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CREATIVE WORK SYSTEMS IN DESTRUCTIVE MARKETS

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Abstract

In the United States, the past twenty years have been marked by significant restructuring of both financial and physical corporate assets designed to strengthen firms' relative market position either voluntarily or in response to the threat of take-over. Firms have also restructured work systems in an effort to improve production efficiency, product quality and flexibility. While most studies find that these new workplace techniques generate substantive productivity and quality gains and financial results that are equal if not superior to those associated with more traditional work systems, in the U.S., they have proven difficult to maintain. Diffusion is slow and not extensive; and even the most promising cases have either failed or come under extreme pressure, both internal and external. Using the productive systems approach, our study examines the inter-relationship between "creative" work systems and "destructive" markets using a sample of U.S. manufacturing firms in the metalworking, jet engine production and steel processing industries.

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CREATIVE WORK SYSTEMS IN DESTRUCTIVE MARKETS

Introduction

During the past three decades, inspired by the success of Japanese work and production systems, many US firms have been experimenting with new forms of work organization, often referred to as “high performance” or “co-operative” work practices. These work system experiments push decision-making responsibility to the lowest appropriate level in the organization. They also typically involve some combination of hierarchy compression, team-working, continuous improvement and training. In exchange for accepting greater responsibility for production and output, employees are often given employment security, while a proportion of their remuneration is linked to performance through such arrangements as production bonuses and gain or profit sharing schemes. Although most studies find that these new workplace techniques generate substantive productivity and quality gains for manufacturers implementing them, and financial results that are at least equal if not superior to those associated with more traditional work systems,¹ in the US they have heretofore proven difficult to maintain. Diffusion is relatively slow and not extensive, and the medium and long-run survival of even the most promising new workplace techniques is far from guaranteed.² Using case studies of three American manufacturing firms—in steel processing, metalworking, and aircraft engines—our study examines this issue and its implications for firms attempting to implement and maintain cooperative work systems in unregulated markets.

The fragility of these “creative” work systems is due in part to the fact that what constitutes a truly co-operative system has yet to be developed in the US. It is also due to pressures from the external environment that must be resolved within the productive system. These include stresses from “destructive” financial and product market requirements, as well as internal institutional vulnerabilities and weaknesses in the work system experiments themselves. Because

creative work systems are expensive to implement and maintain, they require a long term commitment to production relationships in order to ensure sufficient time to recover short run costs and to generate long term performance benefits. They are thus particularly vulnerable to competition from low-road firms that focus on cutting short run costs. They are also vulnerable to financial and stock market pressures to generate continuous share value appreciation. These, and the shift in focus to share value performance over product market performance, often have unanticipated adverse effects on the firm's work system.

Mainstream economic theory provides little help in understanding these trends or the process and outcomes associated with corporate restructuring of which they are a part. This is in large part due to its overwhelming concern with developing a theory of value and exchange rather than a theory of production (by which value is created) and distribution. The neoclassical theory of production views labour and capital as substitutes in production, ignoring the inherently cooperative nature of production relationships. The overwhelming popularity of the theory of shareholder value in debates about corporate governance reinforces the problem. This theory asserts that the stock market operates as an efficient market for managerial control, and that the firm's value is most accurately measured by its stock market share price. Because workers and managers are assumed to receive incomes based on the value of their respective contributions to firm performance, shareholders are the "residual claimants" with a right to the residual income generated by the firm. Increases in shareholder value thus represent increases in efficiency. Because both the firm and the economic system as a whole are assumed to benefit when shareholders' interests are pursued, this theory argues that corporations should be run in the interests of their shareholders³

Despite these assumptions and claims, neoclassical economic theory fails to shed light on the processes and outcomes associated with corporate restructuring and the development of modern capitalism. In contrast, Frank Wilkinson's *Productive Systems* framework⁴ makes an

important contribution to our ability to analyze and understand these developments. His model focuses on the dynamic process by which productive resources are developed and utilized to create value and to innovate. Because labor and capital are complements in production, and because the economy as a whole benefits when its constituent firms are healthy and productive, *cooperation*, both within and among productive systems, is the key to effective performance at both the micro- and macro-levels of analysis. Institutions play a critical role in shaping both productive system relationships (technical and social) and distribution; and interactions among productive systems and productive agents in this context are important because their strategic choices, responses and counter-responses help to shape behavior and outcomes as the system evolves over time. Using the productive systems approach, our study examines the inter-relationship between co-operative or “creative” work systems, and unregulated or “destructive” markets, using a sample of US manufacturing firms in the metalworking, jet engine production and steel processing industries.

Section one reviews theories of the firm, work systems and corporate restructuring. It examines the respective roles of, and relationships among, product markets, financial and stock markets, and work systems; the effect of creative work systems on performance; and the difficulties experienced by these work systems in the context of the unregulated American economic and industrial system. It also demonstrates the inability of neoclassical economic theory to explain these developments, highlighting the important contribution of the productive systems approach in this context. Section two describes the destructive market pressures, industry responses and macro-economic outcomes characterizing the American economic system. Section three presents and analyses the firm-level case evidence, in light of received theory and current practice. Special attention is focused on the sources of performance effectiveness and the contribution of the work system to this process; the sources of both strength and vulnerability in the work system; and the firms’ approaches to maintaining the work

system in the face of intensifying competitive and technological pressures. Section four draws conclusions from the previous discussion and highlights the implications that emerge from the analysis.

1. The Firm, Work Systems and Corporate Restructuring

In the United States, the past twenty years have been marked by significant restructuring of both physical and financial corporate assets. In the face of intensifying domestic and international competition, firms have restructured work systems in an effort to improve production efficiency, product quality and flexibility. They have also engaged in financial and stock market restructuring designed to strengthen their relative position in these markets, either voluntarily or in response to the threat of take-over. Both areas of restructuring have generated changes in corporate governance, or the system determining “who has what control rights under what circumstances, who receives what share of the value created, and who bears what associated risks.”⁵

1.1. Production System Restructuring

For the past two decades, management and industrial relations researchers and practitioners have analysed and debated the relative contribution of cooperative or “high performance” work systems (from here on referred to as “creative” work systems) as an effective approach for strengthening productive efficiency and competitiveness at the level of the production system. In this literature, creative work systems typically involve flattening managerial hierarchies and assigning responsibility for the production process and output to front line workers. Continuous training, involvement in decision-making (both on- and off-line), teamwork and continuous improvement efforts are characteristics of these work systems; and in exchange for accepting greater responsibility for production efficiency and product quality, workers are usually guaranteed employment security and a

share in the value they are contributing through participation in bonus, gain or profit sharing schemes.

Most studies find that creative work systems improve production efficiency, productivity and quality, and that their financial returns are equal or superior to those associated with more traditional work systems.⁶ However, despite this evidence of their effectiveness, firms have struggled to maintain these work systems in the US context. Even those firms that have successfully implemented and maintained creative systems over the short- and even medium-term, find that sustaining them over the long-term is difficult if not impossible.⁷

The fragility of creative work systems often stems from characteristics of the work system experiments themselves, in combination with broader pressures from the American institutional and economic environment. Although the best performance outcomes are associated with creative work systems that form a coherent whole, most American work system innovations tend to be imposed from above, experimental in nature and adopted in a piecemeal fashion.⁸ Efforts to impose workplace changes from above generate opposition from middle managers, union representatives and workers, undermining their effectiveness.⁹ The relative instability in American top management is also a complication. Because of the importance of stable and supportive commitment from top management, creative work systems are particularly vulnerable to resulting changes in management policy that accompany alterations in management personnel and ownership shifts.¹⁰ The relatively low and declining union presence in American workplaces is another impediment to the likelihood that work system changes will endure. Many studies find that union involvement has a strong positive influence on the sustainability of work system innovations; further, the greater the union's involvement, the more cooperative its stance.¹¹

The institutional context in which a firm attempts restructuring is also important because work system restructuring does not take place in a

vacuum: the firm's broader institutional environment profoundly affects the process.¹² Financial, product and labour markets play a significant role in either shaping and encouraging or discouraging reform internal to the firm. The weak US institutional environment means that firms must independently implement and sustain work system innovations. Because creative work systems involve high short-run costs, they are difficult for many firms to afford, particularly in the face of competition from cost minimizing firms pursuing a low road strategy of competition. This is reinforced by the pressure to focus on short-term measures of performance and cost. The often long lead times before investments in work system innovations are realized increases their fragility to competition from traditionally organized low road firms. Further, the absence of an external institutional imperative that socializes some of the costs of creative work systems means that it may not be profitable in the short-run for firms to introduce and/ or to maintain these more efficient modes of work.

The work system is also affected by the ability of the dominant form of corporate governance to support investments in human resources and trust, which appear as costs while their returns are not separately recorded. Because the firm's corporate governance system often shapes choices regarding employment relationships, in shareholder-based systems, like that in the US, the high costs associated with creative work practices are difficult to justify. The US financial environment is thus an impediment to the implementation and long-run viability of co-operative work systems. American managers and strategic decision-makers are under intense pressure to cut costs in the short run for the benefit of largely absentee shareholders. Therefore, rather than encourage or be indifferent to the nature of the firm's work system, the US financial system operates as a *constraint* on the diffusion and maintenance of creative work practices. By rewarding short run profitability, it undermines the ability of shareholders to act as long-term investors, willing to see expensive projects through. It reduces the ability of managers to invest in research and development, new process technology, and training required for new work practices

to be effective; and it can undermine the ability of firms to adopt long-term employment contracts with hourly and managerial employees.¹³ It may also facilitate rapid, often unexpected, changes in ownership without concern for other stakeholders' approval, leading to erosion of trust and morale among employees. Faced with these kinds of pressures, it is easy to understand why firms find it extremely difficult to implement and sustain creative work systems in the US context, and why workers and their unions remain skeptical that creative work systems will enhance employment security.

1.2. Financial and Stock Market Restructuring

In the financial economics literature, the corporate restructuring debate is currently dominated by the *theory of shareholder value* that argues firms are “bundles of assets” that belong to shareholders. Essentially indifferent to production, this theory assumes that the firm's stock price accurately reflects its value. Hence, anything that contributes to stock price appreciation by definition creates value, not only for shareholders but also for the economy as a whole. Using this theory, financial economists justify the rights of shareholders to control corporate decision-making and to lay claim to the income generated therein by identifying them as “residual claimants” to the firm's income. They are “residual claimants” because all other stakeholders receive a share of income based on mutually agreed contractual arrangements: creditors and suppliers have fixed claims and employees negotiate compensation arrangements in advance of performance. Shareholders as residual claimants thus bear the risk of fluctuations in firm performance, in exchange for which they are assigned ownership rights and rewards.

Based on these assumptions, maximizing shareholder value is synonymous with maximizing efficiency. The more efficient the firm is, the greater the wealth created net of costs, the larger the residual income accruing to shareholders and the higher the value of the firm's shares. Managers are employed to manage the firm with the objective of maximizing efficiency, measured by shareholder value. The

principal-agent problem between shareholders (principals) and managers (agents) is also solved by the stock market which operates as an efficient “market for corporate control,” assumed to generate efficiencies in the form of superior management. Managers are forced to pursue shareholder interests by the threat of take-over because a firm can only be taken-over if other potential shareholders believe that they can buy the firm’s shares at the current market price and bring in managers who will manage it more efficiently than the incumbent managers. However, this will only be the case if production efficiency is reflected in share values, and only if it is achieved by means of a long-term strategy aimed at achieving operational and technical efficiencies, rather than a short-term strategy aimed at short-run cost cutting. Although short-run cost cutting does generate short-run profits by increasing the difference between revenues and costs, it damages the institutional framework upon which trust and cooperation are dependent, and often strips the productive system of physical and human assets necessary for long-run performance viability. A firm will not remain viable on the stock market if it fails in its product market.

Critics of shareholder theory focus on the existence of firm specific skills that provide control rights and income claims to other stakeholders besides shareholders, and on the failure of shareholder theory to explain the relationship between the production and distribution of value created by the firm. According to Margaret Blair, “anytime there are parties other than shareholders who make investments specific to a given corporation – employees with specialized knowledge and skills, to cite probably the most prominent example – shareholders are no longer the residual claimants in that corporation.”¹⁴ Although her critique is interesting and persuasive, it does not offer an explanation of the corporate restructuring process or the role of work systems within it. Mary O’Sullivan’s work addresses this problem by highlighting the failure of shareholder theory to address the important role of innovation and its implications for resource allocation and income distribution. She argues that it is

impossible to explain how the return to investment is generated and how it should be distributed without first analysing the process through which productive resources are developed and utilized to create that value.

“Since it has no theory of the business enterprise that generates returns that are not market determined, nor a theory of the distribution of these returns, it provides no direct guidance on the generation or allocation of the persistent profits of dominant enterprises with which the contemporary discussion of corporate governance is centrally concerned.”¹⁵

1.3. The Nature of the Firm and Production Systems

The prescribed corporate governance outcomes, or the stakeholder groups assigned responsibility and control in the production and financial market arenas, vary considerably. Focusing on restructuring of physical corporate assets, management and industrial relations experts widely agree that in production, responsibility and control should be pushed downward in the system. In contrast, financial economists and financial market experts, focusing on restructuring of corporate financial assets, argue that pulling control upward in the organization and assigning it to shareholders benefits both firm and macroeconomic performance.

In these debates, the absence of a widely accepted framework for analysing corporate restructuring that links component parts of the productive system (financial and productive) within its market and institutional context is problematic. Research on corporate restructuring tends to be segmented into studies focusing on either production or financial performance, by researchers in separate disciplines, using different methodologies and coming to divergent conclusions about appropriate responses. The implicit assumption of mainstream theory is that the firm’s market performance is accurately measured and reflected in the value of its stock market shares. However, as discussed above and evident in the cases below, efforts

to generate share value growth often involve approaches that undermine long-term performance viability in production. For example, short run cost cutting risks stripping the productive system of assets and skills required for long-term success, and mergers and acquisitions aimed at boosting share values often generate managerial and shop floor changes that can be very destabilizing to production system relationships. In short, neoclassical economic theory fails to provide a theory of value rooted in production and an explanation of the relationship between the stock market and the production system. It therefore provides little help in understanding the contribution of co-operative work systems to performance, their fragility in the context of unregulated markets, and the corporate restructuring process of which they are a part.

Debates about the nature of the firm are not helpful. Emphasizing opportunism-based theories or resource-based theories, the firm is viewed as the result of transactions costs and the need to control opportunism¹⁶ or a “bundle of resources,” among the most important of which are the skills and knowledge of their workers and what Chandler calls “organizational competencies.”¹⁷ More recently, some researchers have attempted to identify the linkages that help to synthesize the two.¹⁸ However, in all of these cases, production is essentially a “black box,” where the factors of production (labour and capital) are considered to be substitutes in production. Given the unit cost and relative productivity of each, subject to a given technological and market constraint, profits are maximized, costs are minimized and production efficiency is achieved by choosing the level of output that equates the additional revenue (marginal revenue) and additional cost (marginal cost) associated with the last unit produced. Each factor of production receives a payment equal to the value of its relative contribution to output. There is thus a technical trade-off between the quantity of labour and quantity of capital (and other productive resources) employed that ultimately determines the financial return to each factor of production and hence the distribution of income.

1.4. *Productive Systems and Creative Work Systems*

According to Pasinetti:

“in dealing with production, whenever anything came to light that was not quite consistent with the [neoclassical] model of pure exchange, the typical reaction has been to modify the production side of the picture, i.e. to introduce into the theory of production all the assumptions that are necessary to restore its consistency with the preconceived model of pure exchange.”¹⁹

The narrow mainstream view of the firm and of production is based on simplifying assumptions about production relationships that ignore the essentially cooperative and complementary nature of these associations in production and their competitiveness in distribution. The *productive systems approach* takes this as its starting point, arguing that rather than being substitutes, the factors of production are complements. Effective production requires that productive agents work together; and the failure of any to satisfactorily perform its productive role lowers the joint product of the whole. In distribution, productive agents are competitors because what one receives, the others cannot have.

In this context, production relationships have both a technical and social dimension that together and independently influence performance and distributional shares. The *technical relations* of production are the functional inter-linkages between labour, equipment and materials in the production process and between stages of production. They are objective and impersonal relationships, determined by the nature of products and the methods by which they are produced. In contrast, the *social relations* of production are the subjective and personal relationships between the various human agents of production which form the social network within which the technical relations are formed and productive tasks jointly undertaken.

While all parties to productive relationships benefit from co-operation in production—from which their incomes are ultimately derived—

they compete over distribution of the proceeds. In this context, the social relations of production have the dual role of securing co-operation in production, and agreement over distribution of the outcome from production. This is important for performance and efficiency because failure to secure agreement over distribution has the potential to set off a retaliatory withdrawal of productive co-operation—in the case of unionized firms, possible strikes—which serves to reduce both efficiency and the “size of the pie” produced. The trade-off is essentially one of short-term individual interests in relative shares versus longer-term shared interests in the size of the pie. In neither the short nor the long term, however, is the size of the pie likely to be exclusively determined within the productive system. Each productive system is subject to continuous pressures from the technological, market and social, legal and political environment within which it operates. In turn, similar processes within productive systems, both independent of, and in response to, external pressures, initiate changes that also help mould its environment.

Within the productive system, *operational efficiency* is to an important degree dependent upon how well products and processes are designed, labour is trained, materials and components are prepared, and productive tasks are performed. It is also critically dependent on cooperation because, as discussed above, to maximize efficiency, labour and the means of production must work effectively together within each stage of production, and the stages of production must mesh seamlessly together. In relations with its broader system context, a productive system’s *dynamic efficiency* depends on its ability to respond to changes in market requirements, as well as on its capacity for organizational transformation and innovation, both of which are enhanced by the system’s ability to motivate organizational learning.²⁰ Both operational and dynamic efficiency are critically dependent on co-operation. They are also important in determining the competitiveness of productive systems. Competitive success generates additional resources for distribution and increases the prospects for increased co-operation and operational and dynamic efficiencies.

Competitive failure risks the opposite, setting off a degenerative cycle of conflict over distribution, withdrawal from co-operation in production and declining economic performance.

In this context, a work system is “creative” when it promotes operational and dynamic efficiency, which together rely on a high degree of both technical and social cooperation among and between managers and workers. In general, creative work systems feature innovative forms of work organization and management methods, in particular flatter, less hierarchical employment structures with fewer middle managers and greater worker participation in decision-making. There is greater flexibility in job definitions. Enlightened human resource policies feature greater employment security and incentive pay systems such as profit sharing. Continuous training is an important component of creative work systems, contributing positively to the reproduction of a highly skilled labor force and hence to the quality of the labor supply in the external labor market and the long-run strength of the broader productive system. In contrast, destructive systems feature adversarial management methods and human resource policies, and the regular threat of job loss, particularly during labour negotiations. Destructive work systems economize on training, undermining the long-term reproduction of labour force skills.

Based on a system of co-operation among managers and workers—usually built on the basis of trust established over a period of working together—creative work systems are efficient in helping the firm to meet and even exceed the demands of its product markets. For managers, the long-term nature of production relationships within these systems provides a context in which the firm can focus on continually improving product and process quality and efficiency for long-run success rather than on cost cutting and other strategies designed to maintain short-run profit margins. For front-line workers, creative work systems can provide a modicum of job security, relatively high and stable incomes, high levels of training and skill

development, good working conditions, and participation in the productive process.

The important question is, then: how can a “creative” work system be sustained over the long term and how can the common interests in production and divergent interests in distribution be reconciled? This depends to an important degree upon the nature of the social relations of production and the context in which they are conducted. The establishment of a base secure enough to create and maintain the requisite long-term commitments for establishing and sustaining trust and co-operation requires over-coming the effects of both social and economic uncertainty. Social uncertainty arises from the social relations that pervade production and exchange, and the social and political environment within which these relations are formed and reformed. Economic uncertainty results from economic forces, such as changes in technology, resource availability, and market pressures (financial and product).

In short, the quality of the productive system’s relational network, the prosperity and dynamism of the economy within which it trades, and the supportiveness of the social and political environment within which it operates, are instrumental in creating the necessary conditions for “creative” work systems and co-operative long term employment relationships. In the next section, developments in the market and institutional environment within which American firms and workers interact are examined. These provide the context for analyzing the cases of Ferodyn, Smithfield Tool and General Electric, in which the focus is the interrelationship between creative work systems and destructive market pressures. Our objective is to understand the pressures generated by product and financial markets and regulation, firm responses to those pressures, and resulting work system and performance outcomes.

2. Destructive Market Pressures, Responses and Macro-level Outcomes

At the turn of the new millennium, global market pressures and short product life cycles have forced the corporate officers of many firms to consider worker intellect an asset, not a liability. But, as the evidence in this section demonstrates, in the drive to maximize production and increase shareholder value, worker empowerment and team building still play second violin to the first chair occupied by output demand and ‘line speed-up’. The delicate underpinnings of plant-level trust are continually threatened by the wherewithal of owners to arbitrarily shift production to gain even the slightest competitive advantages. Workers and their unions are thus squeezed between a rock and a hard place: They are condemned as backward thinkers should they refuse to consider management-proposed work changes that might give their plant a chance to prosper, yet they are equally doomed when they accede, only to have managers “pick their brains” and transfer the work to plants in less expensive parts of the world.

Less than fifty years ago, the United States accounted for close to half of global manufacturing output. High and increasing productivity coupled with the benefits of Keynesian fiscal and monetary policies contributed to rising living standards for American workers. However, this premier position was eroded during the 1960s, 1970s and 1980s as Japan, continental Europe, and developing Asian nations emerged to challenge US pre-eminence in autos, steel, major household appliances and consumer electronics. Between 1979 and 1983 employment in the highly unionized durable goods sector declined by 15.9 percent, representing slightly over two million jobs, as American corporations shifted large segments of their manufacturing activities overseas and the nation de-industrialized.²¹ Between 1980 and 1990, one in five American workers saw their job disappear, with thousands more being made redundant since that time. Corporate and labor market restructuring was catastrophic for industrial unions; the percentage of unionized manufacturing jobs declined from 50 percent in 1970 to 10 percent in the 1990s.²² In the mid 1950s, one in three

American workers belonged to a union, compared with one in five in the 1980s and one in seven in 1999.²³

A consequence of the disappearance of well-paying manufacturing jobs has been wage depression, declining household wealth and increasing income inequality. Between 1987 and 1996, average compensation grew only 1.1 percent, compared with 4 percent between 1977 and 1986 (including the 1983 recession). For most workers, real wages are below their 1973 levels; and adjusted for inflation, the median income of American employees in the mid-1990s was approximately 5 percent below that in the late 1970s. In aggregate terms, labor's share of the national income has dropped from 66.2 percent in 1970 to 62.6 percent in 1980 to 59 percent in 1995 and continues to decline. Declining household wealth is evident in the fact that for nearly 20 percent of American households, debts exceed assets, meaning that net worth is zero or negative. US household income is now more concentrated than ever before, with the top five percent of households (those making \$133,000 - £83,125 - or more) controlling 21.4 percent of all income, while the bottom 60 percent control 27.6 percent.²⁴

On the surface, these current developments seem inconsistent with US macroeconomic and stock market conditions during the 1990s because they coincide with one of the longest macroeconomic expansions in US post-war history, with unemployment and inflation at record low levels. In 1999, unemployment was 4.2 percent while inflation was 2.2 percent.²⁵ They also coincide with the longest US stock market boom in history, with yields on corporate stock significantly above their depressed 1970s levels. Since 1990, productivity has risen 7 percent, due to enormous gains in certain sectors. By the mid 1990s, corporate profit rates were back to the level they had reached at the peak of the post World War II boom; in 1997, corporate profits rose to 11.8 percent of revenues, up from 11.5 percent in 1996, representing their highest level since 1959, when the Commerce Department first began tracking this data.²⁶

Globalisation plays a role by increasing the readily accessible labour pool and by making capital and jobs portable. During the 1990s, US firms rapidly globalized corporate assets and expanded corporate direct foreign investment in factories, office buildings, office equipment, and machine tools. Whereas in 1965 this amounted to less than \$50 billion (£31 billion), it reached \$124 billion (£77.5 billion) in 1975, surpassed \$213 billion (£133 billion) in 1980 and climbed to \$610.1 billion (£381 billion) in 1994. Presently, General Motors and its major suppliers are investing over \$1.3 billion (£8 million) in seven new plants in two Mexican cities to produce transmissions, chassis, axles, and drive trains. Simultaneously, the auto giant is engaged in the largest American corporate investment in China, spending over \$2 billion (£1.25 billion) in the construction of 16 assembly and components plants there. Global over-capacity in steel, autos, computer chip fabrication and aircraft production will only serve to reinforce these negative trends well into the future. Even in industries where US-based producers have been successful at maintaining market share in international competition, enterprise success has not necessarily served to insulate workers from the effects of corporate restructurings and the job losses they entail. It became commonplace for corporations to interject the possibility of work removal from their US plants during union organizing campaigns and contract negotiations, while the surge in global mergers in the automobile, banking, telecommunications and pharmaceuticals sectors put “bite into the bark” of such intimidation.²⁷

It is in this context that corporations are experimenting with new forms of in-plant work organization designed to reduce direct and indirect labor costs, improve productivity and quality, and achieve greater control over the daily deployment of labor. Whether called “high performance practices,” “employee involvement,” “mutual gains enterprises” or “flexible work organizations,” these efforts are intended to gain functional flexibility on the shop floor, rather than to share control. Functional flexibility refers to the efforts of managers to

redefine work tasks, re-deploy resources, and reconfigure relationships with suppliers to achieve rapid product development and faster changeovers from one product to another.²⁸ Corporations are also investing in computer-controlled machinery that eliminates large numbers of skilled blue-collar workers, decreases reliance on workers' tacit knowledge and eases the relocation of work to other regions of the world. A 1998 report by the International Labour Organization summarizes these trends:

“Recently, while many trade unions have been pressing for reduced work time, guarantees of employment security and measures to combat unemployment, some employers have been seeking to modify many of the hard-won social protection measures in an effort to make labour markets less rigid.” (p. 1)

3. Work Systems in Destructive Markets

Smithfield Tool, Ferodyn and General Electric (GE) represent cases where, in response to potentially destructive market pressures, the work system has figured prominently in the company's overall business strategy. In a brownfield site, Smithfield's creative work system emerged from the rubble of earlier failures to effectively compete using a Taylorist approach to work organization and adversarial relationships between labour and management. At Ferodyn, a creative work system was established in a greenfield site, as an integral component of a high road strategy to compete on the basis of exceptionally high quality and responsiveness to market requirements. In sharp contrast to the other two, GE's work system demonstrates the devastating effects of a global manufacturing strategy on local work systems, workers and managers, and communities. Together, these cases demonstrate the contribution of the work system to performance and the fragility of creative work systems in unregulated and destructive markets.

3.1. Smithfield Tool

Smithfield Tool²⁹ is one of the few surviving union metalworking plants in Springfield Massachusetts,³⁰ and a producer of hand-tools. Like most other metalworking firms, its performance deteriorated in the 1970s and 1980s as foreign competition in several of its key product lines combined with earlier failures to invest in new technologies throughout the 1960s and 1970s. During this period, numerous changes in corporate ownership and a high turnover in the management team generated instability in strategic approaches. In the early 1980s, for example, Smithfield invested \$15.8 million (£9.9 million) in a program designed to improve manufacturing processes and cut costs. However, when the sought after savings remained elusive, 150 workers, all members of the International Union of Electrical Workers (IUE), lost their jobs. As workers and production lines permanently exited the plant, strains between managers and workers intensified.³¹ A series of lengthy strikes ensued as high seniority workers fought to preserve the job classification and seniority provisions of their contract, arguing that it was these measures that kept them employed. By the late 1980s, the workforce dropped to around 100 workers, no investments were made in new technology and a contingency plan to close the plant was drawn up.³² According to one union officer, the plant was “at death’s door.”

Although marked by persistently adversarial labour relations as the unionized workforce scrapped for survival, there were perceptible changes in 1986 with the arrival of a new production manager. Addressing a regional gathering of trade union leaders, plant managers and academics, the new manager announced:

“Frederick Taylor is dead. Today, management needs an entirely different system. Cooperation and integration between labour and management... is the key to success in today’s marketplace.... To solve its problems, Smithfield had to radically change the way it operated and the way its employees ... both union workers and managers ... worked together.”

Soon after the public meeting, Smithfield's ownership agreed to keep the plant open, in part because its principal customer wanted their product manufactured in the United States.

The company attacked production inefficiencies in earnest with the invited participation of production workers. Although union leaders were skeptical, they urged their members to participate in the work teams. Soon afterward, a new company purchased the facility and Smithfield became a subsidiary of a publicly traded global manufacturing corporation with a commitment to continue production a bit longer in Springfield. One visual manifestation of this commitment was the expenditure of \$4 million (£2.5 million) on new machine tools. A Joint Productivity Council (JPC), comprised of four unionists and four members of management, was also established, charged with seven objectives, including: the elimination of a specialized inspection function by building quality in at the source; the establishment of hands-on and classroom training; and training for all workers in continuous improvement techniques.³³ Teams of machine operators, engineers, and managers began to meet regularly to tackle production and quality problems.

In the 1994 contract, management gained the right to eliminate most labor grades and job classifications and was thus able to establish and eliminate work cells and create, combine, and eliminate skill levels and job classifications without negotiating changes with the IUE. In return for this shop floor flexibility, workers were guaranteed employment security and a share in productivity gains through monthly bonuses. Union officials participated in meetings to determine the bonuses and the company was required to share financial information with the union. Smithfield's compensation system was based on knowledge and skill, with equally shared quarterly bonuses, contingent on the plant's achievement of defined output and quality goals. Smithfield workers were trained in systematic problem-solving techniques. In addition, they completed a

42-week course in mathematics and technical report writing, taught in the plant three hours a week by instructors from near-by universities.

Committees were set up, charged with the development of shop floor improvement projects, and each team received a budget for project implementation. “Idea Boards” were located throughout the shop and workers were encouraged to write down daily production problems as they occurred.³⁴ The “idea boards” provided everyone with visible proof that ideas were responded to and that changes were being made. Explicit employment security language took effect when improvement activities eliminated particular jobs. New jobs were to be found for any worker whose job was eliminated through a kaizen project and the worker’s rate of pay would be protected until he or she learned how to perform the new job. In addition, management agreed that no product lines would be moved out of Springfield as long as markets were maintained and productivity in the plant continued to improve. To make certain that productivity objectives were met hundreds of kaizen projects have been completed since 1996.³⁵

In May 1994 Smithfield Tool received a top vendor award for superb quality and on-time deliveries from its largest customer; it was ranked in the top one percent of the customer’s 10,000 worldwide suppliers. The union workforce has climbed to 240 from 160 in the late 1980s, the parent corporation has shifted work to Smithfield from non-union southern affiliates and new product lines were introduced in 1993 and 1999.

3.2. Ferodyn

Ferodyn is a greenfield steel processing plant located in a rural Midwestern community.³⁶ In response to serious industry difficulties during the 1970s and 1980s, Ferodyn was built as a joint venture between American-owned Landis Steel Company³⁷ and a large Japanese-owned steel company. The plant produces high quality finished steel coils using a computerized, state-of-the-art continuous production process for customers in the automobile, appliance and

office furniture industries. Its internal labour market strategy and work system were designed to accommodate both the technology employed and consumer demand for steel of consistently and exceptionally high quality. Teamwork, shared responsibility and broadly defined jobs characterized the organization of work. Job ladders were flat, with promotion lines based on training, knowledge and skill and the expectation that all employees would advance to fully qualified status. Self-directed autonomous teams were assigned control over the entire process, with authority to make on-the-line decisions regarding production, product quality and purchasing. Instead of supervisors, engineers and other management resources were available as needed. However, during the second and third shifts each day and on weekends, there were no managerial or white-collar personnel in the plant. Thus, 16 out of the 21 shifts per week were managed by the workforce with little or no supervision. Information about team and plant performance was shared, and major plant- and production-related decisions were made by consensus.

Although the core workforce was recruited from Landis's main plant, Ferodyn's local autonomy and its location away from the parent plant provided opportunities to divorce itself from the traditional labour market system in steel, and to pursue a radically different system in the new facility. Employees were carefully selected, based on cooperativeness and capacity for working in groups, flexibility, motivation and trainability. They were then trained in both technical and social skills for a year prior to start-up, part of which included training in Japan to gain experience and insight into the effective operation of a plant like Ferodyn.

To promote employee commitment to the Ferodyn work system and its objectives, bargaining unit employees were guaranteed employment security, and a bonus system based on team performance was designed such that all employees would share equally in the system. On a regular basis, employees received work-related technical training; training in math, chemistry and computer programming; and

training in social skills, including teamwork, team building and communication skills. Ferodyn's compensation system was a pay for knowledge system where workers' pay reflected their skill classification level. All workers were guaranteed a 40-hour week, generating relatively high annual incomes by local and industry standards (\$60,000 - £40,000 - in 1998, including bonuses). Labour relations were amicable and characterized by a high degree of trust and mutual respect, based on learning through experience that parties could be depended on to keep their promises and commitments.

After reaching steady state operating levels, the Ferodyn productive system was highly effective, reinforcing plant-level strategies and behaviour. It set world records for efficiency and product quality. Employee performance bonuses were high, averaging approximately \$4,000 (£2,500) per quarter (\$16,000 - £10,000 - per year). The Ferodyn work system was also exemplary, attracting the attention of more than one team of researchers who identified it as a surprisingly creative work system. Employee turnover and grievances were virtually non-existent and Ferodyn employees overwhelmingly agreed that it was a good place to work. According to one bargaining unit employee, "It felt like a career, not a job. For me, it was always what I thought work should be." Similarly, a top Ferodyn manager said, "It was exciting to have the opportunity to take this ride of a lifetime where our instructions were to go out there and run this company."

Despite these successes and Ferodyn's obvious profitability, intense competition from global low cost producers, and pressure from customers to sell high quality steel at a competitive price, prevented Ferodyn from extracting a premium for its high quality products. According to the local union president, "When we started, our product was going to be so much better than the competition that it would command a premium. But that never happened. Market pressures never allowed us to extract the expected premium." Thus, since Ferodyn operated in an industry populated by low road competition, and was a supplier to customers who, too, were under pressure to

compete on cost and price, it was vulnerable to pressure from low road firms in both its own and its customers' markets.

During the implementation and development stages of operation, visionary corporate management and international union support were important in shaping the new company. Landis's CEO and the president of the United Steelworkers of America (USWA) were avid supporters of the Ferodyn productive system. It also had the support of top plant management and union leadership. In this context, plant level employees bought-into the system and it thrived, despite shifting pressures from Landis Steel Company with changes in CEO, company president, and management philosophy during the 1990s. According to a top managerial representative at Ferodyn, the changes in management were the greatest stresses operating on the subsidiary because "it pulled us in all different directions."

Despite outward appearances, however, there was evidence that Ferodyn's creative work system was never effectively institutionalised, making it vulnerable to changes in, and pressures from, its environment, both internal and external. A subsidiary of Landis Steel Company, Ferodyn was never a legally or institutionally independent entity. This meant that it was subject to decisions made at the corporate level that may or may not be in the best interest of the plant. Failure to train new managers in the technical and social requirements of the work system served to slowly but steadily erode the Ferodyn work culture. Although the initial employee base at Ferodyn (management and labour) received such training, in-coming managers did not. As a result, they had difficulty identifying with the Ferodyn work culture, and they lacked the desire to make it succeed.

The structure of Ferodyn's top leadership system and its effectiveness in protecting the plant from pressures from both the Landis corporate office and the union was also unstable in that it was dependent on personalities. Ferodyn's first plant president was an officer of Landis Steel Company with a direct reporting relationship to Landis's

president. Under his leadership, lines of authority were direct: Ferodyn managers reported to Ferodyn's president who in turn reported to Landis's president. Ferodyn's local union also had strong support from the international USWA as they forged a more cooperative relationship with the company, despite persistent tensions between the Ferodyn local and the local at Landis's main plant. The retirement of the USWA president in 1994 and Ferodyn's plant president in 1998 left the plant without strong leadership protection and support, making it vulnerable to opposing managerial paradigms and an unsympathetic union position regarding the type of work system it embodied. With the retirement of Ferodyn's first president, reporting relationships within Ferodyn, and between Ferodyn and Landis, were unilaterally changed in an effort to centralize control. Ferodyn's new president, for example, now reports to a vice president at Landis Steel Company, much like a plant manager would. This change has substantially reduced the plant's relative position and security within the corporate productive system.

The Ferodyn work system was also vulnerable to the impact of decisions made by Landis Steel Company that would affect its ownership structure and management. Although clearly profitable, and one of the largest American steel producers, Landis was a relatively small player in an increasingly global marketplace. On top of this, global market pressures steadily pushed steel prices down, giving rise to widely publicized complaints of dumping. As a result, despite its relative efficiency and recorded profits for four straight years, steel stock prices in general (and Landis's in particular) were accorded a low valuation by Wall Street. This was a continual frustration to Landis's top managers, many of who were terminated during the 1990s for failure to generate share value appreciation. By the late 1990s, under pressure from a group of institutional investors, Landis's chairman of the board and chief executive officer (CEO) decided it needed "to find a buyer" as pressures from shareholders to boost share prices by selling to a larger global player grew more intense. In 1998, in a quickly negotiated buyout, Maximetal,³⁸ a

global steel holding company took advantage of the structural weakness in steel stock values and Landis's anxiousness to improve them. It purchased Landis (and Landis's share in Ferodyn), which by now was a restructured and efficient integrated steel company, at a relatively low price. The resulting change in management and uncertainty about Maximetal's long-term business plan added to the pressures already operating on Ferodyn. According to Ferodyn's local union president, "It's really rough to be left in a vacuum to try and figure out Maximetal's business model because we don't know what they want. All we know is the cost cutting part, and that Maximetal wants to become the biggest and richest steel company in the world."

Maximetal's low cost strategy is in many ways incompatible with the requirements of a creative work system and the customer mix Landis chose to pursue in building the Ferodyn facility. Maximetal's first action following the take-over was to reduce managerial employment by 17 percent in Landis Steel Company, which included a reduction of one third at Ferodyn. It restructured lines of authority such that control is now more centralized in Landis Steel Company. Additionally, many Ferodyn employee rights and responsibilities relating to production were removed. For example, Ferodyn bargaining unit employees no longer choose and order from vendors, regular training has ceased, scheduled equipment maintenance has been reduced, and the flow of information has stopped.

As a result of these developments and expectations about the future, Ferodyn managerial and bargaining unit employees are increasingly demoralized and fearful of the next stage in the process. Perhaps most concerned are remaining plant management personnel, who do not have employment security or contractual protection. A high level manager at Ferodyn commented that, "almost everyone is now counting those inches of pay check until retirement." Despite these concerns, or perhaps because of them, Ferodyn continues to perform effectively and its bonus system still pays. However, its ability to do

so over the long term is uncertain. According to the local union president,

“I’m worried about Maximetal’s approach and our current customer base. The long-term question is whether we will be able to maintain the type of customer base we were built to have. They have the highest quality standards in the industry.”

Already, there is evidence of deteriorating quality which, if it continues, will jeopardize Ferodyn’s ability to maintain its current customer base. According to the local union president, during the first quarter of 2000 Ferodyn used up more than half of its annual reject allotment for several of its major customers because of inferior quality steel inputs. He likened Ferodyn’s situation to a car whose hood is welded shut. “If it is a well-built car, it can go a good long time before the engine blows out. But the question is *when*, not if, that will happen.” Employee morale has also deteriorated, as evident in a sharp drop in employee suggestions for process and product improvements and innovation, recent problems associated with absenteeism,³⁹ and a dramatic increase in the rate of grievances.⁴⁰ In 1999, at the union’s insistence, the collective bargaining agreements between Landis Steel Company and its five union locals were negotiated at the same time to prevent the possibility of whipsawing one local against the other. In this agreement, major gains were made by the union. Among these, the pension provision was increased as part of the steel industry pattern. Ferodyn’s employment security clause was strengthened to include entry-level bargaining unit employees; and the union won the right to first refusal should Maximetal decide to sell Ferodyn off.

3.3. General Electric

General Electric (GE)⁴¹ is the global market leader in supplying engines to power aircraft of all types. In jet engine manufacturing (as in machine tools and steel), the employment picture has been gloomy for most of the 1990s. Both the blue-collar and the white-collar workforces have shrunk by about 35 percent since 1988. While much of the downsizing in the early part of the decade could be attributed to

declining defense orders, the recovery of the aircraft market by the mid 1990s did little to restore employment levels in the jet engine sector. Employment in the industry remains stuck at a level fully one third below 1990 employment levels, while inflation-adjusted average hourly earnings have remained flat throughout the 1990s.⁴²

In 1998, GE registered \$1.7 billion (£1.1 billion) operating profits on \$10 billion (£6.25 billion) in sales, translating into an operating margin of 17 percent. However, this market strength and bright profit picture failed to provide benefits for GE's American workforce. GE's jet engine manufacturing complex in Lynn, Massachusetts, employs over 2,000 members of the IUE and is extremely important to the economy of Eastern Massachusetts. In this facility, GE has implemented numerous shop floor programmes designed to boost productivity, improve quality, and capture production cost advantages through continuous improvement on the shop floor. However, unlike Smithfield and Ferodyn, job security was not linked to these efforts. In fact, GE workers more often have been used as pawns in GE's global manufacturing strategy. Starting in the late 1950's GE moved to parallel production, the practice of building several production facilities capable of handling the same work. By so doing, it could extract union concessions under the very real threat of work removal. Thus, parallel production served as a means to reassert workplace control, first by minimizing the potential damage strikes could cause, and by providing the leverage needed to compel changes in work organization.⁴³

This occurred in the late 1980s, when GE began to implement continuous improvement strategies, called the "GE Workout," in its aircraft engine plants. This programme was designed to accomplish four things: establish trust on the factory floor between workers and managers; empower employees to make production improvement suggestions; eliminate unnecessary work; and establish a new shop floor paradigm of boundary-less work. As part of this strategy, GE sought to change the union labor agreement to eliminate job

classifications and broaden the tasks workers were expected to perform.⁴⁴ Employees were told to welcome the freedom that boundaryless work offered and “to take advantage of it by using their minds creatively to figure out how to improve the company’s operations.”⁴⁵ GE’s Evendale, Ohio, aircraft engine facility was the first to respond. When workers there refused to ratify contract changes, the company shifted work to other facilities. Forty percent of all parts made at Evendale were removed and 3,900 workers lost their jobs.⁴⁶ GE then turned to its workforce in Lynn, seeking the same contract concessions, only to be similarly rebuffed. Chastened, but moving straight ahead, managers shifted work from Lynn and offered it to Evendale if they would accept GE’s work reorganization demands. Some changes were accepted there, and jobs were relocated to Ohio. Eventually the Lynn local agreed to modification, as well to introduce GE’s multi-skilling program. However, unlike the reorganization at Smithfield and Ferodyne, the changes at Lynn came from coercion.

In 1995, GE introduced its “Six Sigma” programme, the company’s latest improvement program. Six Sigma aimed at establishing a virtually defect-free company. Millions of dollars were spent training top managers in the techniques needed to implement the programme, but no production workers were trained. Unlike Smithfield and Ferodyne, where unionists knew that production improvements would translate to wage bonuses, at Lynn “Incentive bonuses are reserved for management. The threat of job loss due to shifts of work is the only incentive held out for production workers.”⁴⁷

In late 1999 GE flexed its global muscles to move well beyond parallel domestic plants and workforce dislocation in its own ranks to focus on its large supplier base. GE hosted a series of conferences where it introduced “Globalization and Supplier Migration”, a 70-page report describing its cost-cutting strategy to suppliers. In what *Business Week* described as a “super-aggressive round of cost-cutting,” suppliers were pressured to achieve 10 to 14 percent cost

reductions, savings that could be realized only by shifting work to countries with lower cost structures. The report stated: “Migrate or be out of business; not a matter of if, just when. We expect you to move and move quickly.” A carrot was offered: “We sincerely want you to participate and will help, but if you don’t we will move on without you.” The benefits for such a move to Mexico, according to GE, included average daily wage rates of \$6 (£3.75), friendly unions, and the promise of long-term low labor costs. The *Wall Street Journal* indicated that several hundred additional American jobs would be lost in the shift of appliance production from Indiana to a 48 percent GE-owned Mexican factory.⁴⁸

This program is likely to cost thousands of skilled machinists their jobs in the next two to three years, while it “chills” efforts to extend labour – management cooperation in hundreds of independently owned mid-size metalworking firms and destroys creative work systems that might exist in these companies. One supplier already affected is Ametek Aerospace, a unionized plant in Wilmington, Massachusetts. Scores of Ametek’s IUE workers have been notified that they will lose their jobs when work is transferred to an aerospace industrial park under construction in Monterrey, Mexico. At the Ametek plant managers and union workers had together implemented a creative work system. According to the local union president, “We had multi-skilled the workforce in a union negotiation and had brought state training money to increase the workforce’s skill level. We had thought we were doing everything right, and so had Ametek.”⁴⁹ The work transfer also comes despite union and worker involvement in numerous manufacturing improvement programmes at Ametek. According to the local union president, until Ametek was pressured by GE, it was a textbook example of a high-road, high value-added, high tech company. The Massachusetts plant took good care of its employees, brought work in from other locations, and even won GE’s Supplier of the Year award.⁵⁰ Now:

“What you have is a third party (GE) ordering a profitable and top quality company (AMETEK) to export its jobs and

technology to Mexico in order to increase the profit margin of the prime contractor which is GE, and which already made \$10 billion (£6.25 billion) in profits last year, of which \$1.7 billion (£1.1 billion) came from the Aircraft Engine division.”⁵¹

The “supplier migration programme” fits well with GE CEO Jack Welch’s figurative vision for the corporation. “Ideally you’d have every plant you own on a barge,” he recently stated, ready to move if any national government tried to impose restraints on the factories’ operations, or if workers demanded better wages and working conditions. Just as it shifted work between its US plants in the 1980s and 1990s, GE now moves work between low-wage countries. GE recently shuttered a factory in Turkey to move it to lower-wage Hungary, and it has threatened to close a factory in Hungary and move it to India. Union officials in Malaysia say they fear GE “putting our plant on a barge and moving to Vietnam,” according to Inter-Press Service. GE’s approach to labor relations is clearly the opposite of what is being attempted at Ferodyn and Smithfield.⁵² However, it demonstrates the pressure of a low road approach on both competing firms and supplier firms attempting to maintain creative work systems.

4. Conclusions

Throughout the 1950s and 1960s in the US a bureaucratic industrial relations system came to narrowly define jobs and the skills required to complete them. Workers were paid to perform precise functions by rote, while a rules-bound set of relationships negated the possibility for labour-management collaborative problem-solving on shop floors. This approach was incompatible with a strategy of innovation and quality production, the essential ingredients of long-term productive system viability, and hence employment security. In an era of US economic dominance, this style did not deter the generation of substantial profits for stockholders and wage increases and job security for many industrial workers. However, global competition

intensified during the 1970s and quickly exposed the flaws in this *modus operandi*.⁵³ By the late 1970s, many American manufacturers were in an increasingly troublesome economic and financial position, reflected in low operating rates, large financial losses, bankruptcies, plant closures and massive employment reductions. Eventually many enterprises—like the firms in our case studies—restructured production to survive. An important part of this restructuring involved the work system because of its direct impact on product quality, customer responsiveness, and labour cost.

Smithfield Tool, Ferodyn and General Electric provide examples of firms in which the work system has figured prominently in the company's broader strategic approach. In each instance, the work system was refashioned to accommodate the requirements of production technologies and increasingly competitive product market conditions. At Smithfield and Ferodyn, employee involvement was seen to be an effective means of achieving high quality output and production efficiency objectives. This gave rise to the establishment of creative work systems in both facilities, despite a historical legacy of rigid job structures and adversarial labour/management relationships. The Smithfield work system was transformed when workers and managers recognized that the plant's viability depended on it. Despite initial skepticism, good faith bargaining, joint participation in the transformation process, tangible performance results and a sharing of the benefits from cooperation, combined with a realization by both sides that they could rely on the other to deliver on promises and agreements. This provided an important foundation upon which the new work system and relationship could develop and flourish within the context of an existing production site.

At Ferodyn, the creative work system was carefully designed and implemented in the context of a greenfield production facility, with imported industrial relationships from a traditional American steel-making plant. Although its core employee base was transferred to the new facility from its American parent's main plant, careful selection

and Ferodyn's location away from Landis's main plant made it possible to divorce from tradition. Ferodyn's strong and committed top management then provided the buffer from both external pressures and pressures from within the corporation that might threaten the work system at Ferodyn. Despite their differences, at both Smithfield and Ferodyn the new work system was founded on an institutional framework that supported the trust and cooperation required for its success.

At Smithfield and Ferodyn there was a turn for the better production-wise when workers got involved in the shop floor transformation process. Workers were not being deskilled, nor were they being directly threatened with job loss. On the contrary, investments in education and training were made, equipment was maintained and workers were assigned responsibility for the production process and output. Compensation was linked to the achievement of measurable performance goals, and employment security was provided in exchange for worker commitment to the production and work system. These changes increased production flexibility and efficiency, helped to achieve exceptionally high product quality standards, and led to significant cost improvements and market growth.

Although the Smithfield and Ferodyn cases show that it is possible to buffer the productive system from the damaging effects of destructive market pressures, in a capitalist institutional framework that drives firms to compete on the basis of low road strategies,⁵⁴ competitive pressures make it difficult to maintain a creative work system over the long run. Such "destructive" market pressures can originate in both product markets and financial markets. Destructive product market pressures can originate in competitive relationships with low road firms as well as in supply relationships with customers who are either low road firms themselves or in competition with them. GE represents a classic example of this dynamic, achieving its cost objectives through coercion and control over the work process, and by putting the squeeze on its suppliers to deliver low cost, low price inputs.

Evidence of the threat of this approach to firms attempting to maintain creative work systems can be found in the impact of GE's "supplier migration" programme on independently owned enterprises like Ametek.

GE focused on achieving its performance objectives through unilateral control over the organization of work and production relationships and the very real threat of plant closures and layoffs should its demands not be met by labour. First with its own blue-collar workforce and now with suppliers, GE destroyed the foundation for creative work systems by exerting extreme pressure to minimize costs to the lowest possible level by global standards or lose business from GE.

At Ferodyn, competition from cost minimizing foreign and domestic steel producers coupled with pressure from customers who were forced to compete on the basis of low cost and low price made it difficult to extract a premium for high quality steel products. For a time, Ferodyn was protected by strong plant management, a nominally committed corporate parent and customers who were willing to pay a reasonable premium for exceptionally high quality products. However, this evaporated with the retirement of the plant president, the take-over of Landis by Maximetal and the dumping of cheap, "good enough" quality steel into the American market. Following the Maximetal take-over, the elimination of employee authority in many areas of production-related decision-making, the removal of key plant management personnel who had been leaders under the earlier regime, and drastic and immediate cost-cutting efforts severely damaged the institutional framework upon which the creative work system was built. As a result, the work system is rapidly deteriorating into a more traditional form and performance is suffering. In contrast, Smithfield continues to maintain its creative work system, to an important degree because it is protected by a main customer that is willing to commit to a long-term supply relationship with Smithfield, and to pay a premium for high quality products that are produced in the US.

Stock markets have exerted important destructive pressures on firms and their work systems. Especially during the 1990s, pressures on publicly traded firms to maintain high and appreciating short run share values have been intense, resulting in efforts to continually reduce costs and/or to expand market share and global reach. However, in mature manufacturing industries, production efficiencies may not be reflected in share value performance, especially in the face of recent speculative activity relating to “new economy” stocks.⁵⁵ Speculation on these stocks is currently drawing capital away from the stocks of traditional manufacturing firms, depressing their share values and making these firms targets for take-over by global corporations intent on market expansion. This has increased the vulnerability of subsidiaries in these firms to resulting shifts top leadership and management philosophy as well as to strategic decisions of new owners that may not be in the best interest of the subsidiary. Ferodyn is a good example because, despite continual efforts to interest Wall Street in Landis’s stock through information sharing about Ferodyn’s unique work system and performance achievements, and the linking of top management compensation to share value appreciation, Landis was never able to generate the share value appreciation its shareholders demanded. Many top managers consequently lost their jobs throughout the 1990s, and eventually, under pressure from a group of institutional investors, the top management team sold the company to Maximetal, a global low road firm. Maximetal’s cost cutting approach has already destroyed many of the key bases for Ferodyn’s creative work system, and although output targets continue to be met, there has been a deterioration in product quality and employee morale that threatens to jeopardize the plant’s long-run productive viability.

Together, Smithfield, Ferodyn and GE demonstrate the contribution of the work system to performance effectiveness and the difficulty of maintaining creative work systems in unregulated and destructive markets. As evident in all three cases, labour-management relations

have a strong impact on the industrial development process and firm-level performance. They also affect the economy as a whole. While a high road strategy of investments in human and physical assets benefits firm performance, it also strengthens macro-economic productive capabilities and living standards. A wage cutting strategy, on the other hand, can be employed to generate higher returns to the firm; however, should this be the dominant strategy employed by a nation's corporations, the failure to invest in more efficient technologies and skills that such a strategy entails, will eventually lead to a sharp decline in national productive capabilities.

For high wage firms in a region to sustain themselves, there must be a capacity to be innovative. Workers must be able to contribute freely to the cumulative learning process inside the firm based on a realistic expectation that their jobs are secure. Firms have to invest in skills to create an atmosphere where workers are able to provide their input, and managers must be committed to a style that solicits and uses the input. Increased supervision, a heightened work-pace, and employment insecurity are not likely to foster this kind of environment. In the Smithfield and Ferodyn cases, innovative capabilities depended on the integration of front-line workers into some aspects of the decision-making process. In both cases, workers were educated in problem-solving techniques and encouraged to use these skills to continuously improve plant efficiencies, knowing that they would share in any increased profits resulting from their involvement. This served to strengthen not only the firm's productive capability, but set into motion a virtuous cycle of innovation, continuous improvement, improved labour and living standards and macro-economic growth.

At GE, the opposite dynamic was set into motion as GE pressured both its own workforce and those of its suppliers to accept steadily deteriorating employment terms and conditions, with damaging effects on the broader productive system. In an effort to extend their global reach and achieve incomparable shop floor control, managers

have sought to capitalize on two conflicting predilections among workers: the first is the deep-seated fear of the loss of a one's job, the second is the desire to contribute one's knowledge and skills in the work environment.⁵⁶ However, as Cowie notes in his study of RCA, "The wielders of capital have far greater ability than workers to transcend and use space.... Management is able to manipulate distance to fragment labor's collective power, and the countless variations in the economic topography offer unlimited terrain for corporations to seek out less costly labor or less aggressive working-class communities."⁵⁷ Jack Welch's barge metaphor comes to mind here as does Boeing CEO Philip Condit's remark in a 1997 interview with the editors of the *Financial Times*, in which he noted that he would be "happy if in twenty years people didn't think of Boeing as an American company at all."

Absent a consistent, concerted and collective international labour voice, and global production giants like the GE, Maximal and Smithfield's global parent have the ability to exercise significant bargaining leverage over their worldwide workforce, as well as the power to worsen wages and working conditions for growing numbers of manufacturing workers.⁵⁸ The question is whether and how they choose to exercise that power, and what form of regulation might prevent the sort of global race to the bottom of the nature of GE's strategic approach. At the end of the day a simple truth remains: regardless of the level of trust between local managers and workers, should there be a substantial lessening of demand for the products being produced, or some sort of "iron law of diminishing improvement gains" that blocks the ability to reduce costs, it is likely that the factory will close. Intrinsic to success at plants like Smithfield and Ferodyn is a perpetuation of production and organizational improvements that contribute to exceptional firm performance. However, as the cases in our study show, this becomes difficult in an environment that fosters and imposes destructive market pressures, and where decision-making is far removed from individual production floors and void of a collective workers' voice. In a context where low

road firms like GE can succeed and grow at the expense of their workers, competitors, suppliers and host economies in the US and abroad, creative work systems which rely on an institutional framework of cooperation and trust, are extremely fragile.

Notes

- ¹ Katz 1985; Appelbaum and Batt 1994; Huselid 1995; Ichniowski, Kochan, Levine, Olson, and Straus 1996; Ichniowski, Shaw, and Prensushi 1997; Black and Lynch 1997; Pfeffer 1998; Baker 1999. For a discussion of Canada see Gunderson and Sharpe 1998.
- ² Osterman 1994; Pfeffer 1996; Doeringer, EvansKlock, and Terkla 1998.
- ³ For reviews of this literature see Hart 1995; Morck, Shleifer and Vishny 1989.
- ⁴ For further discussion, see Wilkinson 1983, and Birecree, Konzelmann and Wilkinson 1997.
- ⁵ Blair 1995a.
- ⁶ Kochan, Katz and McKersie 1986; Best 1990; Appelbaum and Batt 1994; Ichniowski, Kochan, Levine, Olson, and Straus 1996; Ichniowski, Shaw, and Prensushi 1997; Black and Lynch 1997; Pfeffer 1998; Huselid 1995; Lester 1998; Baker 1999.
- ⁷ Kochan and Useem 1992; Osterman 1994; Pfeffer 1996; Doeringer, EvansKlock, and Terkla 1998.
- ⁸ Lawler et. al. 1992; Appelbaum and Batt 1994; Osterman 1994; Kling 1995.
- ⁹ Hill 1991.
- ¹⁰ Mergers and acquisitions very often negate progress in the development of shop floor cooperation; Appelbaum and Batt 1994.

- 11 Eaton and Voos 1992; Kochan and Osterman 1994; Turner and
Auer 1994; Freemant and Rogers 1999.
- 12 Levine and Tyson 1990; Brown and Reich 1997.
- 13 Lazonick 1992.
- 14 Blair 1995b.
- 15 O’Sullivan 2000: 29.
- 16 Coase 1937; Williamson 1975.
- 17 Penrose 1959; Chandler 1990; Odagiri 1984.
- 18 Connor and Prahalad 1996; Kogut and Zander 1996; Marsden
1999.
- 19 Pasinetti, 1977: p. 26.
- 20 Lazonick 1992, 2000, forthcoming; O’Sullivan 1998.
- 21 Shaiken 1987; Bluestone and Harrison 1988; United Nations
1995; Kochan, Lansbury and MacDuffie 1997; Kohler and
Woodward 1997; Meredith 1997.
- 22 Among the Fortune 500’s largest manufacturers, employment
dropped to 12.4 million from 15.9 million between 1980 and
1990. General Motors, Ford, Boeing and General Electric
collectively eliminated 208,500 jobs from 1990 and 1995. By
1996 about three-quarters of all employed Americans worked in
service industries, up from two-thirds in 1979. Giant retailer
Wal-Mart, the fourth-largest US corporation in 1998 measured

by revenues, has created over 500,000 jobs since the late 1980s. (What's good for America is no longer what's good for General Motors but what is good for Sam Walton and Wal-Mart.) At century's end General Electric generates more than half its revenues from financial and other business services, while pharmaceutical companies making pain-killing drugs, ulcer medications and anti-depressants comprise four of the ten largest corporations in the US (Cappelli, et. al. 1997: p. 33, p. 68; Greider 1997: esp. chs. 5 and 7; ILO 1997; Lazonick and O'Sullivan 1997; Tagliabue 1997; Uchitelle 1997).

23 Belsey 2000:p. 1.

24 Hansen 1998.

25 US Department of Commerce, Bureau of Labour Statistics 2000.

26 Hansen 1998; O'Sullivan 2000: p. 6.

27 Kapstein 1996; Cappelli, et.al. 1997; Greider 1997; Mitchner 1997; Smith and Blumenstein 1998; Collins, et. al. 1999; Cowie 1999; Adler 2000; Almeida 2000.

28 Harrison 1994: p. 129; Kochan and Osterman 1994.

29 Smithfield is not the firm's real name. It was changed at the request of management. The case study benefited from numerous interviews with workers and managers at the facilities in 1997 and 1998. I also spent a good deal of time observing the ways work was performed and took part in a one-week continuous improvement training workshop at Smithfield.

30 There were over a dozen machine tool and metal working plant closures in greater-Springfield in less than ten years between the

late 1970s and 1980s that cost the region thousands of well paying, skilled jobs. They were each plagued by the same organizational failures as Smithfield, but none attempted to reorganize for survival as Smithfield has (Farrant forthcoming b).

31 Throughout the Second World War, ST's employment averaged 5,000; but at the war's end, employment dropped to approximately 1,500. It fluctuated between 1,000 and 2,000 into the 1960s before falling to under 500 by the early 1970s.

32 ST's history in Massachusetts dates back to 1845, when it built wooden carriages. After 1900 the company began to forge bicycle frames and forge and perform secondary machining operations on a variety of hand tools and automotive parts. Henry Ford's burgeoning River Rouge Model T plant was one of Smithfield's top customers (Farrant forthcoming a).

33 Unions members are the president, vice-president, recording secretary, and chief steward; company representatives are the director of operations, the human resources manager, and two operations managers.

34 In the two week period that I observed the plant one team had come up with fourteen issues that became the basis for team meetings.

35 Many of these are aimed specifically at improving the flow of production in the plant. Smithfield's operating philosophy is based on the notion of "one piece flow". Parts are no longer machined and placed in inventory, instead completed parts move from operation to operation in the smallest quantity possible to satisfy a particular customer order. Hourly and salaried employees are responsible for keeping orderly things like tools,

fixtures, furniture, and break areas, and there is a systematic approach to maintenance and machine repair to avoid costly down time.

36 Ferodyn is a fictitious name. A greenfield production facility is a newly constructed plant.

37 Landis Steel Company is a fictitious name.

38 Maximetal is a fictitious name.

39 According to the local union president, “Absenteeism has started to be a problem. In the old system, this was an empowering place to work. You were glad to be here and to work hard. Now, people are feeling burned out, tired, over-worked and emotionally drained.”

40 According to the local union president, whereas fewer than five grievances were filed during Ferodyn’s first six years of operation, more than 30 have been filed during the most recent two years. Almost all relate to grievances over unilateral change.

41 Our analysis borrows heavily from the work of Beth Almeida.

42 Almeida 2000.

43 Almeida 2000; interview with Jeff Crosby, President, IUE Local 201 at GE Aircraft Engines, Lynn.

44 Harry and Schroeder 2000; Tichy 1997

45 Slater 2000: p. 50.

46 Employment at Evendale was close to 20,000 in 1988; at the end
of 1994 only 8,000 remained. (Almeida, 2000).

47 Crosby 2000a.

48 Bernstein 1999: p. 74, 78; Millman 2000: p. 8.

49 Crosby 2000b: p. 35.

50 Bass 2000.

51 Crosby 2000: p. 1.

52 Mokhiber and Weissman 2000.

53 For a more detailed case study see Farrant 1998.

54 Low road strategies involve aggressive cost cutting, managerial
control over the production process and output, and competition
on the basis of low price and minimal quality standards.

55 New economy stocks are those of companies operating in high
technology industries such as the Internet, electronic commerce,
computer hardware and software and satellite and
telecommunications. Many of these companies are realizing
high share values and enormous share price appreciation, despite
the fact that they may not yet be producing anything for market.
This is because of speculation about the future value of their
stock.

56 Former GE engineer Oswald Jones (1997) cites GE manager
Charles Pieper, who worked in Europe and supervised a number
of plant reorganization projects there: "I have never seen a
group of people who are not interested. Never. Never. Never.

Whether you are Chinese, Hungarian, Japanese or Swedish, people love to go and make their workplace better...” On the basis of Pieper’s performance at GE, workers gained nothing at all from this willingness to participate, for while president of GE Lighting Europe, workers’ passionate commitment there resulted in a drop in the number of factories from 24 to 12, and employment from 24,000 to 13,000. In a bit of an understatement Jones concludes: ‘It is hardly surprising that workers regard GE managerial initiatives to make the workplace better with considerable skepticism’ (pp. 20 - 2).

⁵⁷ Cowie 1999: p. 185. Cowie concludes that “Command of spatial relations, therefore, becomes a crucial weapon in management’s arsenal, and its mobility increases the return on investment and bolsters its ability to contend with competition” (p. 185).

⁵⁸ ILO 1997; Zuckerman 1997.

References

- Adler, W. (2000) *Mollie's Job: A Story of Life and Work on the Global Assembly Line*, New York, Scribner.
- Almeida, B. (2000) Linking institutions of governance and industrial outcomes: the case of global aircraft engine manufacturing, presented at the 52nd Annual Meeting of the Industrial Relations Research Association, Boston, Massachusetts, January.
- Almeida, B. (1997) Are Good Jobs Flying Away? US Aircraft Engine Manufacturing and Sustainable Prosperity, Working Paper No. 206, Annandale-on-Hudson, New York, Jerome Levy Economics Institute.
- Appelbaum, E. and Batt, R. (1994) *The New American Workplace: Transforming Work Systems in the United States*, New York, ILR Press.
- Baker, T. (1999) *Doing Well By Doing Good: The Bottom Line on Workplace Practices*, Washington, D.C., Economic Policy Institute.
- Bass, C. (2000) Neutron Jack strikes again: GE to suppliers — move to Mexico, *New Haven Advocate*, January 20, 1.
- Belsey, L. (2000) Labour's place in the new economy, *Christian Science Monitor*, vol. 92, no. 86, March 27, 1.
- Bernstein, A. (1999) Welch's march to the South, *Business Week*, December 6, 74.
- Best, M. (1990) *The New Competition: Institutions of Industrial Restructuring*, Cambridge, Harvard University Press.

- Birecree, A., Konzelmann, S. and Wilkinson, F. (1997) Productive systems, competitive pressures, strategic choices and work organization: an introduction, *International Contributions to Labour Studies*, vol. 7, no. 1.
- Black, S. and Lynch, L. (1997) How to compete: the impact of workplace practices and information technology on productivity, *NBER Working Paper Series*, Working Paper 6120.
- Blair, M. (1995a) Rethinking assumptions behind corporate governance, *Challenge*, Nov./Dec., vol. 38, issue 6, 12-18.
- Blair, M. (1995b) *Ownership and Control: Rethinking Corporate Governance for the Twenty-first Century*, Washington, D.C., Brookings Institution.
- Bluestone, B. and Harrison, B. (1988) *The Great U-Turn: Corporate Restructuring and the Polarizing of America*, New York, Basic Books.
- Brown, C. and Reich, M. (1997) Micro-macro linkages in high performance employment systems, *Organization Studies*, vol. 18, no. 5.
- Cappelli, P., Bassi, L., Katz, H., Knoke, D., Osterman, P. and Useem, M. (1997) *Change at Work*, New York, Oxford University Press.
- Chandler, A. (1990) *Scale and Scope: The Dynamics of Industrial Capitalism*, Cambridge, MA, Harvard University Press.
- Coase, R. H. (1937) The nature of the firm, *Economica*, November, 386-405.

- Collins, C., Leondar-Wright, B. and Sklar, H. (1999) *Shifting Fortunes: The Perils of the Growing American Wealth Gap*, Boston, United for a Fair Economy.
- Connor, K. and Prahalad, C. (1996) A resource-based theory of the firm: knowledge versus opportunism, *Organization Science*, vol. 7, no. 5, 477-501.
- Cowie, J. (1999) *Capital Moves: RCA's 70-Year Quest for Cheap Labour*, Ithaca, Cornell University Press.
- Crosby, J. (2000a) AMETEK buckles to severe GE pressure, *Local 201 Electrical Union News*, January 25, 1.
- Crosby, J. (2000b) The kids are all right, *New Labour Forum*, Spring - Summer, 35-9.
- Doeringer, P., EvansKlock, C. and Terkla, D. (1998) Hybrids or hodgepodes? Workplace practices of Japanese and domestic start-ups in the United States, *Industrial and Labour Relations Review*, vol. 51, no. 2, 171-86.
- Eaton, A. and Voos, P. (1992) Unions and contemporary innovations in work organization, compensation and employee participation, in Mishel, L. and Voos, P. (eds), *Unions and Economic Competitiveness*, New York, ME Sharpe.
- Farrant, R. (forthcoming a) Neither a sleepy village nor a coarse factory town: skill in the greater Springfield Massachusetts industrial economy, 1800 - 1990, *Journal of Industrial History*.
- Farrant, R. (forthcoming b) Good jobs and the cutting edge: the US metalworking industry and sustainable prosperity, in Lazonick, W. (ed), *Corporate Governance and Sustainable Prosperity*:

Industrial Innovation, International Competition and Intergenerational Dependence, New York, Macmillan.

Farrant, R. (1998) *Restructuring for Flexibility and Survival: A Comparison of Two Metal Engineering Plants in Massachusetts*, Geneva, International Labour Organization.

Freeman, R. and Rogers, J. (1999) *What Workers Want*, Ithaca, ILR Press.

Greider, W. (1997) *One World Ready or Not: The Manic Logic of Global Capitalism*, New York, Simon & Schuster.

Gunderson, M. and Sharpe, A. (eds) (1998) *Forging Business-Labour Partnerships: The Emergence of Sector Councils in Canada*, Toronto, University of Toronto Press.

Hansen, F. (1998) Compensation in the new economy, *Compensation and Benefits Review*, vol. 30, no. 1, 7-15.

Harrison, B. (1994) *Lean and Mean: The Changing Landscape of Corporate Power in the Age of Flexibility*, New York, Basic Books.

Harry, M and Schroeder, R. (2000) *Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top Corporations*, New York, Currency Books.

Hart, O. (1995) Corporate governance: some theory and implications, *Economic Journal*, vol. 105, 678-98.

Hill, S. (1991) Why quality circles failed but total quality management might succeed, *British Journal of Industrial Relations*, vol. 29, no. 4, 541-68.

- Huselid, M. (1995) The impact of human resource management practices on turnover, productivity and corporate financial performance, *Academy of Management Journal*, vol. 38, no. 3, 635-72.
- Ichniowski, C., Kochan, T., Levine, D., Olson, C. and Straus, G. (1996) What works at work: overview and assessment, *Industrial Relations*, vol. 35, no. 3, 299-333.
- Ichniowski, C., Shaw, K. and Prennushi, G. (1997) The effects of human resource management practices on productivity: a study of steel finishing lines, *American Economic Review*, vol. 87, no. 3, 291-313.
- International Labour Organization. (1997) *World Labour Report: Industrial Relations, Democracy and Social Stability, 1997–1998*, Geneva, International Labour Office.
- Jones, B. (1997) *Forcing the Factory of the Future: Cybernation and Societal Institutions*. Cambridge, MA, Cambridge University Press.
- Jones, O. (1997) Changing the balance? Taylorism, TQM, and work organisation, *New Technology, Work and Employment*, vol. 12, no. 1, 13 – 24.
- Kapstein, E. (1996) Workers and the world economy, *Foreign Affairs*, vol. 75, 16–37.
- Katz, H. (1985) *Shifting Gears: Changing Labour Relations in the US Automobile Industry*, Cambridge, The MIT Press.

- Kling, J. (1995) High performance work systems and firm performance, *Monthly Labour Review*, May, 29-36.
- Kochan, T., Katz, H. and McKersie, R. (1986) *The Transformation of American Industrial Relations*, New York, Basic Books.
- Kochan, T. and Useem, M. (eds) (1992) *Transforming Organizations*, New York, Oxford University Press.
- Kochan, T., Lansbury, R. and MacDuffie, J. P. (1997) *After Lean Production: Evolving Employment Practices in the World Auto Industry*, Ithaca, Cornell University Press.
- Kochan, T. and Osterman, P. (1994) *The Mutual Gains Enterprise*, Boston, Harvard Business School Press.
- Kogut, B. and Zander, U. (1996) What do firms do? coordination, identity and learning, *Organization Science*, vol. 7, September–October, 502-18.
- Kohler, C. and Woodward, J. (1997) Systems of work and socio-economic structures: a comparison of Germany, Spain, France and Japan, *European Journal of Industrial Relations*, vol. 3, no. 1, 59 – 82.
- Lawler, E., Mohrman, S. and Ledford, G. (1992) *Employee Involvement in Total Quality Management: Practices and Results in Fortune 1000 Companies*, San Francisco, Jossey-Bass.
- Lazonick, W. (1992) Controlling the market for corporate control: the historical significance of managerial capitalism, *Industrial and Corporate Change*, vol. 1, no. 3, 445-88.

- Lazonick, W. (ed) forthcoming. *Corporate Governance and Sustainable Prosperity: Industrial Innovation, International Competition and Intergenerational Dependence*. New York, Macmillan.
- Lazonick, W. and O'Sullivan, M. (1997) *Corporate Governance and Employment: Is Prosperity Sustainable in the United States?* Annandale-on-Hudson, New York, The Jerome Levy Economics Institute.
- Lester, R. (1998) *The Productive Edge: How US Industries Are Pointing the Way to a New Era of Economic Growth*. New York, W.W. Norton & Company.
- Levine, D. and Tyson, L. (1990) Participation, productivity and the firm's environment, in Blinder, A. (ed), *Paying for Productivity*, Washington, D.C., Brookings Institution.
- Marsden, D. (1999) *A Theory of Employment Systems*, Oxford, Oxford University Press.
- Meredith, R. (1997) The brave new world of General Motors, *The New York Times*, October 26, section 3, 1.
- Millman, J. (2000) GE boosts Mexican output as labour talks in US near, *The Wall Street Journal*, January 5, 8.
- Mitchner, B. (1997) Europe looks askance at auto subsidies as overproduction looms as a problem, *The Wall Street Journal*, December 14, 8.
- Mokhiber, R. and Weissman, R. (2000) GE: every plant on a barge, www.corporatepredators.org

- Morck, R., Shleifer, A. and Vishny, R. (1989) Alternative mechanisms of corporate control, *American Economic Review*, vol. 79, 842-52.
- Odagiri, H. (1984) The firm as a collection of human resources, in Wiles, P. and Routh, G. (eds), *Economics in Disarray*, Oxford, Blackwell.
- Osterman, P. (1994) How common is workplace transformation and who adopts it?, *Industrial and Labour Relations Review*, vol. 47, no. 2, 173-88.
- O'Sullivan, M. (2000) Shareholder value, financial theory and economic performance, presented at the 52nd Annual Meeting of the Industrial Relations Research Association, Boston, Massachusetts, January.
- O'Sullivan, M. (1998) Sustainable prosperity, corporate governance and innovation in Europe, in Michie, J. and Grieve Smith, J (eds.), *Globalization, Growth and Governance*, Oxford, Oxford University Press.
- Pasinetti, L. (1977) *Lectures on the Theory of Production*, London, MacMillan.
- Penrose, E. (1959) *The Theory of the Growth of the Firm*, Oxford, Blackwell.
- Pfeffer, J. (1998) Seven practices of successful organizations, *California Management Review*, vol. 40, no. 2, 96-124.
- Shaiken, H. (1987) *Automation and Global Production: Automobile Engine Production in Mexico, the United States, and Canada*,

San Diego, University of California, Center for US Mexican Studies.

Slater, R. (2000) *The GE Way Handbook*, New York, McGraw-Hill.

Smith, C. and Blumenstein, R. 1998. In China, GM bets billions on a market strewn with casualties, *The Wall Street Journal*, February 11, 1.

Tagliabue, J. (1997) Buona note, guten tag: Europe's new workdays, *The New York Times*, October 20, D1.

Tichy, N. (1997) *The Leadership Engine: How Winning Companies Build Leaders at Every Level*, New York, Harper Business.

Turner, L. and Auer, P. (1994) A diversity of new work organization: human-centred, lean and in-between, *Industrielle Beziehungen*, vol. 1., no. 1, 38-60.

Uchitelle, L. (1997) Global good times meet the global glut, *The New York Times*, November 16, D1.

United States Department of Commerce. (2000) Bureau of Labour Statistics.

United Nations. (1995) *World Investment Report: Transnational Corporations and Integrated International Production*, New York, United Nations.

Wilkinson, F. (1983) Productive systems, *Cambridge Journal of Economics*, vol. 7, 413-29.

Williamson, O. (1975) *Markets and Hierarchies: Analysis and Anti-trust Implications*, New York, Free Press.

Zuckerman, L. (1997) Boeing startles market with delays costing \$2.6 billion, *The New York Times*, October 23, D1.