CHAPTER 3

Economic performance and the structure of collective bargaining

A. INTRODUCTION AND MAIN FINDINGS

1. Introduction

The economic performance of OECD countries varied substantially over the 1970s and 1980s. Considering unemployment, for example, the variation in countries' performances has been much greater since the first oil price shock in 1973 than was the case beforehand. A large literature has developed which seeks to account for the causes of inter-country variation in various measures of economic performance [OECD (1994*b*)]. One strand of this literature has investigated whether differences in institutional settings might be correlated with economic and labour market performance. In particular, much interest has focused on the potential importance of collective bargaining systems.

Wage bargaining can take place at several different levels. At one extreme, firms and employees negotiate over wages and working conditions at the level of the individual enterprise or establishment while, at the other end of the scale, national unions and employers' associations may bargain for the whole country. An intermediate case is that of sectoral, branch or industry-level bargaining. OECD countries occupy quite diverse positions on this scale. For example, the Nordic countries have typically been characterised by centralised bargaining systems, whereas those in the United States and Canada are at the more decentralised end of the range. In between are countries with what are often termed "intermediate" bargaining systems, such as Belgium, Germany and the Netherlands.

Recent years have seen quite substantial changes in some countries' collective bargaining institutions, driven to some extent by arguments relating to the relative economic merits of different bargaining systems.[1] Decentralisation of collective bargaining has taken place notably in the United Kingdom, starting in the 1960s and accelerating in the 1980s, in New Zealand, with the passing of the Employment Contracts Act in 1991 and the dismantling of the *award* system, and in Sweden, where the previous system of centralised bargaining has been replaced by agreements at the sectoral level. On the other hand, recent years have seen moves towards more centralised bargaining systems in Norway and Portugal. In Australia, the wage bargaining system centralised from 1975 to 1987 and then moved back towards enterprise bargaining. The Danish system exhibited the opposite pattern, decentralising in the 1980s and then centralising from 1989 onwards; the same is true of Italy.

Hypotheses about the possible impacts of institutional arrangements on labour market performance may be described by two extremes: at one end, the "Eurosclerosis" view implies that non-market institutions and regulations are "rigidities" which harm economic performance; the opposite end is occupied by the so-called "corporatist" view, which argues that institutional arrangements exist to overcome various market failures, and may, therefore, be beneficial to national economic performance.[2]

Both hypotheses assume a linear relationship between economic performance and the degree of centralisation of the wage bargaining system. This viewpoint was challenged in an influential article in 1988 by Calmfors and Driffill, who argued that the relationship is non-linear, *i.e.* either centralised or decentralised bargaining systems are likely to outperform countries with intermediate, mainly sectoral, bargaining. This perspective, developed and applied by them and others, argued that the relation between bargaining institutions and employment is "U-shaped": employment rates being higher in both decentralised and centralised systems compared with intermediate ones. The relation with the unemployment rate is seen as "hump-shaped": unemployment rates being lower in both decentralised and centralised systems.

The main tasks of this chapter are threefold. First, it extends Calmfors and Driffill's original analysis to cover the 1986 to 1996 period. Second, it builds on the analysis in the 1991 and 1994 *Employment Outlooks* by making use of new quantitative information on trade union density, collective bar-

gaining coverage (the percentage of workers whose terms of employment are determined by a collective agreement), and measures of both the centralisation and co-ordination of bargaining. Third, it examines statistically the correlations between these bargaining measures and a wide range of indicators of economic performance.

2. Main findings

Accurate assessments of the impact of different systems of collective bargaining on measures of economic performance are difficult because of measurement and methodological problems. While it is premature to draw definitive conclusions on this issue, the evidence presented in this chapter does not show many statistically significant relationships between most measures of economic performance and collective bargaining. This negative conclusion holds irrespective of whether collective bargaining systems are proxied by measures of trade union density, collective bargaining coverage or the centralisation and co-ordination of bargaining. One exception to these negative findings is that there is a fairly robust relation between cross-country differences in earnings inequality and bargaining structures. More centralised/co-ordinated economies have significantly less earnings inequality compared with more decentralised/uncoordinated ones. In addition, while not always statistically significant, the chapter finds some tendency for more centralised/co-ordinated bargaining systems to have lower unemployment and higher employment rates compared with other, less centralised/co-ordinated systems.

How should one interpret such findings? While they raise some doubts about the robustness of the conclusions of some previous research which claimed to have found significant relations (*e.g.* a "hump-shaped" relation between unemployment and the ranking of countries from less to more decentralised bargaining, and a "U-shaped" relation between employment and this same ranking), it is probably premature to consider the issue settled. Labour market performance indicators are undoubtedly affected by a number of institutional factors and policy instruments. Some may themselves be independent of a country's system of collective bargaining, while others may interact in complex ways with bargaining variables not addressed in this chapter. More analysis is necessary to elucidate whether there are any robust relations between collective bargaining systems and economic performance.

B. THEORETICAL ARGUMENTS AND EMPIRICAL EVIDENCE

1. Theory

Wage bargaining can take place at the firm (establishment) level, at the national level, or at intermediate levels (*e.g.* branch, industry or sector-level). In a decentralised system, negotiations take place between employee representatives and single employers. Trade unions may also bargain with employer associations at the branch level (multi-employer bargaining). Lastly, in some countries the peak organisations of trade unions and employers negotiate at the national level, sometimes with the government as a third partner (centralised bargaining). In practice, bargaining may occur simultaneously at more than one level: national or branch-level agreements may set (minimum) standards which can be modified at more decentralised levels. In the case of wage bargaining, any difference between the centrally-negotiated agreement and the actual wage increase – so-called "wage drift" – depends on the ability and desire of the peak-level organisations to enforce the central agreement on all their members.

Economic theory advances the following arguments regarding the relationship between wage bargaining and performance. First, if a trade union and an individual employer bargain, the employment effect of wage increases depends strongly on the price elasticity of demand for the firm's product. A monopoly firm, facing price-inelastic demand, can simply pass wage increases on to its customers without losing sales. However, monopolies are rare and most firms are confronted with competitors, or potential competitors, providing substitute products. As the number of competitors increases, or as the products which they supply become closer substitutes for the firm's own output, the price elasticity of demand which the firm faces will rise. In a perfectly competitive market, firms face an infinitely elastic demand curve, so that any price rise resulting from higher wages will reduce the demand for the specific firm's output towards zero. In such markets, the trade-off between wage increases and employment at the firm level is large and will be recognised as such by enterprise-based unions.[3]

Now consider negotiations by a branch-level or industrial union. Unions which bargain at the industry level may exploit their market power to secure higher wages for that industry's workers [Booth (1995); Calmfors (1993)]. The resulting higher price for that industry's output will not reduce demand by as much as in the competitive case, as there are unlikely to be many close substitutes at the industry level, so that employment in the industry will be

less affected by the wage rise. The "price" for the higher wage is paid by consumers. As above, the strength of the wage-employment relationship depends on the number and closeness of substitute products, but it remains true that there are fewer substitutes for, say, cars as a whole than for one particular brand of cars. The general conclusion is that more decentralised bargaining brings greater wage discipline in its wake through the elasticity of demand in the product market; to this extent economies with more decentralised wage bargaining systems will exhibit lower real wages and higher levels of employment.

A second relationship between wage-setting institutions and economic performance hinges on the presence of negative externalities: wage bargains made by a certain group of workers may have harmful effects on other individuals in the economy. Calmfors (1993) identifies seven such externalities:

- *consumer price externalities:* Higher wages for some workers lead to higher prices for all consumers, and thus to lower real disposable income for those who do not benefit from the bargained higher wages;
- *input price externalities:* Higher wages cause higher input prices and, therefore, lower output and employment in the sectors using these inputs;
- *fiscal externalities:* The unemployment and related welfare benefits paid to those who lose their jobs as a result of a bargained wage rise are paid for by all taxpayers, not just by the parties covered by the bargaining agreement [see Holmlund (1993)]. Similarly, these higher wages may bring about lower output and, thus, lower tax payments;
- *unemployment externality:* A rise in unemployment resulting from higher wages makes it more difficult for all unemployed workers to find jobs;
- *investment externality:* Due to labour turnover, not all of the workers currently employed will benefit from the future higher wages to be gained from current investment. Therefore, the union has a reduced incentive to encourage such investment. However, higher bargained wages may help to encourage the substitution of capital for labour, so the overall effect is uncertain;
- *envy externality*: If, as researchers in a number of disciplines have suggested [Adams (1963); Clark and Oswald (1996); Frank (1985)], individual well-being partly depends on some process of comparison with others, higher wages for some workers will reduce the relative wage, and thus the well-being, of others; and
- *effciency wage externality:* If the effort of workers depends on their relative wage, higher wages resulting from a union bargain will lead to lower effort from those workers who are not covered by the bargain; they may also encourage uncovered workers to quit and seek a job in the covered sector. Both of these effects impose costs on uncovered employers.

Additional externalities might include inter-union rivalries under decentralised wage bargaining. Separate bargains for different groups of workers may exacerbate pay leap-frogging, producing inflationary pressure [Blyth (1979); Cörvers and van Veen (1995); Jackman *et al.* (1996); OECD (1994*b*)]. In addition, any employment loss resulting from higher bargained wages in the covered sector will lead to an increase in labour supply to the uncovered sector, which will drive down the wages of uncovered workers.

The key issue here is the extent to which these externalities are taken into account in the bargaining process. If workers are not altruistic, none of them will be internalised under decentralised bargaining because those who receive the benefits are only a very small percentage of those who are harmed by higher bargained wages – all consumers, workers and taxpayers in the economy. As bargaining becomes more centralised and/or co-ordinated, the distinction between those who benefit and those who are harmed becomes less clear. Under centralised wage bargaining, those who benefit from higher wages and those who are harmed are virtually the same group.[4] It is, thus, argued that more centralised unions (and employers' associations) will internalise to a far greater extent the macroeconomic consequences of their actions, and will agree to lower real wage levels, as there are no large outside groups to which the resulting negative effects can be shifted.

Calmfors and Driffill (1988) argue that the net impact of the competitive and externality effects is to produce a U-shaped relationship between a country's economic performance and the centralisation of its bargaining system (and hence a hump-shaped relationship between unemployment and centralisation). Decentralised bargains externalise to a large degree the negative consequences of higher wages, but are constrained by competition in the product market. A centralised union, on the other hand, will internalise more of the negative externalities resultant on the wage outcome as it considers the welfare of all its members in the economy. By contrast, economies with an intermediate level of wage bargaining suffer from both the absence of competitive pressures and from a lack of

internalisation of negative externalities. These latter countries are hypothesised to exhibit less favourable macroeconomic performance.

The above theory emphasizes the role of lower wages in bringing about higher employment. More generally, the different degrees of wage pressure may also feed through to inflation, at least in the short to medium run. Finally, most studies find that unionisation is typically associated with greater equalisation of wages [Bellman and Möller (1993); Blau and Kahn (1996); Hartog and Teulings (1997); Metcalf (1993); Whitehouse (1992); Zweimüller and Barth (1994)]. This may come about by the setting of wage floors, for example. One hypothesis is that more centralised unions may be in a more powerful position to enforce policies reducing earnings inequality.[5]

It is not clear that the net result of the competition and externality effects would be to produce a U-shaped relationship between the centralisation of the wage bargaining system and economic performance. Some authors have proposed a positive linear relationship [Bruno and Sachs (1985); Layard *et al.* (1991); Soskice (1990); Traxler *et al.* (1996)]. Here, the more centralised (''co-ordinated'' or ''corporatist'') a bargaining system is, the more likely it is to take into account the macroeconomic impacts of any wage agreement. In other words, the favourable performance effects of increasing centralisation that come from internalising externalities are likely to outweigh any concomitant detrimental effects from reduced product market competition. This criticism is essentially one of the relative importance of the two constituent parts of the U-shape hypothesis (*i.e.* the effects of product market competition and of internalising externalities), and not of the theory itself. Its resolution remains an empirical matter.

2. Extensions of the basic model

The model above is a simple one. It does not take into account the increasingly important role that international trade plays in OECD economies, potential interactions between centralisation/co-ordination and trade union density, and the possible coexistence of centralised and decentralised bargaining. These extensions are discussed in turn.

The existence of international trade changes the model considerably by introducing a new class of foreign products which can act as substitutes for domestically produced goods. Foreign competition reduces the ability of industry unions to push for large wage increases by increasing the elasticity of product demand which the domestic industry's output faces [Danthine and Hunt (1994); Driffill *et al.* (1996); Rama (1994)]. For example, when there are no imported cars, there are far fewer substitutes for cars as a product than for one brand of cars. But when trade is introduced, one country's cars are but a few of many different brands available, hence the elasticity of demand facing one country's car output may still be quite high. The same argument can be made with respect to exports. As a result, the theoretical relationship between centralisation of bargaining and economic performance will tend to flatten out in an open economy.[6]

Second, there may be interactions between trade union density and collective bargaining coverage on the one hand, and the centralisation and co-ordination of bargaining on the other. Layard *et al.* (1991, p. 138), for example, argue that the nature of the relationship between economic performance and union coverage depends on whether the bargaining system is centralised or decentralised, due to the effects discussed in this section.

The last extension concerns the possibility that a significant degree of wage drift at the local level may undermine the purpose of a centrally-negotiated wage [Holden (1990); Holmlund and Skedinger (1990); Rødseth (1995)]. Although some degree of wage drift is unlikely to be harmful, too large a level may cause the central organisations to lose their legitimacy.

3. Previous empirical results

Empirical work on this topic is relatively sparse and inconclusive. Some analyses found a positive relationship between a country's economic performance and its degree of ''corporatism'' [Bruno and Sachs (1985); Cameron (1984); Crouch (1985); Tarantelli (1986)]: more corporatist economies exhibited better economic performance, typically measured by some composite ''misery'' index, such as the sum of the inflation and unemployment rates. This finding was challenged by Calmfors and Driffill (1988), who ranked countries according to the perceived degree of centralisation of their wage bargaining systems. They reported some evidence of a U-shaped relationship between economic performance and centralisation: in the 1974-1985 period, intermediate countries exhibited, on average, worse economic performance than did either centralised or decentralised systems. More recent empirical work, using a variety of countries, time periods and performance indicators, has produced a mixed set of findings, as summarised in Table 3.1. Two broad approaches, both based on country rankings, have been used in this literature. The first [Grier (1997); OECD (1988)] is to classify countries into groups (such as ''centralised'' and ''decentralised'') and use dummy variables in the regression analysis. The second [Bean (1994); Jackman *et al.* (1996); Scarpetta (1996)] is to enter the country rank directly as a

Table 3.1. **Economic performance and the structure of collective bargaining: some recent findings**

Study	Performance measure	Number of countries	Years	Findings	Support for U/hump-shape hypothesis
Bean (1994)	Unemployment	20	1956-1992	Linear relationship with coordination.	No
Bleaney (1996)	Unemployment and inflation	17	1973-1989	Negative linear relationship between corporatism and unemployment; some evidence of a hump-shaped relation with centralisation in later years.	Mixed
Dowrick (1993)	Productivity growth	18	1960s-1980s	U-shaped conclusion that intermediate economies grow more slowly.	Yes
Freeman (1988)	Employment, unemployment and wage growth	19	1984, 1979-1984/85	U-shaped relationship between dispersion of wages, as a proxy measure of corporatism, and employment; hump-shaped relationship with unemployment and wage growth.	Yes
Golden (1993)	Unemployment, employment, Okun index and API[a]	17	1974-1984	Mixed results.	Mixed
Grier (1997)	Real GNP growth	24	1951-1988	Negative relationship with decentralised economies growing the fastest.	No
Heitger (1987)	Productivity growth	18	1960s-1970s	U-shaped view that intermediate economies grow more slowly.	Yes
Jackman (1993)	Unemployment	20	1983-1988	Linear relationship.	No
Jackman *et al.* (1996)	Unemployment	20	1983-1994	Linear relationship.	No
McCallum (1986)	Okun index[a] and real wage rigidity	18	1974-1984	Linear relationship between corporatism and performance.	No
OECD (1988)	Unemployment and inflation	17	1971-1986	Hump-shaped relationship for unemployment.	Yes
Rowthorn (1992*b*)	Employment and unemployment	17	1973-1985	U-shaped and hump-shaped relationships, respectively, but only in the 1980s.	Yes
Scarpetta (1996)	Unemployment	15 to 17	1970-1993	Negative relationship between unemployment and co-ordination; Some evidence of U-shaped relationship between unemployment and centralisation.	Mixed
Soskice (1990)	Unemployment and API[a]	11	1985-1989	Positive relationship between co-ordination and performance.	No
Traxler *et al.* (1996)	Unemployment, employment, Okun index and API[a]	16	1974-1985	Negative relationship between co-ordination and unemployment; U-shaped relationship between co-ordination and employment; mixed results for the Okun index and API.	Mixed

a) The Okun index is the sum of the unemployment and inflation rates; the Alternative Performance Index (API) is the sum of the unemployment rate and the current account deficit as a percentage of GDP.

Table 3.2. **Indicators of macroeconomic performance: Calmfors and Driffill's (1988) Table 2 updated**

	Unemployment rate				Employment/population ratio[a]				Okun index[b]				Alternative performance index[c]			
	Levels 1974-1985	Change 1974-1985 over 1963-1973	Levels 1986-1996	Change 1986-1996 over 1974-1985	Levels 1974-1985	Change 1974-1985 over 1963-1973	Levels 1986-1996	Change 1986-1996 over 1974-1985	Levels 1974-1985	Change 1974-1985 over 1963-1973	Levels 1986-1996	Change 1986-1996 over 1974-1985	Levels 1974-1985	Change 1974-1985 over 1963-1973	Levels 1986-1996	Change 1986-1996 over 1974-1985
Centralised economies																
Austria	2.4	0.7	5.2	2.9	66.6	–1.4	63.6	–3.0	8.1	2.2	7.9	–0.2	3.5	1.6	4.9	1.4
Norway	2.2	0.6	4.6	2.5	73.0	5.8	74.7	1.7	11.2	4.3	8.7	–2.5	4.1	1.9	5.6	1.5
Sweden	2.4	0.4	4.5	2.2	78.1	5.7	76.4	–1.8	12.1	5.3	9.5	–2.6	3.6	2.3	3.8	0.2
Denmark	7.4	6.0	9.8	2.5	73.3	–0.2	73.4	0.2	17.1	9.4	12.7	–4.4	10.7	7.9	10.2	–0.6
Finland	4.8	2.6	10.2	5.4	71.3	0.8	67.3	–4.0	15.7	7.3	13.6	–2.2	6.7	3.9	8.6	1.9
Unweighted average	**3.8**	**2.1**	**6.9**	**3.1**	**72.4**	**2.2**	**71.1**	**–1.4**	**12.9**	**5.7**	**10.5**	**–2.4**	**5.7**	**3.5**	**6.6**	**0.9**
Intermediate economies																
Western Germany	4.9	4.0	7.3	2.4	64.6	–4.2	63.9	–0.7	9.3	4.9	9.4	0.1	4.1	4.5	8.6	4.6
Netherlands[d]	5.9	4.5	6.9	1.0	54.4	–6.2	55.0	0.6	11.8	3.5	8.7	–3.2	4.8	3.6	10.5	5.7
Belgium	8.7	6.6	11.2	2.5	56.6	–3.1	55.2	–1.3	16.3	10.2	13.4	–2.9	9.7	8.5	14.7	5.1
New Zealand	2.3	2.1	7.2	4.9	64.3	0.2	59.9	–4.5	15.7	10.1	12.6	–3.0	8.8	8.8	4.0	–4.8
Australia	6.3	4.5	8.5	2.2	65.7	–1.4	67.3	1.5	16.7	10.9	13.5	–3.2	9.8	5.8	4.1	–5.7
Unweighted average	**5.6**	**4.3**	**8.2**	**2.6**	**61.1**	**–2.9**	**60.2**	**–0.9**	**14.0**	**7.9**	**11.5**	**–2.4**	**7.4**	**6.2**	**8.4**	**1.0**
Decentralised economies																
France[e]	6.4	4.1	10.6	4.2	63.5	–2.4	59.6	–3.9	16.9	9.8	13.2	–3.7	6.8	5.1	10.8	3.9
United Kingdom	6.7	4.5	8.5	1.8	68.8	–2.3	68.9	0.1	19.0	11.6	13.0	–6.1	6.5	4.5	6.8	0.3
Italy	6.1	2.1	10.3	4.2	55.5	–1.6	52.9	–2.5	22.0	13.6	15.5	–6.6	8.8	4.7	10.3	1.5
Japan	2.2	0.9	2.6	0.4	70.1	–1.1	72.8	2.7	9.1	1.6	3.7	–5.3	1.3	1.0	5.2	3.8
Switzerland	0.5	0.5	2.2	1.8	74.2	–3.7	79.8	5.6	4.6	0.1	4.9	0.3	–3.3	–3.8	8.1	11.4
United States	7.5	2.8	6.2	–1.3	65.0	3.4	71.3	6.3	15.2	6.9	9.7	–5.5	8.1	3.7	4.2	–3.9
Canada	8.6	3.7	9.5	0.9	65.7	3.4	69.4	3.7	17.2	8.6	12.7	–4.5	9.8	4.3	6.5	–3.3
Unweighted average	**5.4**	**2.7**	**7.1**	**1.7**	**66.1**	**–0.6**	**67.8**	**1.7**	**14.9**	**7.5**	**10.4**	**–4.5**	**5.4**	**2.8**	**7.4**	**2.0**
Unweighted average excluding Switzerland	***6.2***	***3.0***	***7.9***	***1.7***	***64.7***	***–0.1***	***65.8***	***1.1***	***16.6***	***8.7***	***11.3***	***–5.3***	***6.9***	***3.9***	***7.3***	***0.4***

a) Total employment divided by the working-age population (15-64).
b) Defined as the sum of the unemployment rate and the inflation rate.
c) Defined as the sum of the unemployment rate and the current account deficit as a percentage of GDP.
d) 1969-1973 instead of 1963-1973.
e) 1965-1973 instead of 1963-1973.

Sources: OECD, analytical database and *OECD Economic Outlook,* June 1997. Japanese inflation figures prior to 1971 were taken from *Historical Statistics of Japan,* Volume 4; a number of pre-1975 figures for the current account deficit as a percentage of GDP were obtained from OECD, *National Accounts 1960-1993,* 1996.

cardinal variable. Both methods have their drawbacks (the first relies on an arbitrary grouping of countries, while the second treats a country with a rank of six as exactly twice as centralised as a country with a rank of three). This chapter will adopt the first of these approaches.

4. Updating Calmfors and Driffill

Calmfors and Driffill's original paper considered the relationship between the centralisation of collective bargaining and the unemployment rate, the employment/population ratio, the Okun index (the sum of the unemployment and inflation rates), and an ''alternative performance indicator'' (the sum of the unemployment rate and the current account deficit as a percentage of GDP, API). Table 3.2 updates their Table 2, *conserving* the centralisation ranking of countries they used. Later sections of this chapter will update the centralisation rankings to the 1990s, and consider what other aspects of collective bargaining systems may be correlated with economic performance. As in Calmfors and Driffill's original table, average figures for countries with decentralised bargaining systems are presented both including and excluding Switzerland, due to some doubt as to the appropriate classification of the latter country.

The first two columns under each measure of performance reproduce the results in Calmfors and Driffill's Table 2. Some of the results are consistent with their U-shape hypothesis: intermediate countries have the lowest employment/population ratio and the highest value of the alternative performance index (API) over the years 1974-1985. However, no such relationship is evident for either the unemployment rate or the Okun index over the same period.

With respect to the *change* in these performance variables, from 1963-1973 to 1974-1985, the results are a little sharper: intermediate countries' unemployment rates rose faster, and their employment/population ratios fell the most. For example, the average rise in unemployment in intermediate countries was 4.3 percentage points compared with less than 3 percentage points for countries with either more centralised or more decentralised wage bargaining. Furthermore, the value of intermediate countries' API rose more than did that of either centralised or decentralised countries.[7]

The third and fourth columns incorporate data from 1986 to 1996. Do the results from the previous analysis follow through to the 1986-1996 period? While the same broad pattern appears, only the difference in the level of the employment rate is significant between countries with intermediate and non-intermediate wage bargaining systems. Centralised countries experienced the greatest rise in unemployment, whereas decentralised countries showed the greatest improvement in the Okun index over this time period, but the greatest rise in the API.

Thus, this update of the Calmfors and Driffill study shows little systematic evidence of a continued U-shaped relationship over the past decade between their country classification of bargaining systems and performance. The following sections extend this analysis by considering a much more comprehensive set of collective bargaining measures than previously available, including information on centralisation, co-ordination, trade union density and collective bargaining coverage.

C. CHARACTERISTICS OF WAGE BARGAINING SYSTEMS

A key issue for the relationship between bargaining systems and economic performance is the institutional capacity to organise bargaining such that the macro-economic implications of its outcomes are taken into account. Empirical analysis depends crucially on the classification of countries' collective bargaining characteristics. The next subsection highlights two qualitative characteristics of wage bargaining systems, ''centralisation'' and ''co-ordination'', and two cardinal measures: trade union density and the collective bargaining coverage rate.

1. Key concepts: corporatism, centralisation and co-ordination

Whereas it is relatively straightforward to measure trade union density and collective bargaining coverage, the degree of so-called ''corporatism'', while closely related to measures of centralisation and co-ordination, is more difficult to use in applied work. This is because: *i)* there is no standard definition of corporatism; *ii)* the institutional features behind corporatism are difficult to quantify; and *iii)* several different aspects of the economic and political system have to be combined into one measure.

Lehmbruch (1984) identifies three standard definitions of corporatism:

- the existence of strong centralised organisations of employers and worker representatives with an exclusive right of representation;
- the privileged access of such centralised organisations to government; and
- social partnership between labour and capital to regulate conflict over interests, and co-ordination with government.

Instead of corporatism, other authors have concentrated on the notions of "centralisation" [Calmfors and Driffill (1988)] or "co-ordination" [Soskice (1990)] to characterise the wage-setting system. *Centralisation* describes the locus of the formal structure of wage bargaining. Typically, three broad strata are distinguished: the national or central bargain negotiated between peak organisations, which may cover the whole economy (centralised bargaining); negotiations between unions and employers' associations regarding wages and conditions of work for particular industries or crafts (intermediate bargaining); and firm-level bargaining between unions and management (decentralised bargaining).

Analysis of *co-ordination* instead focuses on the degree of consensus between the collective bargaining partners. Bargaining may well be co-ordinated even when it is decentralised, as in the case of pattern bargaining or covert co-ordination. Co-ordination and centralisation may then be thought of as two different routes to achieving the same aims. Soskice (1990) uses such an approach to re-evaluate Calmfors and Driffill's classification, arguing that bargaining systems in Japan and Switzerland are centralised, due to the existence of co-ordinated employers' associations and networks in both countries.[8] This chapter follows the latter approach and combines information on centralisation and co-ordination into one summary measure of the location of collective bargaining.

2. Measures of collective bargaining in OECD countries

The analysis of the relationship between the wage bargaining system and economic performance needs to incorporate the bargaining system's breadth, the level at which it takes place and the degree of co-ordination. Even relatively centralised bargaining will have little effect if few workers are covered. This chapter captures the "breadth" of bargaining by two cardinal measures of trade union presence in the labour market: collective bargaining coverage and trade union density. These measures will be considered in conjunction with the more subjective measures of centralisation and co-ordination.

Table 3.3 presents information on all four measures of collective bargaining for 19 OECD countries for 1980, 1990 and 1994 (or the latest available year). The values for trade union density and collective bargaining coverage are shown in Chart 3.1.[9] In the United States, the union density rate in 1994 was around 16 per cent. In Europe, trade union density ranged from 9 per cent in France (the lowest recorded in the OECD area) to 91 per cent in Sweden. Between 1980 and the early 1990s, it roughly halved in France, New Zealand and Portugal, and fell by a quarter in Australia, Austria, Japan, the Netherlands, the United Kingdom and the United States. On the other hand, five countries have posted increases in trade union density since 1980, especially Spain (albeit from a low base), Finland and Sweden. There are some signs of a slacking in the general fall in union density. Between 1980 and 1990, 15 of the 19 countries recorded a fall, from 1990 to 1994 less than half experienced reductions. The (unweighted) average density rate fell from 46 per cent in 1980 to 40 per cent in 1990, and it remained at this level in 1994.

In most countries, the percentage of workers who are covered by collective agreements is higher than the percentage belonging to trade unions. France is the extreme case, combining the lowest unionisation rate and one of the highest coverage rates. There are two reasons for the higher collective bargaining coverage rate: *i)* employers may extend collective agreements to non-union workers; or *ii)* collective bargaining agreements may be extended by statute to third parties.[10] The coverage rate will thus depend at least as much on the share of employers belonging to employers' associations and the authorities' use of statutory extensions as on trade union density itself.[11] The coverage rate has shown only a small fall in the 1980s, in contrast to the sharper contraction in union density. The unweighted average coverage rate was 72 per cent in 1980, 70 per cent in 1990 and 68 per cent in 1994. However, Japan, New Zealand, the United Kingdom and the United States have experienced a noticeable reduction in collective bargaining coverage.

The third and fourth parts of Table 3.3 extend the classification of collective bargaining systems to include OECD Secretariat estimates of the *prevailing bargaining level* and the *degree of co-ordination*. The latter measure includes both union and employer co-ordination. Each characteristic has been assigned a value between 1 (for uncoordinated/decentralised) and 3 (for co-ordinated/centralised). Values for the classification of countries' bargaining levels are taken from Table 5.1 of OECD (1994*a*), with some modifications made in light of recent developments for some countries. The values for co-ordination are the result of combined information taken from Visser's (1990) classification of trade union co-ordination, the Calmfors and Driffill (1988) index and information gathered by the OECD on employers' associations.

Countries judged to have consistently centralised bargaining systems include Austria, Belgium and Finland. At the other end of the scale, Canada, Japan, New Zealand and the United States are characterised by enterprise or plant-level bargaining, and thus have the lowest values for the

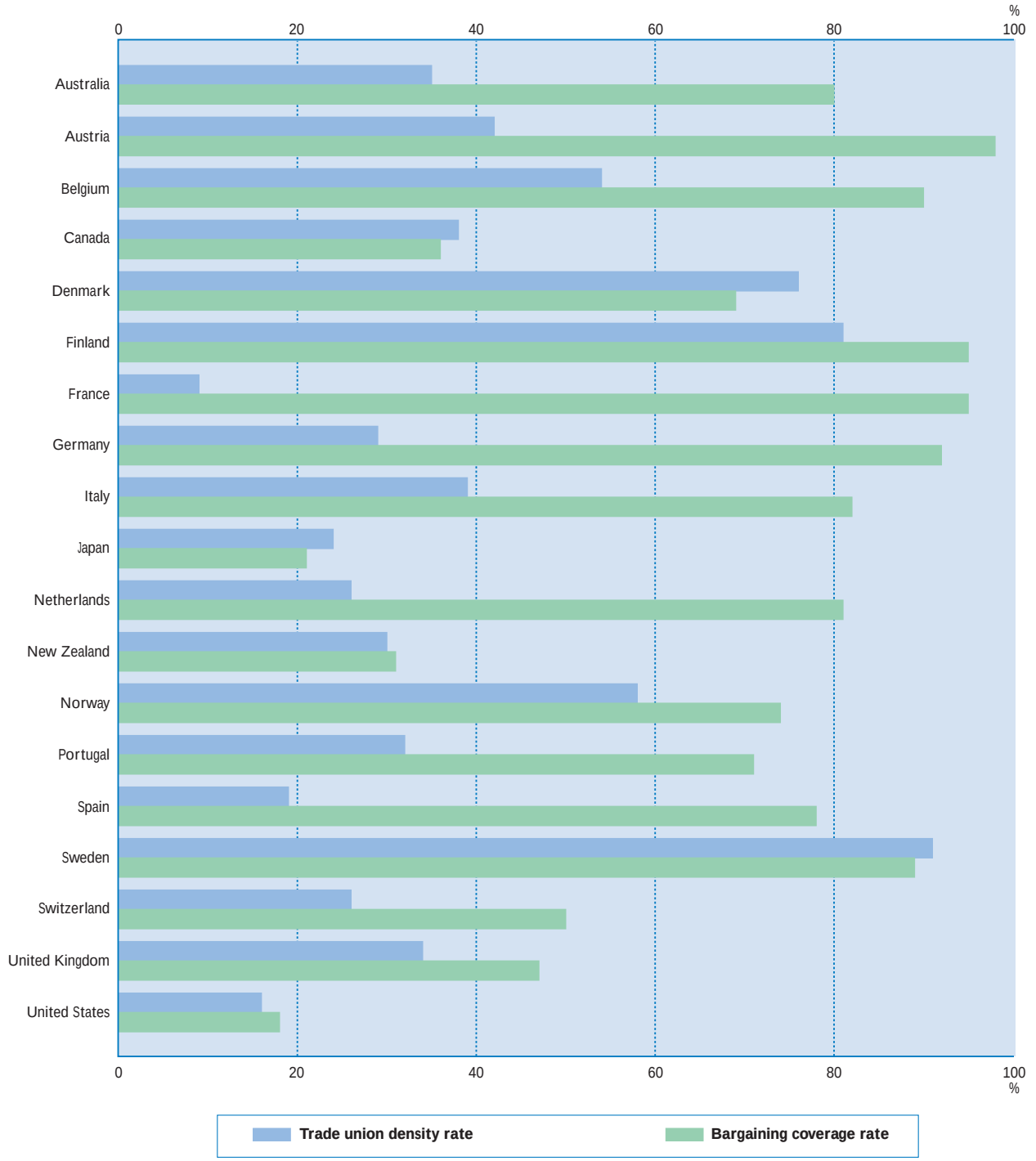
Table 3.3. **Collective bargaining characteristics of OECD countries**

	Trade union density[a]						Bargaining coverage[a]						Centralisation						Co-ordination					
	1980	Ranking	1990	Ranking	1994	Ranking	1980	Ranking	1990	Ranking	1994	Ranking	1980	Ranking	1990	Ranking	1994	Ranking	1980	Ranking	1990	Ranking	1994	Ranking
Australia	48	11	41	8	35	9	88	5	80	8	80	9	2+	3	2+	1	1.5	14	2+	7	2+	5	1.5	15
Austria	56	6	46	6	42	6	(98)	1	98	1	98	1	2+	3	2+	1	2+	1	3	1	3	1	3	1
Belgium	56	6	51	5	54	5	(90)	4	90	4	90	5	2+	3	2+	1	2+	1	2	10	2	10	2	9
Canada	36	12	36	11	38	8	37	17	38	17	36	16	1	17	1	17	1	16	1	18	1	17	1	16
Denmark[b]	76	2	71	3	76	3	(69)	14	69	13	69	13	2+	3	2	8	2	5	2.5	4	2+	5	2+	6
Finland	70	3	72	2	81	2	95	2	95	2	95	2	2.5	2	2+	1	2+	1	2+	7	2+	5	2+	6
France	18	18	10	19	9	19	85	7	92	3	95	2	2	8	2	8	2	5	2–	13	2	10	2	9
Germany	36	12	33	12	29	13	91	3	90	4	92	4	2	8	2	8	2	5	3	1	3	1	3	1
Italy	49	10	39	9	39	7	85	7	83	7	82	7	2–	15	2–	14	2	5	1.5	15	1.5	15	2.5	4
Japan	31	15	25	16	24	16	28	18	23	18	21	18	1	17	1	17	1	16	3	1	3	1	3	1
Netherlands	35	14	26	15	26	15	76	9	71	12	81	8	2	8	2	8	2	5	2	10	2	10	2	9
New Zealand	56	6	45	7	30	12	(67)	15	67	14	31	17	2	8	1.5	16	1	16	1.5	15	1	17	1	16
Norway	57	5	56	4	58	4	(75)	11	75	11	74	11	2	8	2+	1	2+	1	2.5	4	2.5	4	2.5	4
Portugal	61	4	32	13	32	11	70	12	79	9	71	12	2–	15	2+	1	2	5	2–	13	2	10	2	9
Spain[c]	9	19	13	17	19	17	(76)	9	76	10	78	10	2+	3	2	8	2	5	2	10	2	10	2	9
Sweden	80	1	83	1	91	1	(86)	6	86	6	89	6	3	1	2+	1	2	5	2.5	4	2+	5	2	9
Switzerland	31	15	27	14	27	14	(53)	16	53	15	50	14	2	8	2	8	2	5	2+	7	2+	5	2+	6
United Kingdom	50	9	39	9	34	10	70	12	47	16	47	15	2	8	2–	14	1.5	14	1.5	15	1+	16	1	16
United States	22	17	16	17	16	18	26	19	18	19	18	19	1	17	1	17	1	16	1	18	1	17	1	16

a) See Chart 3.1 for the exact years referred to by the 1994 trade union density and collective bargaining coverage figures.
b) Collective bargaining coverage figures have been revised downwards from those presented in OECD (1994*a*). See Annex 3.A.
c) Trade union density figures have been revised and do not agree with those in OECD (1994*a*). See Visser (1996*b*).
Sources: Quantitative data relating to collective bargaining coverage and trade union density for 1980 and 1990 were taken from OECD (1994*a*); for 1994 values, see Annex 3.A. Bracketed 1980 collective bargaining coverage values indicate that information was not available and that 1990 values have been used. Values for centralisation and co-ordination were developed in previous work under the OECD's industrial relations programme and inspired by various other rankings undertaken by social research (see text).

Chart 3.1.

Trade union density and collective bargaining coverage rates, 1994[a]



a) All data refer to 1994 except: collective bargaining coverage in Canada (1993), Finland (1995), France (1995), Italy (1993), Japan (1995), Norway (1993) and Portugal (1993), and trade union density in Denmark (1993), Finland (1995), Germany (1993), Italy (1992), the Netherlands (1993), Portugal (1990), Sweden (1993) and Switzerland (1992).

Source: See Annex 3.A.

Table 3.4. **Comparison of collective bargaining rankings in selected studies**[a]

	Soskice[b] 1990	Calmfors/Driffill[c] 1988	Bruno/Sachs[d] 1986	Blyth[e] 1979	Schmitter[f] 1981	Cameron[g] 1984	Tarantelli[h] 1986	Lehmbruch[i] 1984	Lijphart/Crepaz[j] 1991	Layard/Nickell/ Jackman[k] 1991
Australia	. .	8	3	10	. .	9	10	3	4	7
Austria	10	17	17	16	15	16	16	15	18	17
Belgium	. .	10	9	8	9	15	6	10	10	11
Canada	. .	1	2	1	5	5	5	3	2	3
Denmark	. .	14	11	13	12	13	12	10	14	17
Finland	. .	13	10	12	12	14	8	10	11	17
France	3	7	5	5	3	2	3	18	7	11
Germany	6	12	16	9	8	11	15	10	12	14
Italy	4	5	4	3	1	6	1	6	6	7
Japan	11	4	8	6	. .	3	14	18	9	11
Netherlands	5	11	15	7	10	12	9	15	15	11
New Zealand	. .	9	7	11	. .	. .	4	3	3	3
Norway	8	16	13	15	14	17	11	15	17	17
Portugal	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Spain	. .	. .	. .	. .	. .	1	. .	. .	. .	7
Sweden	7	15	13	14	12	18	13	15	16	17
Switzerland	9	3	12	. .	7	7	. .	10	13	11
United Kingdom	2	6	6	4	2	10	2	6	5	3
United States	1	2	1	2	5	4	7	3	1	3
Rank correlation with trade union density[l]	0.32	0.71***	0.34	0.74***	0.65**	0.88***	0.25	–0.01	0.43*	0.53**
Rank correlation with collective bargaining coverage[l]	0.17	0.70***	0.46*	0.55**	0.46*	0.57**	0.24	0.21	0.52**	0.69***
Rank correlation with centralisation/ co-ordination rank[l]	0.79***	0.78***	0.67***	0.87***	0.84***	0.68***	0.69***	0.46*	0.75***	0.84***

. . Data not available.
* Significant at the 10 per cent level.
** Significant at the 5 per cent level.
*** Significant at the 1 per cent level.
a) For consistency, a high rank (1 or 2, for example) implies a low degree of centralisation, co-ordination or corporatism.
b) Covert and overt co-ordination of unions and employers' associations.
c) Centralisation of unions and employers' organisations.
d) Centralisation of unions, shop-floor representation, employers' co-ordination, existence of works councils.
e) Level of bargaining, union and employers' co-operation.
f) Organisational centralisation and the number of unions.
g) Centralisation of unions, control capacity of central organisation, union membership.
h) Degree of ideological and political consensus of unions and employers, centralisation of bargaining, regulation of industrial conflict.
i) Influence of unions in the policy formulation process.
j) Average of several indices.
k) Unions' plus employers' co-ordination.
l) The Spearman rank correlations reported in the last three rows are computed using the collective bargaining information contained in Table 3.3 for 1980 or 1990, depending on which of these two years is closest to that indicated in the column title.
Sources: See bibliography [apart from Blyth, which is taken from Calmfors and Driffill (1988)].

centralisation measure. Finally, sector-level bargaining is predominant in continental Europe.

The existence of wage drift shows that centralisation measures do not reveal the whole picture: "centralised" bargaining can turn out to be uncoordinated if lower-level negotiations undermine its intentions. Nor is centralisation a necessary condition for co-operation in bargaining: co-ordination among dominant employers and unions in a decentralised or industry bargaining setting, and pattern bargaining, where certain dominant employers and unions act as *de facto* leaders, may be an alternative to, or a functional equivalent of, centralisation, and can result in economy-wide co-ordinated outcomes. Germany and Switzerland have traditionally co-ordinated bargaining, as shown by high scores on the co-ordination measure, despite separate negotiations taking place for each industry; the increased importance of industry-level bargaining in Austria in the 1980s has not significantly reduced the degree of co-ordination there [Traxler *et al.* (1996)]. Despite the preponderance of enterprise bargaining in Japan, unions and, in particular, employers' associations often co-ordinate bargaining strategies among individual members [Sako (1997)].[12] Denmark, Finland and Norway are also characterised by co-ordinated bargaining, while bargaining in Canada, New Zealand, the United Kingdom and the United States is uncoordinated.

The degree of centralisation and co-ordination has changed considerably in a number of countries over the past fifteen years. For example, in Sweden centralised bargaining weakened and finally disappeared, a move which was echoed to a lesser extent in a few other Nordic countries [Due *et al.* (1994); Visser (1996*a*); Wallerstein and Golden (1997); Wise (1993)]. The recent experience of New Zealand shows how rapidly changes can occur. Between 1989 and 1994, as a direct effect of changes in legislation, the number of workers covered by collective bargains decreased by one-half, while the share of workers covered by multi-employer contracts fell even more, from 90 to 14 per cent [Harbridge and Honeybone (1996)]. Notable decentralisation has also taken place in Australia [Brosnan and Bignell (1994)] and the United Kingdom [Millward *et al.* (1992)]. However, there has been no uniform trend across OECD countries towards more decentralised bargaining: in some countries, such as Italy, Norway and Portugal, bargaining became more centralised and/or co-ordinated (through tripartite agreements, "social pacts", etc.), while in others the degree of centralisation and co-ordination did not change. In some cases, there were even simultaneous movements in both directions.

The comparison of OECD Secretariat measures of collective bargaining described above with other measures proposed in the literature is undertaken in Table 3.4. The information on trade union density, collective bargaining coverage, centralisation and co-ordination in Table 3.3 also includes ranks for each of these measures for each year. The bottom three rows of Table 3.4 present the Spearman correlation coefficients between the ranks from Table 3.3 and the other rankings in Table 3.4. For the purpose of this comparison, three ranks have been used: the ranks of trade union density and collective bargaining, taken directly from Table 3.3, and a composite rank which is calculated as the rank of the sum of the centralisation and co-ordination ranks. The correlation coefficient is calculated for the year closest to that at the head of each of the columns. For example, the correlations with Calmfors and Driffill's ranking are calculated using 1990 values from Table 3.3, whereas those for Schmitter use the 1980 values.

The results show that Table 3.3's centralisation and co-ordination index is correlated strongly with almost all of the other indices of centralisation or corporatism used in the literature. However, both trade union density and collective bargaining coverage are correlated at the 5 per cent level with only half of the ten indices in Table 3.4.

D. SIMPLE CORRELATIONS BETWEEN ECONOMIC PERFORMANCE AND COLLECTIVE BARGAINING

1. Measures of economic performance

This section reports the results of correlating the following performance indicators to the level of collective bargaining variables in 1980, 1990 and 1994: the unemployment rate, the employment/population ratio, inflation, real earnings growth and earnings inequality (measured as the ratio of the 9th decile of the earnings distribution to the 1st decile).

All of the variables, apart from earnings inequality, are measured as averages over the five-year period for which the date of the collective bargaining information represents the midpoint. For example, for the 1980 data, averages are taken over the period 1978 to 1982; for the 1994 data, the averages are taken over the period 1992 to 1996. Arithmetic averages are calculated for unemployment and the employment/population ratio, whereas geometric averages are calculated for inflation and real earnings growth. The use of five-year averages helps to control for the effects of the cycle.[13] The question of simultaneity will be addressed in Section E.

2. Collective bargaining and economic performance: linear correlations

The top half of Table 3.5 presents Spearman rank correlation coefficients between economic performance and collective bargaining indicators by year. Across all three of the collective bargaining indicators there are relatively few statistically significant correlations (12 out of 45). The only consistently significant set of results is that of a negative correlation between most of the collective bargaining indicators and earnings inequality.

3. Collective bargaining and economic performance: U-shaped/hump-shaped correlations

The bottom half of Table 3.5 investigates the statistical evidence for a U-shaped or hump-shaped relationship between collective bargaining and economic performance. This is undertaken using the following recoding of the collective bargaining ranks: ranks 1-10 are left unchanged and ranks 11-19 are replaced by the values 9 to 1, respectively. This procedure produces a ranking which is high for countries in the middle of the distribution and low for countries at either end. A positive correlation implies that intermediate countries (such as the Netherlands or Spain) have higher levels of the performance indicator than countries with either high or low ranks of the collective bargaining variables.

A variable which is negatively related to this ascending-descending ranking thus falls from the lowest value of the collective bargaining measure to the middle of the distribution, and then rises again for countries with the highest rankings. This method imposes that the U-shaped or hump-shaped relationships be symmetrical, with their maxima or minima at the midpoint of the distribution.

The results show that there are almost no significant U-shaped or hump-shaped correlations between economic performance and these three

Table 3.5. **Spearman rank correlation coefficients between collective bargaining and measures of economic performance**

	Simple ranking								
	Ranking by trade union density			Ranking by collective bargaining coverage			Ranking by centralisation/ co-ordination		
	1980	1990	1994	1980	1990	1994	1980	1990	1994
Performance measures									
Unemployment rate	–0.117	0.056	0.263	–0.050	0.193	0.423*	–0.280	–0.136	0.189
Employment rate	0.401*	0.224	–0.065	–0.211	–0.414*	–0.621***	0.289	–0.086	–0.451*
Inflation	0.212	0.205	–0.149	–0.098	–0.003	0.204	–0.325	0.018	0.142
Real earnings growth	–0.400*	–0.066	0.291	0.248	0.321	0.144	–0.035	0.087	–0.130
Earnings inequality	–0.572**	–0.607***	–0.371	–0.390	–0.341	–0.469*	–0.596**	–0.474**	–0.530**
	Ascending-descending ranking								
	Ranking by trade union density			Ranking by collective bargaining coverage			Ranking by centralisation/ co-ordination		
	1980	1990	1994	1980	1990	1994	1980	1990	1994
Performance measures									
Unemployment rate	–0.142	–0.039	–0.262	0.235	0.262	0.251	0.113	–0.135	–0.177
Employment rate	–0.142	–0.135	0.086	–0.452*	–0.321	–0.381	0.239	0.092	0.201
Inflation	–0.203	0.081	0.218	0.649***	0.404*	0.292	0.252	0.286	–0.126
Real earnings growth	0.287	0.060	–0.123	0.175	0.000	–0.086	–0.281	–0.388	–0.350
Earnings inequality	0.190	0.323	0.333	–0.356	–0.488**	–0.336	0.229	0.213	0.361

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Sources: OECD analytical database, except the data for earnings inequality, which were obtained from Table 5.2, *OECD Employment Outlook*, July 1993 and Table 3.1, *OECD Employment Outlook*, July 1996. From 1990 onwards, unemployment, employment and real wage data for western Germany were obtained from Statistiches Bundesamt Wiesbaden publications, except for the employment rate and real wage growth for 1995 and 1996, which are Secretariat estimates.

measures of collective bargaining. The only significant relationship of note is the hump-shaped one between collective bargaining coverage and inflation in 1980 and 1990, which becomes insignificant in 1994.

There are obvious drawbacks to the simple rank correlations presented here. First, they do not allow the joint relationship between economic performance and more than one measure of collective bargaining to be addressed. Second, the approach used in the bottom half of Table 3.5 imposes a certain symmetric form on the non-linear relationship, which may be inappropriate. Both of these issues are addressed by the use of multivariate regression techniques in the next section.

E. REGRESSION RESULTS ON ECONOMIC PERFORMANCE AND COLLECTIVE BARGAINING

To use the centralisation and co-ordination information in Table 3.3 in regression analysis, countries are split up into three separate groups. For the 1980 data, Australia, Austria, Denmark, Finland, Germany, Norway and Sweden are classified as centralised/co-ordinated; Belgium, Japan, the Netherlands, Spain and Switzerland are intermediate countries; and Canada, France, Italy, New Zealand, Portugal, the United Kingdom and the United States are decentralised/uncoordinated. This classification changes for 1990 as Portugal moves from decentralised/uncoordinated to intermediate; Denmark moves from centralised/co-ordinated to intermediate; and France moves from decentralised/uncoordinated to intermediate.[14] With respect to the 1994 data, Sweden moves from centralised/co-ordinated to intermediate. Italy moves to centralised/co-ordinated from decentralised/uncoordinated, while Australia moves in the opposite direction.[15]

1. Regression results: grouped data

Table 3.6 presents the results of Ordinary Least Squares regression analysis of all of the economic performance variables on four measures of collective bargaining: trade union density, collective bargaining coverage, and two dummy variables, one for a centralised/co-ordinated collective bargaining system, and the other for an intermediate bargaining

Table 3.6. **Measures of economic performance and characteristics of the collective bargaining system: pooled regression results, 1980, 1990 and 1994**[a]

	Unemployment rate	Employment rate	Inflation	Growth of real earnings	Earnings inequality
Estimated coefficients					
Trade union density	–0.018	0.192***	0.007	–0.003	–0.014***
	(0.027)	(0.050)	(0.022)	(0.007)	(0.004)
Bargaining coverage	0.075***	–0.235***	0.039*	0.016**	–0.006*
	(0.025)	(0.047)	(0.021)	(0.006)	(0.004)
Centralised/co-ordinated country	–2.921*	2.898	–2.966**	–0.584	–0.356*
	(1.517)	(2.820)	(1.225)	(0.367)	(0.212)
Intermediate country	–1.086	–0.001	–2.607**	0.219	–0.560***
	(1.248)	(2.320)	(1.008)	(0.302)	(0.181)
Year 1990	1.677	1.430	–5.215***	0.727**	0.013
	(1.184)	(2.201)	(0.956)	(0.286)	(0.171)
Year 1994	3.815***	–0.615	–7.145***	0.066	0.099
	(1.190)	(2.212)	(0.961)	(0.288)	(0.179)
Constant	2.246	72.701***	8.825***	–0.162	4.293***
	(1.890)	(3.514)	(1.526)	(0.457)	(0.270)
Number of observations	57	57	57	57	51
R-squared	0.283	0.424	0.610	0.289	0.534
F-statistic	3.29***	6.14***	13.04***	3.38***	8.40***
Residual sum of squares	644.4	2 227.5	420.3	37.7	10.6
Standard error of the residual	3.59	6.67	2.90	0.87	0.49

* Significant at the 10 per cent level.
** Significant at the 5 per cent level.
*** Significant at the 1 per cent level.
a) Standard errors are in parentheses.
Source: See Table 3.5.

system as discussed above. The omitted category for collective bargaining system is decentralised/uncoordinated. The estimated coefficients on the centralised/co-ordinated and intermediate dummy variables thus refer to the performance of these systems relative to that of decentralised/uncoordinated collective bargaining systems. This grouping of three years' worth of data produces a maximum of 57 observations. All regressions include year dummies for 1990 and 1994. All of the five equations are significant. The best-explained equations (as measured by the R^2 statistic) are those for inflation, earnings inequality and the employment rate.

The first two rows of Table 3.6 show that there is a positive relationship between trade union density and the employment rate, and a negative relationship with earnings inequality. Collective bargaining coverage exhibits a positive relationship with unemployment, real earnings growth and inflation, and a negative relationship with employment.

The most interesting results are those on the dummy variables for centralised/co-ordinated country and intermediate country. The U-shape hypothesis, outlined in Section B, suggests that centralised/co-ordinated countries and decentralised/uncoordinated countries should outperform intermediate countries. For positive performance indicators, such as the employment rate, this means that the coefficient of the centralised/co-ordinated variable may be either positive or negative, while that of the intermediate country dummy variable should be negative and smaller than that of the centralised dummy. For negative performance indicators, such as unemployment and inflation, the inverse relationship is predicted.

There is no clear evidence of such relationships in terms of the unemployment and employment rates: the only statistically significant result is that centralised/co-ordinated countries have lower unemployment rates. For inflation, centralised/co-ordinated and intermediate countries do equally well, both posting lower inflation figures than decentralised/uncoordinated countries. The strongest results relate to earnings inequality. Here the coefficients show that both centralised/co-ordinated and intermediate countries have more equal earnings distributions than decentralised/uncoordinated countries. The coefficient on intermediate countries is more negative than that on centralised/co-ordinated countries, but the difference between these two estimated coefficients is not statistically significant.

The conclusion is that intermediate countries perform no worse than centralised/co-ordinated countries in terms of inflation and earnings inequality, while decentralised/uncoordinated countries do. Centralised/co-ordinated countries have the lowest unemployment rates.

These results, again, appear to provide little support for the hypothesis that countries with intermediate levels of bargaining experience worse economic performance (the U- and hump-shape hypotheses).[16] The conclusion from this analysis is that intermediate countries sometimes do as well as centralised/co-ordinated countries and sometimes do as well as decentralised/uncoordinated countries, but in no case is their performance clearly inferior to both. In sum, the U-shape hypothesis simply does not stand up to the data.[17]

It is of interest to compare these results with those in Scarpetta (1996). This latter is a careful study of various measures of unemployment in 15 to 17 OECD countries, using both a static model with annual data from 1983 to 1993 and a dynamic model for the period 1970-1993. Unemployment is modelled as a function of active labour market policy expenditure, the unemployment benefit replacement rate, employment protection legislation, the cycle, and a number of other variables. Amongst these are indices of co-ordination and of centralisation, both of which are treated as cardinal variables. Specifications including co-ordination consistently show that more co-ordinated countries have lower unemployment rates. Specifications including the centralisation rank and its square, in an attempt to find U or hump-shaped relationships, find some evidence of a hump-shaped relationship. Co-ordination and centralisation are never included in the same specification, making comparisons with this chapter's results more difficult. The co-ordination finding is consistent with the results in Table 3.6. The weaker centralisation finding is not replicated in our results, which could come from the difference in countries and years analysed, or from the method used.

2. Specification and sensitivity analysis

This subsection considers several possible problems with the relatively simple methods used in Table 3.6. The first part focuses on questions of equation specification, and the second looks at the sensitivity of results to data outliers.

Specification issues

Three issues of model specification are examined: that there is simultaneity bias; that the construction of the centralised/co-ordinated and intermediate dummies is flawed; and that a more flexible estimation procedure consists in replacing these two dummy variables with the rank itself and its square, considered as cardinal variables.

The first point concerns the potential bias from the approach taken which relates collective bargaining variables in 1980, for example, to performance indicators which include information on *precedent* periods, in this case the average between 1978 and 1982. The bias comes from the possibility that the values of the collective bargaining variables might themselves be partly determined by prior macroeconomic performance. As a check, the analysis was rerun using economic performance data referring to the subsequent five-year period (which rules out the use of the 1994 data). The negative conclusion with respect to the validity of the U-shape hypothesis was unaffected by this change.

The second test is based on the discussion in Soskice (1990) regarding the relationship between centralisation and co-ordination. Thus far, the dummy variables have been treated as substitutes for each other, with the classification based on the sum of the ranks of the centralisation and co-ordination series. An alternative view is that what is important is whether a country has either centralisation or co-ordination at a high level.

Consequently, an alternative measure of centralised/co-ordinated and intermediate countries was constructed. A country is defined as "strongly centralised/co-ordinated" if, on the scale of the centralisation and co-ordination measures in Table 3.3, it had a value of 2.5 or above on either measure, and "intermediate" if it had at least one measure at level 2- or above, but none at 2.5 or above. An advantage of this approach is that it is absolute, taking into account the general move towards decentralisation/uncoordination of bargaining in OECD countries, whereas a rank-based system tends to label countries at the top of the rank corporatist, even if there has been a substantial movement in the entire distribution. In the event, this alternative classification made no general difference to the negative conclusion regarding the U-shape hypothesis.

The final specification issue concerns using the simple rank (and its square) of the sum of the centralisation/co-ordination ranks in Table 3.3 rather than dummy variables. This method has simplicity to recommend it, as well as being independent of judgements about which countries are really centralised/co-ordinated or intermediate. It does, however, treat rank variables as cardinal, which is incorrect. The results for unemployment and employment were consistent with those in Table 3.6, no significant relationship being found. However, the cardinal approach finds no relation between centralisation/co-ordination and inflation, instead of the strong results using the dummy variables in Table 3.6. On the other hand, the cardinal results show a very strong hump-shaped relationship between centralisation/co-ordination and real earnings growth, which was not found in any of the specifications with dummy variables. Also a very strong U-shaped relationship was found with earnings inequality, as opposed to Table 3.6's findings of no difference between centralisated/co-ordinated and intermediate countries, but much higher earnings inequality for decentralisated/uncoordinated countries. The earnings inequality results with the cardinal ranks are, however, very sensitive to the inclusion of Austria, which is not the case with the results using the dummy variables. These results suggest that the subjective grouping of countries by their collective bargaining attributes, which is the method preferred in this chapter, and searching for non-linear relationships using rank information treated cardinally are not always good substitutes for each other.

Outliers in the data

A final issue is the sensitivity of the results to outliers in the data. Details of the tests undertaken, and the ensuing estimation results, are provided in Annex 3.B. The overall conclusion from this investigation is that there is little change in the conclusions drawn from Table 3.6 when outliers are accounted for.

3. Interactions

Some analyses of the effects of collective bargaining on economic performance imply rather more complicated transmission mechanisms than those presented so far. There are obviously limits to the sophistication which can be used with only a small number of observations, but, as discussed in Section B, several theories which predict interaction effects of collective bargaining variables can be evaluated empirically. The results of these tests are summarised in Table 3.7.

First, centralisation and co-ordination could have different effects at different levels of trade union density or collective bargaining coverage. To evaluate this, the two dummy variables for centralisation and co-ordination rank were interacted with both union density and collective bargaining coverage and added to the regressions in Table 3.6. The results, in the upper panel of Table 3.7, show that the previous conclusions regarding the relationship between centralised/co-ordinated, intermediate and decentralised/uncoordinated countries are largely unchanged by these experiments. The interaction terms themselves are often insignificant. One notable finding is that there is some evidence that high collective bargaining coverage has a positive impact on the employment and unemployment performance of centralised/co-ordinated countries, but a negative effect on the employment and

Table 3.7. **Interactions between measures of economic performance and characteristics of the collective bargaining system**[a]

	Unemployment rate		Employment rate		Inflation		Growth of real earnings		Earnings inequality	
Estimated coefficients										
Collective bargaining interactions										
Trade union density and intermediate country	–0.063 (0.052)	×	0.039 (0.102)	×	–0.100** (0.044)	×	0.015 (0.013)	×	–0.003 (0.008)	×
Bargaining coverage and intermediate country	0.138*** (0.048)	×	–0.180* (0.094)	×	0.027 (0.040)	×	–0.023* (0.012)	×	0.010 (0.007)	×
Trade union density and centralised/co-ordinated country	×	0.065 (0.059)	×	0.034 (0.109)	×	0.041 (0.046)	×	0.006 (0.014)	×	0.002 (0.008)
Bargaining coverage and centralised/co-ordinated country	×	–0.137 (0.097)	×	0.381** (0.179)	×	–0.173** (0.077)	×	0.046* (0.023)	×	0.043*** (0.013)
Centralised/co-ordinated country	–1.236 (1.678)	5.292 (9.136)	0.258 (3.266)	–31.302* (16.789)	–3.540** (1.397)	9.622 (7.188)	–0.821* (0.423)	–4.807** (2.197)	–0.206 (0.248)	–4.141*** (1.242)
Intermediate country	–7.211** (3.350)	–1.413 (1.244)	9.508 (6.519)	0.473 (2.287)	–0.705 (2.790)	–2.936*** (0.979)	1.092 (0.844)	0.272 (0.299)	–1.076** (0.495)	–0.503*** (0.168)
Import interactions										
Centralised/co-ordinated country	–3.370** (1.471)	×	3.253 (2.850)	×	–3.119** (1.238)	×	–0.599 (0.374)	×	–0.360 (0.217)	×
Intermediate country and high imports	–2.591* (1.371)	×	1.191 (2.657)	×	–3.120*** (1.154)	×	0.168 (0.348)	×	–0.574*** (0.211)	×
Intermediate country and low imports	0.948 (1.498)	×	–1.610 (2.903)	×	–1.913 (1.261)	×	0.288 (0.380)	×	–0.539** (0.241)	×

× Not applicable.
* Significant at the 10 per cent level.
** Significant at the 5 per cent level.
*** Significant at the 1 per cent level.
a) All regressions also include trade union density, collective bargaining coverage, year dummies and a constant. Standard errors are in parentheses.
Sources: See Table 3.5. Import data come from OECD, *National Accounts 1960-1994,* 1996.

unemployment performance of intermediate countries. High bargaining coverage thus seems to exacerbate the unemployment difference found between centralised/co-ordinated and intermediate countries in Table 3.6.

A second hypothesis is that increased levels of foreign competition, by raising the price elasticity of product demand, make it harder for union bargaining at the sectoral level to raise wages. To test this, two new dummy variables were created: one for intermediate countries with a high level of imports as a percentage of GDP (defined as an import ratio greater than the median for the group of intermediate countries), the other for intermediate countries with a low level of imports.[18] The results are reported in the lower panel of Table 3.7. There is a notable difference between high and low-import intermediate countries in terms of their unemployment rates. High-import intermediate countries record just as good unemployment performance as centralised/co-ordinated countries, and better than decentralised/uncoordinated countries, which lends some support to the theoretical prediction regarding import penetration and economic performance.[19]

4. Changes over time

It is likely that countries differ in very many ways other than their collective bargaining systems and that these unobserved differences are significant determinants of economic performance. To the extent that such differences are also correlated with the collective bargaining system, their omission may lead to false inferences being drawn about the correlation between collective bargaining and economic performance. One way of resolving this problem is to examine changes in economic performance and changes in collective bargaining over time in the same country. The analysis of changes over time also avoids the thorny issue of making comparisons of levels of centralisation and co-ordination of bargaining between countries.

Chart 3.2 and Table 3.8 show the relation between the change in the economic performance indicators (defined, apart from earnings inequality, as the change in the average level of the indicator between 1980-1984 and 1990-1994) and the change in the centralisation/co-ordination of bargaining between 1980 and 1990. Countries are split into two groups: those which decentralised or moved towards more uncoordinated collective bargaining between 1980 and 1990 (Denmark, Finland, New Zealand, Spain, Sweden and the United Kingdom) and those which did not. These countries can be easily identified from the information in Table 3.3. A move towards decentralised or uncoordinated bargaining is defined as a reduction in either of the centralisation or co-ordination scores between 1980 and 1990 (in no case is there a reduction in one score and an increase in the other).

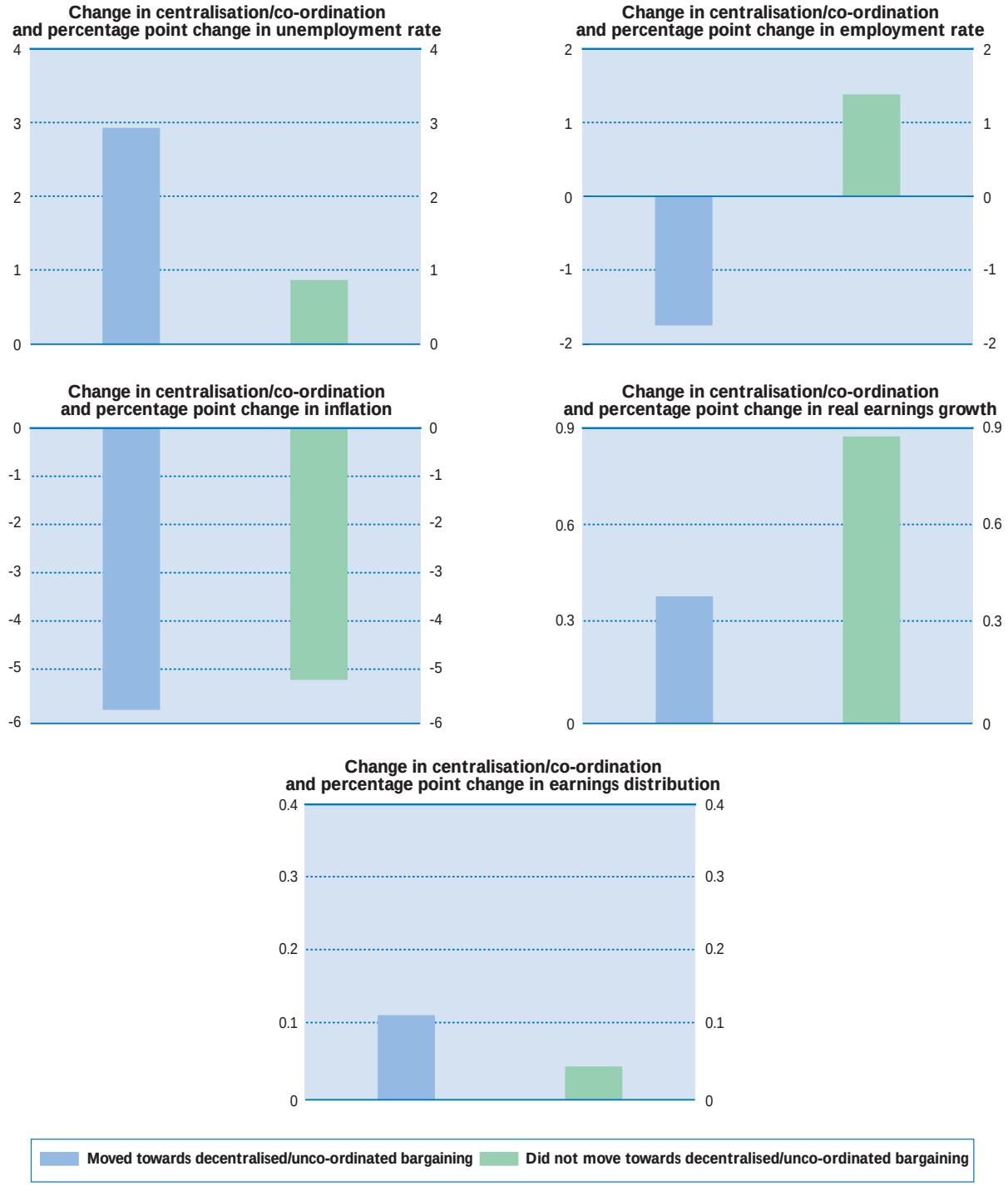
Chart 3.2 presents the simple means of the change in performance for these two groups of countries. Countries which moved towards decentralisation or uncoordinated bargaining between 1980 and 1990 recorded a larger rise in unemployment than those which did not; the mirror-image of this result is shown in the change in the employment rate. These differences are significant at the ten per cent level. In addition, countries which decentralised or moved towards uncoordinated bargaining experienced lower real wage growth compared with countries which did not make such changes in the collective bargaining system. Last, countries which decentralised or moved towards uncoordinated bargaining recorded a slightly larger increase in earnings inequality over the period.

These patterns can be formalised by regressions of the change in economic performance on the change in trade union density and collective bargaining coverage, plus a dummy variable indicating a move towards decentralisation/uncoordination in collective bargaining. The results are presented in Table 3.8. They show that there is a significant relationship, even with few observations, between this dummy variable and falling employment rates (changes in trade union density are positively correlated with the change in the unemployment rate, but not with the change in the employment rate). There is also weaker evidence that moves towards more decentralisation/uncoordination are associated with greater falls in inflation, but higher unemployment (both of these estimates are significant at between the ten and fifteen per cent level). There is no significant relationship between earnings inequality and moves towards more decentralisation/uncoordination. These results are robust to the sensitivity analysis described in Annex 3.B.

The ''change'' results for centralisation/co-ordination mostly mirror those in Table 3.6's pooled cross-section analysis. The exception is that with respect to earnings inequality. The coefficients in Table 3.6 show that earnings inequality is estimated to be higher in decentralised/uncoordinated countries, but that there is little difference in earnings inequality between centralised/co-ordinated and intermediate countries. The implication is that earnings inequality rises when the collective bargaining system changes from centralised/co-ordinated or intermediate to decentralised/uncoordinated. However, between 1980 and 1990 none of the six countries which moved towards a decentralised/uncoordinated bargaining system made this change of system (two were centralised/co-ordinated in both

Chart 3.2.

Change in economic performance and change in centralisation/co-ordination[a]



a) The change in centralisation/co-ordination levels refers to the change between 1980 and 1990; the change in economic performance is defined as the average level in 1990-1994 *minus* the average level in 1980-1984.

Source: See sources to Table 3.2 and Table 3.4.

Table 3.8. **Changes in measures of economic performance and changes in characteristics of the collective bargaining system**[a]

	Change in unemployment rate	Change in employment rate	Change in inflation	Change in growth of real earnings	Change in earnings inequality
Estimated coefficients					
Change in trade union density	0.167**	–0.114	0.261**	–0.103**	0.001
	(0.068)	(0.109)	(0.102)	(0.044)	(0.007)
Change in bargaining coverage	0.109	–0.209*	–0.272**	0.125**	–0.015*
	(0.073)	(0.117)	(0.110)	(0.047)	(0.007)
Moved towards a decentralised/ unco-ordinated collective bargaining system	1.622	–3.207*	–2.586	0.342	0.010
	(1.044)	(1.682)	(1.577)	(0.674)	(0.107)
Constant	2.222***	0.327	–3.389***	0.214	0.039
	(0.753)	(1.213)	(1.137)	(0.486)	(0.078)
Number of observations	19	19	19	19	17
R-squared	0.457	0.350	0.469	0.476	0.285
F-statistic	4.21**	2.70*	4.41**	4.55**	1.73
Residual sum of squares	58.9	152.6	134.1	24.5	0.5
Standard error of the residual	1.98	3.19	2.99	1.19	0.19

* Significant at the 10 per cent level.
** Significant at the 5 per cent level.
*** Significant at the 1 per cent level.
a) Standard errors are in parentheses.
Source: See Table 3.5.

1980 and 1990, one moved from centralised/co-ordinated to intermediate, one remained intermediate, and two were decentralised/uncoordinated in both years).

F. CONCLUSIONS

Following an influential article published in 1988 by Calmfors and Driffill, the hypothesis that the relation between the centralisation of bargaining institutions and employment is U-shaped, and that with unemployment is hump-shaped, has attracted much attention. This chapter has investigated this proposition in a number of ways. An initial update of Calmfors and Driffill's original table showed some weak evidence that intermediate, as opposed to centralised or decentralised, countries exhibit worse economic performance, as measured by their rates of unemployment and inflation.

However, centralisation is not the only important characteristic of collective bargaining. The degree of unionisation, the coverage of collective bargaining and the degree of co-ordination in bargaining should also be considered. This chapter has sought to assess the impact of these other facets of collective bargaining systems on performance. Accurate assessments of the impact of different systems of collective bargaining on measures of labour market performance, such as unemployment or employment rates, are difficult in part because of the complexity of specifying the interactions of and measuring each facet of these systems. While it is somewhat hazardous to make global statements, the statistical results presented, whether based on simple correlations or multivariate analysis, are best characterised as ''negative'' in the sense that there seems to be little robust evidence for either a U-shaped relation between the structure of collective bargaining and employment or a hump-shaped relation with the unemployment rate. Indeed, in many instances, the analysis has not found statistically significant relationships between measures of economic performance and collective bargaining, whether the latter is proxied by measures of trade union density, collective bargaining coverage or the centralisation and co-ordination of bargaining. One exception to this is that there is a fairly robust relation between cross-country differences in earnings inequality and bargaining structures. More centralised/co-ordinated economies have significantly less earnings inequality compared with more decentralised/uncoordinated ones.

Further analysis showed no strong evidence of an interaction between centralisation/co-ordination

and the level of either trade union density or collective bargaining coverage. There is, however, some evidence supporting the prediction that intermediate countries with higher levels of imports as a percentage of GDP have better economic performance than intermediate countries with lower import penetration.

Finally, the examination of changes in collective bargaining characteristics and changes in economic performance tentatively suggest that countries which moved towards decentralisation or less coordination over the past decade have experienced larger declines in the employment rate than countries which did not experience such decentralisation/uncoordination.

To conclude, many of the statistical results show little in the way of significant statistical relations between measures of economic performance and certain indices of bargaining systems, with the major exception of earnings inequality. A key question is how one can interpret such findings. While they raise serious doubts about the robustness of the conclusions of some previous research which claimed to have found significant relations (*e.g.* a "hump-shaped" relation between unemployment and a "U-shaped" one between employment and the ranking of countries from less to more decentralised bargaining), it is probably premature to consider the issue settled. Labour market performance indicators are undoubtedly affected by a number of institutional factors and policy instruments. Some may themselves be independent of a country's system of collective bargaining, while others may interact in complex ways with bargaining variables. More analysis is necessary to elucidate whether there are any robust relations between bargaining systems and economic performance.

Notes

1. Golden and Wallerstein (1996) present a detailed summary of collective bargaining in 15 OECD countries from 1950 to 1990; see also Katz (1993). Recent European developments are discussed in van Ruysseveldt and Visser (1996) and Crouch and Traxler (1995).
2. For example, Henley and Tsakalatos (1993, p. 2) maintain that corporatist institutional features "have enabled a more prolonged achievement of full employment than where such corporatist features were absent".
3. The concession bargaining which has occurred in several countries in recent years [Mitchell (1994)] is an illustration of the recognition by both firms and unions of the link between costs, and thus prices, and output and employment.
4. If workers are altruistic, externalities may be taken fully into account without the presence of centralised wage bargaining. However, it seems unlikely that altruism is pervasive enough in practice to internalise completely the effects on others. It should be noted also that not all externalities will be internalised under centralised bargaining, as those who consume and/or pay taxes, but do not work, are not directly represented in the bargaining process.
5. Another strand of research has considered the relationship between collective bargaining and productivity, which is not explored in this chapter. This relationship is, *a priori*, ambiguous [Metcalf (1993)]. For instance, unions may discourage investment by their ex-post appropriation of rents and as a result of the investment externality described above. On the other hand, they may be associated with higher productivity growth because higher wages induce substitution towards capital or because of union "voice" effects encouraging participation and discussion [Freeman and Medoff (1984)] which may, among other things, lead to greater efforts by firms to train workers [Green *et al.* (1996)]. In addition, in a standard labour demand framework, higher real wages, and their associated lower employment, imply higher average productivity for those who remain employed.
6. An analogous issue, which is not discussed in this chapter, is the interaction between bargaining and the degree of accommodation of monetary policy to any bargained wage rise: see Bleaney (1996) and Iversen (1996).
7. These points are partially supported by statistical tests of the hypothesis that intermediate countries have worse average economic performance than do either centralised or decentralised countries. For the level variables, only the difference in the employment rate between intermediate and decentralised/centralised countries is statistically significant. However, the mean change in the unemployment rate, the employment/population ratio, and the API are all significantly different (at the 10 per cent level) between intermediate and non-intermediate countries. In every case, the average change in performance is worse for intermediate countries.
8. A similar approach has recently been taken by Traxler *et al.* (1996).
9. Some caution is warranted in the interpretation and comparison of the data on trade union density and collective bargaining coverage, as they are measured with error and very often do not come from the same source. Some countries in Chart 3.1 have collective bargaining coverage rates which are lower than their union density figures. This may result in part from the difficulty of making accurate calculations of the coverage of collective bargains [see Sako (1997) for the case of Japan] and from the different data sources used. In addition, as noted by Scheuer (1997) with respect to the Danish figures, union members are often present in firms where collective bargaining does not take place.
10. Legal extension arrangements may influence both trade union density and the degree of organisation of employers. With legal extension, some workers gain the benefits of collective agreements without being union members. This may make workers less likely to join a union. On the other hand, employers will have a greater interest in influencing the results of negotiations, if they know that these will apply to their firms irrespective of whether they bargain with a union or not. Thus, the existence of extension arrangements creates a greater incentive to join the employers' association.
11. The trade union density and collective bargaining coverage figures in Table 3.3 are not very strongly correlated: a regression of the latter on the former produces R^2 coefficients of less than 20 per cent in each of the years examined.
12. Blyth (1979, p. 75) defines centralisation as "the extent to which trade union and employer organisations are federated or joined into strong central bodies at the national level with substantial executive (negotiating) powers capable for instance of negotiating with one another and dealing with government on behalf of their members". Calmfors and Driffill's definition of centralisation as "the extent of inter-union and inter-employer co-operation in wage bargaining with the other side", as well as their two operationalised measures "co-ordination level within central organisations" and "existence of parallel central organisations and their co-operation" relate, in fact,

more to "co-ordination" than to "centralisation". Rowthorn (1992*a*) also argues that co-ordination of wage bargaining does not necessarily depend on formal structures since unions may co-ordinate wage bargaining irrespective of the degree of formal centralisation. For example, in Germany regional settlements by the metal workers union usually set the benchmark for wage increases in the metal industry as a whole, followed by those for other industries. As indicated above, Table 3.3 has tried to take these considerations into account by providing separate rankings for centralisation and co-ordination.

13. Although not shown here, the addition of a variable measuring the output gap (defined as the ratio of actual total economy output to its potential) to the regressions reported has no effect on the results. This variable is always very insignificant in these regressions, suggesting that this use of five-year averages does indeed iron out a lot of the cyclical effects.

14. There is some doubt regarding this movement in France's classification, as it can be argued that French bargaining remained decentralised during the 1990s [Barrat *et al.* (1996)]. The results in Table 3.6 are not changed by the question of France's classification.

15. The approach taken in this chapter, to assign countries to broad groups reflecting their bargaining system, precludes the use of country dummies in the regressions, as these would be very collinear with the centralised/co-ordinated and intermediate dummy variables.

16. Many different specifications were investigated, without altering the conclusion that there is little evidence for the U-shape/hump-shape hypothesis. These include: dropping trade union density; dropping collective bargaining coverage; using a cardinal specification of the centralisation/co-ordination variable and adding country dummies; not using the observations for which collective bargaining coverage information is missing in 1980 (and which are therefore in parentheses in Table 3.3); and adding the output gap, the replacement rate, expenditure on active labour market policies and an index of employment protection. In addition, there is little evidence of the key relationships changing when the three years of data are examined separately. The exception is inflation. In 1980, intermediate countries have the best inflation performance. The size of the estimated coefficient falls in 1990, although remaining significant, but becomes insignificant in the 1994 results (this same pattern is apparent in the correlation coefficients in Table 3.5).

17. How can this conclusion be squared with the numbers presented in Table 3.2, which seemed to show that intermediate countries performed worse than both centralised and decentralised countries? The resolution of this apparent contradiction could lie in the ranking given to countries, the countries included in the sample (Calmfors and Driffill's work does not include either Spain or Portugal), or the presence of control variables for the union density rate and collective bargaining coverage rate in the analysis. The question of ranking the 17 countries that are common to both samples is likely to be a crucial one: of these 17 countries, six are ranked differently in 1980, eight in 1990 and nine have different rankings in the 1994 data. To test whether it is the difference in ranking that lies behind the lack of support found for the U-shape hypothesis, the regressions in Table 3.6 were re-estimated with the two dummy variables for centralisation and co-ordination ranking being replaced by those based on the Calmfors and Driffill ranking. Only unemployment, employment and inflation are analysed as they are the performance measures common to the two investigations. The results, for a number of different specifications, although not shown here, show no evidence that intermediate countries (on Calmfors and Driffill's definition) do worse than decentralised countries in terms of unemployment or employment, and that they outperform them with respect to inflation. The conclusion from this analysis is that it is not the countries included nor the "explanatory" variables added which is driving these results. This can be seen from Table 3.2. The largest part of the "U-shape" almost always comes from the superior economic performance of centralised/co-ordinated countries. The only significant difference (at the 10 per cent level) between intermediate and decentralised/uncoordinated countries is that for the change in the Okun index from 1974-1985 to 1986-1996. For every other performance measure in Table 3.2, there is little to choose between intermediate and decentralised/uncoordinated countries.

18. The high-import intermediate countries are the Netherlands, Switzerland (1980 and 1990), Belgium (1980), Denmark (1990) and Portugal (1994).

19. The same results can be obtained analysing intermediate countries by their level of exports relative to GDP.

ANNEX 3.A

Sources of data on trade union density and collective bargaining coverage

General

Where data are based on sample surveys, coverage rates were calculated directly from them. Otherwise, the coverage rate was calculated on the basis of the number of employees covered by a collective agreement divided by the corresponding total number of wage and salary earners. Data on total wage and salary earners were taken from OECD *Labour Force Statistics*. Data on trade union density for all European countries are from Visser (1996*b*).

Sources and methods by country

Australia

Trade union density data are calculated from an August 1994 survey of trade union members carried out as a supplement to the monthly labour force survey [Australian Bureau of Statistics, *The Labour Force in Australia*, December 1994]. The figure for collective bargaining coverage was supplied by the Department of Industrial Relations and the Australian Bureau of Statistics.

Austria

The figure for collective bargaining coverage was supplied by Franz Traxler, University of Vienna, based on the methodology outlined in the *Employment Outlook* [OECD (1994*a*)].

Belgium

There are no official coverage statistics; an estimate of the collective bargaining coverage rate was provided by an expert at the Ministry of Employment and Labour.

Canada

The trade union density figure comes from the 1995 OECD *Economic Survey* of Canada. Collective bargaining data were supplied by Statistics Canada from the 1993 Survey of Labour Income and Dynamics (SLID).

Denmark

An estimate of collective bargaining coverage, on the basis of a number of questions in a survey of 1 720 employees, was taken from Scheuer (1997), who emphasizes that previously published figures appear to be substantially over-estimated. In the absence of additional information concerning the evolution of collective bargaining coverage, the 1994 figure of 69 per cent has been taken to apply to 1990 also.

Finland

The collective bargaining coverage rate was provided by the Ministry of Labour on the basis of data from the *Statistical Yearbook of Finland*.

France

There are no published figures on collective bargaining coverage. The 95 per cent coverage figure used comes from an estimate by the Direction des Relations du Travail that 800 000 wage and salary earners do not have their pay determined by collective bargains [communication from Claude Siebel, Director of Direction de l'Animation de la Recherche, des Etudes et des Statistiques (DARES)].

Germany

Collective bargaining coverage rates were communicated directly by the Ministry for Labour and Social Affairs.

Italy

Collective bargaining covers all workers in theory. The rate of collective bargaining coverage was then estimated by Istituto Nazionale per lo Studio della Congiuntura (ISCO), using National Accounts data, as 100 minus the estimated share of informal workers (irregular workers, illegal immigrants, etc.).

Japan

The *Year Book of Labour Statistics* contains data on bargaining coverage compiled from information provided by unions. The main difference from all other figures used in this chapter is that these data refer only to union members covered by a collective agreement. In 1995, about 30 per cent of persons belonging to trade unions were not covered by such agreements.

To calculate the actual collective bargaining coverage rate, the figure for members covered by collective agreements is taken (*Year Book of Labour Statistics*, 1995, Table 191), minus the small number of government-sector union members (from the same table) who, in general, cannot conclude collective bargains. This study then uses data on the difference between unionisation and bargaining coverage in the United States, whose labour relations system, in terms of bargaining level and union density, somewhat resembles that of Japan. In the United States, the total number of employees covered by collective agreements exceeded the number of union members in 1995 by 12.1 per cent. This percentage was used to estimate Japan's total bargaining coverage. The denominator

of the collective bargaining coverage rate is calculated as the total number of wage and salary earners (*Year Book of Labour Statistics*, Table 4), adjusted to exclude the number of employees in the government sector (OECD Analytical Database).

Trade union density figures are taken from the *Year Book of Labour Statistics* 1994, Tables 4 and 211.

Netherlands

Data on coverage are taken from Table 1.2 of *CAO-AFSPRAKEN*, 1995 (Ministry of Social Affairs and Employment, Den Haag, February 1995). The denominator of the collective bargaining rate is calculated as the total number of wage and salary earners (OECD *Labour Force Statistics, 1974-94*).

New Zealand

Data on trade union membership and collective bargaining coverage were supplied by Raymond Harbridge, Industrial Relations Centre, Victoria University. Employment data are taken from the *Household Labour Force Survey*. Union membership density is the ratio of union membership to average full-time equivalent (FTE) employment in the concurrent and previous three quarters. FTE is defined as full-time plus one-half of part-time workers.

Norway

The estimates for collective bargaining coverage come from a 1993 survey described in Torunn S. Olsen, "EUs arbeidslivspolitikk: Nasjonale og europeiske utfordringer", *Tidsskrift for samfunnsforskning*, No. 4, Vol. 36, 1995.

Portugal

Collective bargaining coverage figures were supplied by the Industrial Relations Division of the Ministry of Education and Employment.

Spain

Estimates of collective bargaining coverage have been revised relative to those in OECD (1994*a*) according to figures and interpretation supplied by the Ministerio de Trabajo y Asuntos Sociales. The number of workers covered by collective bargains are from the *Boletin de Estadisticas Laborales*, Ministerio de Trabajo y Asuntos Sociales. Information is given on both the number of workers covered by firm agreements and the number of workers covered by sector agreements. It is estimated that 80 per cent of the former are also counted in the latter and a correction has been made for this double counting.

Sweden

Data were compiled by Christian Nilsson of Uppsala University from reports of private-sector agreements between trade unions and employers' associations, and from agreements between individual employers and trade unions.

Switzerland

Collective bargaining coverage is described in detail in Dario Lopreno, "Conventions collectives de travail (CCT) en vigueur en Suisse au 1er mai 1994", *Vie économique*, 10/95.

United Kingdom

Collective bargaining for 1990 was calculated using the *New Earnings Survey* and *Workplace Industrial Relations Survey* [see OECD (1994*a*)]. This figure was updated to 1994 using the change in coverage recorded in the 1990 and 1994 *Time Rates of Pay and Hours of Work* surveys.

United States

Both trade union density and the collective bargaining coverage rate come from Table 40 of *Employment and Earnings*, January 1995, which is based on figures from the Current Population Survey.

ANNEX 3.B

Sensitivity analysis of outliers in the data

There are a great number of tests that can be carried out to detect the presence of outliers. The two approaches adopted here both rely on information captured in measures of *residuals* and *leverage*. A large residual (e_i) is one for which the fitted or predicted value is far from the observed value; an observation with high leverage (h_i) is one for which the values of the explanatory variables are far removed from those of most of the other observations.

The first approach consists of a search for outliers from the regression analysis. Exclusion is based on the value of the *studentised residuals*, $r_i = e_i/(s_{(i)}\sqrt{(1 - h_i)})$, where $s_{(i)}$ is the root mean square error of the regression omitting observation i.[1] The r_i can be interpreted as the t-statistic for testing the significance of a dummy variable representing observation i. Values of r_i greater than two indicate an outlier. The pooled regressions in Table 3.6 were then re-estimated excluding outliers.

The second method uses a technique for dealing with potentially over-influential observations. The data are first filtered, with all observations having a value of Cook's Distance greater than one being dropped.[2] Subsequently, as suggested by Li (1985), Huber iterations are performed followed by biweight regressions (in which the weights run

Table 3.B.1. **Measures of economic performance and characteristics of the collective bargaining system: pooled robust regression results, 1980, 1990 and 1994**[a]

	Unemployment rate	Employment rate	Inflation	Growth of real earnings	Earnings inequality
Estimated coefficients					
Trade union density	0.005	0.190***	0.009	0.000	–0.013***
	(0.024)	(0.054)	(0.015)	(0.007)	(0.005)
Bargaining coverage	0.059**	–0.227***	0.019	0.016**	–0.008*
	(0.022)	(0.050)	(0.014)	(0.007)	(0.004)
Centralised/co-ordinated country	–3.088**	2.985	–1.482*	–0.689*	–0.438*
	(1.314)	(2.995)	(0.859)	(0.398)	(0.231)
Intermediate country	–1.835*	–0.354	–2.332***	0.135	–0.608***
	(1.081)	(2.465)	(0.707)	(0.327)	(0.197)
Year 1990	1.590	1.545	–4.181***	0.634**	0.022
	(1.026)	(2.338)	(0.671)	(0.310)	(0.186)
Year 1994	3.185***	–0.379	–5.733***	–0.042	0.043
	(1.031)	(2.350)	(0.674)	(0.312)	(0.195)
Constant	2.492	72.233***	8.075***	–0.106	4.281***
	(1.638)	(3.732)	(1.071)	(0.495)	(0.294)
Number of observations	57	57	57	57	51
R-squared	0.255	0.387	0.681	0.239	0.513
F-statistic	2.85**	5.26***	17.81***	2.62**	7.74***
Residual sum of squares	483.8	2 512.9	206.9	44.3	12.5
Standard error of the residual	3.11	7.09	2.03	0.94	0.53
Countries/years omitted (°) or given low weight (< 0.2)	*Spain 1994* *Spain 1990*	×	*Portugal 1980°* *Spain 1980°* *Portugal 1990* *Italy 1980* *Norway 1980*	×	*Portugal 1994* *Austria 1980* *Austria 1994*

× Not applicable.
* Significant at the 10 per cent level.
** Significant at the 5 per cent level.
*** Significant at the 1 per cent level.
a) Standard errors are in parentheses.
Source: See Table 3.5.

from zero, for omitted observations, to one). The results of this second procedure are reported in Table 3.B.1. They are very similar to those given by the earlier "manual" analysis (which are therefore not reported).

The countries which are omitted from the analysis or which are given low weights are listed at the foot of each column of results. The significant differences between the results from this procedure and those in Table 3.6 are as follows: the results now suggest that both centralised/co-ordinated and intermediate countries experienced significantly lower levels of unemployment, as opposed to only the former beforehand. The results for the inflation rate continue to show both centralised/co-ordinated and intermediate countries experiencing lower levels of inflation than decentralised/uncoordinated countries. The results for earnings inequality and growth of real earnings are largely unchanged from those in Table 3.6. There is no relation between collective bargaining coverage and inflation in the robust results. The inflation equation is the one which exhibits the most influential observations at the foot of the table.

Notes

1. Alternative tests consist of analysing leverage versus residual-squared (L – R) plots or of considering DFITS coefficients, where $DFITS_i = r_i/\sqrt{(h_i(1 - h_i))} = e_i/(s_{(i)}\sqrt{h_i})$. Both of these approaches are taken in Scarpetta (1996).
2. Cook's Distance is related to the DFITS statistic as $D_i = s_{(i)}^2 DFITS_i/ks_i^2$, where k is the number of variables (including the constant) in the regression and s_i is the root mean square error of the regression including the ith observation.

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