may contribute to reduce, and certainly not to expand, the individual autonomy of workers in the execution of their tasks. According to their rationale, quality is clearly management's responsibility.

Much of the confusion about the place of employee involvement in such programs comes from the fact that, to be effective, they have to be accepted by workers, who certainly have a support role to play. This is the case in particular for standardization procedures such as ISO, at least at the implementation stage. The end-result depends, in fact, on whether TQM programs really have a statistical or technical dimension or whether they are more watered down, as is often the case. The real impact of such programs on workers' influence is a complex issue, which still needs to be clarified through empirical research.

In the study of employee involvement and productivity, work organization is the principal sphere of interest. Work organization refers to the way labour power is used in the production process and is more circumscribed than production management, although the two are closely related.

Patterns of Work Organization



The above figure, based on the distinction between the technical and the social division of labour, seeks to illustrate the direction and meaning of ongoing change in the sphere of work organization. The technical division of labour, on the horizontal axis, refers to the way work is fragmented and subdivided into limited operations performed by separate workers. The description of a pin-making factory by Adam Smith, at the very beginning of *The Wealth of Nations*, sheds light on the traditional idea of *specialization* as a major source of productivity. The simplification of a specific operation, repeated according to a very short cycle, was meant to increase a worker's dexterity on a given task. Frederick Taylor is rightly seen as the one who developed this idea most systematically, an approach that was well adapted to the industrial production of standardized goods. The Fordist era of production, and particularly the system of rules associated with a large number of job classifications, then brought this conception of production to its utmost possibilities. Over time, however, its limitations as regards efficiency became increasingly obvious. Since the 1960s, even before structural changes in market

conditions took place, there have been several waves of experimentation aimed at reducing specialization and individualized work.

For more than three decades, the tendency has been to decrease the technical division of labour and give workers a *wider scope* of activities. In the 1960s, experts in organizational behaviour thought that job enlargement and job enrichment would help to reduce alienation and tackle the "motivation problem." But the reduction of task fragmentation was often minimal. Various forms of multi-tasking and multi-skilling sought to do more than enlarge the duration of work cycles. Over the last ten years or so, there has been a clear trend to reduce the number of job classifications, foster job rotation and internal mobility, and make the work group or team responsible for a degree of horizontal coordination. While workers used to be assigned individually, often for long periods, to a given job made up of well-specified tasks, the ongoing trend is to make workers more versatile and work organization more flexible. Case studies and national surveys (such as the British survey reported in Gallie et al., 1998) confirm the growth of task discretion in most sectors of employment.

The vertical axis of the figure illustrates the social division of labour, that is, the structural division between management and labour that we discussed in the second section. As noted, this is a general feature of the employment relationship and management control remains a necessity in the current economic structure. But major developments have been observed in the forms of control and supervision. Clearly, the tendency is to reduce *direct supervision*, a key element of the traditional hierarchical structure and of the taylorist vision of work organization. For several decades the tendency was to "soften" direct control, to make it more subtle. But, many workplaces are doing more than changing the style of supervision. As the conception of work organization evolves from the individual to the immediate work group, the sphere of *self-regulation* in which employees manage their contribution to production is growing. This development of new forms of social control has both an objective and a subjective dimension. Many decisions regarding the organization and co-ordination of work are devolved to workers, individually or collectively; this is referred to as the objective dimension. But self-regulation also relies on both the internalization by individuals and groups of production and quality standards and the acceptance of the need to "improve performance in the context of globalization," which is the subjective or symbolic dimension.

It is also important to consider the slow movement of individual organizations located at various points on the two axes as part of an ongoing process. While the pin factory observed by Adam Smith would be located at the extreme upper left, in contrast the ideal-type of the knowledge economy, such as the research and development of information technology in the Silicon Valley, would be at the extreme lower right of the figure. It is important to emphasize that we are not suggesting that there is one best pattern of work organization. For a given organization, the optimal position on the figure depends on several factors, including technology, product standardization and human capital. The point is that the organizations studied by many researchers in recent years are moving, from different starting points and at quite different paces, on a trajectory from upper left to lower right, that is, towards wider scope and a growing degree of self-regulation.

It is relevant to look more specifically at teamwork, the form of employee involvement which has been studied most thoroughly in the academic literature and which is rightly considered as the most representative example of autonomy and self-regulation. The development of teamwork, internationally, is the object of much discussion in the academic literature. Sometimes labelled "semi-autonomous," "self-directed" or "self-managed," teams are groups of workers who gradually take charge of many activities and decisions concerning the organization and co-ordination of their work, many of which used to be dealt with by front-line supervisors.[3]

Empirical accounts of the effects of teamwork on social control and efficiency present varied pictures. In particular, results are quite variable in the automobile industry, where the rigor of the assembly line remains a major constraint. Some of the main difficulties of teamwork relate to the ambiguous role of team leaders and the phenomenon of peer pressure, which refers to excessive social control between co-workers. Although peer pressure is certainly present in many workplaces and is a matter to be considered seriously, observation shows that such a development is not universal and suggests that other factors, which have been discussed very

[3] For his surveys, Osterman defines self-directed work teams as: "Employees supervise their own work, they make their own decisions about pace and flow and occasionally the best way to get work done" (1994: 187). Appelbaum and Batt point out: "By self-directed teams we mean groups of workers who have substantial discretion over the work process, make changes in production methods as needed, and take on many of the tasks traditionally carried out by front-line supervisors, such as allocating and coordinating work between different employees and scheduling" (1994: 253, n.3).

little in the literature, may be more important in understanding the connection between teamwork and productivity.

We call the first of these factors the “decompartmentalization” effect, which occurs when work evolves from an individual to a more collective form. With hindsight, some of the limits of the specialization and division of labour advocated by Smith and Taylor become obvious. But breaking down the walls of specialization and individual assignment through the creation of a collective unit can make a difference. Although further research is needed here, what we call the decompartmentalization effect seems related to broader changes in the management of production (Klein, 1991). This effect, whereby new connections and links are fostered, also extends beyond the limits of a given team. Indeed, as self-regulation develops further, workers communicate more openly with teams operating upstream and downstream in the production chain and take charge of some of the co-ordination with service departments such as planning, maintenance, or quality control. In particular, production workers communicate with maintenance craftsmen directly instead of reporting faulty equipment through formal communication between foremen as in the “old days.”

A second key factor has to do with the ongoing change in the nature of work, namely the development of activities that are based more on knowledge, cognition and abstract labour. As noted earlier, in such situations, productivity depends even more on the application of skills and less on work pace or on giving the impression of “working hard.” Productive activity often involves monitoring a flow of production or, indeed, a process by which the consumer will receive what is perceived as professional, high-quality service. This phenomenon adds much and gives a new dimension to the intangibility of output. The problem for management is that it becomes even more difficult to appraise performance. In such a context, teamwork may offer more possibilities than direct supervision because it is based on self-regulation by a group of employees of a process made of many interdependent activities.

Various national and sectoral surveys have sought to estimate the diffusion of change. This involves considerable methodological difficulties. In particular, the appellations of various practices are often peculiar to organizations. An even greater difficulty relates to the level of

penetration of a given measure, that is, to the proportion of employees actually affected by the innovation. In short, respondents who report that there are teams in their plant are not necessarily referring to the same thing.

Paul Osterman's successive surveys of private-sector firms with over 50 employees in the United States are at the leading edge of research on the diffusion of workplace practices. Of the establishments that responded in 1992 (published in 1994), 457 took part in the follow-up conducted in the 1997 survey, which covered a total of 683 establishments. Results show that in spite of the process of economic restructuring, the incidence of work reorganization grew considerably from 1992 to 1997. According to this methodology a practice is considered as adopted if 50% or more of core employees are involved.[4] If we examine only the firms surveyed in both 1992 and 1997, the penetration of three of the four measures studied increased considerably (quality circles, from 29.3 to 58.7%, job rotation, from 23.8 to 47.3%, and TQM, from 23.6 to 51.1%) (Osterman, 2000: 186). Only teams remained at the same level of adoption (approximately 40%), a fact Osterman explains by noting that teamwork is the most difficult work innovation to implement and sustain. A clear indication of the growth of diffusion and of the consolidation of workplace change is that while 37% of establishments had adopted two or more of these four measures in 1992, as many as 71% had done so by 1997 (ibid., 187, Table 2). The key conclusion of Osterman's research, though, is that while this continuing diffusion of work reorganization appears to enhance productivity, it does not appear to have produced "mutual gains."[5] Indeed, the lack of positive results for workers involved leads him to question "whether these patterns are sustainable in the long run" (Osterman, 2000: 195).

Although no comparable survey was conducted in Canada, various studies indicate that the extent of workplace change is also considerable. Betcherman notes that Canadian employers reacted less quickly than their American counterparts in a similar business environment. He points out that "while the Canadian employer community talked through much of the 1980s

[4] For instance, in 1992, teams were reported in 54.5% of all establishments, but they involved 50% or more of core employees in 40.5% of all establishments.

[5] The author concludes the section in which statistical analyses are conducted with the following: "In summary, the central conclusion from these models is that the presence of HPWO practices in 1992 is associated with a higher probability of layoffs in subsequent years and with no gains in real wages…The bottom line is that there is very little evidence that HPWOs have delivered on the promise of 'mutual gains' " (Osterman, 2000: 192-193; also p. 190). HPWO stands for high performance work organization.

about the fundamental challenges posed by globalization, domestic deregulation, and technological change, it was not until this decade that companies actually started to respond forcefully, at least on the human resources and industrial relations front" (Betcherman, 1999: 25). He then draws on the results of two national surveys that indicate a significant diffusion of the workplace practices discussed here. The Workplace Training Survey (WTS), which reached 2,584 Canadian establishments in 1995, reports the occurrence of team-based systems in 55.5% of workplaces, while the incidence of formal employee involvement programs (e.g. labour-management committees, quality circles) is at 46.7% (Betcherman, 1999: 31). These numbers seem rather high and consideration should be given to the level of penetration of these practices. But the bottom line is that workplace change is real. Surveys also indicate rather consistently that the diffusion of such practices is more advanced in large organizations. Indeed, Betcherman observes that the WTS and the 1993 Human Resource Practices Survey concur as regards the determinants of workplace innovation: "the incidence of 'high performance' practices…were positively correlated with size, the adoption of new technology, competing in international markets, and reporting 'people-centred' business strategies" (1999: 31).

Reporting on a major survey of the private-sector in the United States, Freeman and Rogers (1999) present a convincing account of *What Workers Want*, and of further possibilities for employee involvement. Their definition of employee involvement is rather broad, covering various means by which workers may have "more say in decision making" (1999: 101). A key result from our point of view is that work organization, defined as "deciding how to do your job and organize the work" (pages 48-49), is already, by far, the matter over which workers have the most influence. No less than 57% of the whole sample reported that they had a lot of direct influence and involvement. But employees want more! Indeed, there is still a considerable "influence gap" on work organization, that is, 31% of workers have less involvement than they want. While this book analyzes material from the U.S. survey, which entailed several stages of data collection, questionnaires were also administered to a Canadian sample of 1,100 respondents for the purpose of follow-up and comparison. However, we only learn in this publication "that Canadian private-sector workers express much the same attitudes as American private-sector workers" (Freeman and Rogers, 1999: 36).

It is widely accepted that the recent wave of workplace change is important and may have considerable implications. Fuelled by more flexible technologies and new ideas about the production of less standardized goods and services, these changes appear to be structural. This section focussed on the interpretation of ongoing innovations in the spheres of production management and work organization. The first sphere (production management) is the scene of a phase of *rationalization* that is very much in line with developments observed earlier in the century. The second (work organization) is characterized as a move away from specialization and direct supervision, in the search for a different way of fostering employees' *involvement* and commitment in modern conditions of production. While the key ideas of rationalization and involvement have long been seen as contradictory, recent trends suggest that they may be reconciled in practice. Indeed, there are many instances, depending on the technology and the degree to which labour is based on knowledge, in which rationalization and involvement are actually brought together in the search for efficiency.

Over the last five years, a major stream of research, especially in North America, has sought to assess the effects of employee involvement on productivity and firm performance more generally. There has been a proliferation of acronyms such as high involvement work systems (HIWS) or high-performance work systems (HPWS), the latter now being the most usual. These constructs are fraught with conceptual and methodological limitations worth mentioning briefly here.

While some emphasize measurement problems and the fact that too much discussion is based on case studies (for instance Ichniowski et al. 1996), our view is that there are other, more major problems "earlier" in the research process, namely at the conceptual and theoretical levels. In fact, some of the publications discussed in this section are based on sophisticated research design and data analysis. But the construction of categories and broader concepts does not always reflect the pragmatic, partial and evolutionary process through which workplace innovations are diffused.

First, the very notion of high-performance work systems is ambiguous and highly suggestive of expected favourable effects. As a general rule, applying the necessary distinction between intent and outcome is highly demanding in workplace research. This problem is particularly obvious here. The term "high performance" is not used on the basis of actual effects but in reference to the occurrence of a given workplace practice. Paradoxically, this literature focuses mostly on the effects of high-*performance* work systems on organizational *performance*. The title of a standard reference is this area, "High Performance Work Systems and Firm Performance" (Becker and Huselid, 1998), is illustrative of this problem of logic.[6] While the label high involvement work systems (HIWS) is less ambiguous, it also suggests that a given set of practices results in high

[6] The following comment by Pil and MacDuffie are relevant in this regard: "In using the term 'high-involvement' as a descriptor for new work practices, we depart from the convention of many recent writings on this topic that use the term 'high-performance' instead. We do so because we believe that to label new work practices 'high-performance' can be misleading in the absence of clear empirical tests of their actual link to economic performance in a given situation" (1996: 423, note 1).

involvement. In an effort to go beyond these difficulties, the term "innovative work systems" is preferred here to refer to the developing workplace practices examined in Section 3.[7]

Secondly, there is much variation in the literature as regards the set of complementary practices that are part of such work systems. This difficulty is noted and considered seriously by Osterman, who uses the term high performance work organization (HPWO). "Decisions about the definition of HPWOs are even less clear, since the term is basically a general description of a diverse set of practices. Most researchers would include teams as an essential element of an HPWO system, but there is not a total consensus about other practices" (Osterman, 2000: 180). Using a particularly strong research design, he studies teams, job rotation, quality circles and TQM and, as he notes (page 186), he "arbitrarily" considers an establishment as an HPWO when two or more practices cover at least 50% of core employees.

Thirdly and relatedly, there is a tendency on the part of many authors to suggest a natural contrast between firms that "have" innovative work systems and those that "have not." This is important because, as we will see, research has shown that workplace practices have limited effects individually; real gains come when bundles or clusters of measures act in a complementary way. But is it really the case that some establishments adopt such systems of coherent measures while others do not? In their national U.S. survey, Freeman and Rogers tested the view that "the high-performance workplace is a bit of an all-or-nothing proposition—qualitatively different from other workplaces" (1999: 93). While this idea is "intuitively appealing" (p. 94), it is not confirmed by their data. The distribution "resembles more the bell-shaped normal curve, with a central tendency around which firms cluster" (Freeman and Rogers, 1999: 95). In short, "firms do not appear to cluster neatly into 'high-performance firms' and 'all-others' in the way that the popular understanding suggests" (ibid. p. 97).[8]

[7] Nevertheless, when drawing from or discussing a specific research, it will often be necessary to use the same terms as the author(s).

[8] The authors report they also conducted a similar analysis on two data sets from other American scholars, with the same result. They "found that the distribution of firms by number of advanced practices looks more like a normal distribution than a discontinuous one in those data sets also" (Freeman and Rogers, 1999: 97). Again, "the bell curve gave a more valid summary of the data than the alternative hypothesis that the distribution was sharply bifurcated between good and bad firms" (ibid., page 212, note 8).

Finally, in much of literature under review, there is conceptual confusion between HPWSs and human resource management (HRM).[9] In an article which is quite critical of the "'high performance' paradigm", Godard and Delaney (2000) analyse it as part of the HRM perspective which challenges the traditional conception of industrial relations. While there are obvious links between these areas of change, it is also important not to confuse them. For instance, MacDuffie's important contribution is based in part on a conceptual distinction between changes in work organization versus changes in HRM policies (1995). Such a useful conceptual distinction between changes in work organization and the HRM practices supporting these is also made by Appelbaum et al. (2000: 39-44, 102-104).

These considerations are not meant to be overcritical of recent research. Indeed, the task of disentangling the effects of workplace change on productivity is highly demanding, even using the most sophisticated research techniques. The usual difficulty of dissociating the impact of labour from that of other factors of production remains. But there is more. The possible impact of any given workplace practice, or of any given bundle of such practices, on productivity and other performance outcomes is mediated by many structural and organizational variables. In short, the chain of reactions is complex. Nevertheless, research is progressing and the following pages present a qualitative assessment of what we know about the impact of new ways of fostering employee involvement.

Many authors have stressed that productivity—defined as an input-output ratio—is too narrow a concept to account for the significant effects of innovative work systems on organizational performance. Furthermore, it does not take into consideration the impact of such systems on the employees concerned. As some research suggests, these effects on workers may be much less positive than performance outcomes. Nevertheless, the view adopted here is that productivity

[9] In spite of its wide appeal, the concept of HRM is in itself in need of clarification. This is discussed at some length by Guest, who makes a distinction between strategic, descriptive and normative theories of HRM (1997 : 264-266). Guest opens his article with the following observation: "The impact of human resource management on performance has become *the* dominant research issue in this field." But, he insists, "if we are to improve our understanding of the impact of HRM on performance, we need a theory about HRM, a theory about performance and a theory about how they are linked" (1997: 263).

remains a relevant concept, partly because of its specificity, but that proper attention must also be given to other performance outcomes, such as quality, and to the impact on workers themselves.

It is now quite common for researchers to state that innovative work systems have a positive effect on productivity and firm performance. A standard reference is the synthesis written by Ichniowski et al.(1996). On the basis of a careful assessment of the research, they conclude that the empirical evidence tells a "consistent story": "Innovative human resource management practices can improve business productivity, primarily through the use of systems of related work practices designed to enhance worker participation and flexibility in the design of work and decentralization of managerial tasks and responsibilities" (1996: 322). It is worth noting that the authors are careful to state that "systems of related practices" (a notion to be discussed below) "can" have a positive impact.[10] As a result of their series of papers which use sophisticated research protocols, Becker and Huselid are considered among the leaders in this stream of research. While documenting some positive results, their recent synthesis of research concludes rather cautiously (1998: 91-98). They stress in particular that:

> Despite the growing academic and practitioner interest in strategic HRM, what we can say with confidence about the HRM-firm performance relationship is actually quite limited. Theoretically, there is a strong foundation for the expectation that superior human capital strategies will be reflected in valued-firm level outcomes. Empirically, however, we have only begun to 'peel back the onion' to gain an understanding of the *processes* through which HPWS add value, as well as to provide significant econometric evidence of the *magnitude* of such an effect. (Becker and Huselid, 1998: 91-92)

In general terms, research certainly indicates that new work systems have a positive impact on productivity and firm performance. However, this general proposition must be qualified in many ways in order for it to correspond to the current state of empirical research. A major reason is that, given that the "independent variable" (HPWS, HIWS, etc.) is poorly specified, research is not really additive. As noted by Guest, in spite of the statistical sophistication of many of the studies under review, "they are not looking at quite the same thing so they are cumulative in only a very general sense" (1997: 270). Two other British researchers come to a similar conclusion

[10] In the opening sentence of a more recent article, Ichniowski and Shaw state: "Recent research finds that systems of innovative human resource management (HRM) practices that promote employee participation improve a firm's economic performance" (1999: 704).

(Edwards and Wright, forthcoming). On the basis of theory and of a review of empirical work, they express confidence about the connections between HIWS and performance outcomes, but they stress that the causal chain has not been established and doubt, considering that "causal linkages are multiple and reciprocal," that it can ever be specified empirically. By way of analogy with Granovetter's concept, they emphasize that: "the ties between HIWSs and outcomes are variable, reciprocal and contingent, but the remaining weak ties still have a strong and simple message, that managing people well rather than badly affects productivity" (Edwards and Wright, forthcoming: 4; see also 21).

One way to go a step further in assessing what we know about productivity outcomes is to look more closely at some leading-edge intra-industry studies in this area. One of these, which will be returned to below, makes a useful distinction between the complementary ways in which innovative work systems can generate economic gains:

> First, an HPWS may reduce the total number of employees—including supervisors, service workers and warehouse staff—required to produce a given amount of output. This increases labor productivity and reduces the plant's unit labor costs. Second, an HPWS may increase total factor productivity and reduce costs in a variety of ways over and above the reductions, if any, in unit labor costs. It may reduce inventories of raw materials, work-in-process, or final products, for example...Third, by reducing equipment failures or other interruptions of the production process, the actual production of plants can more closely approximate their potential production, thus increasing the measured productivity of the plants' capital and labor resources. Finally, regardless of whether an HPWS reduces costs, it may lead to economic gains for the plant by increasing revenues and creating information rents. (Appelbaum et al., 2000: 45; also 105-106)

A first major reference is the international study of 62 automotive assembly plants by John Paul MacDuffie (1995). His key contribution is to show how three bundles of innovative practices, relating to manufacturing practices, work organization and HRM policies are actually connected and work together. Each of the two following hypotheses was supported by the analysis of survey data: "innovative HR practices affect performance not individually but as inter-related elements in an internally consistent HR 'bundle' or system; and that these HR bundles contribute most to assembly plant productivity and quality when they are integrated with manufacturing policies under the 'organizational logic' of a flexible production system" (MacDuffie: 1995: 217). Statistical analysis shows that these three bundles, for which different indices are created, are internally consistent and have positive effects on productivity and quality when they act in a

complementary way. Hence, flexible production, based on elements such as the limitation of buffers, teamwork, and a given set of HRM policies, consistently outperformed mass production plants. An important implication of this line of analysis is that differences in performance outcomes, for example between Japanese and American plants, can be accounted for by organizational characteristics rather than by unexplained cultural or national differences.

The longitudinal study realized by Casey Ichniowski and his colleagues, from monthly performance data in a homogeneous sample of 36 steel finishing lines in the United States, also provides strong support for the idea that only a coherent and integrated system of practices really makes a difference. Statistical analysis "shows that innovative HRM practices raise worker productivity. Moreover, systems of innovative HRM practices have large effects on production workers' performance, while changes in individual employment practices have little or no effect" (Ichniowski, Shaw and Prennushi, 1997: 311). The combination of practices that is categorized as the most innovative system (out of four) consistently corresponds to the highest levels of productivity and product quality, while the most traditional system is associated with the lowest outcomes. The "most conservative estimate" of the productivity effects of this innovative HRM system, expressed in terms of uptime[11] differentials, is in the order 6.7 percentage points (ibid., 303).

In a subsequent study, Ichniowski and Shaw (1999) compared performance data relating to five Japanese production lines. Their results again support the idea of a complementary system of practices, as Japanese plants use a coherent set of measures such as problem-solving teams, rotation across jobs, extensive training, etc. "The empirical results show that technologically similar production lines achieve gains in *both* productivity (or uptime) and product quality when systems of innovative HRM practices are introduced" (Ichniowski and Shaw, 1999: 717). More specifically, comparative analysis shows that Japanese lines are, on average, 5% more productive than U.S. lines but that American plants using the same set of innovative practices are as productive as Japanese ones, both in terms of productivity and quality. Indeed, the set of lines

Japan, are on average 7% more productive than lines having the most traditional system (pp. 713-715, 719).

Eileen Appelbaum and her colleagues recently published a comprehensive study on the effects of high-performance work systems on performance outcomes in the U.S. steel, apparel and medical imaging industries. Performance data were collected from 44 plants, in which interviews with managers and a survey of nearly 4,400 employees were conducted. The notion of HPWS is defined and operationalized around three basic components, namely, opportunity to participate, policies to enhance skills, and appropriate incentives (Appelbaum at al., 2000: 39-44, 116-124). The authors explain how the relevant measures of performance are specific to each of the three industries: productivity (measured as machine uptime) in steel, cost and throughput time in apparel, and work-in-process and finished product inventories in medical imaging (pp. 19, 105). As the subtitle of the book suggests, the results indicate that the effects of innovative work systems on organizational performance are positive and consistent in each of the three industries. Data are analyzed in much detail and the conclusion stresses that "in general, organizational changes at the shop-floor level make plants more productive and enable them to produce a greater volume of output or a qualitatively superior or more varied output with a given amount of resources" (Appelbaum et al., 2000: 227). The authors assert that this is made possible because "HPWSs elicit discretionary effort from workers. The more participatory work organization in an HPWS draws on the latent knowledge of workers to reduce waste, to solve problems more quickly, and to balance the workload and regulate the production process. Effective effort per hour of work in an HPWS is higher than in traditional workplaces because workers have the opportunity to work smarter" (ibid., 229).

In sum, a considerable body of research, which we did not intend to review in an extensive way here, indicates that innovative work systems have positive effects on productivity. But the difficulty of quantifying these effects remains, and probably will always remain, considerable. Drawing on secondary sources, Freeman and Rogers estimate that: "as a broad summary, employee participation raises productivity modestly—say, by 2 percent to 5 percent" (1999: 105). But although they list a series of publications in reference, it is unclear how they come to this figure. In fact, the magnitude of the impact depends very much on technology and systems of production. To date, the most accurate calculations (e.g., those by Ichniowski and colleagues)

seem to have been made in firms using continuous process technology, where a productivity increase in the order of 6 or 7% is considerable because of its effect on profitability. However, in less capital-intensive production, as is generally the case in batch production and assembly work, variations in productivity are often much more pronounced because output depends less directly on technology and more on workers' contribution and on organizational arrangements.

So far, researchers have paid less attention to the effects of innovative work systems on quality than to their impact on productivity. But it is worth noting that in the intra-industry studies referred to above, indicators of quality show the same positive pattern as do those on productivity. In short, current knowledge suggests that productivity improvements are not achieved at the expense of quality; innovative work systems can have a positive influence on both.

Finally, a clear and recurrent result of research is that single workplace practices have little effect but that a combination of such practices really makes a difference when these operate in a complementary way. This notion of bundles does not mean that an organization simply has to increase the number of innovative practices. The change process is much more complex. The key is to generate a synergistic effect, which in turn depends on the fit between the various components of a work system. Some of the research reviewed here provides direction, showing that certain forms of work organization and HRM policies that enhance skills and incentives can be linked and give good results. But this is not to suggest the possibility of a "one best way," because this complex combination of arrangements also has to be well adapted to the technology and system of production which prevail in a given industry, or in a given segment of an industry.

While there is growing evidence that innovative work systems are good for organizational performance, the picture is not so clear as regards the effects of these developments on the workers involved. Research on this question is much less advanced.

In fact, there are reasons to believe that the new patterns of work may have negative consequences for workers' welfare and this aspect is often considered as the social cost of such work systems. Although the empirical evidence remains limited, it is reasonable to expect that

the drive to rationalize work and the greater involvement of non-managerial employees in the organization and coordination of work may have led to a degree of work intensification. Some evidence suggests that workers are not only working "smarter," in many workplaces they are also working "harder." But these connections are highly complex and some preliminary distinctions may be useful.

First, a distinction has to be made between the immediate intensity of effort (or simply work pace) and the distribution of effort during the whole period of work. Our own observations suggest that much of the recent productivity gains derive from an increased proportion of working time effectively applied to production. Secondly, it is important to study the conditions under which workers are willing to expend more discretionary effort. Since the mid-1980s, a stream of research has developed in Great Britain that seeks to establish if workers really are working harder. The overall finding is that, in general, they actually do. But in reviewing this research, Edwards et al. (1998: 40-45) point out that workers were not necessarily dissatisfied with their level of effort as a result. For instance, in the six organizations studied by Edwards, Collinson and Rees, 57% of the sample could be classified as "committed," in that they were working harder and liked doing so (1998: 462). Although we are far from a definitive explanation of such complex matters, these authors advance the idea of a "disciplined worker thesis," which essentially means that workers are prepared to put in extra effort if the workplace is well managed, a situation which they prefer. In short, "time passes smoothly, and there is a sense of achievement at the end of the day" (Edwards, Collinson and Rees, 1998: 453; also 470). Thirdly, and relatedly, the notion of "effort" is in itself ambiguous. If the fluidity of work and the flow of production are improved, workers can produce more without necessarily giving more "effort" and experiencing more fatigue. Our own observations clearly indicate that workers do not object to this type of improvement, quite the contrary; but increasing the work pace and "speeding up" is a different matter. Fourthly, a considerable limitation on research on the impact of innovative work systems on workers' welfare is the difficulty of specifying the real "cause of the problem." Assuming that employees feel more pressure at work in the current period of increasing competitive pressure, globalization and budgetary restraints, does higher involvement and participation make matters worse, or better?

In a recent article, Conti and Gill (1998) were able to conceptualize the possible effect of lean production and just-in-time production systems on job stress. But they acknowledge that empirical support remains limited in this regard. One important source is the survey of 1,670 workers employed in 16 plants in the Canadian independent automobile components sector (Lewchuk and Robertson, 1996). It provides evidence of work intensification and more stressful and unhealthy working conditions. For instance, 61% of unionized workers surveyed "reported that their workload was either too fast, too heavy, had to be done by too few people, or in too little time" (Lewchuk and Robertson, 1996: 66). No less than 44% reported that "compared with a couple of years ago, their current job was more tense" (ibid., 67). However, the classification scheme developed by the researchers illustrates how difficult it is to differentiate and specify systems of production in order to assess the impact on given outcomes. Only two of the 16 organizations studied were "far enough along the path to lean production to be called lean companies" (ibid., 69); the most difficult working conditions were found in these two plants.

Much of the available evidence on the negative effects of new production systems on working conditions relates to the automobile industry (for instance, Rinehart, Huxley and Robertson, 1997). It is also the industry in which the system of lean production inspired by Japanese manufacturers was implemented most thoroughly, especially in North American transplants. In other industries, the application of lean production appears much less systematic, although many of the broader principles relating to production management have been diffused to varying degrees in manufacturing and services, worldwide. It follows that, in quite many workplaces, it would be methodologically difficult to establish a correlation between a "model" such as lean production and workers' health and welfare.

The worker survey conducted by Appelbaum et al. (2000) in the steel, apparel and medical imaging industry represents the most comprehensive effort to estimate the effects of HPWSs on workers' welfare. Their detailed statistical analyses focus mostly on the correlation between workers' opportunity to participate and five different outcomes. Although the necessary nuances are noted, the overall results are very clear for each of these: participation is positively associated with levels of trust, intrinsic rewards, organizational commitment, and job satisfaction, and it does not generate more work-related stress. The authors conclude that "improvements in productivity associated with HPWSs do not come at the expense of workers' welfare"

(Appelbaum et al., 2000: 228). The analysis of data on stress, the issue regarded by many as the most problematic, concentrates mostly on the possible connection between the opportunity to participate and five job stressors: role overload, required overtime, inadequate resources, conflict with co-workers, and unsafe and unpleasant physical conditions. Again, the authors insist that the evidence is clear: "these results provide little support for the notion that participatory forms of work organization require workers to work harder ('speed up') by placing too many conflicting demands on them, asking them to do more work than they can handle, or requiring them to work overtime" (ibid., 198). In short, the authors conclude that they "found no support for the thesis that higher effective effort in more participatory workplaces is due to speed-up" (ibid., 229). Nevertheless, it is worth pointing out that this research does not indicate that workers reported low perceptions of stress (see in particular Table 9.1). Rather, it shows that participation is generally related to lower levels of job stressors (ibid., 198). In other words, these results do not mean that stress is low in these industries; they nevertheless suggest that participation may have appeasing effects on job stressors.

In sum, while the literature suggests that workers' mental and physical contribution to organizational performance has increased in recent years, more research is needed to assess the impact of this ongoing process on workers' stress and health conditions more generally. The issue of workers' welfare has so far received much less attention than organizational performance in the academic literature on innovative work systems and deserves close consideration. Indeed, a deterioration of working conditions would not be a problem only from the perspective of the quality of work life. It would also affect the sustainability of new approaches to production as well as the capacity of organizations to renew their human and social capital and to reproduce over time the necessary conditions for productive and innovative work environments.

Given the current state of knowledge, there are at least two ways in which public policy could support workplace innovation. One is to encourage research on the conditions in which innovative work systems flourish and generate more positive-sum arrangements between management and labour. Another is to foster institutional developments that would incite employers and unions to work on a social compromise which would be more attuned to recent and ongoing developments in the sphere of production. Each of these two propositions deserves some elaboration. The first, on directions for research, will be developed briefly here, while the notion of institutional support will be discussed in the Conclusion.

We would suggest that progress in research on innovative work systems lies very much in finding the middle ground between two extreme views. At one extreme, some literature suggests there exists something of a "one best way" in terms of organizational characteristics which, if they could be found and properly tested in a given firm, could be replicated by competitors and even have universal applicability. According to this view, innovative work systems would have public goods characteristics and only give a short-term competitive advantage, a factor which would deter investment in organizational development. While not so many specialists on workplace relations explicitly hold such a view about the possibility of a "one best way," it certainly underlies many management fads as well as some highly influential books on production models (for example, Womack, Jones and Roos, 1990). Indeed, in their synthesis on work systems and firm performance, Becker and Huselid observe: "A related debate that runs throughout this literature is whether there is a *best* HRM system with universal applicability, or whether the strategic impact of HRM is *contingent* on the fit between the HRM system and corporate strategy" (1998: 58).

Considering the specific features of any productive organization and the complexity of the innovation process, this notion of a "one best way" does not fit with reality. But the other extreme, held by many experts in organizational research, is hardly more fruitful. Insisting too much on the specificity and idiosyncrasies of every workplace and stressing variations from case to case often leads to the view that optimal organizational choices are "totally contingent." In other words, they see so much firm specificity that no pattern can be inferred. On this account,

there would be only limited prospects for theory and public policy. Our point is that each of these two extreme views leads to an impasse. Workplace research suggests, however, that there may be a middle ground, to be outlined briefly here.

The way forward is to examine the conditions under which mutually reinforcing practices happen to fit with a given technology and system of production, and hence contribute to organizational performance. There is some emphasis in the literature on the fact that only clusters of complementary practices can make a difference. In the words of Ichniowski et al., "there are no one or two 'magic bullets' that are *the* work practices that will stimulate worker and business performance" (1996: 322). Some of the studies reviewed above go further in indicating the set of work organization and HRM practices that adequately support a given technology. We have in mind MacDuffie's research in the automobile industry (1995) and the comparative studies of Ichniowski et al. (1997, 1999) on steel finishing lines. In the latter case, a given set of practices produced similar positive results for productivity and quality in the United States and Japan.

Our own observation of different types of batch production and of continuous process technology indicates that systems of production really make a difference as regards the possibilities for work reorganization. For instance, we studied the progress of teamwork in two aluminium smelters. In such a continuous process, also in operation for example in steel and other metal smelters and in oil refineries, production workers have to monitor technical systems. They have large areas to cover, and performance does not depend directly on individual effort on a day-to-day basis. Rather it requires good co-ordination within and between teams, as well as with employees (e.g. maintenance craftsmen, engineers and technicians) whose task is to assist production. Such a system of production creates favourable conditions for self-regulation and limited direct supervision. In contrast, in routine assembly work, where performance depends directly on the volume and quality of output of each individual on a daily basis, it is more difficult to do away with direct supervision. Some research suggests that teamwork may then lead to peer pressure and excessive forms of social control (Barker, 1993; Sewell, 1998).

Of course, our aim is not to suggest a form of technological determinism but rather to remind that technology matters. In fact, the key factor is not so much technology per se as the system of production more generally. It may be worth re-examining Woodward's early research (1965) on

the links between production systems and organizational structure. In short, she combined the 11 categories of production systems observed in British manufacturing into three main groups, namely unit and small batch production, large batch and mass production, and process production. Her theory holds that unit and small batch production leave more uncertainty to be managed by the social system. Recent observation of small batch production shows that work is hardly rationalized and standardized by technology and that frequent adjustments (different product specifications, new set-ups, etc) have to be made to production lines. This tends to demand more direct supervision. The contrast between this and a modern aluminium smelter, which is at the other end of the continuum, is striking. Conditions in the latter are favourable to the operation of teams with very little supervision. The hypothesis could be made that as we move from small batch to continuous process, production is more capital-intensive but can be operated efficiently with less supervision. More empirical research is also needed to consider related aspects of the system of production which have consequences on patterns of management control.

These propositions need to be validated through further empirical research; but they also indicate that research has made some progress in identifying the conditions under which a particular set of working practices may find relatively fertile ground.

Innovative work systems can have positive results for productivity and firm performance more generally. But there are two major concerns from the viewpoint of public policy, that is, the lack of a more general diffusion and the impact of such practices on workers. Regarding the first matter, considering the evidence that the effects on performance are positive, there is much speculation about the reasons why so many employers stick to traditional work systems. Among possible explanations, Ichniowski et al. consider the following: limited performance gains for some businesses, system inertia, linkages with other organizational practices, labour-management distrust, the fact that only some of the employees may gain, and, finally, institutional and public policy constraints (1996: 325-329). When analyzing more specifically why not more U.S. steel producers shifted to an innovative HRM system, which has proved its effectiveness, Ichniowski and Shaw note that all greenfield sites actually have done so, but that older lines have to consider "switching costs." Hence, "changing the traditional U.S. HRM system to the innovative system in an on-going line would cause a costly upheaval in work relations among employees" (Ichniowski and Shaw, 1999: 718). Indeed, more generally, changing work systems is not a technical matter, but raises issues of power. Many employers are still worried that by making their production system too dependent upon employee involvement, the production systems would become more vulnerable and the employers' decisions would be more open to discussion.

It is important for the logic of our argument to be more specific about why the issues of diffusion and of workers' welfare really are matters for concern from the viewpoint of public policy. Indeed, some analysts may suggest that we simply have to let the market play its role.

The first concern may be understood by standard economic analysis. While some firms obtain good performance and profitability, at least for the time being, without being much influenced by the workplace practices studied here, their contribution to economic growth at the macro level may be more limited. In particular, by sticking to what is often characterized as a "low road" or a cost-cutting strategy, some firms contribute little to the development of the human and social capital which are more and more required as we evolve toward a more knowledge-based economy. As noted by Appelbaum at al., "The spillover effects of the adoption of HPWSs in

manufacturing plants on knowledge creation and productivity growth suggest that the gains to society from greater worker participation in shop-floor decisions may exceed the benefits to individual employers. As a result, societies may have an interest in developing institutions that encourage firms to implement these workplace changes and that reduce the cost to individual plants of doing so" (2000: 233).

The second concern, the apparent lack of adequate returns for workers, is relevant because of its possible implications on social cohesion. The workplace innovations studied here, often in the context of highly competitive market forces, have contributed to productivity gains. Considering the ongoing process of globalization and the progress in the spheres of technology and management, this spiral is not likely to slow down in the coming years. There is certainly no principle in economic analysis suggesting it may do so. So the only limit, in theory, relates to workers' willingness to go further along this cumulative process of performance improvements. The lack of "mutual gains" in terms of wages and permanent jobs, as well as possible negative effects in terms of work pressure and stress, may affect attitudes and behaviour on this regard.

This research review indicates that clear patterns are taking shape in the spheres of production management and work organization. Sure, social tensions will always remain at the point of production and there are many alternative programs and practices, but the general principles of flexible production and workers' self-regulation can now be discerned clearly. In contrast, it is still unclear which institutional framework could usefully support these developments in the sphere of production. By this we refer to institutional arrangements at both the macro and micro levels. In spite of much discussion in Canada about the limitations of the system of labour regulation associated with the New Deal compromise in the current economic era, only adjustments have so far been considered. In the workplace, in spite of considerable experimentation in many sectors, the system of rules that could preserve workers' rights and foster more involvement in production is only slowly taking shape. Of course, a precondition of more decisive progress on this regard is the development by the economic agents of a new compromise regarding the regulation of the employment relationship. In the absence of such a compromise, market forces prevail over jointly-agreed arrangements and institutions. This

situation not only hampers the possibilities of employee involvement but may also generate further inequalities.[12]

A key question related to this research review is: will workers and unions participate in decisions regarding the design and implementation of innovative work systems. In this regard, some evidence certainly suggests that such work systems are diffused more widely and are more effective when unions are involved in their development. This view was recently reinforced by an U.S. survey (Freeman and Rogers, 1999: 106, 114-116). On the basis of international comparison, Streeck (1996) observes that collective representation actually helps foster workers' participation in new forms of work organization. In fact, as this author argues more generally, rather than being impeded by formal rules and institutions, trust between management and labour is actually fostered by the development of such mechanisms (Streeck, 1992). In Canada, various studies have documented how unions often play a positive role in helping to redefine the traditional system of work rules and making it more adapted to production flexibility (see the studies collected in Verma and Chaykowski, 1999; also Lévesque and Murray, 1998; Bourque, 1999).

Although this paper has focussed on the links between work systems and performance at the micro level, the linkages between these work systems and the structural and institutional environment have no less importance on firm performance. The comparative research on the United States and Japanese employment systems conducted by Brown et al. (1997; also Brown and Reich, 1997) provides some indication of the way forward in this regard. The authors insist in particular on the pay structure and its effects on the incentive system, a key element for stimulating workplace productivity. This is one of the key factors, along with employment insecurity, which leads to the conclusion that "U.S. macroeconomic and labour market institutions are not as supportive of high-performance organizations, especially for production workers, as Japanese institutions" (Brown and Reich, 1997: 779).

[12] In a comparative study entitled *Converging Divergences*, Katz and Darbishire report increasing similarities in employment practices across countries but, in contrast, growing variations within countries. Their argument holds particularly well in the U.S. where, they insist, market and institutional forces (and particularly low unionization) have generated increased income inequality (2000: 63-65).

In sum, this research review shows that non-managerial employees are increasingly involved in workplace decisions. In our view, these changes, which are not limited to a specific economic context but are structural, have a real potential for enhancing productivity. But this paper seeks to put these developments in perspective and indicates some of the conditions that are necessary for sustaining and stimulating workplace innovation. In particular, unless innovative work systems are supported by arrangements that foster mutual gains and good working conditions, they may lead to economic inequality and social tension. In contrast, social arrangements which are more conducive to trust and social capital will lead to further organizational innovation and economic growth.

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