Unions and Productivity, Financial Performance and Investment: International Evidence

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1. Introduction: the issues and the countries

If the presence of a union in a workplace or firm boosts pay, financial performance is likely to be worse unless there is a roughly equivalent union effect on productivity. Any such impact on profitability may lead to higher consumer prices and is likely to cause lower investment rates, contributing to economic senescence, although when the product market is monopolistic it might under some circumstances be benign – a simple transfer from capital to labour – with no efficiency implications.

Productivity matters a lot: increased productivity is the source of higher living standards for employees, more profits for capitalists and lower prices for consumers. Similarly investment in physical and human capital is a crucial source of economic dynamism at the level of the firm as well as for the aggregate economy. Therefore the manner in which industrial relations institutions in general, and unions in particular, affect productivity, financial performance and investment is keenly important. This chapter distils evidence on such effects from six countries: USA and Canada from North America, UK and Germany from Europe and Japan and Australia from Australasia. Most of the evidence comes from cross sections of workplaces or firms because there are rather few good recent case studies. This is a pity because case studies of aircraft production (Kleiner et al. 2002) and tyre manufacturing (Krueger and Mas 2002), which combined detailed institutional knowledge with sophisticated statistical technique, probably epitomise the direction of future research.

These six countries were chosen for two reasons. First, the vast bulk of accessible studies analysing links between unionisation and productivity, investment and profits have been undertaken for these countries. It would have been nice to include some LDCs or other evidence from Africa, Asia and southern Europe but little seems to exist. Second, the system of industrial relations in these six countries varies greatly

which, in principle, might be expected to lead to different union effects among the countries.

Consider table 1 which summarises the industrial relations systems on the basis of six indicators carefully constructed by OECD. In the mid-1990s union density (row 1) in Canada, Australia and UK was over double that in the USA with Japan and Germany in between. In the USA, Canada and Japan union density and coverage of collective bargaining rates (row 2) are much the same reflecting decentralised bargaining and high density achieved via mandatory dues check-off provisions where such bargaining occurs. In the UK more employees are covered by collective bargaining than are in unions because there are lots of free riders. In Germany and Australia collective bargaining coverage is around three times as high as union density because bargains in unionised firms get extended (*erga omnes*) to non-union enterprises.

The level of bargaining (row 3) and extent of coordination (row 4) also vary among the six countries. In the mid-1990s bargaining was decentralised to firm level in the USA, Canada and Japan. In Germany and Australia sector level bargaining predominated, although a move towards decentralisation is now apparent in both countries. Even though bargaining is decentralised in Japan there is considerable coordination in bargaining strategy and tactics among both employers and unions (as there is in Germany), whereas there is much less coordination in the UK, USA and Canada although there is still some pattern bargaining in the auto and construction industries in North America.

Employment regulation by the state varies greatly among the countries. The mid-1990s labour standard index – covering working time regulations, fixed term contracts, employment protection, minimum wage arrangements and employee

representation rights ranges from 8 (out of 10) in Germany to 0 in the USA and UK. The more specific employment protection "stickiness index" also demonstrates that regulations covering procedures, notice period, severance pay and rules for individual and collective dismissals are much more stringent in Germany and Japan than they are in the UK and USA.

There is now a substantial cross-country literature examining links between such industrial relations institutions and macroeconomic performance and income distribution (see for example, successive annual issues of OECD, Employment Outlook). It is plausible that particular bundles of characteristics among these institutions might also affect the performance of firms and workplaces. In very broad terms, for our six countries, the USA, Canada and UK can be thought of as having low coverage, decentralised bargaining and weak labour standards, while Germany, Japan and Australia have high coverage (not Japan), less decentralised or more coordinated bargaining and stronger employment protection. There are, however, no automatic links with workplace performance. For example, strong employment protection coupled with sector level bargaining might promote security and voice leading to information sharing and more investment in human capital, thereby boosting performance. But equally decentralised bargaining with minimal standards might imply mutual gain negotiations at firm level, which could also enhance performance. We shall just have to wait and see what the evidence suggests.

Some patterns do emerge. Unions and works councils influence productivity modestly favourably in Japan and Germany respectively. In the USA workplaces with both so-called high performance work (HPW) practices and union recognition attain superior productivity to workplaces with just recognition or just HPW practices. And in each country more intense product market competition and the evolution of cooperative

industrial relations has weakened any negative associations between unions and productivity and strengthened positive ones. The vast weight of the evidence suggests that a union presence is associated with lower profitability but that the union impact is largely dependent on weak competition in the product market and the consequent surplus available for redistribution to employees. Unions appear also to lower the rate of investment in physical capital in the USA, UK and Germany – perhaps because of their impact on financial performance? – but to raise investment in human capital in the UK and USA.

But such patterns must be treated cautiously. First, there is considerable heterogeneity in the findings even within countries. For example one recent, possibly idiosyncratic, USA study of small entrepreneurial firms finds a strong positive link between unions and profits. And in Germany the vital information, consultation and voice role played by works councils does not yield unambiguous findings on any of the three performance measures. Second, "unions" are themselves heterogeneous. It seems, for example, that enterprise unions and works councils have a more positive impact on performance than multiunionism and fragmented bargaining. Third, links between unionisation and performance alter over time in response, for example, to greater competition ("globalisation"), less adversarial relations between management and labour and modifications to the legal environment in which unions operate.

Studies in this area, including some in this survey, are sometimes incomplete. Insufficient attention is paid to product market – labour market links. Nickell (2001) recently pointed out that "what unions do depends on what they **can** do, and this depends on the extent of product market competition". This link is given considerable prominence below. Next, there is rather little on process. Statistical studies typically relate institutions to outcomes but are silent on the how and why. If, for example,

unions raise productivity does this come about through better quality labour, greater job satisfaction, fewer quits, better work organisation or harder work? Some complementary case studies are urgently needed. Replication is also useful. The world moves on so any union impact in the more regulated UK labour market pre-Thatcher might not hold now. Similarly bargaining is becoming more decentralised in Australia and Germany and this is bound to have an effect on the role and power of unions. As heterogeneity of outcomes increases with decentralised bargaining the need for firm level studies becomes even stronger.

The chapter is organised as follows. Union effects on productivity, financial performance and investment are set out in sections 2-4 respectively. In each case the relevant theory and methods of investigation are discussed followed by evidence. We attempt to distil the weight of the evidence and provide an exemplary study for each country on each indicator, sometimes one with unexpected results. Many issues require further analysis and section 5 goes into a bit more detail on product market–labour market links, the evolution of more cooperative industrial relations and its impact, the effects of different union structures, unions' impact on investment in human capital, and the role of German works councils. Summary and conclusions are set out in section 6.

2. Productivity

a. Theory and testing

Unions can influence industrial relations and personnel management for good or ill. The union impact on things like apprenticeship methods, promotion policies, work organisation, wage levels and payments systems and grievance procedures will feed through into productivity. It is impossible to determine a priori whether such a union effect will raise or lower the level of labour productivity. Indeed, it is likely that productivity-enhancing union effects and productivity-detracting effects occur simultaneously, so the net effect must be a matter of careful empirical investigation. In what follows, we set out the channels by which unions might lower or raise productivity and we emphasise the limitations of and caveats to the studies reviewed.

Reasons why union presence may lower labour productivity

Four sets of reasons why union presence may lower labour productivity are noted. First, unions may be associated with restrictive work practices. Second, industrial action may have an adverse impact. Third, union firms may invest less than non-union firms. Fourth, if unions are associated with an adversarial style of industrial relations the consequent low trust and lack of cooperation between the parties may lower productivity.

Restrictive work practices surely lower labour productivity. Pencavel (1977) suggests that such practices result from "union malfeasance". Increased security from disagreeable management decisions is more possible for union than for non-union labour. Such security may be formalised through work rules (job regulation) and unions

may operate in a conventional cartel-like fashion by restricting output. Such restrictive practices take a number of forms (see e.g. Donovan 1968, ch.6). There may be work rules concerning, for example, pace or job demarcations. Over-manning might result from fixed gang sizes or extensive use of assistants. Capital may not be used intensively or might be poorly maintained. Finally, there may be policy overtime i.e. a restriction on effort during normal hours in order to boost total pay via overtime working. But the scope for such practices is limited in competitive markets because the firm may go out of business. So we should expect such practices to be more prevalent in the public sector and in monopolistic product markets.

Industrial action will lower output where it occurs, but that output might be made good over time or by other firms. Such action, or the threat of it, causes uncertainty about output levels and this will tend to reduce the effectiveness of resources devoted to marketing and distribution; and company performance will be impaired if delivery dates are not met (Caves 1980). If labour relations tend to deteriorate as plant size increases this might encourage companies to build plants smaller than would otherwise be indicated by technical economies of scale. Finally management time is diverted to problems of labour relations and away from other tasks. Particular care needs to be taken with the arrow of causation between industrial action and labour productivity. It is quite plausible that poor labour productivity reflects poor management which also causes more industrial action.

Unionised firms may invest less in capital equipment and research and development than non-union firms or the returns from such expenditure may be lower causing, in turn, less future investment (Grout 1984a, 1984b). Shareholders and managers get locked into specific investments of plant and machinery and R&D. They are therefore vulnerable to ex post exploitation by unions. For example, capital may be

kept idle because of disputes over manning levels. This lowers the rate of return to the investment thus causing under-investment. Such arguments may hold with special force to more risky investments. The impact of unions on investment is analysed in section 4.

Union presence may sometimes result in an adversarial style of industrial relations, lowering trust and cooperation. If both parties strive for their own selfish ends they may both end up worse off – in terms of labour productivity and real earnings – than if they cooperated (see Leibenstein 1988, ch.5 for an intuitive but formal discussion). It is often forgotten that this point was made very forcibly by Freeman and Medoff (1984). Their argument was that unions would raise productivity only under very strict circumstances: "if industrial relations are good, with management and unions working together to produce a bigger "pie" as well as fighting over the size of the slices, productivity is likely to be higher under unionism. If industrial relations are poor, with management and labour ignoring common goals to battle one another, productivity is likely to be lower under unionism". Any such productivity-reducing effects of union presence may be compounded if multi-unionism is present in the organisation.

Reasons why union presence may raise labour productivity

Five sets of reasons why labour productivity may be higher in the presence of unions are discussed. First, firms' responses to union relative wage effects may result in higher labour productivity, but this should not be interpreted as raising the welfare of society. Second, unions may play a monitoring role on behalf of the employer. Third, the familiar collective voice arguments may have favourable consequences. Fourth, it is sometimes held that a union presence may make managers less lethargic. Finally, unions should stop exploitation of labour, resulting in improved productivity.

If unions achieve a wage differential over non-union workers firms respond by increasing the capital intensity of production and employing better quality labour, both of which raise labour productivity. But this route to higher productivity needs careful interpretation. We do not want productivity to rise because of wage push: it is not in societies' interest if unions raise wages and productivity rises because firms respond by substituting capital for labour-lowering employment – and raising prices to consumers. Rather, it is the other union routes to higher productivity like monitoring and collective voice which truly raise welfare.

Pencavel (1977) emphasises the important role played by unions in monitoring work. His arguments are related to, and anticipated, the voice and agency arguments considered below: "the trade union may be interpreted as the employees' auditor of management checking that the employer is fulfilling his part of the labour contract. Or when the union is given a role overseeing work performance and in disseminating wage payments to workers, its officials become the monitors of the employees. The degree to which these monitoring activities achieve a close association between productivity and rewards will determine the efficiency of the organisation". Donovan's (1968) classic study of UK shop stewards confirmed such functions. It emphasised the shop stewards' role in communication, information and discipline and described shop stewards as lubricants rather than irritants. Although the employer does not have to operate through the union Pencavel points out that because the shop steward is drawn from the ranks of the workers, employees will be less suspicious when work operation rules are altered and there may be greater cooperation between labour and capital. Thus labour productivity may be raised because craft unions enforce standards of workmanship, and all unions may seek to prevent malingering and shirking by individuals. This favourable productivity effect may, however, be offset by the greater role now played

by unions in supporting members at both internal grievance hearings and at Labour Courts.

The collective voice provided by a union may improve efficiency within the firm. First, collective voice is an information source on worker preferences which should result in an effective mix of wages and personnel policies. For example there is the standard public good (i.e. non-rival consumption) argument for collective voice to achieve the right level of health and safety provision. Without such a voice it will be underprovided. Second, the collective voice may improve morale, motivation and cooperation. For example, firm specific skills learned on the job require cooperation and this may be forthcoming if unions lessen rivalry among individuals. Likewise, unions may provide greater security against arbitrary decisions on matters like dismissal or redundancy. Thus teamwork may be enhanced. Third, the voice may improve communications leading directly to better plant layout or improved working practices – a gain in x-efficiency. Fourth, better grievance procedures may result. Fifth, voice may provide a mechanism to improve the employment contract, encouraging or discouraging, for example, performance related pay or a less rigid workweek. These collective voice arguments are the centrepiece of the Harvard School approach to the possibility that unions may raise productivity. However, it is unclear why a union is required. A works council or some other form of consultative arrangement might do just as well. The consequences that flow from such collective voice will, in turn, also tend to raise labour productivity. Labour turnover should be reduced (over and above any lower labour turnover resulting from higher union pay). This leads to lower costs and higher returns to training and hence to greater accumulation of human capital and a more skilled workforce. Further, recruitment costs and interruption of work should both

be lessened as a result of lower turnover. Similar arguments hold if voice also results in less absenteeism and greater job satisfaction.

Union presence may be associated with a shock to management and therefore to improvements in the management of labour. There are two strands to this argument, which tend to get conflated. First, there may be an impact effect of unionisation. When a union initially gets recognised a firm might put better managers or equipment in place (it is a moot point as to how long the shock effect lasts and whether this argument is symmetrical when unions get de-recognised). Second, there is held to be a continuing effect: "managerial responses to unionism that take the form of more rational personnel policies and more careful monitoring of work raise productivity by reducing organisational slack" (Freeman and Medoff 1984). These two potential positive effects of unionisation on labour productivity may spillover to non-union firms, which may be kept on their toes in their attempts to keep unions out.

Finally, unions may counter unfair bargaining power on the employer's side. If unions stop exploitation of labour by raising wages this is socially desirable. The firm will, in turn, respond by raising the capital intensity of production, resulting in improved labour productivity.

Union presence and changes in productivity

Union presence can influence the **level** of labour productivity for good or ill, so unionisation can also be associated with differentiated **changes** in labour productivity. If any of the productivity-enhancing channels discussed above, like voice, are strengthened or if restrictive practices and the like which are harmful to labour productivity are weakened, union presence will be associated with improved

performance relative to the non-union sector. These dynamic forces are obviously important because the manner in which union(s) interact with management or influence investment will vary over time. For example, if managerial practices become more effective or the industrial relations climate more cooperative in unions firms, then union presence will be associated with faster growth than before. Similarly, if previously the union sector invested less than the non-union sector or lagged in the adoption of new techniques, but now invests more, we would expect to see an improvement in the relative performance of the union sector. It is most unlikely that heavily unionised workplaces or industries can have **permanently** higher or lower productivity growth than corresponding less- or non-unionised organisations. This would imply an ever-widening gap between the two groups, which is most implausible. Thus findings for the one decade should not, for example, be extrapolated to the next.

Limitations and caveats

Pencavel (1991) notes that the ideal data to examine the net effect of unionisation on productivity require: a single industry, making the assumption of a common technology among plants more plausible; a physical measure of output so as not to conflate price and quantity effects; longitudinal information for each plant; a change of union status for some plants during the period such as the granting of union recognition. A fruitful sector for such analysis is British docks where Evans et al. (1993) analysed productivity change in docks previously covered by the National Dock Labour Scheme, relative to non-Scheme ports, consequent on the abolition of the Scheme in 1989.

In the event, few of the studies reviewed below meet these stringent criteria. Therefore the **limitations** of the studies, and the **caveats**, must both be spelled out.

These include the neglect of management, the lack of a theory of union behaviour, disregard of underlying industrial relations, failure to deal with the heterogeneity of unions and the structure of collective bargaining, the fact that the studies are time-specific, and emphasis on outcomes at the expense of processes; various measurement problems, the lack of appropriate control variables, the nature of the sample, the nature of the causal mechanisms, and the fact that there is great variation around average "union effects".

It takes two to tango. Any impact of unions on productivity must reflect the way in which **management** and unions interact. Indeed the very decision to recognise unions "may form part of a cluster of characteristics whose effects warrant study" (Edwards 1987). Further, the underlying **model of union behaviour** is seldom fully set out. This is a pity because predictions concerning the strength and direction of union productivity effects vary according to the preferred model of union behaviour. The monopoly model, for example, has different implications concerning productivity and profits to the efficient bargaining model.

Harvard School writers do not claim that unions mechanistically raise labour productivity. They state explicitly that this will only happen if, hand-in-hand with union recognition, there is a non-adversarial **industrial relations system** and competition in the product market. In Great Britain in the 1960s and 1970s unions were fragmented, there was considerable strength at shop floor level, manufacturing had overall high density and, till recently, a considerable public sector presence. Perhaps therefore we might expect a less favourable impact of unions on labour productivity in the UK at that time than (say) in the US or Germany. And now that UK unions emphasise cooperation and partnership any union impact should have become more favourable than previously.

Unions are not homogeneous but unfortunately in many studies "unionism remains an abstraction: one union is like every other union, one collective bargaining relationship is like all the rest" (Lipsky 1985). There is little attempt to capture the various forms of unionism and collective bargaining. Two examples will suffice. First, craft unions may have different consequences than general or industrial unions because craft unions have more scope for restrictive practices and are more likely to impose constraints on the growth of productivity since they will evade many of the costs associated with their protection of particular occupational interests and job territories. By contrast, an industrial union may be less likely to block technical change because a smaller proportion of its membership is displaced. Second, the structure of collective bargaining may also influence productivity outcomes. For example, multi-unionism will tend to both enlarge the number of bargaining units and increase the uncertainty inherent in the bargaining process. This could, in turn, lower labour productivity via strike activity or by in-fighting among sectional groups. The studies of the association between unions and productivity are **time specific**. The world moves on so any association found for the 1980s does not automatically hold in the new millennium.

Statistical analyses deal with outcomes. Case studies are a vital complement because they illuminate the **processes** by which unions influence productivity at the workplace level. Such case studies might incorporate (Lipsky 1985) the history of the parties and their relationships; the customs and traditions of the worksite; the personalities, attitudes and leadership skills of the actors; negotiating tactics used by the parties; the degree of inter- and intra-organisational conflict; and the availability of various dispute resolution procedures.

Measurement problems bedevil many studies. Ideally labour productivity should be measured by a physical measure of output like tons of coal per man-shift. But

as firms and industries make different things value added per employee is often used. If gross value added per employee is used then it is necessary to control for both differences in the capital equipment and in bought-in inputs, which also contribute to value added. But this is only the beginning. Net value added per employee is the result of both quantity and price effects. There is always the danger that what is measured as higher productivity is in fact attributable to a higher price in that firm or industry. Alternatively, the existence of a union wage mark-up may cause higher costs and this, in turn, may induce higher prices – which show up as an apparently higher productivity level. More recently, some studies have sidestepped these issues by measuring productivity on a 5-point ordinal scale comparing the workplace with other similar workplaces in the same industry. Union presence has also been measured in different ways. Recognition, density or the existence of a closed shop seems unproblematic. But the coverage of collective agreements used by some authors is not the same as unionisation and may be inappropriate to capture the influence of union presence on labour productivity.

Selection of the sample presents problems too. For example inefficient firms might get selected out of the sample. Or unions might select inherently more productive firms to unionise. Appropriate **control variables** are vital to get at the true association between unions and productivity. The life cycle of plants raises particular difficulties. A negative association between union presence and productivity is spurious if it just happens that, by coincidence, unions are over represented in "declining" workplaces and industries which also have lower productivity. Ideally, the vintage of the workplace should be incorporated as a control. The studies of union impact on productivity often present an **average** union effect. But there is great variation around the average. The richness in the variety of union practices in enhancing or discouraging labour

productivity, particularly concerning their interaction with management, is not always captured by these statistical studies. Finally, the **arrow of causation** must be examined carefully. An association does not necessarily imply causation and, anyway, causation might sometimes go "the other way". For example a well-organised workplace would tend to have high productivity and low strikes, producing a negative relationship between the two. But, in this case, the lower strike activity is not the cause of the higher productivity.

b. Evidence

On the basis of the discussion above it might be expected that unions would have a positive impact on productivity in the USA – consequent on the substantial union wage premium – and in Germany and Japan because of voice and cooperative industrial relations achieved through works councils and enterprise unions. By contrast, at least until recently, adversarial industrial relations and multi-unionism in the UK and Australia made a negative link more likely. In all countries it would be expected that more intense product market competition and moves away from antagonistic relations between management and labour towards a mutual gain system would lessen adverse union effects and enhance positive ones. Those wanting a thorough trawl of studies on unions and productivity should consult Doucouliagos and Laroche (2000) who provide evidence on some 100 studies but end up emphasising how the findings are country, time and sector specific.

In their very careful recent study of **US** unions, working practices and labour productivity, Black and Lynch (1997) note that "empirically, the evidence on the impact of unions on productivity is mixed". They state that most empirical work has looked at

industry level productivity and union density data or industry-specific studies: "The range of estimates on the impact of unions on labour productivity runs from minus 3% in Clark (1984) to plus 22% in Brown and Medoff (1978) to no effect in Freeman and Medoff (1984)". Further any effects may vary by sector. For example Bronars et al. (1994) state that unions are associated with higher relative productivity levels in manufacturing and lower productivity in non-manufacturing.

Black and Lynch (see table 2) try and reconcile these disparate findings by interacting the union status of the establishment with other workplace practices. Essentially the aim is to distinguish between different types of labour-management relations – traditional and new – and their impact on labour productivity. This seems a very useful approach because the focus of much recent research concerns not unions and productivity but high performance work practices and productivity (see e.g. Ichniowski and Shaw (1995) and Huselid and Becker (1996) who calculate a detailed HRM index and analyse how changes in this index influence the performance of the firm).

The sample is over 600 manufacturing workplaces in 1993 (a panel study from 1987-1993 yield very similar results). Black and Lynch construct a base case benchmark workplace which is a non-union multi-establishment plant, has profit sharing for managers but not for non-managers, no TQM, no benchmarking, 1 percent of employees meeting regularly about work issues, 10 percent of non-managerial employees using computers, 1 percent of employees in self managed teams and mean values for age of equipment, education levels, turnover, and number of employees per supervisor. They then alter the characteristics of this benchmark to see how labour productivity changes:

	change in productivity cf base case (%)
unionised, no employee involvement	-15
HPW systems, non-union	+11
HPW systems, union	+20

Thus an old fashioned plant with union recognition but no employee involvement does 15% worse than the base case. Introducing high performance work systems (HPW systems) has a large and positive effect on productivity. The HPW system plant has 50% of non-managers using computers, 50% of workers meeting to discuss workplace issues regularly, profit sharing for non-managers, 30% of workers in self-managed teams, TQM and benchmarking. And if the plant has all these HPW practices and is unionised, productivity increases 20 percentage points above the base case. Thus for US manufacturing at least, "unionised firms who have succeeded in moving to a more cooperative labor management relations system which gives employees more voice in decision making but at the same time links their compensation with performance have higher labor productivity". Cappelli and Neumark (2001) note that HPW practices raise employee compensation as well as productivity. This is consistent with the Black and Lynch study but causes them to emphasise an alternative conclusion, namely "HPW practices have little effect on overall labor efficiency measured as output per dollar spent on labour". Links between unionisation and various employee involvement work/practices are discussed further in section 5.

Most studies of unions' impact on performance compare performance (say productivity) among otherwise similar firms or workplaces that differ according to union status. An ingenious alternative approach (Pencavel 2001) compares productivity according to the governance of the firm. The plywood mills in Washington state are of

three types: classical text book (non-union) mills, traditional unionised mills and cooperative mills owned and managed by the workers. When he compares total factor productivity between cooperative mills and unionised mills Pencavel finds that productivity is 14 percent higher in the former. It is suggested that the higher coop productivity reflects greater industriousness and lower levels of supervision in cooperative mills than in unionised mills. This seems consistent with the Black and Lynch study where unionised workplaces with high performance work practices such as voice and self-managed teams had higher productivity than more traditional unionised workplaces like the unionised plywood mills.

Labour economists are going "inside the firm" more frequently now than in the past. This research method, which blends detailed knowledge of the operation of the firm with modern statistical technique, has yielded two marvellous case studies on the subject of unions and productivity. These explorations overcome many of the problems associated with the cross section studies noted above. The first deals with the impact of industrial relations variables on productivity at "Big Plane", the largest US plane manufacturer. The second shows the dire impact of a major strike on product quality at a tyre firm.

Big Plane [Boeing] is the largest manufacturing exporter and the second largest manufacturing employer in the US. Kleiner et al. (2002) analyse 18 years (1974-1991) of monthly production data to assess the impact of three strikes, a 10-month long work to rule, the nature of union leadership inside the firm and the introduction of TQM on productivity. They find: "strikes, slowdowns and union leaders influenced the productivity of this plant by large percentages and large absolute dollar amounts [but] did not have long term productivity effects, the firm was able to return to pre-event levels of production within one to four months". Further, introducing TQM into a low

trust industrial relations environment reduced labour productivity and increased labour costs; rather productivity was restored when TQM was abandoned after two years and the previous heavy monitoring authoritarian governance system reintroduced.

Product quality is affected by industrial relations but this link has been little studied. A skilful analysis (Krueger and Mas 2002) of the consequences of a major dispute which lasted over 2 years (1994-96) at the Bridgestone/Firestone tyre plant at Decatur, IL, examines this issue. It is coupled with the recall of 14.4 million tyres by Ford and Firestone and Firestone tyres were linked to 271 fatalities and 800 injuries at the time of and immediately after the dispute. The previous contract expired in April 1994 and employees worked without a contract for 3 months prior to going on strike. In negotiations Bridgestone/Firestone demanded a move from 8 hour to 12 hour shifts, as well as cutting pay for new hires by 30 percent. Almost immediately after the 4200 workers went on strike the company began to hire replacement workers. Krueger and Mas state that the strike could have led to poor product quality in a number of ways. The replacement workers might have been under-trained. Lax supervision during the strike could have contributed to tyre defects. Discord among replacement workers, union members who crossed the picket line and returning strikers could have resulted in production defects. And workers may have been fatigued and more prone to errors because Firestone introduced a 12-hour, rotating shift to operate the plant 24 hours a day during the strike.

The evidence assembled strongly "suggests that the strike and strife in Decatur was a major contributing factor to the production of defective tires". For example the analysis finds an excess number of complaints for tyres produced at Decatur in the few months before the strike began, when Bridgestone/Firestone demanded concessions, and in the period when many replacement workers and recalled union members worked side

by side. It is not simply that under-trained or poorly supervised replacement workers produced defective tyres. Instead, the timing suggests that the concurrence of replacement workers and union members working side by side before the contract was settled, as well as labour strife in the months leading up to the strike, coincided with a high number of defective tyres. The stock market valuation of Bridgestone/Firestone more than halved from $16.7 billion to $7.5 billion in the four months after the recall was announced. Further, the authors estimate that more than 40 lives were lost as a result of the excessive number of problem tyres produced in Decatur during the dispute. It is hard to disagree with the authors understated conclusion that "this episode serves as a useful reminder that a good relationship between labour and management can be in the company's interest".

Analysis of the impact of unions on productivity in **Canada** used a time series from 1926-78 (Maki 1983) covering the whole economy except for agriculture. The author calculates that the growth in union density during the 1970s reduced the annual growth in total factor productivity by 1.7 percent per year and the increase in strike activity had a corresponding reduction of 1.0 percent per year. These seem remarkably large effects.

Links between the industrial relations regime in a company or workplace and its productivity performance have long been a matter of interest and debate in the **UK**. The state of play in the 1970s and 1980s was surveyed by Metcalf (1990b). The focus of the studies of that period was manufacturing industry where "the weight of the evidence suggests that around 1980 union presence was associated with lower **levels** of labour productivity, but that in the first half of the 1980s strongly unionised workplaces and industries had faster **growth** in labour productivity than their non-union counterparts". This turnaround in the productivity performance of the highly-unionised manufacturing

sector was examined by Metcalf (1990a). Britain went from being bottom of the league table of productivity growth in the G-7 countries in the 1960s and 1970s to top in the 1980s (and near top in the 1990s). This was attributed to the interaction of more intense product market competition, higher levels of unemployment and the legislative onslaught against organised labour which altered management and labour practices in favour of higher productivity.

Recently, attention has concentrated on any lingering effects of multiple unionism and possible links between tougher product market competition and improved productivity performance. Multi-unionism (i.e. more than one union in a workplace) was an important feature of British industrial relations. For example in 1980 41% of establishments employing 2000 people or more had 3-5 unions present and a further 38% had 6 or more present. Although there are only a small number of such plants they account for a large fraction of total employment. Oulton (1995) states that up till the 1980s the UK system of industrial relations required, particularly in large plants, "that several different unions had to be able to reach agreement with management on changes in working methods. If they could not agree, the status quo continued. The costs of change, in terms of management time or interruptions to production, were high and the probability of no agreement at the end of the day was not negligible. It seems very likely that the greater the number of partners to a negotiation, each with the power of veto, the lower is the probability of agreement. Common sense suggests that change is likely to occur at a slower pace than in systems not suffering from these handicaps". This was precisely the position of Bean and Crafts (1996) who concluded that the decline in multi-unionism was central to the improvement in labour productivity in the 1980s.

Two questions flow from the discussion so far. First, is there any longer any difference in productivity performance between workplaces which do and do not recognise a union? Second, do multi-union workplaces perform worse than single union workplaces and can any such disadvantages be offset if the separate unions bargain jointly? Pencavel (2002) investigates these issues (table 2). His sample is drawn from WERS98 and uses the subjective productivity measure where the manager compares his/her productivity performance with other workplaces in the same industry on a 5-point scale. The sample size was 1484 of which 322 were single union workplaces, 337 were multi-union with joint bargaining, 228 were multi-union with separate bargaining and 597 were non-union. The control variables were percentage of labour force part-time, percentage female, and workplace size and age. The results are clear-cut. There is no difference in the productivity performance of union compared with non-union workplaces. But multi-unionism with fragmented bargaining still puts the workplace at a disadvantage. Pencavel concludes: "By the end of the 1990s, average union-non-union differences in labour productivity appear to be negligible. Where such differences emerge, they are in establishments where fragmented bargaining occurs. Such bargaining is unusual – approximately only 7% of workplaces in 1998 were characterised by fragmented bargaining. This allows the generalisation that unionism may serve as an agent permitting employees to participate in shaping their work environment without productivity suffering". There is one important caveat to Pencavel's conclusion, discussed further in section 5, which demonstrates a remarkable difference in the link between unions and productivity when we compare monopolistic and competitive workplaces.

The **German** industrial relations system has a dual structure of employee representation. Collective agreements are negotiated between trade unions and

employers' associations at industry level, while works councils watch the implementation and coordination of such agreements at workplace level. Some studies of links between employee representation and firm performance focus on works councils while others examine the union impact.

Consider first the associations between works councils and productivity. In her survey Schedlitzki (2002) states that three out of four recent studies found a positive link between the two variables, but only one of them reported this link to be statistically significant for the whole sample (Addison, Schnabel and Wagner 2001). Due to their role as the main body for collective voice and employee involvement at the plant level, works councils might be expected to have quite a sizeable effect on the behaviour of employees and hence on their productivity. This potential impact is strengthened by the extensive set of rights formally prescribed to works councils by the Works Constitution Act 1972. For example, works councils have to be informed/consulted about redundancies and the introduction of new work methods. Further, they have co-determination rights regarding social matters such as the regulation of overtime, changes in working hours, remuneration arrangements, the introduction of technical devices to monitor employee performance.

Theoretically the link between works councils and labour productivity could be either, positive or negative (Addison, Kraft and Wagner 1993). Works councils could use their rights in order to facilitate the flow of information and the introduction of new technology as suggested by Freeman and Medoff's 'collective voice' model. On the other hand, they could use their veto rights so as to delay important decisions on employment, technology and work organisation issues. Any such negative impact that works councils might have on labour productivity might also occur via the 'managerial competence' hypothesis of FitzRoy and Kraft (1987). They argued, that 'most

competent managers typically devote much attention to personnel matters, and presumably will establish effective communication and participation without the imposition of any formal institutions or regulations'. Consequently, they hypothesise that works councils impose legal constraints on the internal organisation of a company and so reduce the efficiency of competent managers.

A recent exemplary study measuring the link between works councils and productivity (Addison et al. 2000) used data from the Hannover Firmenpanel wave in 1994, from 1,025 manufacturing plants in Lower Saxony. Productivity was measured by value added per employee and a dummy variable captures works council presence. Numerous controls were included in this study such as human capital, establishment size and age, the state of technology, the degree of market power, capacity utilization and profit-sharing schemes for employees and for management. The authors also controlled for several work organisation and industry variables. The findings showed a statistically significant positive link between works councils and labour productivity only for large establishments with 101-1000 employees. For smaller establishments with 21-100 employees the link was positive but statistically insignificant. The authors speculate that the German mandatory works councils 'might set too high a level of employee involvement for smaller establishments and might better accord with the needs of larger plants in this regard'. They conclude, that the differentiation between large and small establishments provided by the Works Constitution Act 1972 is insufficient.

Links between German trade unions and labour productivity have not been studied as much as the impact of works councils. The most thorough study (Addison, Genosko and Schnabel 1989) is a cross-section analysis of 30 German industries organised by trade unions in 1983. The authors found a negative but statistically

insignificant link between trade unions and labour productivity. Schnabel (1991) confirms that "trade union density seems to exert a negative, but quantitatively small, influence on labour productivity" in his survey of five German studies.

Increased international competition and moves towards decentralised bargaining have affected the German industrial relations systems recently (Hassel 1999). Therefore, the above findings might not be representative any longer and more up to date studies are needed before a firm conclusion can be drawn on the relationship between works councils, unions and labour productivity.

Initial studies of the link between union recognition and labour productivity for **Japan** showed mixed results. Brunello (1992) suggested negative union effects but this finding was contradicted by Muramatsu (1984) and Morishimo (1991). Fortunately the two most recent studies reach more consistent conclusions. It might be expected that enterprise unions – the norm in Japan – would be likely to enhance efficiency in the workplace or company but neither study shows this directly. Rather it is by subtle, indirect, channels – via longer tenures and the role of full-time union officials – that unions raise productivity. Tachibanaki and Noda (2000) analyse data from a panel of 404 listed manufacturing firms 1992-1995 of which 350 recognise unions and 54 do not. Productivity is measured as value added per employee and the controls include firm size, the capital:labour ratio, average job tenure, average age, fraction female and the age of the workplace. Union recognition is negatively (significantly) associated with productivity but the union/tenure interaction has a positive effect. Tenure is longer in unionised firms and once tenure is above 15 years (which it is in two thirds of their sample) the union effect becomes positive overall. They summarise their findings as follows: "The larger the share of employees with longer tenures, the higher the productivity of a firm. Longer job tenures imply that they are highly experienced and

skilled workers. A labour union lowers separations and thus consolidates cooperative behaviour. Such cooperative behaviour in unionised firms raises employees' work incentives, skill formation and possibly solidarity, and their loyalty to the firm as well as mutual trust".

Benson (1994) also finds no direct significant link between recognition and productivity but notes an important role for full-time union officials (see table 2). The sample is 253 manufacturing firms employing 100+ employees in the Kansai region. Productivity is measured subjectively by comparing it with other firms in the same industry. Three indicators of unions are used: recognition, density and the presence of a full-time union official at the company. Various enterprise, workforce, management, industrial relations and product market characteristics are used as controls. Firms with a full-time union official(s) have slightly higher levels of productivity than their non-union counterparts. This is because "full-time local union officials are more likely to enforce agreements and contracts relating to working conditions. They may assist management in creating a more efficient and productive working environment. Their intimate knowledge of the enterprise often means that management relies heavily on them to solve disputes, to contribute to the smooth running of the organisation and to assist in the effective management of human resources".

These two studies therefore suggest little or no direct impact of unions on productivity. Rather, any effects (modestly positive) come via lengthening tenures which may enhance cooperation and the role of the full-time official which Benson describes as "an unpaid personnel manager". It would be interesting to know whether similar productivity-enhancing effects of unions occur in other countries too.

Compared with Japan and Germany, **Australia** probably has a less cooperative tradition of labour relations, partly influenced by multi-unionism. This resulted,

according to the first Australian Workplace Industrial Relations Survey (AWIRS), in union presence being associated with lower labour productivity, but the impact of unions was rather small. Drago and Wooden (1992) conclude in their comprehensive survey that the "net effect of unions on productivity in Australia does indeed appear to be negative . . . to the extent that multiple unionism is associated with poorer outcomes for profits, costs and productivity it follows that single union workplaces will perform better than the average workplace (which, in this sample, has about 2.5 unions)".

The detailed study of Crockett et al. (1992) analysed data from 759 private sector workplaces employing 20+ people from the 1991 AWIRS. Productivity was measured on the subjective 5-point scale comparing the respondent's workplace with other workplaces in the same industry. Three indicators of unionisation were used – recognition, density and the number of unions (to examine the effect of multi-unionism). Various workplace, workforce, labour relations and product market controls were included. It is concluded that "trade unions are associated with lower relative productivity in the Australian labour market" and each union indicator has a negative sign and is significant at 10% or better. But the effect of density itself is small. Rather, "the negative union effect is strongest when unionism is measured by the number of unions. Where there are several unions present, the detrimental effect on productivity is greater than if the workplace had a single union. The presence of a number of unions presumably causes demarcation problems, inter-union competition and communication problems and may be associated with possible conflicts between different union voices". Thus evidence from both the UK and Australia points to an adverse link between multiunionism and productivity.

c. Summary

Rising living standards for employees, higher profits for capitalists and lower consumer prices flow, in the long run, from the growth in productivity. Therefore links between industrial relations institutions and processes and the level and growth of productivity are profoundly important. It is not possible to use theory to predict unambiguously any union effect on productivity because unions can both enhance and detract from the productivity performance of the workplace or firm. Union presence may lower labour productivity via restrictive work practices, industrial action, causing the firm to invest less and if adversarial industrial relations lowers trust and cooperation. Alternatively labour productivity may be higher in the presence of a union if unions may play a monitoring role on behalf of the employer; collective voice provided by the union may have favourable consequences; unions may make managers less lethargic; and unions stop exploitation of labour, resulting in improved productivity.

Testing for links between union presence and productivity is tricky. The ideal data require a single industry, making the assumption of a common technology among workplaces more plausible; a physical measure of output so as not to conflate price and quantity effects; longitudinal information for each plant; and a change of union status for some plants during the period. In the event many studies have limitations including a neglect of the role of management, lack of a theory of union behaviour and insufficient attention to the heterogeneity of unions and the measure of productivity.

Results from six countries were set out. On the basis of the discussion it might have been expected that unions would have a positive impact on productivity in the US – consequent on the large union wage premium – and in Germany and Japan via voice and cooperative industrial relations achieved through works councils and enterprise

unions. By contrast, until recently, adversarial industrial relations and multi-unionism in the UK and Australia made a negative link more likely. In all countries more intense product market competition and moves towards mutual gains employee-management relations would be predicted to weaken any adverse union effects.

By and large these expectations are borne out. In the US workplaces with both high performance work systems and union recognition have higher labour productivity than other workplaces. And a case study of bitter adversarial industrial relations at a tyre plant showed what a dreadful effect this had on the quality of the product. In the UK previous negative links between unions and labour productivity have been eroded by greater competition and more emphasis on "partnership" in industrial relations. There is a lingering negative effect of multi-unionism, just as there is in Australia. In Germany the weight of the evidence (but not all of it) suggests that the information, consultation and voice role of works councils enhances labour productivity particularly in larger firms. Finally, in Japan unions also tend to raise labour productivity via the longer job tenures in union workplaces which makes it more attractive to invest in human capital and through the unpaid personnel manager role played by full-time enterprise union officials in the workplace.

3. Financial performance

The impact of unions on profitability or financial performance flows from any impact union recognition has on pay levels and productivity. If union presence boosts pay, financial performance will be worse unless there is a roughly equivalent union effect on productivity. The weight of the evidence reviewed here, focussing on the private sector, suggests a negative link between unionisation and financial performance. But this association is much weaker when product markets are competitive rather than oligopolistic and industrial relations are cooperative not adversarial.

a. Theory and testing

If unions raise the level of wages without similarly increasing productivity the resources underpinning the higher pay level have to come from somewhere. Such union wage gains might come from lower wages for non-union workers; or from consumers via higher product prices; or from the owners of capital via lower profits. As Hirsh and Addison (1986) point out each of these routes is circumscribed by competition. Large wage differentials between similar union and non-union workers tend to be partially eroded by selective hiring, threat effects raising wages in the non-union sector and cost advantages enjoyed by non-union firms. Cost increases cannot easily be passed through to consumers in the form of higher prices unless a union has organised an entire industry or local market where exclusion of foreign and non-union competition is possible. And in many sectors competition in the product market will limit surplus profits as a source of wage gains. Therefore any union gains from potential firm profits turn largely on the existence of above-normal profits resulting from market power,

government regulation, returns from fixed capital and firm-specific advantages like location and R&D returns. These channels will be briefly considered in turn.

Links between the product market and labour market are the key to the market power channel. In the short run if the firm has some monopoly power in the product market, unions may be able to raise wages and capture a share of the economic profits associated with market power. Such a firm with market power will try to pass some of the wage push onto consumers but not all of it can be passed on in this way. In the simplest case, when the firm remains on its demand curve, the union jacks up wages and the monopolist cuts back on employment and simultaneously raises prices to consumers. This is not a simple reallocation of income from the firm to the union; this is a case where part of the union wage gains come out of monopoly profits, but a part are paid for by the vulnerable consumer, with possible consequences for future jobs and investment. There is an alternative, but special – and probably atypical – case where the union maximises rents and negotiates efficient contracts (see Pencavel 1991). In such circumstances the income redistribution is benign – a simple transfer from capital to labour – and has no long run consequences for investment and employment. The simple notion that there is a fixed level of profit some of which the unions may capture without any subsequent consequences is not correct except in this special case. Normally the monopoly firm will try to defend its profit and take corrective action by getting consumers to pay more. The end result is lower profits for the firm, but not as low as if it did not raise its prices.

Many sectors are or were previously either in state hands (nationalised industries) or regulated such that entry and price competition were simultaneously limited. This again creates a potential pot of economic profit that may be captured in part by labour. For example, in the US this happened in trucking and the airlines. In

the UK the utilities were nationalised from the 1940s to the 1980s, but other also sectors experienced extensive regulation including the ports under the National Dock Labour Scheme and commercial television. It is noteworthy that unions normally opposed the privatisation of the utilities and deregulation of sectors like commercial TV or legal practice. The relevant test here is whether unions made wage concessions and experienced membership losses after deregulation.

Returns on investment in physical capital or intangible capital such as R&D provide a further channel for union gains at the expense of profits. "When the capital replacement cycle is long relative to the union's time horizon, the 'surplus' that provides the return on durable and specialised capital, and that occurs only after costs are sunk, is vulnerable to capture by monopoly labor" (Hirsh and Addison 1986). If this is the route to lower profitability the union effect definitely lowers investment and the accumulation of capital (see also section 4).

Profitability is one of the most difficult economic variables to measure. Freeman and Medoff (1984) state, for example: "The profits reported on company balance sheets generally differ from true economic profits. They may differ in treatment of interest charges, in depreciation, in valuation of inventories or in estimation of pension fund liabilities. For tax reasons, companies often seek to report lower profits than in fact they actually earn. There are also problems in measuring the capital investments with which profits are compared. Valuing machines of different vintages is difficult; the book value reported by accountants differs from the true value of assets. Estimates rarely exist of important but nebulous forms of capital such as goodwill or reputation". Until recently studies of industry or company profitability tended to use two "objective" indicators. First, the return on capital was defined as business revenue less variable (usually labour) costs divided by some measure of the value of capital such

as the replacement cost of plant and equipment or the gross book value of total assets. Second, the "price-cost margin" defined as the excess of prices over variable costs. Not surprisingly these indicators came in for criticism. It is, for example, notoriously difficult to measure the value of capital, and profits should be, conceptually, measured in present values rather than on an annual basis.

More recently studies use an ordinal scale to sidestep such problems. For example, in the UK WERS98 defines financial performance rather than profits and uses a subjective rather than objective measure. The following question was put to managerial respondents: *"I now want to ask you how your workplace is currently performing compared with other establishments in the same industry. How would you assess your workplace's financial performance?"* Responses were coded along a 5-point ordinal scale, from 'a lot better than average' to 'a lot worse than average'. Recent British and Australian studies of the association between union presence and profits/financial performance have used this kind of measure.

Financial performance is influenced by many factors other than union presence and controls are included in statistical analyses to allow for this. Workforce controls include percent part-time, female and skilled. Workplace characteristics include size, location and vintage. Some studies include controls for management characteristics like the extent of human resource management and the existence or otherwise of contingent pay. The nature of the product market – the number of competitors for example – is also controlled for in some studies.

b. Evidence

The bulk of studies examining links between unionisation and financial performance refer to just four countries and these will be considered in turn. "Prior reviews of the literature [for the **US**] have presented this relationship as an open and shut case: unions reduce financial performance. . . . Empirical studies that have found a significant negative relationship between unions and financial performance have used a variety of financial outcome measures, including price-cost margin, net revenues per unit of capital, Tobin's q and stock market value" (Batt and Welbourne 2002). For example, Addison and Hirsch's (1989) review of 16 studies that used various methodologies and measures of profitability found a consistent large negative relationship between unions and financial performance. This association was confirmed by Bronars et al. (1994) using data from the 1970s and 1980s for some 300 firms. They concluded that there is "fairly strong and significant evidence that the total effect of higher union coverage is to reduce profitability". They argue that this effect does not come via unions directly sharing rents but rather occurs indirectly through any union impact on impact on investment behaviour and growth. Kleiner (2001) updated the Addison and Hirsch review and similarly concluded "unions are still associated with lower profits".

The link between union recognition and shareholder wealth was analysed by Ruback and Zimmerman (1984) who found a 1.4 percent reduction in NYSE-listed firms' stock prices on the day a petition to hold a union election is held (and a 2.4 percent for petitions which, ex post, are successful) and a further 1.4 percent fall on the day of a successful election, for a cumulative total loss of 3.3 percent. Kuhn (1998) points out that, given the share of wages in costs and the average fraction of each firms employees involved in new unionisation bids, "this loss is surprisingly consistent with a

15 percent wage increase among newly unionised workers" which is the norm for new recognitions.

Batt and Welbourne suggest, however, that the association between unions and profits is more "nuanced" than realised. It is influenced – as elsewhere – for example, by product market competition and the degree of labour-management conflict: "In sum, much of the evidence showing a negative relationship between unions and financial performance may be understood as a result of oligopolistic markets, mass production approaches to work organisation and conflictual labor relations in a particular historical period". Thus Batt and Welbourne accept the previous negative association but argue that labour and product markets have altered so fundamentally in the last decade or so that it may no longer hold – even though Kleiner's (2001) survey suggests unions are still associated with lower profits.

They point to the following developments in the 1990s. First, US firms, particularly high tech and entrepreneurial firms, have adopted much more flexible approaches to organising work, such as "high performance work systems" (Appelbaum and Batt 1994) which reduce status differences between workers and managers. Next, union power has dropped significantly, with union membership falling from 24% of the private sector workforce in 1973 to 10% in 1995. Further, mutual gain and win-win approaches to bargaining have transformed union-management relationships in many instances, leading to greater cooperation and less zero-sum conflict.

So Batt and Welbourne revisited the relationship between unions and financial performance by drawing on evidence from 464 entrepreneurial firms at the time of their initial public offering (IPO) in 1993 and their subsequent financial performance 1993-1996 (see table 3). These entrepreneurial firms are "small and young". They are less likely to have the kind of "monopoly union power", conflictual labor management

relations, or rigid work rules traditionally found in large US mass production enterprises. These IPO firms are not concentrated among high tech companies. They are split roughly equally between manufacturing and services and are located in all geographic areas within the United States. Just over one fifth (21%) report having a union at the time of the IPO. Three measures of financial performance were used: Tobin's q is the ratio of market value to book value at the initial public offering; growth in earnings per share and growth in stock price. The control variables were firm size and age, industry, region and the degree of risk at the time of the IPO.

The results are pretty remarkable. (This study was chosen as our exemplar precisely because the results are so out of line with other studies.) Union presence is associated with significantly superior financial performance on all three measures. For example, the growth in stock price was 17% higher in unionised firms than non-union firms and earnings per share were correspondingly 10% higher. The authors conclude that "unionisation does not inevitably reduce financial performance. Rather new forms of organising work and union-management relations hold the promise of maximising shareholder wealth as well as employee welfare. This is not an inevitable zero-sum trade-off". Thus the great weight of US studies suggest that unions reduce profits but it is just possible that changes in industrial relations and human resource management in the last decade have now weakened, or in some cases overturned, this previous stylised fact. However, if unions really do boost profits this begs the question of why firms are not asking to be unionised. The US evidence (e.g. Kleiner 2001) demonstrates very strong continued employer resistance to unionisation.

There are only a limited number of studies which have investigated the links between union presence and profitability in **Japan**. Fortunately, the two most thorough studies have used very different samples but come to identical conclusions. The

exemplary study (see table 3) by Tachibanaki and Noda (2000) presents evidence from a panel of 12 manufacturing industries for the period 1966-1984. Profits are measured objectively, via labour's share in income, defined as wage payments divided by total value added. Union presence is indicated by either density or disputes – the number of disputes, workers involved or days lost. Controls include the capital:labour and capital:output ratios, product market competition (as measured by the concentration ratio), average firm size and workforce characteristics such as the average age of employees and the proportions female or graduate.

Union presence is associated with a higher fraction of income going to labour. Prior to the 1970s oil shock union density, disputes and labour's share were all rising. After 1974 density, disputes and labour's share all fell. For example, for the period 1966-74 an increase in the number of disputes by 10% increases labour's share by 0.9% (the mean value is 38%) while a 10% rise in the number of workers involved in disputes is associated with a 0.27% increase in labour's share. The authors interpret these findings as causal and state unambiguously that "it is possible to conclude that the increase in labour disputes which occurred in the pre-oil crisis period raised labour shares, while the decrease during the post-oil crisis lowered them".

More recent evidence comes from the cross section survey of 253 enterprises in the Kansai region, which includes Osaka, Kyoto and Kobe by Benson (1994). Profits were measured by the rate of return on capital, indicated by pre-tax profit divided by total assets. Unionisation was captured by any members present or density or the presence of a full-time union official in the enterprise. Numerous controls were included covering the characteristics of the enterprise, workforce, management practices, industrial relations and product market. Benson concludes that union presence "reduced the probability of managers reporting a rate of return of 6% or more

[and] increased the probability that these enterprises would have lower profits". Higher wage costs in unionised firms are suggested to explain lower profitability. Union firms may not pay a higher base wage but pay higher bonuses, higher female wages and have lower annual hours.

In the 1980s virtually all **UK** studies reported a negative association between union presence and financial performance. For example Metcalf (1993) reported that "Eight UK studies use workplaces, firms or industries to analyse the link between profitability and unionisation: all but one show a negative association". But Wilkinson (2000) notes that "Over the course of the 1980s this negative impact weakened such that by 1990 the overall union effect was halved as compared to 1984 and unionised establishments had lower financial performance only where the union was strong and the establishment had some product market power". This tempering of the impact of unions was confirmed by Machin and Stewart (1996) who concluded that by 1990 unions only impacted adversely on profitability where there was a closed shop and/or weak competition in the product market. They also found that multi-unionism detracts from good financial performance. By 1990 the closed shop was outlawed in the UK and during the 1990s there was growing competition in the product market and a lower incidence of multi-unionism. It is plausible, therefore, that any impact of unions on financial performance would be attenuated by the end of the decade.

The most thorough investigation of such links is by Wilkinson (2000) using the WERS98 sample (see table 3). Wilkinson analysed links between financial performance and unionisation using 4 different WERS samples and a number of different indicators of union presence and the ordinal financial performance scale noted above. Union presence was also measured in four ways: simple recognition; then the extent of collective bargaining coverage with or without recognition was added; then the

level of bargaining was added – workplace, organisation, industry and multiple. Finally there was a union strength measure. A strong union was defined as one with 100% coverage or membership. A weak union was one with under 50% coverage and membership. All remaining recognised unions were defined as medium strength. By the end of the 1990s Wilkinson states that there was no overall association between union presence and financial performance. A total of 76 coefficients are reported (4 samples and 19 different union indicators) and only four (2 positive, 2 negative) are significant at the 5% level. More of the coefficients were positive (45) than negative (31). This lack of association probably reflects weaker union effects on pay and productivity.

There is little doubt that any impact of UK unions on financial performance is muted now compared with two decades ago. The "average" results – no effects – found by Wilkinson are confirmed by both Addison and Belfield (2000) and McNabb and Whitfield (2000). As Bryson and Wilkinson (2002) put it "the absence of general union effects on financial performance implies that the negative influence of unions on performance identified by previous studies has diminished in the 1990s". But some residual union effects do remain when different tests are done. First, Pencavel (2001) shows that multi-unionism continues to have adverse consequences for financial performance. Second, unions have a very different effect on profits (and productivity) when the product market is monopolistic compared with when it is competitive (Metcalf 2003). When there are 5 or fewer competitors, unions are associated with significantly worse financial performance but union recognition has no such impact when the product market is more competitive. Third, Wilkinson finds that it is weak unions which have negative associations, while medium and strong unions have a positive link with performance. This hints that where a union is recognised it is – at least when

considering financial performance – better to have an encompassing union rather than one where under half the workforce belong.

When examining the characteristics and influences of unions and works councils on profitability in **Germany** it is important to bear in mind the unique features of the dual system of cooperative industrial relations. First, pay settlements take place at the industry-level and are therefore decoupled from participatory and other factors at the plant-level (Hassel 1999). This means that work councils are excluded from the negotiation and settlement of wage agreements with the employer 'unless the latter explicitly authorises work agreements of such type' (Addison et al. 1996). Rather, works councils focus on their extensive rights covering information, consultation and co-determination at the plant level. Second, in order to ensure cooperation at plant level, the Works Constitution Act of 1972 has precluded any strike activity initiated by works councils. The legislation even 'enjoins the employer and works council to work in a spirit of mutual trust'. Third, although works councils are formally independent of unions, in practice the two institutions are intertwined. Works councils feed trade unions with members, reserve seats for union members and supervise the implementation of collective agreements, and trade unions support and help works councils in their local bargaining function. The bulk of the literature analysing the link between institutions and profits in Germany has focussed on works councils rather than unions.

Bearing in mind that works councils are neither allowed to strike nor to bargain on wages, it seems reasonable to predict a positive impact on profitability as suggested by the collective voice model. During the 1990s there was considerable interest in studies measuring and evaluating the link between works councils and profitability. This was mostly a reaction to the debate on the transferability of the German model of

mandatory works councils initiated by the Dunlop Commission (1994) in the United States. In the event various studies surveyed by Schedlitzki (2002) reported a negative impact of works councils on profitability. Addison et al. (1996) similarly argue that 'the works council is a classic vehicle for the expression of collective voice, [but] 'the dual system of industrial relations in Germany by no means excludes the possibility that works councils are rent-seeking agencies'.

The most recent and thorough study measuring the link between works councils and profitability is by Addison, Schnabel and Wagner (2001). They used data from two waves of the Hannoveraner Firmenpanel conducted in 1994 and 1996 that was collected in personal interviews by Infratest Sozialforschung. The dataset is representative of all manufacturing establishments in Lower Saxony, and contains information on 1,025 plants. Top management was asked to rate the establishment's current profitability on an ordinal scale from 'very good' to 'very bad'. The authors measured works council presence via a dummy variable. Further, detailed establishment controls were included such as size, the market share of the most important product line, capacity utilisation, profit sharing for the workforce and for management, the state of production technology and industry.

The results show a statistically significant negative association between works councils and profitability. This finding 'obtains irrespective of the profit indicator and sample' (Addison et al. 2001). This confirms a previous detailed study (Addison et al. 2000) which concluded: "among both small and large establishments, works councils are associated with significantly lower profitability". In many ways the consistent empirical finding that the existence of a works council lowers profits is something of a surprise. Works councils do not formally bargain and cannot initiate a strike, and they express the collective voice of the employees. So what is the mechanism by which they

adversely impact on financial performance? Two channels have been put forward. Fitzroy and Kraft (1987) suggest that works councils are themselves linked to various legal provisions which constrain competent managers – and such constraints are not present when there is no council. Alternatively, Addison et al. (2001) show that although councils do not formally bargain they do engage in rent seeking behaviour and achieve a higher wage level than counterpart firms without a council.

Empirical evidence on the impact of unions on profitability is quite scarce and rather inconclusive. Huebler and Jirjahn (2001) measured the effect of collective bargaining coverage on the rent-seeking behaviour of works councils and hence on the impact of works councils on firm performance. They found that works councils in establishments covered by collective agreements were less likely to be engaged in rent-seeking activities and therefore less likely to impact negatively on firm performance. In a nutshell, where there is collective bargaining the works council engages less in rent seeking than it would do without collective bargaining. This emphasises, again, how important it is to examine the institutional framework in which unions operate.

c Summary

If unions raise the level of pay the resources to fund the higher wages must come from somewhere. There are four possibilities. Unions may have a corresponding positive impact on productivity. Or, non-union employees may receive corresponding lower wages. Alternatively, consumers may fund the higher pay via higher retail prices. Finally – and the focus of interest here – firms' profits might be lower. There are limits on each of these routes.

Capital may receive lower returns and labour an increased share of income. Broadly, this can happen in three ways. First, if the firm has monopoly power in the product market the union is, in principle, able to siphon off a fraction of the monopoly profits. Next in state owned or regulated industries entry and price competition are typically limited and such restrictions on competition may permit unions to absorb some of the rents in such firms. Finally, unions may cream off returns which more properly belong to sunk investments in physical capital or R&D. This third has important deleterious effects on the long run health of the unionised sector.

The evidence is pretty clear-cut. The bulk of studies show that profits or financial performance is inferior in unionised workplaces, firms and sectors than in their non-union counterparts. This was documented for USA, Japan, UK and Germany. But the link between unionisation and profitability is more nuanced than first meets the eye. In the US and the UK industrial relations has altered profoundly in the last two decades, thereby tempering the traditional association between unions and profits. In the US many firms – particularly smaller, entrepreneurial firms – have adopted high performance work systems. Simultaneously, union power has corroded and parties are now more likely to adopt a mutual gains approach to bargaining. A recent study of such firms found a positive link between the presence of a union and profitability. In the UK product market competition has been greatly enhanced. And the outlawing of the closed shop coupled with a lower incidence of multi-unionism has contributed to a more cooperative style of industrial relations. Consequently all the very recent UK studies find no links between unions and financial performance.

Germany is something of a surprise. It has a dual system of industrial relations such that collective bargaining occurs at sector level while efficiency issues are dealt with in the workplace. Works councils have statutory information and consultation

rights and provide employee voice on issues like the introduction of technical change and alterations in work patterns. Yet the evidence shows that the presence of a works council lowers financial performance. In turn this is attributed either to the fact that, actually, works councils do engage in rent seeking activity, or to the constraints imposed by the works council on otherwise able management.

Finally, it is worth remembering that any union impact on financial performance not only affects investment in physical and human capital (considered next) but may also influence the rate of growth of employment and the probability that the workplace or firm closes as between union and non-union organisation. A survey of studies on employment and closures would require a separate paper. In very broad terms US and UK evidence (see e.g. Bryson 2001, Kleiner and Freeman 1999) suggests that any union impact on profits has little or no association with closure – unions may cannily focus on monopoly profit and know just how far to push. But employment in union workplaces grows (falls) some 3% p.a. less (faster) than that in non-union workplaces. This has serious implications both for the displaced members themselves and for future union membership.

4. Investment

Capital accumulation is the key to long run growth. Therefore the impact of unions on investment is a matter of great importance. In this section we examine the routes by which unions might influence investment, and the evidence that exists on this issue for our six countries "but there is surprisingly little empirical research analysing unions' impact on investment" (Odgers and Betts 1997). The arguments typically refer to investment in new technology and process innovations, but could also be used to analyse any effect unions might have on investment in research and development; on product improvements through design, marketing, advertising and after sales service; and on human capital where a few studies are now appearing and assume greater importance with the growth of the knowledge economy (these are analysed in section 5). A further dimension (not analysed here) concerns 'where to invest' which influences closure and relocation decisions, especially in multi-establishment organisations.

a. Theory

Rent seeking behaviour by unions suggests a negative impact on investment. By contrast the traditional on-the-demand curve approach implies union firms substitute away from expensive labour and invest more.

The presence of a union in a workplace might inhibit investment either directly or indirectly in the rent-seeking model. The direct effect occurs if a union delays the installation of new machinery, perhaps because the union representatives are not content with associated organisational changes such as modifications to shift patterns or any required easing of skill demarcations. Further, inflexible work rules might mean that

the investment is not used to its full capacity, effectively adding to the cost of installation.

Indirect union effects are set out formally by Grout (1984a,b). When a firm invests in a new project, unionised workers may capture ("tax") some of the returns in the form of higher pay because, once the capital is installed or the R&D done, the process cannot easily be reversed thereby weakening the firm's bargaining position. This "holdup" reduces the profit incentive for new investment thereby depressing the overall investment rate. It was shown in section 3 that the union may be able to appropriate rents accruing from monopoly power in the product market. The argument here is that, in addition, the union is able to capture quasi-rents from capital that represent some of the normal competitive return to capital. If part of the competitive return is captured by unions, firms will reduce investment in capital (see Odgers and Betts 1997 for more details). Hirsch (1992) describes this behaviour as "rational myopia" because unions' members have a lack of interest in wages far into the future. Any such rational myopia can lead to opportunistic behaviour by the union.

There is an offsetting force. In the traditional on-the-demand curve model the union-set wage is exogenous and the firm adjusts along the demand curve. Therefore a higher union wage stimulates investment because the firm substitutes away from expensive labour. In this case union activity raises investment (although the positive substitution effect might be attenuated by a negative scale effect), but recall that higher investment consequent on wage push does not necessarily raise social welfare (see section 2).

As the rent seeking model predicts unions have a negative effect on investment but the traditional substitution approach predicts a positive impact the issue cannot be

decided empirically: any impact of unions on capital accumulation is an empirical matter.

b. Evidence

Studies of the impact of unionisation on investment in the **USA** reach a remarkably consistent conclusion – a union presence reduces investment. The classic studies are by Hirsch (1990, 1991a) dealing with union effects on physical capital accumulation. The 1990 study (see table 4) used detailed data from 315 American firms and matched investment and other firm/sector information spanning 1970 to 1980 to union density in 1972. The evidence suggested that unionisation reduced investment by 20% plus in the typical union firm. Around half this effect was a consequence of the rent seeking activity described in the theory section above and the other half came via the reduced profitability associated with unions. Hirsch's second study had even more observations and covered a later period and got similar results. More recently Hirsch (1992), Bronars and Deere (1993) and Bronars, Deere and Tracy (1994) have each reached the same conclusion using different data sets: at firm level, higher levels of unionisation are associated with lower investment rates. For example Bronars et al. (1994) state that a 10 percent increase in unionisation decreases the R&D/sales ratio by around 4 percent in manufacturing, the advertising/sales ratio by some 6 percent in manufacturing and a bit less in non-manufacturing.

Results from a detailed study by Odgers and Betts (1997) for **Canada** mirror those from the USA. The data set contains observations for 18 Canadian manufacturing industries on profits, taxation, investment, capital stock, employment, union membership, imports and exports and the study uses a balanced panel of 378

industry/year observations 1967-87. The impact of unions on investment (as on productivity) seems rather large in Canada. An industry with an average unionisation rate experiences a reduction in its gross investment rate of 18-25% relative to a similar non-union industry. The corresponding reduction of net investment is put at 66-74%. It is a nice question how Canadian unionised manufacturing industry survives given such large effects.

Hirsch found that the steepest declines in US investment occurred at low levels of unionisation. This non-linear impact of unions on investment is replicated for Canada and the UK. Odgers and Betts (1997) suggest that one reason for this non-linear effect is "a plateau effect in union bargaining power" such that if firms cannot easily substitute one type of labour for another "a union representing any of these types of labour can extract most of the quasi-rents by threatening to strike. . . . it follows that a relatively small component of a firm's workforce could extract most of the quasi-rent for itself". An alternative explanation is that the voice effects of an encompassing union are more beneficial than those generated by partial coverage.

UK evidence is fully surveyed in Metcalf (1993) and is mixed. Denny and Nickell (1991, 1992) get the most clear-cut union effects (see table 4). Their sample is drawn from manufacturing industries and incorporates information on industrial relations variables from WIRS1 and WIRS2. They find, for 1980-4 – before unions were tamed - that union recognition depressed investment, but that this adverse effect was offset as density rose. However, even 100% density did not completely counter the negative recognition effect. By implication, they point out that the worst possible situation is union recognition but with only a small fraction of the workforce being union members. Voice effects are also apparent – where many workers are covered by

joint consultative councils (whether in union or non-union workplaces) - investment rates are higher.

Union density in **Germany** tends to be negatively related to investment in capital and in R&D. Likewise the presence of a works council tends to reduce the investment or innovation rate. But these links between mechanisms of employee representation and investment are almost all non-significant (see Schedlitzki (2002) for a full survey). One exception is the study of Addison, Kraft and Wagner (1993) which gets quite clear cut effects. The sample was 101 manufacturing firms in Niedersachsen and Baden-Württemberg. After controlling for other factors which might influence the investment rate – like capacity utilisation and product innovation – the authors find that an establishment with a works council has a gross investment rate between a fifth and a third below a counterpart firm without a council. The impact on net investment is also negative but much weaker.

Benson (1994) is one of the few who have analysed the links between unions and investment in **Japan**. The definition of union presence and controls were as set out in section 2 dealing with productivity. There was no available evidence on investment rates so, instead, Benson used labour's share in total cost arguing that (1-labour's share) measures capital intensity which "reflects capital investment in the long run". The evidence suggests that union recognition goes hand-in-hand with greater capital intensity. There is no evidence that unions siphon off returns to capital or impose restrictions on the use of capital – under 6% of managers claimed that unions constrained them in the introduction of new technology. Rather, capital-labour substitution was sometimes promoted by the union because "in many cases the introduction of new technology has replaced dirty, dangerous or repetitive work". If

this latter explanation is correct it suggests that "holdup" in Japan is not the problem it is in the US and Canada.

c. Summary

Unions can influence investment in physical capital both positively and negatively. Any positive effect occurs when the firm invests more to substitute away from expensive union labour. The negative impact is directly observed when a union delays the installation of new machinery. But there is possibly a more subtle, indirect, negative effect if unions raise wages and thereby capture returns properly due to (sunk) investment.

North American and German evidence suggests that unionisation reduces investment by around one fifth compared with the investment rate in a non-union workplace. Importantly, in both Canada and the USA this effect is felt at even low levels of unionisation. The UK evidence is mixed: the most thorough study also finds that union recognition depresses investment, but this adverse effect is offset as density rises. The exception is Japan where union recognition goes hand-in-hand with greater capital intensity.

5. Extensions

Many of the issues raised in sections 2-4 are worthy of more detailed investigation. In this section we examine five such matters. Links between the product market and the labour market show the crucial role that competition plays in moderating any union effects. Similarly, in both the USA and UK, cooperative industrial relations between capital and labour are shown to yield superior outcomes to adversarial relations. Union structures matter too: multi-unionism is associated with worse productivity and financial performance than a single union or enterprise unions. The long run health of any enterprise depends on sufficient investment. While findings on links between unions and capital investment are mixed, it is shown here that a union presence boosts investment in human capital in both the USA and UK. Finally, the unique dual structure of industrial relations in Germany is discussed. The information, consultation and voice role of works councils does seem to raise productivity but these institutions also engage in rent-seeking activities similar to unions in the other countries analysed here.

a. Links between the product market and the labour market

Links between the product market and the labour market have not received sufficient attention in many of the studies surveyed in sections 2-4. Recall that Nickell (2001) points out: "What unions do depends on what they can do, and this depends on the extent of product market competition". It is well known that non-competitive product markets permit unions to raise wages. But, as Nickell states, unions can capture product market rents in forms other than wages: "For example, they can impose rigidities in the

workplace to reduce the pace of work [which] may discourage innovation and result in lower productivity growth".

The British WERS permits this matter to be investigated thoroughly because it contains information on the number of competitors faced by each workplace. Metcalf (2003) has analysed how variation in product market competition influences the impact of unions on labour productivity, quality of product service and financial performance. The results are summarised in table 5 and demonstrate the crucial role played by product market competition in determining union influence. The nationally representative sample covered around 1200 workplaces in the trading sector. In the survey productivity, service quality and financial performance are defined by the familiar 5-point scale and this was collapsed to the probability that a workplace was above average on the indicator. Unionisation was defined by recognition and numerous workplace and workforce controls included.

When no account is taken of product market competition unionisation has a modest negative impact on each of the three variables. But it will be seen that the results are driven by the non-competitive sector. Thus when there are just 1-5 competitors the probability of above average labour productivity is 14 percent lower for a unionised workplace than its non-union counterpart. But when there are 6 or more competitors the corresponding figure is 0.6 percent (not statistically significant). And when there is little product market competition the likelihood of above average financial performance is 12.4 percent lower for a union than non-union workplace, yet the corresponding figure is 7.4 percent higher with a more competitive product market.

If replicated for other countries results like this have profound implications for the future of unions. Blanchard (2001) has noted that across OECD countries "rents are getting smaller, leading to less room for rent extraction. . . . this decrease in

attractiveness [of unions to members] is reflected, in nearly all countries, by decreased membership and support". More intense product market competition implies a corrosion of the impact of union recognition in the workplace which suggests that in the longer term unions may need to find a different role if they are to prosper.

b. Role of, and unions links with, management

Our focus is on links between unionism and productivity, performance and profitability. Of course, performance is affected by numerous factors other than unionisation – that is why so many control variables are included in the studies analysed in sections 2-4. But there is one factor, so far inadequately discussed, which may both dominate and itself affect any impact unions have on performance, namely – management. The debate in the management literature turns on whether or not those firms and workplaces with high-involvement management (HIM) practices such as job flexibility, team working and minimal differences in status will universally outperform those without and/or the importance of aligning such HIM practices to the business or competitive strategy of the firm in order to achieve superior performance. In his exhaustive survey Wood (1999) states that the evidence on both issues is mixed and that it is too early to draw general conclusions on the importance of management practices and strategy. For us a narrower issue is important. If relations between management and unions are cooperative does the workplace have a superior performance to those with adversarial relations? This is an important matter. It should, for example, be remembered (see section 2) that Freeman and Medoff (1984) held that superior performance is contingent on cooperation between labour and capital.

We have evidence on this issue for both the USA and UK and it is remarkably consistent. Section 2 noted the USA manufacturing evidence. Black and Lynch (1997) showed that there was a hierarchy for productivity performance. A traditional workplace with union recognition but no employee involvement does worse. In the middle are non-union plants with high performance work (HPW) systems, but superior productivity performance is achieved by establishments with **both** HPW practices and union recognition. Analogous evidence for the UK is set out in table 6 (for more details see Metcalf 2003). A HRM workplace with no union has a superior productivity and financial performance to a unionised workplace with no HRM. But when the workplace with union recognition also has the various HRM practices its performance is much enhanced, indeed in the case of labour productivity growth the best performing workplaces are those with both HRM and recognition.

Another way of analysing the influence of cooperative industrial relations is to study partnerships. As espoused by the British TUC (1998) partnership agreements include mutual recognition of the roles of management and the union, joint commitment to the success of the business and job security, open information sharing, continuous improvement in the quality of working life and adding value. The spread of such agreements has been rapid. For example Gall (2000) states that there were 748 new recognitions agreements in the five-year period beginning in 1995 and of these 150 are partnership agreements. Further, many previous recognitions have been transformed into similar agreements. The impact of such partnerships in British workplaces is set out in table 6. A workplace is defined as having a partnership when a union negotiates pay and management negotiates with, or consults, the union(s) on recruitment, training, payment systems, handling grievances, staff planning, equal opportunities, health and safety and performance appraisals. It will be seen that such designs significantly raise

the probability of above average performance for financial performance and both the level of and change in labour productivity. These are potentially important findings. Union recognition with partnership yields substantially better economic and industrial relations outcomes than union recognition without partnership.

c. Union structure and organisation

The nature of workplace unionism varies considerably both within and among countries. For example in some workplaces union membership is or was compulsory (defined as a union shop in the USA and a closed shop in the UK). In other, typically larger, workplaces multiple unions exist side-by-side to represent the interests of different groups like craft and less skilled employees. Such multiple unionism is a distinctive feature of industrial relations in Australia and the UK. By contrast, in Japan enterprise unions are the norm – one union for one enterprise. It is worth considering briefly some links between union organisation and workplace performance outcomes. For example how does productivity or financial performance compare under enterprise unionism versus multi-unionism?

Multiple unionism is generally held to be detrimental to performance because of the greater difficulty of reaching agreement among the parties, communication and demarcation problems and inter-union competition. Bean and Crafts (1996) go as far as to suggest that the decline of multi-unionism in the UK in the 1980s was the key alteration in industrial relations contributing to the raising of Britain's productivity growth. Pencavel (2002) provides the most up to date analysis for the UK. He first compares union with non-union workplaces, then goes on to contrast multi-union workplaces with joint bargaining (where the multiple unions sit around a "single table")

and those with separate bargaining. He finds that union recognition is associated with lower financial returns and when there is multi-unionism if bargaining is fragmented the workplace is over 5 percent less likely to have better than average financial performance compared to a joint bargaining workplace. Likewise, for labour productivity, although there is no overall association between union presence and labour productivity, when there are multi-unions, workplaces with fragmented bargaining have a 4 percent lower probability of being better/lot better than average compared with those with joint bargaining. He concludes that: "On average, by the late 1990s, unionism per se has negligible effects on productivity; the state of labour relations is the key variable associated with productivity and, in Britain, workplaces with fragmented bargaining are associated with poorer productivity. With respect to financial performance, unions tend to reallocate an organisation's rents towards workers and this occurs more substantially in fragmented bargaining workplaces". This conclusion is replicated in Australia where Crockett et al. (1992) state that "where there are several unions present, the detrimental effect on productivity is greater than if the workplace had a single union".

This evidence begs the question as to why management was prepared to recognise multiple unions in the first place. Presumably it reflects either incompetence, possibly motivated by divide-and-rule tactics, or an inability to control the growth of such multi-unionism because the costs of doing so would have been greater than the benefits. It is noteworthy that alterations in the political climate in both the UK and Australia yielded a reduction in fragmented bargaining in recent years.

In Japan enterprise unionism is the normal type of union organisation such that there is one union in one firm. All regular and permanent employees – blue collar, white collar and sales – who do not occupy managerial positions join the union which organises in the one firm. Tachibanaki and Noda (2000) state that this imparts

"common goals" among management and employees particularly in overcoming economic crises facing a firm: "Enterprise unionism [is] one of the sources of a relatively better performance of firms in Japan because it encourages cooperative behaviour of unions towards management . . . unions want to work in close cooperation with management because they believe that a cooperative attitude produces an ultimate benefit to them. A more direct interest in the overall performance of the firm is ultimately more beneficial to employees than adversarial behaviour". On this basis we might expect that a union presence would be associated with superior productivity and investment performance and possibly even better financial performance than non-union counterparts. In the event, as we showed in sections 2-4, while capital accumulation rates are higher in unionised workplaces both productivity and profit levels are modestly lower. However, the direct productivity effect is offset by a favourable indirect effect stemming from longer tenures and, in some enterprises, the presence of a full-time union official who acts as an unpaid personnel manager. So, it may be that enterprise unions actually have rather similar links with performance to traditional western unions.

d. Investment in human capital

The presence of a union might influence investment in human capital in the workplace over and above any more traditional effect on investment in physical capital or R&D. Such investment in the incidence and amount of training could be higher where a union is recognised for the following reasons. First, unions might widen their bargaining agenda to include investment in human capital, a way of raising employees' living standards in the longer run. Second, unions provide a voice thereby lowering labour

turnover which, in turn, increases the incentives of both the employer and employee to invest as they will reap a return over a longer period. Third, the lower labour turnover in unionised workplaces implies greater job security and employees will feel less threatened by alterations to working practices which may flow from investment in human capital. Finally, a unionised workplace is more likely to have a formal procedure to identify training needs and to implement them.

Alternatively, some arguments point in the opposite direction. First, if unions raise wages compared with similar non-union workers the firm may not be able to afford to invest in human capital. Second, seniority is an important (objective) factor in promotion decisions in unionised workplaces, which may reduce the incentive of employees to invest in training. Third, Green et al. (1999) points out that, in Britain for example, greater aggregate investment in human capital in the last two decades has occurred at a time when unions have become much weaker. As good arguments can be advanced to suggest unions might either increase or decrease investment in human capital the issue can only be settled empirically.

There is quite a large body of empirical research investigating the relationship between training and unionism for the USA. Booth et al. (2001) summarises it as follows: "Some of the early studies find a negative impact of unions on training (e.g. Duncan and Stafford 1980). More recent studies, however, find that the probability of receiving on-the-job training and the amount of work-related training received are higher for unionised workers than non-unionised ones (e.g. Lynch 1992; Frazis, Herz and Horrigan 1995). An exception is the study by Lynch and Black (1998), which uses data from a 1994 representative survey of US establishments and reports no statistically significant impact of unionisation on either the provision of formal training or the proportion of workers receiving it. It should be noted that this study concentrates on a

rather specific set of formal training programmes, including computer literacy training, teamwork or problem solving training, literacy, numeracy or basic training, and sales or customer service training".

British evidence (Booth 1991 and Claydon and Green 1994) also points to a positive impact of union presence on training investments. Recently Green et al. (1999) used nationally representative samples to analyse both the incidence and intensity of training. It will be seen from table 7 that unionised establishments and workers are more likely to provide and receive training than their non-union counterparts (panel 1). This union impact holds with even more force for the intensity of training (panel 2). Consider, for example, non-manual workers. A unionised workplace provided nearly an extra day of training during the previous year (the sample average is 2.7 days so this is a large effect). Likewise unionised workers received an extra 0.34 hours of training in the previous week (sample average 1.3 hours). Related work (Arulampalam and Booth 1997) suggests that these positive union effects hold more strongly for women than men. Booth et al. (2001) also suggest that the payoff to such training is greater for union workers than non-unionists. For union men the post-training wage was 21 percent higher than the pre-training wage, but the corresponding increase for non-unionism was only 4 percent. This is an important finding because it contradicts the often-stated notion that egalitarian or seniority-based union wage policies reduce the return to investing in human capital.

e. Works councils and employee involvement in Germany

The German industrial relations system is well known for its unique dual-structure of employee representation. Collective agreements are negotiated between trade unions

and employers' associations at the industry-level, while works councils watch the implementation and coordination of such agreements in the workplace. Theoretically, works councils are pure agents of employee representation because legislation forbids them to engage in any form of industrial action or to negotiate wage agreements. Reality looks a bit different as trade union members very often dominate works councils so the line between the rent-seeking behaviour of trade unions and the voice function of works councils is often blurred.

Generally, works councils constitute the most important collective voice institution in Germany. They were legally established in 1920, but the current form and legal basis has its origin in the Works Constitution Act, passed in 1952 (Mueller-Jentsch 1995). This Act prescribes an extensive set of information, consultation and co-determination rights to the works council. Employers have to inform works councils on the current and future economic situation of the firm, on reductions in operations and introduction of new work methods. Further, works councils have to be consulted on issues such as dismissals, personnel planning, and changes in equipment. Additionally, works councils have co-determination rights on social and personnel matters.

Some studies have analysed the incidence of works councils. For example Sadowski, Junkes and Lindenthal (2001) state that only a fifth of eligible plants use their right to form a works council, but that such plants employ some two thirds of all eligible employees. The probability of a works council being present increases with plant size, age of firm and with the share of workers and that it decreases with the share of part-time and female workers. There is also evidence (Addison, Schnabel and Wagner 1997) works councils are less likely to exist where the firm or workplace has well developed direct or indirect participation mechanisms.

In broad terms recent evidence suggests that works councils increase productivity, reduce profitability, and have a negative but insignificant impact on investment and innovation (Addison, Schnabel and Wagner 2001; Addison, Kraft and Wagner 1993; Frick 1996; Frick and Sadowski 1995. See Frege 2002 for a useful critique of these studies.) The behaviour of works councils can probably be best explained via a mixture of the monopoly union model and the collective voice model. The monopoly model explains the negative relationship between works councils and profits, by suggesting that the extensive set of legal rights prescribed to works councils, the domination of trade union members and the indirect impact on wage determination jointly foster rent-seeking behaviour on the part of works councils. Further, the collective voice model proposes that the provision of a formal collective voice for the workforce will improve the working climate, reduce labour turnover and tend to raise productivity.

Until the early 1990s, the German model of centralised bargaining was famous for its high degree of consensus, social cohesion, few disputes, competitiveness and high levels of training (Hassel 1999). But this system is facing pressure from international competition and moves to decentralise. Hassel (1999) suggests that a steady erosion of the dual structure and therefore the decrease in the incidence of works councils and trade union presence is quite likely in the near future. In the face of a potential future "representation gap", it is worth investigating what could or already does substitute the works council as the formal plant-level institution of employee representation. In recent years, new forms of employee representation, also known as "employee involvement (EI) programmes", have emerged in Germany. Those programmes allow employees to participate in the decision-making of a company. Several US and UK studies have suggested a positive relationship between such EI

programmes and establishment profitability, so employers might consider those programmes as possible substitutes for works councils in terms of employee representation.

Schedlitzki (2002) has investigated the impact of works councils and EI programmes on establishment profitability and the interaction between those two forms of employee representation. The theoretical underpinnings are based on the "managerial competence" hypothesis (FitzRoy and Kraft 1985), which argues that competent managers will provide employee representation on their own initiative, yielding higher profits because they do without the legal complexity and rent-seeking behaviour of works councils. Competent managers are assumed to know about the efficiency of EI programmes and to implement them. Consequently, presence of EI programmes is defined as a proxy for the presence of competent managers. This permits the "managerial competence" hypothesis, the interaction of works councils and EI programmes and their impact on establishment profitability to be studied.

The research used data from the third wave of the Hannoveraner Firmenpanel, which is representative of the manufacturing industry in Lower Saxony, Germany. It confirmed the "managerial competence" hypothesis: there is a negative impact of works councils, and a positive impact of EI programmes, on establishment profitability. When both a works council and an EI programme were present in a workplace profitability was lower compared to a workplace with just EI. It was concluded that the competent managers do better without works councils so in future employers may focus on EI programmes as the major vehicle for employee representation. Such a move would be congruent with recent US evidence (Kleiner and Freeman 2000) which suggests that EI "has no adverse effects or a slight positive effect on the bottom line" while

simultaneously workers report that EI has a “strong [positive] effect on their working lives”.

6. Summary and conclusions

If the presence of a union in a workplace or firm raises the pay level, unless productivity rises correspondingly, financial performance is likely to be worse. If the product market is uncompetitive this might imply a simple transfer from capital to labour with no efficiency effects, but is probably more likely to lead to lower investment rates and economic senescence. Therefore the impact of unions on productivity, financial performance and investment is extremely important. This chapter distils evidence on such effects from six countries: USA, Canada, UK, Germany, Japan and Australia. These countries were chosen for two reasons. First, the bulk of the evidence is for them. Second, they have very different systems of industrial relations on dimensions like density, coverage and level of collective bargaining, coordination, labour standards, employment protection, union structures and voice mechanisms. In principle, this diversity should contribute to understanding where unions have favourable or unfavourable effects. The unit of analysis in this chapter switches between sectors, firms and workplaces. There is an urgent need for comparative analysis of union effects using international data with standardised measures of unionisation and performance.

It is not possible to use theory to predict unambiguously any union effect on productivity because unions can both enhance and detract from the productivity performance of the workplace or firm. Union presence may lower labour productivity via: restrictive work practices; industrial action; causing the firm to invest less; and if adversarial industrial relations lowers trust and cooperation. Alternatively labour productivity may be beneficially higher in the presence of a union if: unions may play a monitoring role on behalf of the employer; collective voice provided by the union has

favourable consequences; unions may make managers less lethargic; and unions stop exploitation of labour.

The evidence indicates that, in the USA, workplaces with both high performance work systems and union recognition have higher labour productivity than other workplaces. And a case study of bitter adversarial industrial relations at a tyre plant showed what a dreadful effect this had on the quality of the product. In the UK previous negative links between unions and labour productivity have been eroded by greater competition and more emphasis on "partnership" in industrial relations but there is a lingering negative effect of multi-unionism, just as there is in Australia. In Germany the weight of the evidence suggests that the information, consultation and voice role of works councils enhances labour productivity particularly in larger firms. Finally, in Japan unions also tend to raise labour productivity via the longer job tenures in union workplaces which makes it more attractive to invest in human capital and through the unpaid personnel manager role played by full-time enterprise union officials in the workplace. These results emphasise that there is no one generalised or average productivity effect of unions – it all depends on the quality of management and unions. As decentralisation of bargaining spreads, so any union effects become more varied.

Unions will reduce profits if they raise pay and/or lower productivity. Unions might capture surplus profits in monopolistic or regulated sectors. Alternatively they may siphon off returns which belong to sunk investments in physical capital or R&D, which would have serious consequences for the long run health of the union sector. The evidence is pretty clear cut: the bulk of studies show that profits or financial performance is inferior in unionised workplaces, firms and sectors than in their non-union counterparts. This may, in turn, influence the rate of growth of employment and closures in union compared with non-union firms and workplaces. But the world may

be changing. A recent study of small USA entrepreneurial firms found a positive association between unions and profits and in the UK the outlawing of the closed shop, coupled with a lower incidence of multi-unionism has contributed to greater union-management cooperation such that recent studies find no association between unions and profits. There is something of a paradox in this evidence. In Japan and Germany, known for cooperative labour relations and proper employee voice, unions or works councils are linked to inferior financial performance. By contrast, this traditional stylised fact – unions lower profits – may no longer hold in the UK and, possibly, the US. This suggests that more intense product market competition inhibits unions' ability to cream off (previous monopoly) profits. To the extent that any union effects are weaker than previously, employees' affinity with the union may also crumble, implying that unions' survival may depend on them embracing a different – representational – role to their more traditional collective bargaining role.

Unions can influence investment in physical capital both positively and negatively. Any positive effect occurs when the firm invests more to substitute away from expensive union labour. The negative impact comes if a union delays the installation of new machinery or capture returns properly due to (sunk) investment. North American and German evidence suggests that unionisation reduces investment by around one fifth compared with the investment rate in a non-union workplace. In both Canada and the USA this effect is even felt at low levels of unionisation. The UK evidence is mixed: the most thorough study also finds that union recognition depresses investment, but this adverse effect is offset as density rises. The exception is Japan where union recognition goes hand-in-hand with greater capital intensity.

More detailed investigation of some issues shows: the vital role of product market competition in both mediating and moderating any adverse union effects; that

management-union cooperation yields superior outcomes to adversarial relations; multi-unionism confers worse productivity or profitability than a single union or enterprise union; a union presence boosts investment in human capital, possibly offsetting any adverse impact on investment in physical capital; while German works councils, with their consultation/voice role, do raise productivity they also lower profits.

Table 1
Industrial relations characteristics in our six countries, mid 1990s

Characteristic	USA	Canada	UK	Germany	Japan	Australia
Unionisation and collective bargaining						
1. Density % [rank]	16 [18]	38 [8]	34 [10]	29 [13]	24 [16]	35 [9]
2. Coverage of collective bargaining % [rank]	18 [19]	36 [16]	47 [15]	92 [4]	21 [18]	80 [9]
Bargaining level and coordination						
3. Bargaining level [rank]	1 [16=]	1 [16=]	1.5 [14=]	2 [5]	1 [16=]	1.5 [14=]
4. Coordination [rank]	1 [16=]	1 [16=]	1 [16=]	3 [1=]	3 [1=]	1.5 [15]
Standards and protection						
5. Labour standards index	0	2	0	8	-	-
6. Employment protection legislation, stickiness index [rank]	0.7 [1]	1.1 [4]	0.9 [2]	2.6 [20]	2.3 [14]	1.2 [6]

Notes and sources

Rows 1 and 2. % of employees who are union members or covered by collective bargaining, respectively. Rank refers to rank out of 19 countries. OECD, Employment Outlook 1997, table 3.3.

Row 3 refers to prevailing level of collective bargaining, ranging from 1 decentralised through 2 sector level to 3 centralised. Rank refers to rank out of 19 countries. OECD Employment Outlook 1997, table 3.3.

Row 4 refers to the degree of coordination among employers and among unions, ranging from 1 uncoordinated to 3 coordinated. Rank refers to rank out of 19 countries. OECD Employment Outlook 1997, table 3.3.

Row 5 is the aggregate score on 5 separate indices, each ranging from 0-2 (a higher score indicating greater protection) covering: working time regulations; fixed-term contracts; employment protection; minimum wage protection; employee representation rights. OECD Employment Outlook 1994, table 4.8.

Row 6 measures the stickiness of employment protection legislation for regular and temporary workers. An average of 4 indices covering: regular procedural inconveniences; notice and severance pay for no fault individual dismissal; difficulty of dismissal; regulation of collective dismissal. Index runs from 0-6 on each indicator but there are few instances of numbers greater than 3. High number means most sticky. Rank refers to rank out of 27 countries. OECD Employment Outlook 1999, table 2.5.

Table 2
Unions and productivity: international evidence

Country Author	Sample	Indicator of productivity	Indicator of union	Controls	Results
USA Black and Lynch (1997)	627 mfc workplaces 1993 (results confirmed in panel 1987-93)	labour productivity (from Cobb-Douglas production function)	recognition (plus interactions)	IT (4 variables) human capital (3) high performance work systems (7) profit sharing (2)	cf base workplace (see text) • HPW + union +20% • HPW + non-union +11% • union + no employee involvement -15%
Canada Maki (1983)	time series 1926-78 whole economy exc. agric	total factor productivity growth	density strike activity	education cycle	tfp growth (% points per year) density – 1.7 strikes – 1.0 during 1970s
UK Pencavel (2001)	1484 workplaces WERS 98	compared with workplaces in same industry % a lot better 12 better 40 average 43 below average 5 lot below average 1	non union (597 workplaces) single union (322) multiple unions joint barg. (337) multiple unions separate barg. (228)	workplace: size, age workforce: % PT, F	difference between union and non union workplaces / separate and joint bargaining prob (a lot below ave) 0 / 0 prob (below ave) 0 / 0.02 prob (ave) 0 / 0.06 prob (better than ave) -0.01 / -0.05 prob (a lot better than ave) -0.01 / -0.03
Germany Addison et al. (2000)	1025 mfc workplaces Hanover Panel 1994	value added per employee	works council Yes/No	workplace: size, age capacity utilisation workforce: education technology and work organisation profitsharing industry	estabs 101-1000 employees +, significant estabs 21-100 employees +, ns

Table 2 (contd.)

Country Author	Sample	Indicator of productivity	Indicator of union	Controls	Results
Japan Benson (1994)	253 mfc firms employing 100+ in Kansai region 1992	rate the level of productivity in the co. compared with other firms in same industry. % much higher 4 little higher 34 same 40 little lower 20 lot lower 2	recognition density f.t. official present	enterprise: size, K/L ratio workforce: % F, skilled, non-permanent mg: quality circle, JIT labour practices: communications, contingent pay, other benefits product market: competitors, expanding/contracting	recognition –ve (ns) but f.f. official +vc (ns)
Australia Crockett et al. (1992)	759 private sector workplaces 20+ e'ees AWIRS 1990	compared with workplaces in same industry % lot higher 11 little higher 33 same 42 little lower 12 lot lower 3	recognition density no. of unions	workplace: size, K/L ratio capacity utilisation workforce: composition EI, labour turnover product market: competitors expanding/contracting	recognition –ve (sig at 10%) density –ve (sig at 10%) no. of unions –ve (sig at 5%)

Table 3
Unions and financial performance: international evidence

Country Author	Sample	Indicator of financial performance	Indicator of union	Controls	Results
USA Batt and Welbourne (2002)	464 entrepreneurial firms at IPO 1993	• Tobin's q • change in earnings per share • change in stock price	Recognition	firm size, age industry region degree of risk	Union firm has significantly higher: • Tobin's q by 15% • earnings per share by 10% • stock price by 17%
Japan Tachibanaki and Noda (2000)	Panel of 12 mfc inds 1966-1984	Labour's share in income (wage payments ÷ total value added)	Density Disputes • no. • workers involved • days lost	K:L ratio K:O ratio CR firm size ave age of workforce % female, graduate	+ sig association pre oil shock density, disputes and labour's share all rising post oil shock density, disputes and labour's share all falling eg 1966-1974 10% increase in no. of disputes increases labour's share by 0.9% (mean 38%)
UK Wilkinson (2000)	WERS 1998 up to 1843 workplaces	4 ordered categories subjective	recognition recognition by coverage bargaining level union strength	workplace size, age % female, PT JCC, HRM score ESOS, incentive pay product market (9 variables) industry, region	no association 76 coefficients reported, only 4 significant result holds for • whole economy • trading sector • private trading sector • private trading sector with profit measure
Germany Addison, Schnabel and Wagner (2001)	Hanover Panel 1994, 1996 1,025 mfc plants in Lower Saxony, Germany	5 ordered categories subjective • high profit dummy • index of profitability from 1 to 5	Dummy variable for works council presence	Establishment size, market share, capacity utilisation, state of production technology, profit sharing, industry dummies	sig - ve association • holds for both profit indicators and different sample sizes

Table 4
Unions and investment: international evidence

Country Author	Sample	Indicator of productivity	Indicator of union	Controls	Results
USA Hirsh (1990)	315 firms data 1970-80	investment rate	density	concentration ratio firm growth rate vintage industry import %	unionisation reduced investment by 20% in the typical unionised firm half effect directly half effect via lower profits
Canada Odgers and Betts (1997)	18 mfc industries 1967-1987	investment rate gross net	density	strike activity import share accelerator cost of capital	compared with non-union industry, one with average density reduces investment rate by: gross 18-25% net 66-74%
UK Denny and Nickell (1992)	73 3-digit mfc industries 1980-84 incorporating WIRS1 and WIRS2 data	investment rate	recognition density	industry demand prices technical progress pay expected growth	recognition –ve density +ve 100% density not sufficient to offset recognition effect
Japan Benson (1994)	253 mfc firms employing 100+ in Kansai region	Labour's share in total costs Labour's share % / % of firms <10 / 3 10-20 / 24 21-40 / 41 41-60 / 25 61+ / 6	recognition density f.t. official	See table 1	recognition associated with higher K-intensity: reduces [raises] probability of capitalisation rate less than 60% [above 60%]
Germany Addison et al. (1993)	101 mfc establishments in Niedersachsen and Baden-Württemberg 1990-91	investment rate • gross • net	work council present	capacity utilisation firm size export: sales ratio hours of overtime product innovation	presence of works councils lowers investment: • gross by 20-33% (sig) • net by 1-11% (ns)

Table 5
Union recognition and workplace performance

Indicator	Sample	Union indicator	Control variables	Union effect Probability of above average when union recognised	
Labour productivity					
compared with establishments in same industry	WERS 1998 trading sector 1153 workplaces (25+ e'ees)	recognition	HRM (9 variables) % female % skilled private/public pay cf local LM workplace size industry	whole sample 1-5 competitors 6+ competitors	-4.5% -14.0% 0.6%
Quality of product service					
compared with establishments in same industry	as above 1262 workplaces	recognition	as above	whole sample 1-5 competitors 6+ competitors	-8.5% -8.5% -6.6%
Financial performance					
compared with establishments in same industry	as above 1195 workplaces	recognition	as above	whole sample 1-5 competitors 6+ competitors	-8.2% -12.4% 7.4%

Source: Metcalf (2003)

Table 6
Workplace governance and performance

Outcome	HRM workplace, no union recognition	Union recognition, no HRM	HRM workplace with union recognition	Marginal effect of partnership
1. % with financial performance above-average for industry	86	40	76	32.2*
2. % with labour productivity above average for industry	75	43	70	31.7*
3. % with labour productivity increased over past 5 years	89	73	95	51.9**

Source: 1998 Workplace Employment Relations Survey, Management Questionnaire. Nationally representative sample of all workplaces with 10+ employees in trading sector.

Notes:

1. Outcomes 1-3 probit regressions. Statistical analysis based on approximately 1300 workplaces.

2. Outcomes 1-3 are from 5-point scale and refer to probability of the workplace being in the top two categories. For example 86% of managers in the HRM workplaces believe that their workplace has above average (for the industry) financial performance, compared with 40% for union workplaces and 45% for authoritarian workplaces.

3. Definition of independent variables.
HRM: Formal strategic plan on human resources, with employee relations manager involved in formulation; personality or performance tests in recruitment, or recruitment based on skills, qualifications, experience and motivation only; most employees in largest occupational group trained in job other than their own; individual- or group-performance-related pay.
Other controls: Union recognition; joint consultative committee; employee involvement viz some form of financial involvement i.e. profit-related pay, employee share ownership or deferred profit-sharing, and either a quality circle or employee suggestion scheme; partnership viz union negotiates pay and management negotiates with, or consults union on recruitment, training, payment systems, handling grievances, staff planning, equal opportunities, health and safety and performance appraisals; collective dispute in previous year; variety in work of largest occupational group; growing market; more than half the workforce in managerial, professional or technical occupations; workplace under 10 years old; proportion of workers female; private sector; level of most recent pay increase compared with similar employees in locality; size of workplace and industry.

4. Definition of benchmark workplaces.
HRM: No union recognition, all HRM variables and all other variables at weighted means.
Union recognition: Union recognition and all other variables at weighted means.

5. *Partnership*: We defined partnership as where union negotiates pay and management negotiates with, or consults union on recruitment, training payment systems, handling grievances, staff planning, equal opportunities; health and safety and performance appraisals. Such partnerships significantly raise the probability of above average performance on the financial performance, productivity level, productivity growth and relations between managers and workers. They also lower the quit and absenteeism rates i.e. union recognition with partnership yields substantially better economic and industrial relations outcomes than union recognition without partnership. Related work also shows that such partnership arrangements yield better outcomes concerning the incidence of family friendly policies (e.g. paid parental leave, extended maternity leave) and equal opportunity policies (e.g. monitoring the composition of the workplace).

Table 7
Unionisation and the incidence and intensity of training

	Union compared with non-union			
1. Incidence %	Establishments providing training in the 12 months prior to survey		Individuals receiving training in the 4 weeks prior to survey	
Manual	+17		+1.6	
Non-manual	+7		+5.1	
2. Intensity	Days provided per year		Hours in previous week	
	Sample average	Extra in union workplace	Sample average	Extra in union workplace
Manual	2.1	+0.9	0.6	0.17
Non-manual	2.7	+0.9	1.3	0.34

Notes:
1. Employer provision from nationally representative survey of 1693 workplaces (25+ employees) 1990-91.
2. Employee receipt from Labour Force Survey covering 60,000 employees, autumn 1993.
3. Control variables: % females, % part-time, % ethnic minority, % manual, public sector, skill shortage in establishment, fewer than 5 competitors, single site establishment, establishment size, industry and region dummies.

Source: Green, Machin and Wilkinson (1999).

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