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# Unions and microeconomic performance: A look at what matters for economists (and employers)

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The weak need representation. Though the meaning of each word in this statement differs from one society to another and may change over time, it is increasingly acknowledged that representation can increase efficiency – the prime concern of economics. For example, civil society and non-governmental organizations are acknowledged as key agents for improving the welfare of their members and, in doing so, for accelerating economic development (World Bank, 2004).[1] These voluntary organizations can bridge the gap between policy-makers (and, more generally, those in authority) and those in need in many ways. For example, they can better identify policies and programmes needed by the poor; they can also provide a voice to the disempowered and reduce corruption. Not only can more useful services be supplied in this way, but their quality and impact can increase. More importantly, perhaps, many believe that the "deadweight loss" (the decrease in the size of the pie) arising from lack of transparency and rent seeking can thus be reduced.

These positive effects are reluctantly, if at all, attributed to trade unions even when unionization is voluntary and union operations are legal. Two reasons for this stand out. First, trade unions have at times pursued political objectives and, though they have toppled undemocratic

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[1] The latest *World Development Report*, on equity and development, notes that inequality of agency often leads to institutions that reproduce inequality (World Bank, 2006).

regimes, they have also contributed to the demise of elected governments. Second, though trade unions have historically contributed to the welfare of their members and society at large, they may also foster what has been called "a labour aristocracy": Do workers need representation if those represented are only a few and not weak? And if so (at least in some cases at some times),[2] what do economists have to say about the broader effects of unions upon the economy at large?

Among the answers produced by economists, there are studies supporting the view that trade union movements may have a strong and positive role in economic development, but there are also others that show that this, if true, depends on many factors. In fact, if there is anything that characterizes the already vast and fast-increasing empirical literature on the economic effects of trade unions, it is the finding that unions can be "good or bad" and "red or blue" (Freeman, 1993). This is not surprising since the relevant research is carried out by "two handed" economists who, "on the one hand", have numbers and use methods that can show what really happens but, "on the other hand", warn that neither are their data perfect nor are all their assumptions realistic nor yet are the facts subject to singular interpretations.

Is the jury still out? To a large extent, yes. However, some partial verdicts are also emerging. First, the economic effects of trade unions vary by country and over time. Second, the behaviour of trade unions depends very much on the economic, institutional and political conditions under which they operate. Such conditions include (a) whether the economy is competitive or not and whether it is protectionist or open to trade, (b) the nature and enforcement of regulations governing the right of workers to organize and the way they can exercise this right, including for collective bargaining, and (c) the pro-market or pro-welfare orientation of the government.

This article attempts to organize some parts of the ongoing debate by focusing on a fundamental aspect of economics, namely, *efficiency*. By focusing on efficiency one can provide at least an approximate assessment of the frequently claimed link between the presence or behaviour of trade unions and reduced output, slow economic growth and perpetuation of

[2] There are historical examples where union rules clearly amounted to restrictive practices without much justification (compared to, say, licensing requirements in the case of doctors). An example of pre-entry closed-shop arrangements is the policy of the International Typographical Union in the United States that required workers hired for the composing room to possess union cards already. In the United Kingdom, post-entry closed shops used to be widespread in many industries (such as metal engineering, transport and communications) with 23 per cent of all workplaces covered by a closed-shop arrangement in 1980 and 88 per cent in nationalized industries (Stevens, Millward and Smart, 1989). But the incidence of such arrangements has declined significantly since then: by 1998 a mere 2 per cent of all workplaces had a closed-shop arrangement.

poverty.[3] In economic terms, such negative impacts can arise because of lower:

- *allocative efficiency:* If unions prevent scarce resources from being allocated to the production of goods and services wanted and needed by consumers (for example, by affecting relative union/non-union wages between sectors and types of workers);
- *technical efficiency:* If unions prevent firms from producing the maximum output they could produce with the inputs they employ (for example, by restrictive practices that limit the productive use of workers);
- *dynamic efficiency:* The previous two aspects of efficiency are essentially static, while dynamic inefficiency can arise if unions prevent the economy from growing (for example, by reducing investment or slowing down the rate of employment creation);
- *distributional efficiency:* If unions result in an allocation of incomes that departs from that which would maximize social welfare (for example, by securing higher pay for union members than for other workers simply on the basis of their being "insiders" or by arbitrarily changing the functional distribution of incomes between wages and profits).[4]

Most of the literature examines some key indicators that are expected to be positively associated with efficiency, rather than efficiency itself.[5] Such indirect indicators include the level and growth rate of productivity, the speed at which new technology is introduced, the rate of introduction of physical investments, and resources spent on research and development. While these areas form the main focus of this article and are covered in the next three sections, the discussion would be incomplete if the effects of trade unions on some other aspects of the labour market were omitted. Indeed, economists have also used many other indicators to assess the microeconomic effects of trade unions, and some are summarized in table 1. Thus expanding the discussion can be useful in

[3] In the empirical literature, some researchers use as the relevant "union variable" some measure capturing the scale of unionization (union density or coverage of collective agreements), the union status of individuals or whether a firm recognizes a union or not, while others deal with the behaviour of unions in specific contexts of industrial relations (such as decentralization, co-ordination, multi-unionism and so on).

[4] The term "distributional efficiency" is not a standard one in the economic literature, which often prefers to use the term "equity". We use this term to indicate that any economy can, in principle, achieve any specific Pareto-efficient outcome (assumed to be desired by society) under a specific initial allocation of resources (which redistributive policies can induce). In the current context we prefer the term "distributional efficiency" in order to tie the arguments to the second fundamental theorem of welfare economics. This avoids confusion as the term equity may mean different things to different people.

[5] Indeed, few studies on unions have measured efficiency directly (some are summarized below).

Table 1. Selected indicators of microeconomic effects of trade unions

| | |
|---|---|
| **Wage mark-up** (wage premium of unionized workers versus non-union members) | **Voluntary turnover, lay-offs and job tenure** |
| **Differences in the mark-up** among different groups of workers (e.g. public/private, ethnicity and gender) | ***Profitability*** |
| **Efficiency loss of the wage mark-up** | ***Productivity*** *(levels or rate of growth)* |
| **Wage dispersion/inequality** (by industry or occupation) | ***Implementation of new technology*** |
| **Market conditions** (e.g. product competition) | ***Physical investments*** |
| **Employment level** | ***Research and development*** |
| **Employment growth** | ***Human capital development*** *(education and training)* |
| **Hours worked** | **Health and safety regulations** |
| **Fringe benefits** | **Individual performance pay and seniority** |
| | **Pensions** |

Note: ***In italics*** are indicators examined in this article; for evidence related to the other indicators, see Aidt and Tzannatos (2002)

the sense that an apparently adverse *partial* effect of unions – e.g. labour rigidity because of restrictive union practices – may lead to a compensatory attempt by employers to mitigate the effects of the rigidity, e.g. through additional investment in human capital (discussed in the fourth section below). This leads to an examination of profits (in the fifth section) which are a prime drive for entrepreneurship and investment and also the main determinant of the surplus that unions are suspected of taking advantage of.[6]

The article follows up its microeconomic findings with a review of the economy-wide effects of unions in the form of efficiency losses (sixth section). Given that there is no smoking gun evidence for this, the final question, raised in the seventh section, is why unions may care for efficiency. The last section concludes.

## Are the levels and rates of change of productivity different under unionization?

Trade unions can contribute positively to labour productivity by improving work morale, facilitating cooperation with management, reducing grievances (through their "collective voice" function), and so on. These participatory benefits can, however, be countered if management's ability to adjust to changing economic circumstances is reduced, say, when unions impose restrictive practices (such as overstaffing

[6] We acknowledge, however, the omitted indicators might also relate to efficiency. Similarly, the overall healthiness of the economy depends on broader economic policies that determine the openness and competitiveness of various industries, factors which also affect the impact of unions.

or guaranteed overtime). Moreover, the positive "collective voice" effects can be expected to be more pronounced in countries like Japan and Germany where industrial relations are based more on cooperation through works councils and enterprise unions. Multi-unionism and other adversarial industrial relations practices of the type that used to be more common in the United Kingdom and Australia can result in negative effects. Likewise, one would expect that more intense product market competition induces unions and management to move towards industrial relations systems which would enhance the positive effects of unions and reduce the negative ones. Thus, it is not clear from theoretical considerations how unions will affect the productivity of firms, and it would seem that the nature of industrial relations matters a lot.

The union/non-union productivity differential is typically estimated econometrically from *a production function model*. Productivity, defined either as labour productivity or as total factor productivity, is explained by the input mix (employment, hours worked and capital), a vector of observed firm and industry characteristics (for example, industry concentration), a union dummy variable, and other control variables (such as business cycle indicators or the level of union coverage in the industry).

However, the production function approach is problematic for a number of reasons. First, measured productivity in unionized firms can be higher than in non-unionized firms without implying that unionized firms are more efficient. This is because the wage mark-up, other things being equal, reduces employment in unionized firms. As a consequence, the marginal product of labour would be higher in unionized firms than in non-unionized ones. Second, unionized firms are likely to change their input mix in response to the wage mark-up. Hence, the input mix cannot be considered an exogenous determinant of productivity, and a simultaneity bias can develop. And third, a problem also arises because management's role is largely ignored. Since the interaction between management and unions affects productivity levels, lack of knowledge of what management does can give a biased view of the impact of unions (Denny, 1997). This problem is more generally related to unobserved heterogeneity and can best be dealt with by estimating productivity *growth* models instead of productivity *level* models.

An alternative to the production function approach is to use subjective measures of productivity. This has been done in a number of recent studies from the United Kingdom, Japan and Australia, by asking management to assess their establishment's labour productivity performance relative to other establishments in the same industry. The answers range from "a lot below average", "below average", "about average", "better than average", and "a lot better than average". Clearly, this approach too is problematic, and one can question whether managers have the required information to make reliable estimates of relative performance.

With these methodological issues in mind, we now review studies that estimate the productivity level and growth differential.

## The productivity level differential

Evidence on union/non-union productivity level differentials derives mainly from the United States, the United Kingdom, Germany, Japan, Australia and Canada. The pattern of results is not clear-cut and the estimated differentials hide a lot of important variation.

For the United States the conclusion is a qualified one, as there is considerable variation across studies (Addison and Hirsch, 1989; Booth, 1995; Filer, Hamermesh and Rees, 1996). For example, in those industries in which firms are subject to substantial product market competition, unionized firms tend to have higher productivity levels than non-unionized ones. The quality of industrial relations is also important. The "quality" of industrial relations can be proxied by the number of grievances filed, the number of unresolved grievances, the number of strikes and quits, and the use of long-term collective agreements. Firms with high-quality industrial relations are associated with higher productivity levels and higher product quality than firms with low-quality industrial relations (Katz, Kochan and Gobeille, 1983). However, the significantly higher absenteeism among union workers than among non-union workers can have a negative impact on productivity: some studies find that absenteeism is 30 per cent higher among unionized workers than among non-unionized ones. There is also some evidence that unionized establishments which have adopted industrial relations practices that promote joint decision-making coupled with incentive-based compensation have higher productivity than similar non-union plants. In contrast, those establishments that are unionized but maintain traditional labour-management relations have lower productivity. This strongly suggests that unions have positive productivity effects only when industrial relations are "good".

The evidence from the United Kingdom is more complex. British unions appear to have a negative impact on the level of productivity. However, this conclusion is far from robust, and the average estimates hide a lot of variation (Kennan, 1986; Metcalf, 1993; Booth, 1995, ch. 7). First, the results are affected by how unionism is measured. For example, studies that use union density as an indicator of unionism find a negative productivity effect. However, studies that use strikes as an indicator tend to find positive or insignificant effects.

Second, the degree of product market competition has a critical influence on union effects. Though unionization is found to have a small negative impact on productivity on average, this overall effect is driven by the non-competitive sectors of the economy. The relevant research suggests that, when there are only a few competitors in the product market,

the probability of reporting productivity levels above the industry average is 14 per cent lower among unionized workplaces than among non-unionized ones, but when there are more than six competitors the difference is insignificant.

Third, the productivity effect of unions varies over time. British unions had no impact on productivity levels before 1979 (Knight, 1989; Moreton, 1993). But in the Thatcher era in the early 1980s, unions appear to have had a negative impact on productivity (Denny, 1997). More recent studies using the subjective productivity measure from the 1998 British Workplace Employee Relations Survey show that by the end of the 1990s, unionism per se was no longer associated with poor productivity performance. The negative impact persists only in those establishments with multi-unionism and separate bargaining, i.e. where many different unions compete to organize employees in the same establishment and bargain separately with the management. Establishments with either a single union or multiple unions that bargain together are as likely as those without any unions to report above-average productivity. This accords with the earlier conclusion for the United States in that the state of industrial relations seems to affect the relationship between unionism and productivity.

In Japan, unions are enterprise-based and concentrated in larger firms, and the attitude of Japanese unions is often viewed as cooperative with management. Accordingly, Japanese unions seem like an obvious place to look for the "collective voice" effect of unions. Nevertheless, empirical studies from Japan find that unions have mixed effects on productivity. Some note that unions had a positive impact on productivity levels in the 1970s when technology and labour-quality variables are held constant (Muramatsu, 1984), while others find that productivity in unionized firms was 15 per cent lower than in similar non-unionized firms (Brunello, 1992). The latter finding is confirmed when subjective productivity measures are used that ask managers to rank the productivity performance of their firm relative to that of other firms in the same industry (Benson, 1994). The presence of full-time union officials in the workplace is found to have a positive impact on productivity. This suggests that such officials can assist management with implementation of procedures that enhance workplace efficiency. Other studies using objective productivity measures (such as value added per worker) found that, while unions have a ceteris paribus negative impact on productivity, this effect is mitigated by the fact that workers in unionized firms have longer tenure (Tachibanaki and Noda, 2000). By reducing labour turnover, unions appear to encourage cooperative behaviour that raises employees' work incentives and skill formation. Overall, the evidence probably suggests that Japanese unions have an indirect positive impact on productivity.

In Germany, unions appear to have a negative, but quantitatively small impact on productivity (Schnabel, 1991). This may be related to the fact that German workplaces have works councils that provide the collective voice function of unions, even in non-unionized firms. The evidence on the impact of works councils suggests that such councils have a positive effect on productivity but only in larger firms (Addison et al., 2000).

A similar result is found in the Republic of Korea where unions seem to have no impact on labour productivity in manufacturing firms, while the presence of mandatory works councils has a positive impact (Kleiner and Lee, 1997). In Australia and Canada the limited evidence available has found a negative effect of unions on productivity (see, respectively, Drago and Wooden, 1992; Maki, 1983).

With respect to developing countries, a study on Malaysia found that unionized firms have higher productivity levels than non-unionized firms and that the positive productivity differential is primarily associated with industrial rather than company unions (Standing, 1992). The study argues that this provides prima facie evidence that unions in Malaysia have been associated with dynamic efficiency.

Further, a comparative study on the productivity impact of unions in nine Latin American countries found that

> As regards union effects on perhaps the most interesting and controversial outcome, productivity, [comparative country] results mirror those in the United Kingdom and the United States: both positive and negative effects are observed, in different industries and at different times. A blanket case, either for or against unions, cannot be made on productivity grounds on the basis of the evidence presented in this volume (Kuhn and Márquez, 2005, pp. 11-12).[7]

## *The productivity growth differential*

The evidence on the union/non-union productivity growth differential in the United States in the 1980s and the early 1990s suggests that, while unions slow productivity growth in some cases, there is no significant difference between unionized and non-unionized firms (see the survey by Belman, 1992). And though the evidence cited earlier on the United Kingdom indicates that unions may have had a negative impact on productivity levels in the 1980s, the evidence regarding productivity growth is mixed (see the survey by Booth, 1995). Some studies on the United Kingdom suggest that unionized firms had higher productivity growth than non-unionized firms during the 1970s and early 1980s

[7] These authors – and others (see Aidt and Tzannatos, 2002) – go on to conclude that "careful attention to industry conditions, the structure of bargaining, and the nature of industrial relations is required to assess the effects of unions on the productivity of Latin American firms" (Kuhn and Márquez, 2005, p. 12).

(Nickell, Wadhwani and Wall, 1989). Then, many firms "de-recognized" unions and terminated closed-shop arrangements, and differences in productivity growth between unionized and non-unionized firms disappeared. In fact, firms that experienced a change in union arrangements in the late 1980s had higher productivity growth than both unionized firms with constant union arrangements and non-unionized firms (Gregg, Machin and Szymanski, 1993). However, a comparative study of 19 OECD countries for the period 1950-80 concluded that union density did not correlate with any statistically significant union/non-union difference in productivity growth (Bean and Symons, 1989).

In evaluating these effects it should be kept in mind that it is highly unlikely that productivity differences between unionized and non-unionized workplaces can exist for long. If they did, it would imply that the gap between these two types of workplaces would be ever expanding. Thus, productivity differentials – particularly those observed for the 1980s – can best be thought of as short-term effects that may not be readily extrapolated into the far future.

## Unions and the implementation of new technology

As in the case of productivity, theory is also ambiguous with respect to the attitude of unions toward new technology (for example, computers and new machinery). On the one hand, unions may resist technological changes because they fear immediate or short-run employment losses. On the other hand, they may take a long-run view and welcome new technology that increases productivity and the prospect of future increases in wages.

The empirical evidence available suggests that new technology is adopted as fast in unionized firms as in non-unionized ones. The extent of unionization does not seem to have had any significant influence on the diffusion of numerically controlled machine tools in the United States engineering industries in the 1980s (Taymaz, 1991). Unions are found to have had a small positive impact on the introduction of new microelectronic equipment in firms in the United Kingdom in the mid-1980s (Daniel, 1987; Machin and Wadhwani, 1991; Latreille, 1992). Similarly, unionized firms in Canada are more likely than non-unionized firms to introduce technological changes for cost-cutting or production control reasons (Betcherman, 1991).

More broadly, studies of unions and technological change in these three countries in the 1980s indicate that unions "have no effect on a firm's use of advanced manufacturing and microelectronic technology" and that "in most cases, unions welcome technological modernization; sometimes encouraging it, most often accepting it, infrequently opposing it, but usually seeking to protect their members" (Keefe, 1992, pp. 110-111).

## Unions, physical investments, and research and development (R&D)

As in the cases of productivity and implementation of new technology, there is no clear prediction on how unions would affect investments in physical capital and R&D. On the one hand, when firms realize that workers are going to appropriate part of the profits associated with (risky) investments in physical capital and R&D, a unionized firm may invest less than a similar firm operating in a competitive labour market.[8] The capacity of unions to share rents/profits with firms can have significant dynamic efficiency effects. On the other hand, this "rent-seeking" view of unions stands in contrast to the more traditional view that firms will substitute capital for labour in response to an increase in the relative cost of labour (due to unionization). This will increase investment.

The empirical evidence does, however, suggest that unions in the United States tend to reduce investment (Bronars and Deere, 1993; Hirsch, 1990).[9] A study on Canada finds similar results (Odgers and Betts, 1997). Unionization in the United Kingdom is also found to have a negative impact on investment in physical capital. Holding wages and productivity constant, the rate of investment in firms that recognize a union and have an average union density is, on average, 23 per cent lower than in other firms (Denny and Nickell, 1991 and 1992). However, the impact is reduced as union density increases. Furthermore, distinguishing between competitive and non-competitive sectors and taking second-round wage effects into account reduces the investment rate by 13 per cent for a competitive unionized firm but only by 4 per cent for a non-competitive unionized one.[10] In Germany, the impact of unions on investments has been found to be negative but somewhat smaller than in North America and the United Kingdom (Schedlitzki, 2002).

The available evidence also suggests that unionization can reduce spending on R&D. In Japan, however, union recognition seems to go hand-in-hand with greater capital intensity (Benson, 1994). In the United Kingdom, spending on R&D is lower in unionized firms than in non-unionized ones though this adverse effect is offset as density rises (Connolly, Hirsch and Hirschey, 1986; Acs and Audretsch, 1987; Ulph and Ulph, 1990; Van Reenen, 1996). In North America and Germany, union-

[8] This can happen because of the resulting "hold-up problem" (see Grout, 1984; Ulph and Ulph, 1990).

[9] Hirsch (1990) finds that unionization reduced investment in physical capital by about 20 per cent in a typical United States firm in the 1970s.

[10] This result is surprising in that it suggests that product market competition has an adverse impact on the behaviour of unions, but it is unclear how robust the result is.

ization is estimated to reduce investment by around one-fifth compared to the investment rate in a non-unionized workplace (Metcalf, 2002). In contrast to what has been observed in the United Kingdom, this effect is felt even at low levels of unionization in both the United States and Canada.

## Unions and human capital formation

Unions are likely to affect the amount and quality of training that employees receive in the workplace through a number of channels. For example, unions might bargain over these issues with employers and demand more training. Also, the fact that unions reduce turnover can have a positive impact on the amount of firm-specific human capital that workers are willing to invest in.

In the United Kingdom, the evidence on the relationship between training and unionism is rather clear-cut: unionized workers receive more training and benefit more from participating in such programmes than non-unionized workers, as measured by post-training wages relative to pre-training wages (Booth, 1991; Booth, Francesconi and Zoega, 2003). These effects can partly offset the negative impact on investments in physical capital and R&D.

The empirical evidence from the United States is mixed. Some studies find that the amount of work-related and on-the-job training that workers receive in unionized firms is higher than in non-unionized ones (Lynch, 1992). Others cannot find any differences with regard to specific programmes such as computer literacy, numeracy and sales training (Lynch and Black, 1998).

More broadly, unions can even affect pre-employment investments in education by changing relative wages (through the wage mark-up). For example, studies of the wage mark-up for different skill groups indicate that unions contribute to the compression of wages within the unionized sectors of the economy (Freeman, 1980; see also Tzannatos, 1987, for methodological issues in measuring the wage mark-up). If unions reduce the return to schooling, say, by compressing the wage differential between workers with different skills, they can have an adverse impact on the formation of human capital. But when the relative wage of unskilled workers increases, firms substitute away from unskilled workers. To avoid being unemployed, (unskilled) workers have to acquire more skills, so the compression of the wage distribution may induce more, rather than less, education (Ravn and Sørensen, 1997).

## Unions and profitability

It is a commonly held view that unions reduce the profitability of firms because they appropriate part of the rent that would otherwise have

accrued to shareholders. The fact that unions are able to get a wage mark-up supports this view.[11] However, it is unwise to deduce the effect of unions on profitability by looking at the wage mark-up alone (Clark, 1984). This is because a union's ability to extract rent from a firm depends on the bargaining power of the union and on the size of the rent. Both depend on a mixture of factors such as the nature of collective bargaining, the structure of the product market and the production technology used. Besides, by improving morale and job satisfaction among workers and by facilitating worker–employer cooperation, unions can contribute positively to profitability. In other words, instead of trying to capture a given rent, unions may help to create profits from which they can achieve future wage gains or employment security (Filer, Hamermesh and Rees, 1996).

Studies have used a number of different measures of profitability such as price/cost margins, net (of wages) return to capital, Tobin's *q* (the market value of the firm relative to the replacement costs of the firm's assets), and subjective profitability judgments by management. They estimate the union impact using industry, firm or stock-market data. The evidence from the United States in the 1980s and early 1990s suggests that financial performance as measured by the above indicators is better in non-unionized than in unionized workplaces and firms (for a survey of studies on the United States, see Belman, 1992). The impact tends to be larger in industries or firms that have some monopoly power in their product market. Some of the evidence suggests that the unions' share of monopoly profits may be as large as between 47 and 77 per cent (Karier, 1988). While these figures may not be very representative, they do show that under specific circumstances unions are able to appropriate a substantial share of monopoly profits.

While a few studies on the United Kingdom find that unions have no impact on profitability, the generally accepted view is that unions have a negative impact on profitability in British manufacturing firms (for a survey of studies on the United Kingdom, see Booth, 1995). In Japan unions are found to reduce the rate of return on equity by 20-25 per cent and the ratio of profits to sales by 40 per cent (Brunello, 1992). Union presence is also associated with a higher fraction of profits going to workers (Tachibanaki and Noda, 2000). Unionization in the Republic of Korea is found to have a negative, but statistically insignificant, impact on operating profits (Kleiner and Lee, 1997).

While all of this evidence points in the same direction, more recent studies looking at the United States and the United Kingdom in the late

[11] Though studies generally confirm that the mark-up is positive, this effect is often found to be insignificant, for example, in countries such as Canada, Israel, the Netherlands, Spain and Switzerland (see Blanchflower, 1996; Blanchflower and Freeman, 1992; Blanchflower and Oswald, 1994).

1990s find that unions can have positive effects on profits. Batt and Welbourne (2002) looked at 464 entrepreneurial firms in the United States at the time of their initial offering in 1993 and followed their subsequent financial performance. Their study finds that union presence is associated with better financial performance. This surprising result can be due to a number of factors that have affected the impact of unions on profitability in this cohort of "new" firms coming into maturity in the mid-1990s. Such factors include more intense product market competition, a lower degree of labour-management conflict, the adaptation of high performance work systems, and a general fall in union power.

These themes also come up in recent British studies that no longer find evidence of a negative relationship between subjective performance measures and unionization using data from the latest British Workplace Employment Relations Survey (Wilkinson, 2000; Addison and Belfield, 2000). On balance, the evidence suggests that the earlier negative influence of unions on profits has diminished over time.

However, important differences still exist. First, multi-unionism (but not union recognition as such) continues to be associated with lower (self-reported) firm profitability in the United Kingdom (Pencavel, 2004). Crockett et al. (1992) find a similar result in their study of Australian workplaces. Second, it is mainly in unionized firms facing little product market competition that negative union effects are found (Metcalf, 2003). This may suggest that unions mainly share super-normal profits rather than cut into normal profits (Reynolds, 1986).[12] Thus, product market competition and/or development of better and more effective labour-management practices can reduce and perhaps even eliminate the negative effects of unions on profitability.

In fact, the literature on unions sharing corporate profits often ignores that, especially with the growth of financial markets, rents are capitalized in the value of the firm and so are not available for sharing. When a monopoly situation is established, for example as a result of an innovation, and the prospect for high profits is real, the inventor is likely to sell the right and make a large capital gain instantaneously. Thereafter, sales grow and the firm reverts to a public company. The monopoly power of the company is then reflected in the value of its shares, not in the rate of operating profit. It is the rate of return to the shares (in the form of dividends and capital gains) that is relevant for collective bargaining and this is determined competitively in the stock market. The firm's ability to

[12] See also footnote 7 in Sapsford and Tzannatos (1993).

provide high wages to its workforce therefore diminishes or may even disappear (Sapsford and Tzannatos, 1993).

## Efficiency at the economy-wide level

### *The costs of unionization*

In the traditional "monopoly view", when trade unions succeed in securing benefits for their members that would not have been possible under competitive conditions, they impose costs on society, the so-called monopoly costs of unions (Rees, 1963). In a similar vein, unions can create "rent-seeking costs". In this view, unions are seen as representatives of special interests of their members in collective bargaining and in the political process (Pencavel, 1995), and they can promote policies that reduce competition in labour and product markets (Rama, 1997; Rama and Tabellini, 1998). In either case, when unions are successful in achieving such narrow objectives, workers tend to be displaced from the unionized sectors to non-unionized sectors. This creates a deadweight loss.

A number of economy-wide studies have estimated this deadweight loss of the wage mark-up and found it, somewhat surprisingly, to be quite small. For the United States, the welfare loss is estimated to be less than 0.5 per cent of GDP – i.e. less than one percentage point (Rees, 1963; Johnson and Mieszkowski, 1970). Similarly, the simulated welfare loss associated with a 15 per cent union/non-union wage mark-up is found to be around 0.2-0.4 per cent of GDP (Freeman and Medoff, 1984). Interestingly, the results for the United States are similar to those for Australia where the average mark-up is 7 to 17 per cent (Christie, 1992) and where 80 per cent of the workforce is covered by collective agreements (compared to 15 per cent in the United States).

### *Can the costs of unionization be mitigated or even reversed?*

Against the aforementioned negative effects, unions may have some economy-wide positive effects. For example, some studies have considered the issue of disclosure of information on risks associated with different jobs (Maskus, Rutherford and Selby, 1995). The risks can arise from the use of different technologies that involve different exposures to toxins and industrial accidents. When workers do not know or appreciate the dangers inherent in different jobs, and firms are not required to compensate workers fully for the hidden risks involved in their jobs, this leads to an inefficient allocation of labour across sectors, with too many workers doing jobs that are too dangerous. Though this information failure and myopic behaviour of workers can be corrected in many different ways –

e.g. through labour market reforms that induce full disclosure of risk levels – trade unions often play an instrumental role in rectifying this distortion. A study on the Mexican economy of the welfare effects of a labour market reform of this type found that the well-being of workers would increase by 0.5 per cent of baseline GDP per year. Moreover, the real income of the owners of the firms would increase as well because the reform would increase the demand for capital for risk-abatement purposes. The total gain is then estimated to be 0.6 per cent of baseline GDP per year (Maskus, Rutherford and Selby, 1995). This is a substantial gain and is of the same order of magnitude as the estimated monopoly cost of unions.

## But would unions care for efficiency?

What then determines the "face of a union", that is, whether it will exploit its power to extract rents from firms rather than provide various agency services that reduce or eliminate inefficiencies at the workplace and thus create benefits for its members and in doing so enhance productivity and economic outcomes more broadly?

A useful starting point in answering this question is to note that a union has limited resources, which it can devote either to activities related to rent extraction or to activities related to rent creation. On the one hand, it may try to extract a larger share of the rent that the parent firm earns from its monopoly position in the product market. On the other hand, it may try to improve productivity at the workplace in order to increase the rent available for sharing. The union leadership is thus faced with the task of allocating its resources between these two activities.

It is reasonable to assume that the union leadership will, in general, choose to allocate some resources to both activities (Aidt and Sena, 2005). Resources allocated to rent extraction yield returns in the form of higher wages – a larger share of a given pie – while resources allocated to rent creation yield returns in the form of higher employment – the same share of a larger pie. The choice made by the union leadership would be conditioned by the economic and legal environment in which the union operates.

In this regard, product market competition plays an important role. The rent the union shares with the firm derives from the latter's monopoly position in the product market. When this position is weakened and the rent available for sharing is reduced, the union is likely to shift its attention away from rent extraction towards rent creation. By doing so, it attempts to compensate its membership for the rent lost by making it more attractive for the firm to retain more of its members. Loosely speaking, the union wants to make the pie to be divided between the two parties larger, rather than trying to capture a larger share of a smaller pie.

Another important factor is labour market regulation. For example, in response to labour market deregulation that cuts into their bargaining power, unions will devote more resources to the task of building up (union-specific) bargaining power and take a more aggressive and militant stance. This line of reasoning accords with the often observed symptom of labour market deregulation of increased industrial conflict.

These are just two examples of how changes in the economic and legal environment shape the "face of a union". But the general principle is clear: whether unions mostly devote their resources to rent extraction or to rent creation varies systematically with the characteristics of the external environment. The face of a union is, therefore, not set in stone and changes over time in response to such external pressures. An implication, then, is that government policy, such as deregulation of product markets, can exercise substantial influence on the behaviour of unions.

A case study demonstrates quite clearly how this might happen (Brown and Ryan, 2003). In 1996 a number of utility companies in the United Kingdom's water and electricity industry were privatized. The nationalized industries from which these companies emerged used to be characterized by industry-wide collective bargaining, closed-shop arrangements and adversarial industrial relations. After privatization the companies found themselves in a highly competitive product market and rationalization was urgently needed. Within three years industrial relations had been totally reformed and the old militant stance of the unions had been replaced by "partnership agreements" that emphasized the principles of consultation and cooperation as opposed to conflict. The face of unions changed.

## Concluding remarks

The net effect of unions on efficiency is theoretically ambiguous. The negative monopoly view and rent-seeking view of unionization can be countered – if not completely, at least to some extent – by the organizational view. The latter acknowledges that unions can have efficiency-enhancing participatory benefits for both workers and management by facilitating cooperation at the workplace. The benefits can arise because unions are institutions with a collective voice and can communicate worker preferences to management, as well as participate in the establishment of work rules and seniority provisions in the firm's internal labour market (Faith and Reid, 1987). These agency services can change the "exit-voice" trade-off of workers by providing a channel through which they can express their grievances ("voice") without having to leave the firm ("exit"). Reducing turnover increases the incentive of employers to provide firm-specific training and facilitates long-term productive

working relationships.[13] Unions may help to enforce contracts between workers and management and thus increase productivity by providing a channel through which labour can draw management's attention to changes in working methods or production techniques that may again be beneficial to both parties (Malcomson, 1983). This channel also offers a mechanism by which unions can reduce X-inefficiency by the adoption of better practices at the workplace.[14]

In empirical terms, this article has offered an eclectic assessment of union effects on the economy from the point of view of efficiency. The main issues reviewed can be summarized in the form of the following four questions:

- Are the levels and rates of change of productivity lower under unionization?
- Do unions slow down the implementation of new technology?
- Do physical investments take place at a slower rate under union influence?
- Is investment in research and development impeded by the presence of unions?

Though answers to these questions are naturally indicative of only partial effects, a positive answer to any one of them would give reasons for concern. Positive answers would support the view that unions impose some form of allocative, technical or dynamic efficiency loss upon the economy with subsequent loss of output, decrease in the rate of economic growth and perpetuation of poverty. Our review of the answers economists have to offer produced a rather mixed picture. Though others may be uncomfortable with such ambiguity, economists can live with this.

This mixed picture also emerges with respect to profits. The lack of solid evidence for distributional inefficiency is not unexpected as the view of rent extraction (that unions take away a greater share of profits from firms today) can be countered by the view of rent creation whereby unions may be concerned to increase profits in a sustainable way so they secure more benefits tomorrow even though the share of profits they appropriate remains the same.

The article also addressed issues related to human capital development (education and training) and also human capital protection (health and safety regulations). The evidence on training and education is again mixed, though the introduction of health and safety regulations

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[13] Whereas individual firms have an incentive to give in to union demands (to avoid a local conflict), the industry as a whole has less incentive to do so, and by joining forces, it is easier for firms to resist union demands (Dowrick, 1993).

[14] X-inefficiency refers to a situation in which a firm's total costs are not minimized because the actual output from given inputs is less than the maximum feasible level.

can create enough economy-wide benefits to compensate (or even over-compensate) for some of the negative effects of unionization.

Finally, also at the economy-wide level, the article examined why and whether unions may care about efficiency. This depends on the market conditions and labour regulations unions and employers face. These two factors can significantly affect the way unions behave. In this context, it is these external factors that determine the face of the union rather than the other way round.

In conclusion, trade unions are most effective at improving conditions for workers without efficiency costs when product markets are competitive and unions cannot simply extract rents for their members but need to care about rent creation; when collective bargaining arrangements and broader coordination in the labour market are sufficiently flexible to accommodate different demand and supply conditions for different types of workers and industries; and when unions operate in a context that allows them to internalize and absorb the cost of their actions. However, there are cases where unions can be co-opted by political elites or by the state or certain groups of workers, and their actions can then have significant negative economic effects and costs for efficiency. For example, evidence from industrial societies suggests that union involvement can reduce the employment of young and older workers ("outsiders") and benefit prime-age workers, while evidence from manufacturing in some African countries suggests that the wage mark-up can exceed 30 to 40 per cent.

All of these points highlight the necessity of examining the role of unions together with the roles of employers and governments. It is the package of economic and labour policies and the totality of their effects that matters. For example, improvements in health and safety at work need not be just the result of union action. They can also arise from action taken by enlightened governments or socially responsible employers. Though this does not negate the role of unions, it strengthens the point that labour market coordination by all the social partners can be a powerful mechanism for improving economic outcomes and increasing welfare. In fact, in many instances coordination in the labour market has been found to have a host of beneficial effects at the macroeconomic level (see Aidt and Tzannatos, 2005). To enable coordination, all social partners should be able to be represented at the negotiating table.[15]

Workers need representation – and though the meaning of each word may be different in different economies and can change over time

[15] Nicolas Sarkozy, France's interior minister and head of the UMP Party, argues that: "The problem in our country is not that we have too powerful unions, but that they are too fragmented and too small. … Let's help the union organizations to enlarge their base" by encouraging wider representation at the workers' councils and giving a tax break for union dues to boost membership (*The Economist*, April 29, 2006, p. 32.). Compare this macro view to the micro view: "Wal-Mart [argues] its employees are treated so well they don't need representation" (Keogh, 2005).

– this statement is probably true in all places and at all times.[16] And when this need is addressed properly, static, dynamic and distributional efficiency can all be enhanced. This can enhance the welfare of workers, increase employers' profits and satisfy economists.

## References


Acs, Zoltan J.; Audretsch, David B. 1987. "Innovation in large and small firms", in *Economics Letters* (Amsterdam), Vol. 23, No. 1, pp. 109-112.

Addison, John T.; Belfield, Clive R. 2000. "The impact of financial participation and employee involvement on financial performance: A re-estimation using the 1998 WERS", in *Scottish Journal of Political Economy* (Edinburgh), Vol. 47, No. 5, pp. 571-583.

—; Hirsch, Barry T. 1989. "Union effects on productivity, profits, and growth: Has the long run arrived?", in *Journal of Labor Economics* (Chicago, IL), Vol. 7, No. 1, pp. 72-105.

—; Siebert, W. Stanley; Wagner, Joachim; Wei, Xiangdong. 2000. "Worker participation and firm performance: Evidence from Germany and Britain", in *British Journal of Industrial Relations* (Oxford), Vol. 38, No. 1, pp. 7-49.

Aidt, Toke Skovsgaard; Sena, Vania. 2005. "Unions: Rent creators or extractors?", in *Scandinavian Journal of Economics* (Oxford), Vol. 107, No. 1, pp. 103-121.

—; Tzannatos, Zafiris. 2005. *The cost and benefits of collective bargaining*. Cambridge Working Papers in Economics, No. 0541. Cambridge, University of Cambridge, Faculty of Economics.

—; —.2002. *Unions and collective bargaining: Economic effects in a global environment*. Washington, DC, World Bank.

Batt, Rosemary; Welbourne, Theresa M. 2002. "Performance and growth in entrepreneurial firms: Revisiting the union-performance relationship", in Jerome A. Katz and Theresa M. Welbourne (eds.): *Advances in entrepreneurship, firm emergence and growth. Volume 5: Managing people in entrepreneurial organizations: Learning from the merger of entrepreneurship and human resource management*. Amsterdam, Elsevier.

Bean, Charles R.; Symons, Jim. 1989. "Ten years of Mrs. T.", in Olivier J. Blanchard and Stanley Fischer (eds.): *NBER Macroeconomics Annual 1989.* Cambridge, MA, MIT Press.

Belman, Dale. 1992. "Unions, the quality of labor relations, and firm performance", in Lawrence Mishel and Paula B. Voos (eds.): *Unions and economic competitiveness*. Armonk, NY, M.E. Sharpe, pp. 41-107.

Benson, John. 1994. "The economic effects of unionism on Japanese manufacturing enterprises", in *British Journal of Industrial Relations* (Oxford), Vol. 32, No. 1, pp. 1-21.

Betcherman, Gordon. 1991. "The effect of unions on the innovative behaviour of firms in Canada", in *Industrial Relations Journal* (Oxford), Vol. 22, No. 2, pp. 142-151.

Blanchflower, David G. 1996. *The role and influence of trade unions in the OECD*. Centre for Economic Performance Discussion Paper No. 310. London, London School of Economics.

—; Freeman, Richard B. 1992. "Unionism in the United States and other advanced OECD countries", in *Industrial Relations* (Malden, MA), Vol. 31, No. 1, pp. 56-79.

—; Oswald, Andrew J. 1994. *The wage curve*. Cambridge, MA, MIT Press.

Booth, Alison L. 1995. *The economics of the trade union*. Cambridge, Cambridge University Press.


[16] For example, the World Bank recognizes that the free organization of people into groups based on shared concerns and common goals is a fundamental part of a dynamic, successful society in building partnerships with the business community and civil society and with organizations that have been leading the way in civil society in the fight against corruption (World Bank, 1998).

—.1991. "Job-related formal training: Who receives it and what is it worth?", in *Oxford Bulletin of Economics and Statistics* (Oxford), Vol. 53, No. 3, pp. 281-294.

—; Francesconi, Marco; Zoega, Gylfi. 2003. "Unions, training and wages: Evidence for British men", in *Industrial and Labor Relations Review* (Ithaca, NY), Vol. 57, No. 1, pp. 68-91.

Bronars, Stephen G.; Deere, Donald R. 1993. "Unionisation, incomplete contracting and capital investment", in *Journal of Business* (Chicago, IL), Vol. 66, No. 1 (Jan.), pp. 117-132.

Brown, William; Ryan, Paul. 2003. "The irrelevance of trade union recognition? A comparison of two matched companies", in *Australian Journal of Labour Economics* (North Ryde), Vol. 6, No. 2, pp. 383-408.

Brunello, Giorgio. 1992. "The effect of unions on firm performance in Japanese manufacturing", in *Industrial and Labor Relations Review* (Ithaca, NY), Vol. 45, No. 3, pp. 471-487.

Christie, Virginia. 1992. "Union wage effects and the probability of union membership", in *Economic Record* (East Ivanhoe), Vol. 68, No. 200, pp. 43-56.

Clark, Kim B. 1984. "Unionization and firm performance: The impact on profits, growth, and productivity", in *American Economic Review* (Nashville, TN), Vol. 74, No. 5 (Dec.), pp. 893-919.

Connolly, Robert A.; Hirsch, Barry T.; Hirschey, Mark. 1986. "Union rent seeking, tangible capital, and market value of the firm", in *Review of Economics and Statistics* (Cambridge, MA), Vol. 68, No. 4 (Nov.), pp. 567-577.

Crockett, Geoffrey; Dawkins, Peter; Miller, Paul; Mulvey, Charles. 1992. "The impact of unions on workplace productivity in Australia," in *Australian Bulletin of Labour* (Adelaide), Vol. 18, No. 2, pp. 119-141.

Daniel, W.W. 1987. *Workplace industrial relations and technical change.* London, Frances Pinter.

Denny, Kevin. 1997. "Productivity and trade unions in British manufacturing industry 1973-85", in *Applied Economics* (London), Vol. 29, No. 10, pp. 1403-1409.

—; Nickell, Stephen J. 1992. "Unions and investment in British industry", in *Economic Journal* (Oxford), Vol. 102, No. 413, pp. 874-887.

—; —.1991. "Unions and investment in British manufacturing industry", in *British Journal of Industrial Relations* (Oxford), Vol. 29, No. 1, pp. 113-122.

Dowrick, Steve. 1993. *Wage bargaining systems and productivity growth in OECD countries.* Background Paper No. 26. Report prepared for the Economic Planning Advisory Council. Canberra, Australian Government Publishing Service.

Drago, Robert; Wooden, Mark. 1992. "The Australian Workplace Industrial Relations Survey and workplace performance", in *Australian Bulletin of Labour* (Adelaide), Vol. 18, No. 2, pp. 142-167.

Faith, Roger L.; Reid, Joseph D. 1987. "An agency theory of unionism", in *Journal of Economic Behavior and Organization* (Amsterdam), Vol. 8, pp. 39-60.

Filer, Randall K.; Hamermesh, Daniel S.; Rees, Albert E. 1996. *The economics of work and pay.* Sixth edition. New York, NY, HarperCollins College Publishers.

Freeman, Richard B. 1993. "Labor markets and institutions in economic development", in *American Economic Review, Papers and Proceedings* (Nashville, TN), Vol. 83, No. 2 (May), pp. 403-409.

—.1980 "Unionism and the dispersion of wages", in *Industrial and Labor Relations Review* (Ithaca, NY), Vol. 34, No. 1 (Oct.), pp. 3-23.

—; Medoff, James L. 1984. *What do unions do?* New York, NY, Basic Books.

Gregg, Paul; Machin, Stephen; Szymanski, Stefan. 1993. "The disappearing relationship between directors' pay and corporate performance", in *British Journal of Industrial Relations* (Oxford), Vol. 31, No. 1, pp. 1-9.

Grout, Paul A. 1984. "Investment and wages in the absence of binding contracts: A Nash bargaining approach", in *Econometrica* (New York, NY), Vol. 52, No. 2 (Mar.), pp. 449-460.

Hirsch, Barry T. 1990. "Innovative activity, productivity growth, and firm performance: Are unions a spur or a deterrent?", in Albert N. Link and V. Kerry Smith (eds.): *Advances in applied microeconomics: A research annual*. Vol. 5. Greenwich, CT, JAI Press, pp. 69-104.

Johnson, Harry G.; Mieszkowski, Peter. 1970. "The effects of unionisation on the distribution of income: A general equilibrium approach", in *Quarterly Journal of Economics* (Cambridge, MA), Vol. 84, No. 4 (Nov.), pp. 539-561.

Karier, Thomas. 1988. "New evidence on the effect of unions and imports on monopoly power", in *Journal of Post Keynesian Economics* (White Plains, NY), Vol. 10, No. 3, pp. 414-427.

Katz, Harry C.; Kochan, Thomas A.; Gobeille, Kenneth R. 1983. "Industrial relations performance, economic performance, and QWL programs: An interplant analysis", in *Industrial and Labor Relations Review* (Ithaca, NY), Vol. 37, No. 1, pp 3-17.

Keefe, Jeffrey H. 1992. "Do unions hinder technological change?", in Lawrence Mishel and Paula B. Voos (eds.): *Unions and economic competitiveness.* Armonk, NY, M.E. Sharpe, pp. 109-141.

Kennan, John. 1986. "The economics of strikes", in Orley Ashenfelter and Richard Layard (eds.): *Handbook of labor economics.* Volume 2. Amsterdam, North-Holland, pp. 1091-1137.

Keogh, Bryan. 2005. *Oh that Starbucks ubiquity.* New York, NY, New York University, Business and Economics Reporting Program. Available at: http://journalism.nyu.edu/pubzone/theoryb/node/685.

Kleiner, Morris M.; Lee, Young-Myon. 1997. "Works councils and unionization: Lessons from South Korea", in *Industrial Relations* (Cambridge, MA), Vol. 36, No. 1 (Jan.), pp. 1-16.

Knight, K.G. 1989. "Labour productivity and strike activity in British manufacturing industries: Some quantitative evidence", in *British Journal of Industrial Relations* (Oxford), Vol. 27, No. 3 (Nov.), pp. 365-374.

Kuhn, Peter; Márquez, Gustavo. 2005. "The economic effects of unions in Latin America", in Peter Kuhn and Gustavo Márquez (eds.): *What difference do unions make? Their impact on productivity and wages in Latin America*. Washington, DC, Inter-American Development Bank.

Latreille, Paul L. 1992. "Unions and the inter-establishment adoption of new microelectronic technologies in the British private manufacturing sector", in *Oxford Bulletin of Economics and Statistics* (Oxford), Vol. 54, No. 1, pp. 31-51.

Lynch, Lisa M. 1992. "Private sector training and the earnings of young workers", in *American Economic Review* (Nashville, TN), Vol. 81, No. 1, pp. 299-312.

—; Black, Sandra E. 1998. "Beyond the incidence of employer-provided training", in *Industrial and Labour Relations Review* (Ithaca, NY), Vol. 52, No. 1, pp. 64-81.

Machin, Stephen; Wadhwani, Sushil. 1991. "The effect of unions on organisational change and employment", in *Economic Journal* (Oxford), Vol. 101, No. 407, pp. 835-854.

Maki, Dennis R. 1983. "The effects of unions and strikes on the rate of growth of total factor productivity in Canada", in *Applied Economics* (London), Vol. 15, No. 1, pp. 29-41.

Malcomson, James M. 1983. "Trade unions and economic efficiency", in *Economic Journal* (Oxford), Vol. 93 (Conference Papers Supplement), pp. 51-65.

Maskus, Keith E.; Rutherford, Thomas J.; Selby, Steven. 1995. "Implications of changes in labor standards: A computational analysis for Mexico", in *North American Journal of Economics and Finance* (Boulder, CO), Vol. 6, No. 2, pp. 171-188.

Metcalf, David. 2003. "Unions and productivity, financial performance and investment: International evidence", in John T. Addison and Claus Schnabel (eds.): *International handbook of trade unions*. Cheltenham, Edward Elgar, pp. 118-171.

—.2002. *Unions and productivity, financial performance and investment: International evidence.* Working Paper No. 539. London, London School of Economics, Centre for Economic Performance.

—.1993. "Industrial relations and economic performance", in *British Journal of Industrial Relations* (Oxford), Vol. 31, No. 2, pp. 255-283.

Moreton, David. 1993. *Trade union effects on labour productivity in UK manufacturing, 1950-1987*. Unpublished mimeo. London, University of Greenwich.

Muramatsu, Kuramitsu. 1984. "The effect of trade unions on productivity in Japanese manufacturing industries", in Masahiko Aoki (ed.): *The economic analysis of the Japanese firm*. Amsterdam, North-Holland, pp. 103-123.

Nickell, Stephen J.; Wadhwani, Sushil; Wall, Martin. 1989. *Unions and productivity growth in Britain, 1974-86: Evidence from UK company accounts data*. Working Paper No. 1149. London, London School of Economics, Centre for Labour Economics.

Odgers, Cameron W.; Betts, Julian R. 1997. "Do unions reduce investment? Evidence from Canada", in *Industrial and Labor Relations Review* (Ithaca, NY), Vol. 51, No. 1, pp. 18-36.

Pencavel, John H. 2004. "The surprising retreat of Union Britain", in David Care, Richard Blundell and Richard B. Freeman (eds.): *Seeking a premier economy: The economic effects of British economic reforms, 1980-2000*. Chicago, IL, University of Chicago Press, pp. 181-232.

—.1995. *The role of labor unions in fostering economic development*. Policy Research Working Paper No. 1469. Washington, DC, World Bank.

Rama, Martín. 1997. "Organized labor and the political economy of product market distortions", in *The World Bank Economic Review* (Washington, DC), Vol. 11, No. 2 (May), pp. 327-355.

—; Tabellini, Guido. 1998. "Lobbying by capital and labor over trade and labor market policies", in *European Economic Review* (Amsterdam), Vol. 42, No. 7, pp. 1295-1316.

Ravn, Morten O.; Sørensen, Jan Rose. 1997. "Minimum wages: Curse or blessing", in Solomon W. Polachek (ed.): *Research in Labor Economics*. Vol. 16. Greenwich, CT, JAI Press, pp. 343-368.

Rees, Albert 1963. "The effects of unions on resource allocation", in *Journal of Law and Economics* (Chicago, IL), Vol. 6, pp 69-78.

Reynolds, Morgan O. 1986. "Trade unions in the production process reconsidered", in *Journal of Political Economy* (Chicago, IL), Vol. 94, No, 2, pp. 443-447.

Sapsford, David; Tzannatos, Zafiris. 1993. *The economics of the labour market.* London, Macmillan.

Schedlitzki, Doris. 2002. *German works councils, employee involvement programs and their impact on establishment profitability.* Working Paper No. 1191. London, London School of Economics, Centre for Economic Performance.

Schnabel, Claus. 1991. "Trade unions and productivity: The German evidence", in *British Journal of Industrial Relations* (Oxford), Vol. 29, No. 1, pp. 15-24.

Standing, Guy. 1992. "Do unions impede or accelerate structural adjustment? Industrial versus company unions in an industrializing labour market", in *Cambridge Journal of Economics* (Oxford), Vol. 16, No. 3, pp. 327-354.

Stevens, Mark; Millward, Neil; Smart, David. 1989. "Trade union membership and the closed shop in 1989", in *Employment Gazette* (London), Nov., pp. 615-623.

Tachibanaki, Toshiaki; Noda, Tomohiko. 2000. *The economic effects of trade unions in Japan*. Basingstoke, MacMillan.

Taymaz, Erol. 1991. "The impact of trade unions on the diffusion of technology: The case of NC machine tools", in *British Journal of Industrial Relations* (Oxford), Vol. 29, No. 2, pp. 305-311.

Tzannatos, Zafiris. 1987. "Union versus non-union wages, arithmetic versus geometric means and grouped data revisited", in *Bulletin of Economic Research* (Oxford), Vol. 39, No. 1, pp. 91-94.

Ulph, Alistair; Ulph, David T. 1990. "Union bargaining: A survey of recent work", in David Sapsford and Zafiris Tzannatos (eds.): *Current issues in labour economics*. London, MacMillan.

Van Reenen, John. 1996. "The creation and capture of rents: Wages and innovation in a panel of U.K. companies", in *Quarterly Journal of Economics* (Cambridge, MA), Vol. 111, No. 1, pp. 195-226.

Wilkinson, David. 2000. *Collective bargaining and workplace financial performance in Britain*. Unpublished mimeo. London, Policy Studies Institute.

World Bank. 2006. *World Development Report 2006: Equity and development*. Washington DC.

—.2004. *World Development Report 2004: Making services work for poor people*. Washington, DC.

—.1998. *Development and human rights: The role of the World Bank*. Washington, DC.