

WAGE-SETTING MEASURES

A Survey and Assessment

By LANE KENWORTHY*

RESEARCH in comparative political economy relies heavily on quantitative measures of institutions. Increasingly, researchers are confronted with a multitude of alternative indicators from which to choose. The proliferation of measures stems in part from the fact that they are frequently based on subjective judgment, and with different experts making different coding choices. It is also a product of substantive theoretical disagreement, as differing conceptualizations of variables and causal relationships lead to divergent measurement strategies. There is no single, correct answer to the question of what is a “left” political party or a “social democratic” welfare state or a “corporatist” mode of policy-making. A key conceptual difference concerns whether measures should focus on institutions themselves—that is, the organizations, rules, and routines that guide behavior—or on the behavior generated by institutions. For example, should a measure of democracy or of central bank independence focus on the laws that govern political actors or central banks, or should it instead be based on the actual behavior of such actors and organizations?

Too little critical attention is devoted to the characteristics of and differences between alternative indicators of political economic institutions. An illustrative case is corporatist wage setting—one of the most heavily studied institutions in the field of comparative political economy over the past two decades. Researchers have examined its trends, studied its causes, and analyzed its effects on outcomes such as macroeconomic performance and the level and distribution of earnings.¹

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¹ On trends, see Gudmund Hernes, “The Dilemmas of Social Democracies: The Case of Norway and Sweden,” *Acta Sociologica* 34, no. 4 (1991); Marino Regini, “Between Deregulation and Social Pacts: The Responses of European Economies to Globalization,” *Politics and Society* 28 (March 2000); Michael Wallerstein and Miriam Golden, “The Fragmentation of the Bargaining Society: Wage Setting in the Nordic Countries, 1950 to 1992,” *Comparative Political Studies* 30 (December 1997). On causes, see Torben Iversen, “Power, Flexibility, and the Breakdown of Centralized Wage Bargaining,” *Comparative Politics* 28 (July 1996); Peter Swensen, *Fair Shares: Unions, Pay, and Politics in Sweden and*

World Politics 54 (October 2001), 57–98

Quantitative measures have been integral to this research. There have been more than a dozen attempts to score or rank wage-setting arrangements in affluent countries in terms of their degree of centralization or coordination. But only limited effort has been committed to careful evaluation of these measures. This article offers a survey and assessment of the principal existing measures in the literature: eight measures of wage centralization and seven measures of wage coordination.

The article has three aims. One is simply to provide an inventory of existing wage-setting indicators.² The appendix lists the fifteen measures and describes their coding and the countries and years covered.

The second aim is to examine the features and relative merits of the various measures. Geoffrey Garrett and Christopher Way have remarked that wage-setting measures tend to be “relatively crude indicators whose validity is hard to ascertain.”³ Yet there has been considerable development in this field in the past few years, with an array of new indicators appearing. Are the newer measures more valid and/or more reliable than earlier ones? Are some of the newer measures preferable to others? How do they differ in conceptualization and measurement strategy? What are the relative strengths and weaknesses of measures of wage centralization versus those of wage coordination?

The third aim of the article is to assess the sensitivity of empirical findings generated by these measures. If there are nontrivial differences between wage-setting measures, how much confidence should we place in findings generated by any given one of them? Like their counterparts in many other areas of social science research, students of wage setting have frequently paid only limited attention to the impact of indicator choice on empirical results. I compare the results produced by the various measures in a set of otherwise identical regression analyses of the effect of wage setting on unemployment, the relationship most commonly tested in the corporatist literature. The presumption guiding most of this research is that centralized or coordinated wage arrange-

West Germany (Ithaca, N.Y.: Cornell University Press, 1989), chap. 2; Bruce Western, *Between Class and Market: Postwar Unionization in the Capitalist Democracies* (Princeton: Princeton University Press, 1997), chap. 10. On effects on macroeconomic performance, see, for references, Robert J. Flanagan, “Macroeconomic Performance and Collective Bargaining: An International Perspective,” *Journal of Economic Literature* 37 (September 1999). On effects on the level and distribution of earnings, see David Rueda and Jonas Pontusson, “Wage Inequality and Varieties of Capitalism,” *World Politics* 52 (April 2000); Michael Wallerstein, “Wage-Setting Institutions and Pay Inequality in Advanced Industrial Societies,” *American Journal of Political Science* 43 (July 1999); Bruce Western and Kieren Healy, “Explaining the OECD Wage Slowdown: Recession or Labor Decline?” *European Sociological Review* 15 (September 1999).

² Here and throughout the terms “measure” and “indicator” are used interchangeably.

³ Garrett and Way, “Public Sector Unions, Corporatism, and Macroeconomic Performance,” *Comparative Political Studies* 32 (June 1999), 415.

ments help to reduce unemployment by encouraging moderate rates of increase in labor costs.

To preview, I argue that newer measures of wage centralization represent a substantial improvement over their predecessors in terms of construct validity. Yet even the best of the newer measures have important limitations. Because of inherent measurement difficulties, the principal measures of wage coordination may suffer from a considerable amount of measurement error. Two new coordination measures help to alleviate this problem, but at a cost. Variation in conceptualization and measurement strategy generate some notable differences in assessments of the degree of centralization or coordination in certain countries and in assessments of trends over time. Finally, depending upon the measures compared and the model specification, empirical findings can be highly sensitive to the choice of wage-setting measure.

CONCEPTUALIZATION AND MEASUREMENT STRATEGY

WAGE CENTRALIZATION

Wage centralization refers to the level(s) at which wages are bargained or set. Three principal elements must be considered in determining the degree of centralization in a given country-year. The first is the *level* itself. Three tend to be most salient: peak/central/intersectoral, sector/industry, and company/plant. The second is the *share of the workforce* for which wages are determined at each level. If a central wage agreement covers only 10 percent of the workforce, it hardly makes sense to consider the wage-bargaining process highly centralized. The third is the *degree of horizontal centralization*. In Britain craft unions have traditionally negotiated wages for small groups of employees within a firm or plant, whereas in Japan most unions cover all employees within a plant or company. Bargaining is decentralized in both Britain and Japan, but arguably more so in the former because of this horizontal split. Similarly, in Sweden during the 1970s wages were negotiated mainly at the peak level. However, they were often bargained separately by one peak organization representing private sector blue-collar workers (LO) and by another representing private sector white-collar and professional workers (PTK). Where bargaining is mainly at the sectoral level, the degree of horizontal centralization depends in part on the number of union and employer organizations and the degree of concentration among them.

The best-known early measure of wage centralization was created by David Cameron, who elaborated a measure originally devised by Doug-

las Hibbs.⁴ Cameron aimed to capture “the scope of collective bargaining, ranging from restrictions on collective bargaining on the one hand to economy-wide bargaining on the other.”⁵ His measure is an index ranging from 0 to 1. The Cameron measure was widely used by comparative political economists in the 1980s, and it became a useful basis on which creators of other centralization indicators could draw.

In the late 1980s Lars Calmfors and John Driffill created a rank-ordered centralization measure based on the degree of coordination within central organizations of business and labor and the degree of cooperation between such organizations.⁶ In the 1990s the Calmfors-Driffill indicator was by far the most widely used by economists interested in wage-setting arrangements and their effects.

Since 1990 six new centralization measures have appeared. One, created by the OECD,⁷ assigns countries scores of 1, 2, or 3, representing company-level, sector-level, and economy-wide bargaining, respectively. Intermediate scores (for example, 2+) are assigned to cases in which bargaining occurs at more than one level. This measure appears to have replaced that of Calmfors and Driffill as the most commonly used centralization indicator in recent econometric analyses. Of the five other new measures, three were developed by Miriam Golden, Peter Lange, and Michael Wallerstein (GLW).⁸ The fourth was created by Torben Iversen⁹ and the fifth by Franz Traxler, Sabine Blaschke, and Bernhard Kittel (TBK).¹⁰

These five indicators improve on those of Cameron, Calmfors and Driffill, and the OECD in two respects. First, the Cameron and Calmfors-Driffill measures are time invariant, and the OECD measure is available only for 1980, 1990, and 1994. By contrast, the GLW, Iversen, and TBK indicators vary over time and are measured annually. This is certainly a beneficial development, as wage-setting arrangements have changed quite a bit over time in some countries (see Figure 1a-p).

⁴ David R. Cameron, “Social Democracy, Corporatism, Labour Quiescence, and the Representation of Economic Interest in Advanced Capitalist Society,” in John H. Goldthorpe, ed., *Order and Conflict in Contemporary Capitalism* (Oxford: Clarendon Press, 1984); Douglas A. Hibbs, Jr., “Industrial Conflict in Advanced Industrial Societies,” *American Political Science Review* 70 (December 1976).

⁵ Cameron (fn. 4), 164.

⁶ Lars Calmfors and John Driffill, “Bargaining Structure, Corporatism, and Macroeconomic Performance,” *Economic Policy* 6 (April 1988).

⁷ OECD (Organization for Economic Cooperation and Development), “Collective Bargaining: Levels and Coverage,” in *OECD Employment Outlook* (Paris: OECD, 1994); idem, “Economic Performance and the Structure of Collective Bargaining,” in *OECD Employment Outlook* (Paris: OECD, 1997).

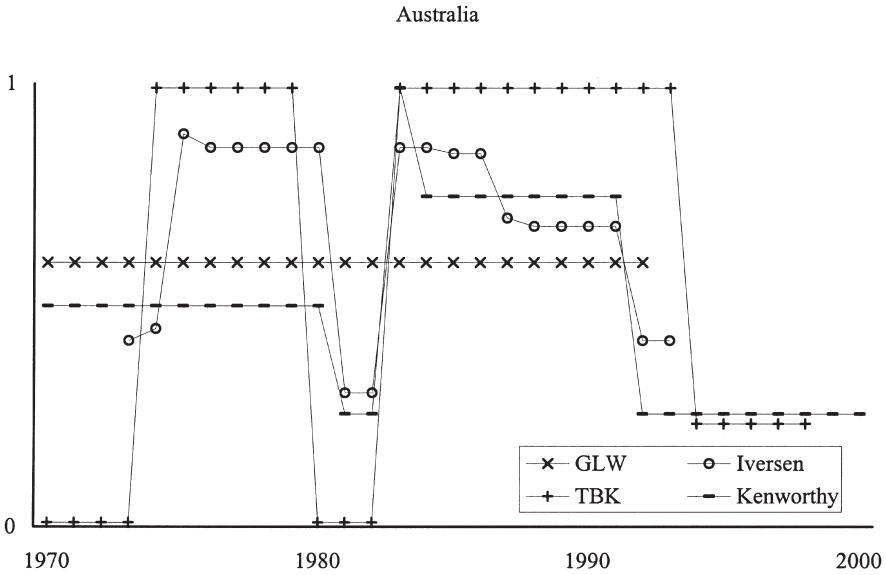
⁸ Golden, Lange, and Wallerstein, “Union Centralization among Advanced Industrial Societies: An Empirical Study” (Data set, www.shelley.polisci.ucla.edu/data, version dated November 2, 1998).

⁹ Iversen, *Contested Economic Institutions* (New York: Cambridge University Press, 1999).

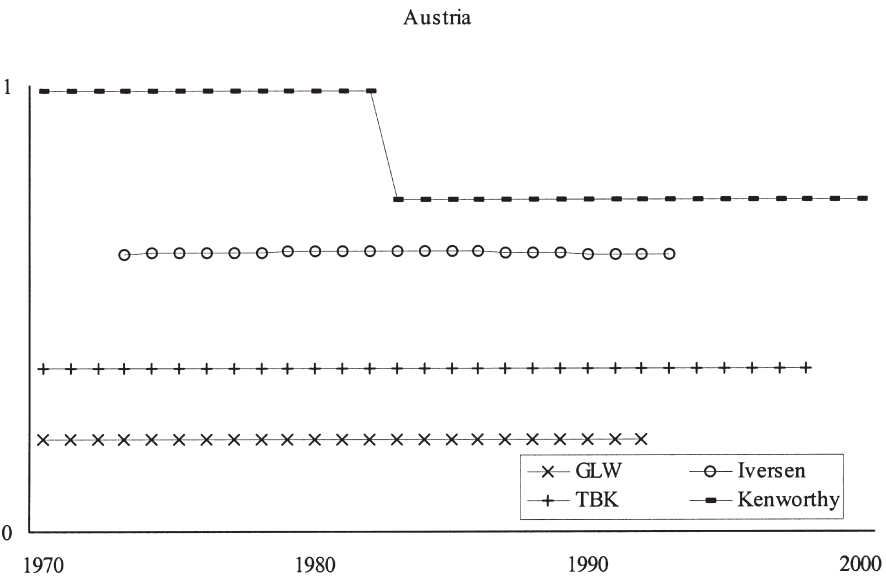
¹⁰ Traxler, Blaschke, and Kittel, *National Labour Relations in Internationalized Markets* (New York: Oxford University Press, 2001).

FIGURE 1
 GLW (CONFEDERATION INVOLVEMENT), IVERSEN, TBK, AND
 KENWORTHY WAGE-SETTING SCORES^a

^aMeasures have been adjusted so that each ranges from 0 to 1.

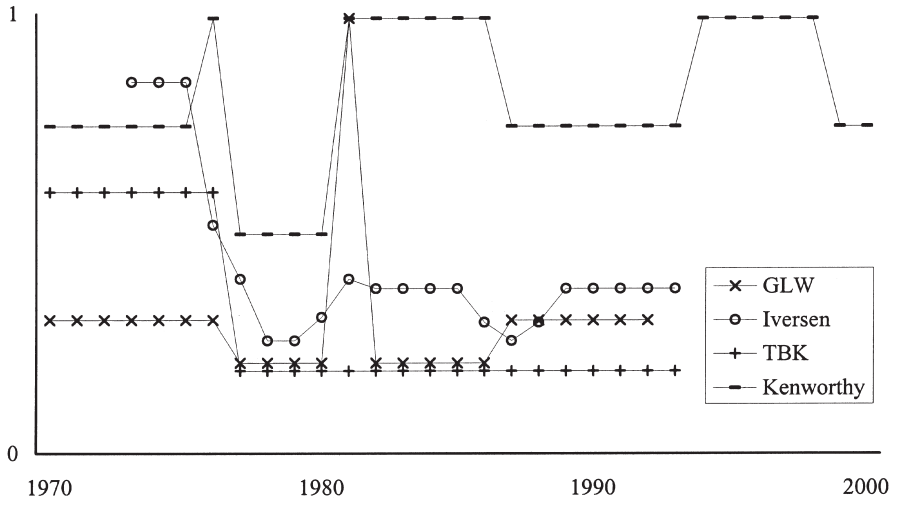


(a)



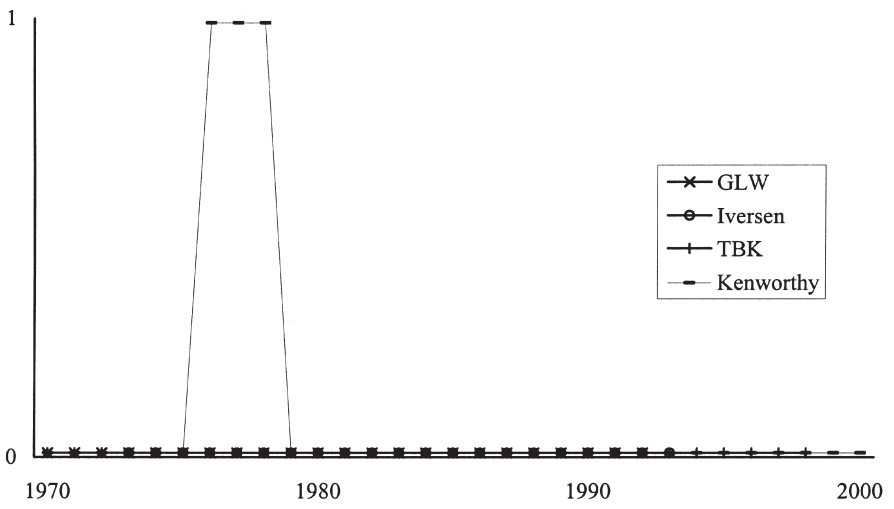
(b)

Belgium



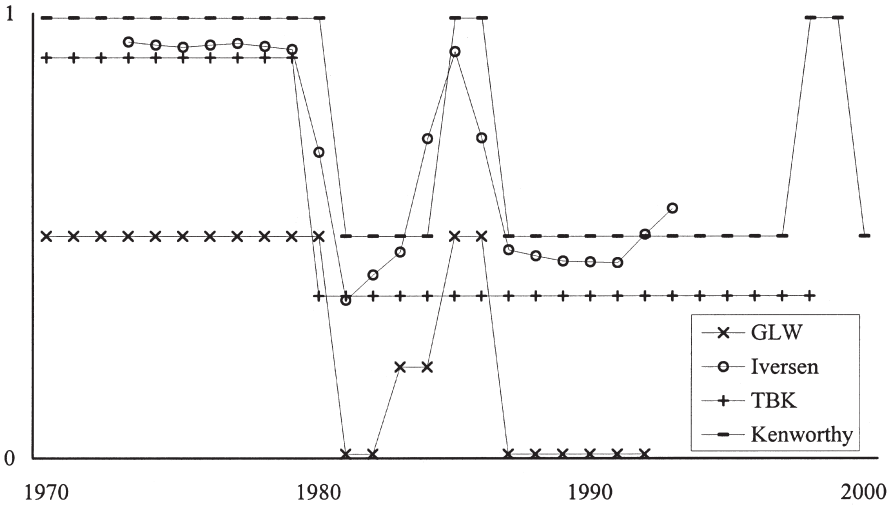
(c)

Canada



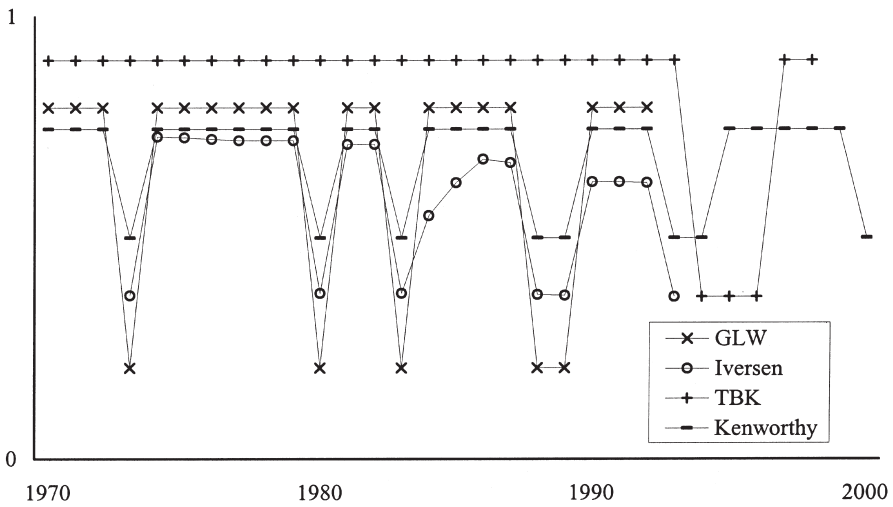
(d)

Denmark



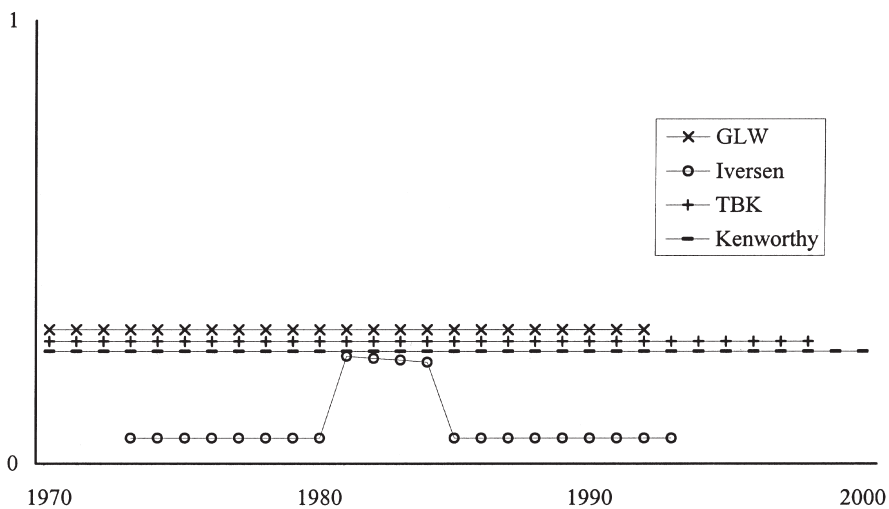
(e)

Finland



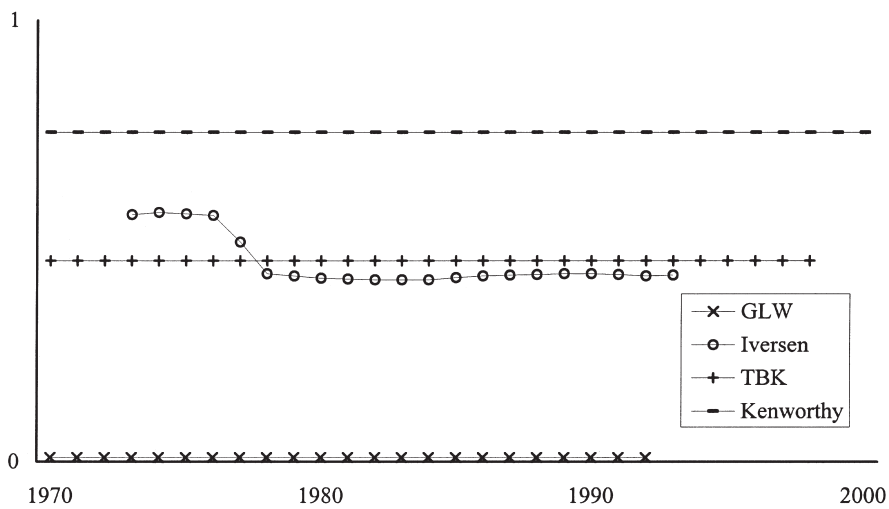
(f)

France



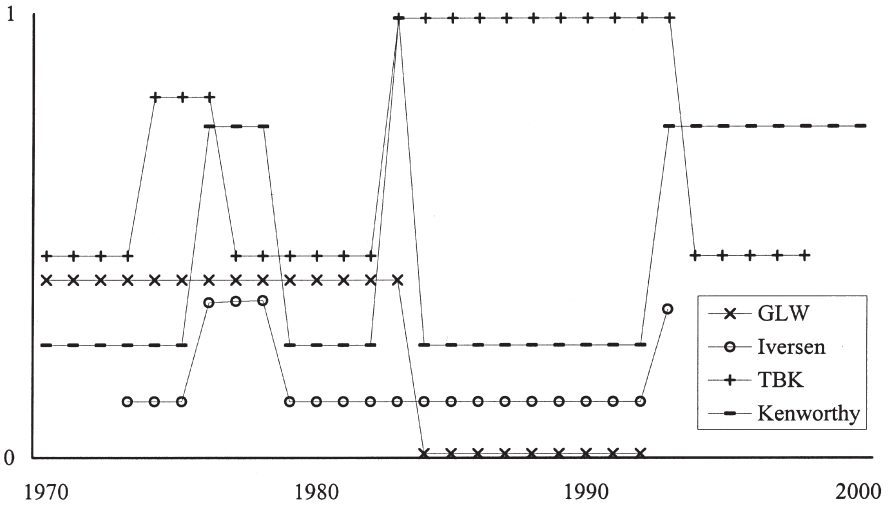
(g)

Germany



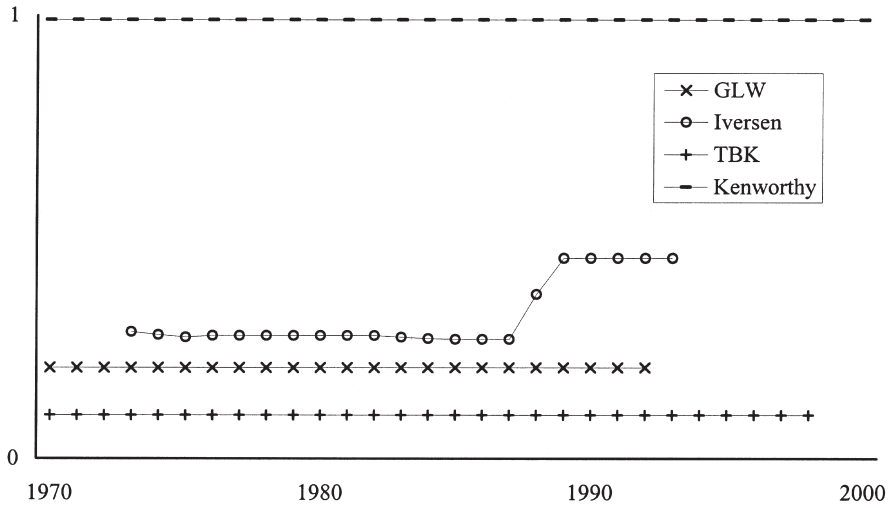
(h)

Italy



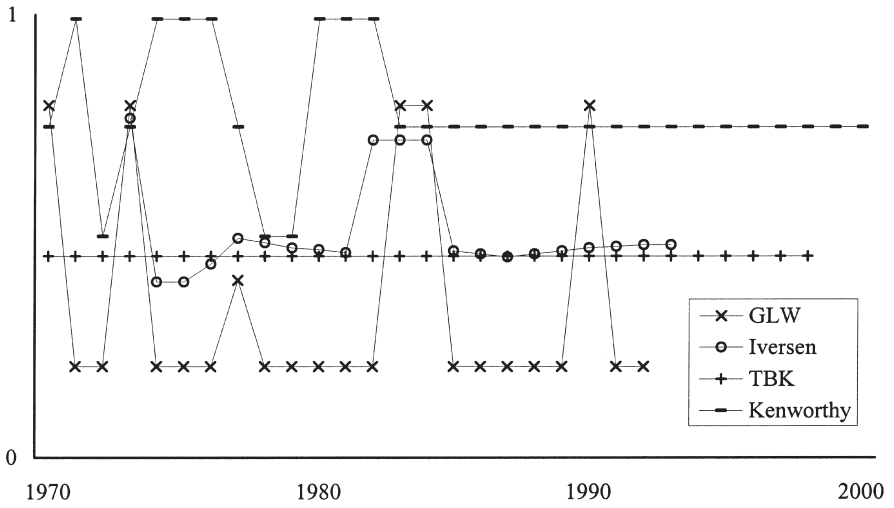
(i)

Japan



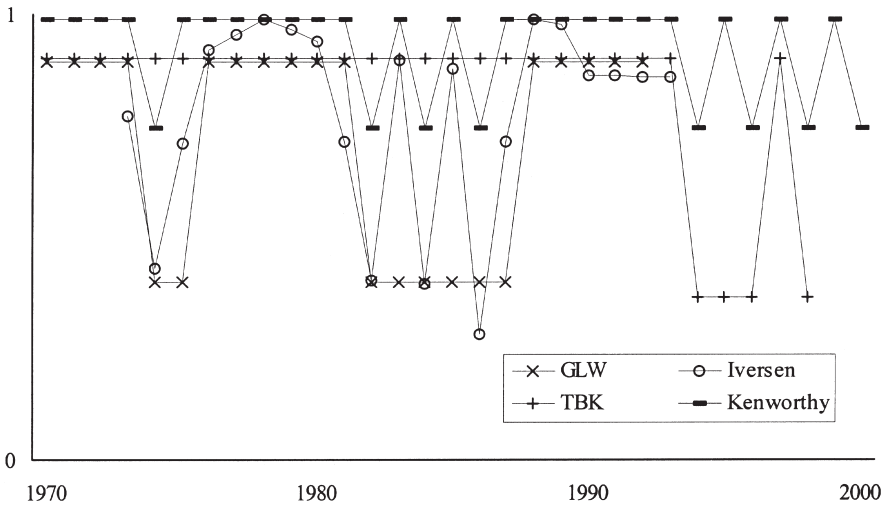
(j)

Netherlands



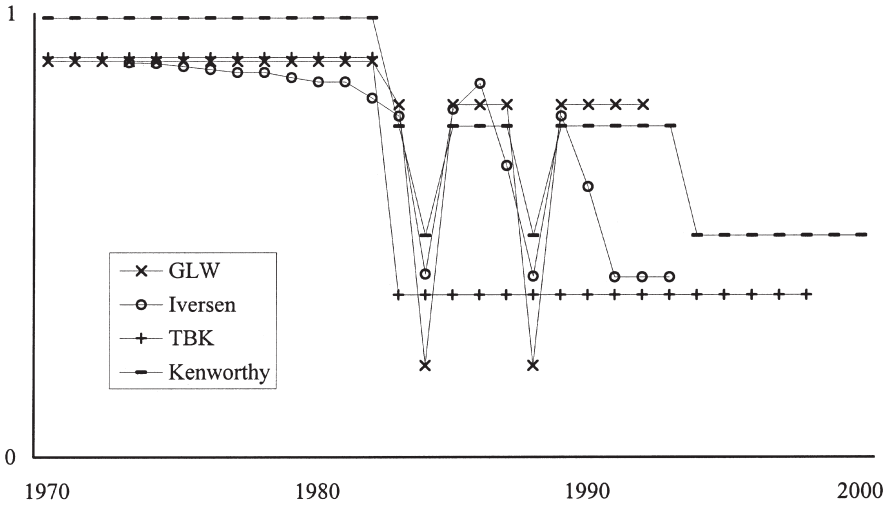
(k)

Norway



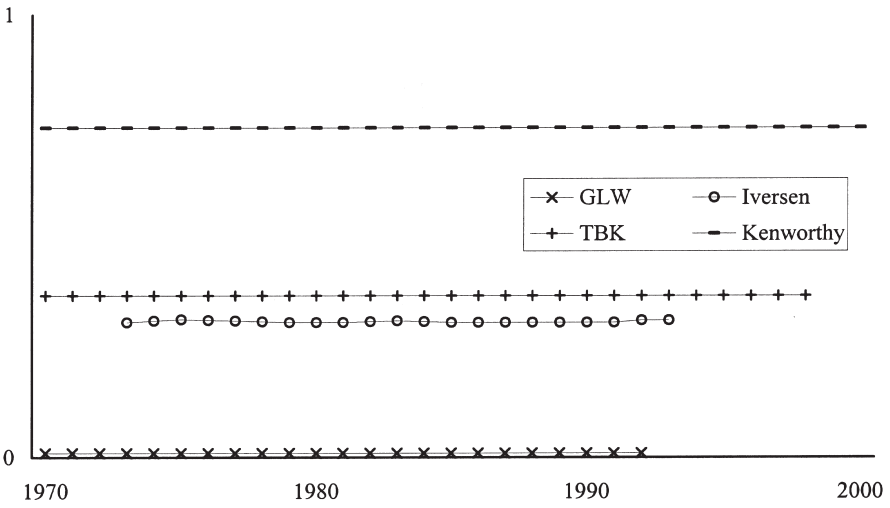
(l)

Sweden



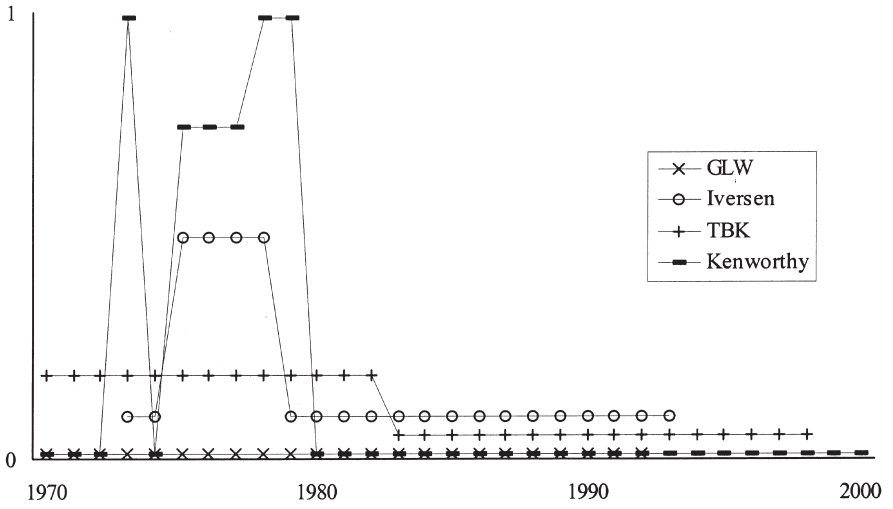
(m)

Switzerland



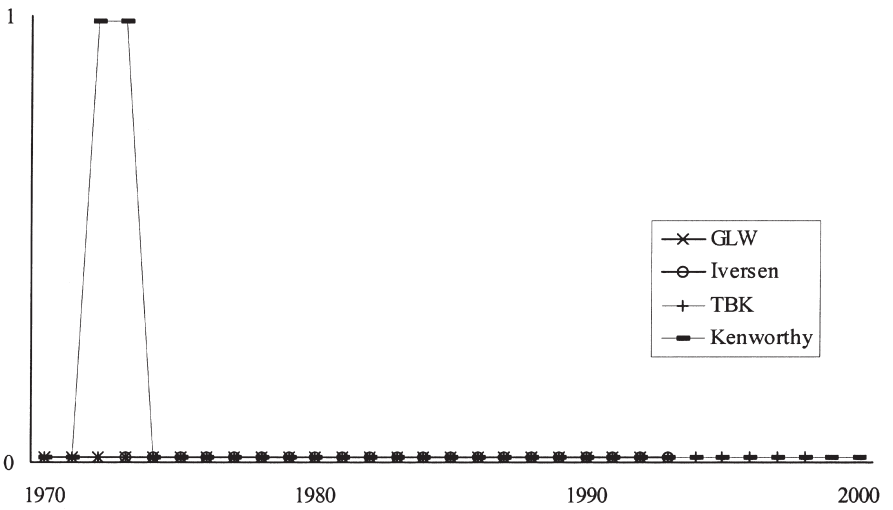
(n)

United Kingdom



(o)

United States



(p)

Moreover, the impact of wage setting may vary across different periods.¹¹ If a time-invariant measure is used in analyses, it is impossible to know whether a finding of period-specific effects is a result of changes in the effects of wage setting or of (unmeasured) changes in the wage-setting arrangements themselves.

Second, the GLW, Iversen, and TBK measures tend to be grounded in more and better data. Available data on the details of wage setting in specific national contexts are much more extensive now than was true a decade or two ago, and in several cases those data have been gathered by the creators of the wage-setting measures themselves. The Golden-Lange-Wallerstein measures are based on data collected as part of their Union Centralization among Advanced Industrial Societies project, which includes extensive information on the structure and practices of union and employer organizations drawn from the organizations themselves and from other data sources in the individual countries. In creating his centralization scores, Iversen drew on monthly reports in the *European Industrial Relations Review*, data from the Golden-Lange-Wallerstein project, Jelle Visser's comprehensive study of union organizations,¹² and a variety of national data sources. The Traxler-Blaschke-Kittel measures are based on information gathered in the Internationalization, Labor Relations, and Competitiveness project directed by Traxler. A standardized questionnaire was used by labor-relations specialists in each individual country to collect data for that country. The responses were then compared with the existing literature and discrepancies resolved via discussion with the specialists.

Each of the Golden-Lange-Wallerstein indicators is a measure of centralizing activities or efforts by relevant actors, rather than of the degree of wage centralization per se. The first is an index of involvement in wage bargaining by peak-level union and employer confederations. The scores range from 1 to 11, with the lowest score representing complete lack of involvement and the highest indicating that the confederations negotiate a central wage agreement with limits on supplementary bargaining.

The second GLW measure is an index of government involvement in the wage-setting process. The scores range from 1 to 15, with the lowest score indicating that government is entirely uninvolved and the highest referring to government imposition of a wage freeze with a pro-

¹¹ See, e.g., Lane Kenworthy, "Unions, Wages, and the Common Interest," *Comparative Political Studies* 28 (January 1996); idem, "Corporatism and Unemployment in the 1980s and 1990s" (Manuscript, Department of Sociology, Emory University, 2001); Traxler et al. (fn. 10).

¹² Visser, "In Search of Inclusive Unionism," *Bulletin of Comparative Labour Relations* 18 (1990).

hibition on supplementary local bargaining. Forms of state intervention that fall between these extremes include, among others, the provision of economic forecasts to bargaining partners, imposition of a cost-of-living adjustment, and imposition of a national wage schedule by a government arbitrator.

The third GLW measure is a summary index of the overall degree of wage centralization. This indicator is scored from 1 to 4. Centralization can result from bargaining by peak-level interest-group associations or from government intervention or from both. Thus, Golden, Lange, and Wallerstein combine their first two indicators to yield the third. The GLW overall centralization index is the only existing indicator that explicitly measures the centralization of wage *setting* by taking into account situations in which there is government-imposed centralization. Others are measures of the centralization of wage *bargaining*. For researchers attempting to explain wage restraint, the inclusion of government involvement may be theoretically preferable, since in many instances government intervention is aimed at encouraging or mandating such restraint. If the interest is in explaining wage inequality, it may be preferable to use a centralization measure that excludes government intervention, since in many cases such intervention does not aim to affect the distribution of wages. Minimum-wage laws are an obvious exception, but they are scored by GLW as the weakest form of government involvement.¹³

In my view, the Iversen and Traxler-Blaschke-Kittel indicators are the best existing bargaining centralization measures. Like the GLW confederation involvement measure, these two improve on prior measures in featuring annual measurement and being better grounded in objective data. Unlike the GLW measure, they focus on the degree of centralization itself rather than on the extent of centralization-related activities by confederations. And their construction makes them almost certainly more valid than earlier measures. They differ from one another in that Iversen's measure focuses on the structural characteristics of the wage-bargaining process, whereas the TBK measure treats centralization as a behavioral concept. Iversen's measure seeks to identify the degree to which wage-bargaining *arrangements* are centralized. The

¹³ In the theoretical framework developed by Iversen (fn. 9), the aim is to examine the effects of wage determination on wage restraint (and thereby on unemployment). Yet the proclivity of various wage-bargaining structures to generate such restraint is hypothesized to be partly a function of unions' interest in pursuing pay equality ("wage solidarity"). In this type of model it makes sense to use a measure of centralization of wage *bargaining* and to include a measure of government involvement in the wage-setting process as a separate variable in the regression analyses.

TBK measure seeks to capture the degree to which bargaining itself is centralized.

Iversen's indicator is based on the locus of bargaining authority and the degree of concentration of union membership. It aims to measure organizational centralization, rather than the degree to which wages actually end up being set at higher levels.¹⁴ A score ranging from 0 to 1 is assigned for each of the three main bargaining levels: centralized, intermediate, and decentralized. The scores for the three levels sum to 1, with the score for each level based on the bargaining rights accorded that level. The scores are:¹⁵

—0, 0.1, 0.9: Plant- and firm-level bargaining predominates with some elements of industry-level bargaining.

—0.1, 0, 0.9: National associations and the government set nonenforceable targets for plant-level bargaining, but local organizations retain rights to bargain and to call strikes or lockouts.

—0, 0.8, 0.2: Industry-level organizations monopolize bargaining and strike/lockout decisions, and agreements are enforceable. Local bargaining is permitted subject to a peace clause.

—0.1, 0.7, 0.2: National associations and/or the government set nonenforceable targets for lower-level bargaining, but industry-level organizations retain rights to bargain enforceable agreements. Local bargaining is permitted, subject to a peace clause.

—0.5, 0.3, 0.2: National associations negotiate central agreements with some capacity for enforceability, but industry-level organizations retain the right to bargain separate agreements without adherence to a peace clause.

—0.8, 0, 0.2: National associations monopolize bargaining, and agreements are enforceable. Local bargaining is permitted, subject to a peace clause.

—0.9, 0, 0.1: National associations monopolize wage bargaining, and agreements are enforceable. Lower-level bargaining is banned.

Each of the three scores is then weighted by an index of union concentration at that bargaining level. The three weighted scores are then combined (using the formula shown in the appendix) to create the centralization score.

Notice that a number of Iversen's categories for coding the level of bargaining are based partly on whether or not there is a peace clause governing lower-level bargaining. A peace clause (or peace obligation, as it is sometimes called) is a type of sanction that prohibits strikes and lockouts at lower levels. It thereby forecloses one strategy by which lower-level bargainers may attempt to circumvent central- or industry-level wage agreements. However, by no means does it eliminate the

¹⁴ Iversen (fn. 9), 49.

¹⁵ *Ibid.*, 84–85.

ability of company- or plant-level bargainers to reach separate agreements. Peak-level settlements in Sweden and Norway in the 1970s included a peace obligation, yet agreements reached at lower levels accounted for 30 to 60 percent of total wage increases during that decade.¹⁶ This reliance on the presence or absence of a peace obligation as a key for coding decisions is indicative of how Iversen's measure focuses on structural features of the wage-bargaining process (institutions) rather than on the level(s) at which wages are actually bargained or set (behavior).

The principal use of wage centralization measures has been as a predictor of macroeconomic performance. One could argue that a structural measure should be preferred in such analyses because structure is causally prior to behavior. Using a structural measure to predict macroeconomic performance presumes, however, that the centralization of wage-bargaining arrangements determines wage-setting behavior, which in turn determines wage changes, which in turn determines macroeconomic outcomes. In other words, two links in the causal chain are assumed. Using a behavioral measure of centralization has the advantage of closing one gap in the hypothesized causal sequence. There seems no compelling a priori reason to favor either a measure based on wage-bargaining structures or one based on wage-bargaining behavior. It depends on the researcher's theoretical interest.

One drawback of Iversen's measure is that it does not take into account the share of the workforce covered by wage bargaining at each level. To compensate for this measurement deficiency, which characterizes almost all centralization indicators, some analyses of effects of wage centralization include the overall coverage rate as a separate variable in their regression models.¹⁷ However, the key for an accurate measure of wage centralization is coverage *at each particular level* of bargaining, not the overall rate of coverage. Another drawback is that lack of available data prohibits a calculation of centralization scores for countries in which bargaining occurs largely at the firm or plant level. Iversen is thus forced to simply assign scores for these cases.¹⁸

The Traxler-Blaschke-Kittel measure is based solely on behavior. That is, it focuses on the actual level(s) at which bargaining takes place, rather than on the bargaining authority of each level, and it takes into

¹⁶ Robert J. Flanagan, "Centralized and Decentralized Pay Determination in Nordic Countries," in Lars Calmfors, ed., *Wage Formation and Macroeconomic Policy in the Nordic Countries* (New York: Oxford University Press, 1990), 398; Traxler, Blaschke, and Kittel (fn. 10) 127.

¹⁷ OECD (fn. 7, 1997).

¹⁸ Iversen (fn. 9), 55, 86.

account the actual degree of influence that lower-level bargaining has on final wage outcomes, rather than relying on the presence or absence of a peace clause as a proxy for that influence.¹⁹ The TBK measure also incorporates the share of workers covered at each bargaining level. They assign a centralization score based on their case-by-case judgment regarding the appropriate mix of the importance of each bargaining level (in terms of its effect on wages) and the coverage rate at each level, with a heavier weight generally attached to the latter.²⁰ The horizontal dimension of centralization is also included in the TBK measure. Traxler, Blaschke, and Kittel assign a higher centralization score if bargaining at a given level occurs for all groups of workers jointly than if it is group specific. The scores for the TBK measure are as follows (I have reversed the scores so that higher values indicate greater centralization):²¹

- 1: company and plant, with group-specific bargaining
- 1.5: company and plant, with all groups and group-specific bargaining equally important
- 2: company and plant, with all groups bargaining jointly
- 3: combination of industry and company and plant, with group-specific bargaining
- 3.5: combination of industry and company and plant, with all groups and group-specific bargaining equally important
- 4: combination of industry and company and plant, with all groups bargaining jointly
- 5: industry, with group-specific bargaining
- 6: industry, with all groups bargaining jointly
- 7: combination of central, industry, company, and plant, with group-specific bargaining
- 7.5: combination of central, industry, company, and plant, with all groups bargaining jointly at the central level and group-specific bargaining at all other levels
- 8: combination of central, industry, company, and plant, with all groups bargaining jointly
- 9: central and industry, with group-specific bargaining
- 10: central and industry, with all groups bargaining jointly
- 11: central, with group-specific bargaining
- 12: central, with all employees bargaining jointly

For researchers interested in a measure of the degree of actual centralization in the wage-setting process, the Traxler-Blaschke-Kittel

¹⁹ Traxler, Blaschke, and Kittel (fn. 10) have also created a separate, dichotomous indicator of “bargaining governability,” which refers to the presence or absence of sanctions on lower-level bargaining (p. 184).

²⁰ *Ibid.*, 112–13.

²¹ *Ibid.*, 307.

measure seems clearly to be the best available. Its principal weakness is its heavy reliance on subjective judgment. Reliability would likely be increased if the index were based on an explicit formula, as is Iversen's. Traxler, Blaschke, and Kittel suggest that combining the three elements of centralization—the bargaining level(s), the coverage rate at each level, and the degree of horizontal centralization—does not yield a consistent ranking.²² That is almost certainly true, but it merely implies a need to make difficult theoretical choices in devising such a formula—not that case-by-case judgment is preferable. In some instances, however, application of a preset formula might lead to very misleading results. Substantial wage increases may be bargained at the plant level but anticipated and adjusted for at a higher bargaining level. The higher level may therefore be the most important source of wage outcomes even though the formal share of wage changes for which it accounts is fairly small.²³

Is it appropriate to measure wage centralization using a metric scale rather than a rank ordering? Given the limited data available to creators of the earliest centralization measures, it is understandable that Calmfors and Driffill opted for a ranking. However, the greater volume and improved quality of data now available seem sufficient to justify the use of scales in the newer measures—which is not to say that all researchers will agree with the particular scale used for any given indicator. Quantitative analyses using rank-ordered variables are less susceptible to outliers than are those using scale measures. Yet this problem can be remedied via standard regression diagnostics and/or “jackknife” analyses, in which the data are reanalyzed with cases dropped one at a time. Rankings are less valid in the sense that they hide the true degree of difference in centralization between countries. In particular, when treated as scale variables, as they frequently are in statistical analyses, rank orderings may artificially inflate the degree of variation between countries on the high and low ends. In addition, rankings are difficult to keep consistent for a measure that varies over time.

A number of the centralization measures are limited in their coverage of countries and/or years. Among the eighteen usual suspects in comparative research on affluent democracies,²⁴ Ireland and New Zealand are missing in several of the indicators, including the Golden-

²² *Ibid.*, 112.

²³ See Douglas A. Hibbs, Jr., and Håkan Locking, “Wage Compression, Wage Drift, and Wage Inflation in Sweden,” *Labour Economics* 3 (September 1996).

²⁴ Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

Lange-Wallerstein and Iversen measures. In terms of coverage of years, the Traxler-Blaschke-Kittel indicator is measured from 1970 to 1998, Iversen's from 1973 to 1993. The GLW measures currently are available from 1950 to 1992. Miriam Golden and Michael Wallerstein are in the process of extending them through the year 2000, with this update expected to be available by the summer of 2002. Although the TBK measure is scored annually, as of this writing (August 2001) the data have been made available for public use only as averages for three- to five-year periods.

To summarize, there exist a number of alternative indicators of wage centralization. Although each has drawbacks, recently developed measures represent a notable improvement over their predecessors. In particular, the Iversen and Traxler-Blaschke-Kittel measures appear to be significantly more valid than the measures that have dominated analyses of wage centralization and its effects over the past two decades. The differences between these two indicators stem primarily from the fact that the Iversen measure is based on institutional features of wage-setting arrangements while the TBK measure focuses on behavior.

WAGE COORDINATION

David Soskice argued in an influential 1990 article that the focus of analysts interested in effects of wage-setting should be on *coordination* rather than centralization.²⁵ The degree of coordination in the wage-setting process is likely to greatly influence wage outcomes, he suggested, and bargaining centralization is only one means (albeit an important one) of achieving such coordination. A second is state-imposed centralization, as in Belgium, the Netherlands, and Denmark in some years and even Canada and the United States in a few. A third is guidance of industry or firm-level bargaining by peak union and/or employer confederations, as in Switzerland, Austria prior to the mid-1980s, Norway in a number of years, the Netherlands since 1983, and Italy since 1993. This might usefully be termed "informal centralization." A fourth means of achieving coordination is pattern setting led by a powerful sector, as in Germany, or by a group of influential firms, as in Japan.

Wage coordination is fundamentally a behavioral concept. It refers to the degree of intentional harmony in the wage-setting process—or, put another way, the degree to which minor players deliberately follow along with what the major players decide. "Major" players include, for

²⁵ Soskice, "Wage Determination: The Changing Role of Institutions in Advanced Industrialized Countries," *Oxford Review of Economic Policy* 6 (Winter 1990).

example, peak-level union and employer confederations in countries such as Norway and pre-1983 Sweden, the metalworkers union and its employer counterpart in Germany, and a set of influential large firms in Japan.

Coordination was the focus of Colin Crouch's 1985 dichotomous indicator of "industrial relations systems," which in turn drew on a classification created nearly twenty years earlier by Anne Romanis.²⁶ Soskice himself offered coordination scores, though for only eleven countries. The Soskice scores have been updated and extended to a larger set of nations by Richard Layard, Stephen Nickell, and Richard Jackman and more recently by Peter Hall and Robert Franzese.²⁷ In addition, the OECD has created a coordination counterpart to its centralization measure.²⁸

Each of these indicators appears to be attempting to score countries based on the degree of intentional harmonization observed in the wage-setting process. This is perhaps clearest for Soskice's measure. Soskice ranked each country according to the degree of coordination of wage outcomes he observed in it (in the mid- to late 1980s) and then described the institutional structures or organizations that helped to generate such coordination in each country. His scoring is as follows:²⁹

—United States and United Kingdom (0): zero employer and union coordination

—France (1.5): tacit government coordination via public services and large nationalized industry sector

—Italy (2): informal employer coordination via big employers, especially Fiat, IRI, and some regional employer associations; some help from union confederations, CGIL and CISL

—Netherlands (3): strong employer organizations and informal coordination between giant companies; occasional differences between giants and industry organizations; medium union coordination

²⁶ Crouch, "Conditions for Trade Union Wage Restraint," in Leon N. Lindberg and Charles S. Maier, eds., *The Politics of Inflation and Economic Stagnation* (Washington, D.C.: Brookings Institution, 1985); Romanis, "Cost Inflation and Incomes Policy in Industrial Countries," *International Monetary Fund Staff Papers* 14 (March 1967). I do not include the Romanis measure here because it appears not to have been used in empirical analyses.

²⁷ Layard, Nickell, and Jackman, *Unemployment: Macroeconomic Performance and the Labor Market* (New York: Oxford University Press, 1991); Layard and Nickell, "Unemployment in the OECD Countries," in Toshiaki Tachibanaki, ed., *Labour Market and Economic Performance* (New York: St. Martin's Press, 1994); Nickell, "Unemployment and Labor Market Rigidities: Europe versus North America," *Journal of Economic Perspectives* 11 (Summer 1997); Hall and Franzese, "Mixed Signals: Central Bank Independence, Coordinated Wage Bargaining, and European Monetary Union," *International Organization* 52 (Summer 1998).

²⁸ OECD (fn. 7, 1997).

²⁹ Soskice (fn. 25), 55.

—Germany (3.5): strong employer organizations, with considerable coordination across industries; medium-strong union coordination

—Sweden (4): powerful centralized employer organization; generally strong coordination across industries, with some divergence of interests; centralized union confederations with some internal conflicts

—Norway (4): as Sweden, with government playing an additional coordinating role

—Switzerland (4): very powerful employer organizations, playing tacit coordinating role; unions weak and pliant

—Austria (5): very powerful union, with centralized coordinating role; medium-strong employer organizations

—Japan (5): very powerful tacit employer coordination across large companies, in more or less centralized way, with backing from industry employer organizations; weak and pliant unions

This is a relatively heroic exercise, as it is not easy in practice to measure the actual degree to which the various actors involved in the wage-setting process deliberately harmonize their bargaining. To do so in an accurate fashion, the researcher must factor in both the share of the workforce whose wages are deliberately pegged to the agreement(s) reached by the major players and the degree to which minor players follow along (how closely they adhere). It is not clear exactly how Soskice decided, for instance, that the degree of harmonization in Sweden exceeded that in Germany. I suspect his scores were based on an impressionistic reading of the degree to which minor players follow along with major-player decisions, coupled with intuition about the degree to which the wage-setting institutions in each particular country are likely to (rather than actually do) generate coordination. The Lazard-Nickell-Jackman, Hall-Franzese, and OECD coordination indicators appear to follow Soskice's measurement strategy, though it is difficult to know for certain because no explicit rationale is provided for their coding schemes. Plainly, there is potential for significant measurement error in such indicators.

Could one instead use a wage-setting outcome, such as the degree of wage restraint, as the basis for measuring the degree of coordination in each country? Information on this is certainly easier to obtain and much more straightforward to rank. But the answer is no, for two reasons. First, this would render the measure useless—because tautological—for the purpose of attempting to explain wage restraint, which has indeed been one of the principal uses of wage-coordination measures. Second, and more important, coordination of wages and restraint of wages are distinct phenomena. A wage-setting process that is effectively centralized, for instance, should be considered highly coordi-

nated even if the central agreement yields extremely high pay increases, provided that bargainers at lower levels do not alter the central agreement excessively. Similarly, wage setting in Germany should be considered relatively coordinated even if the metalworkers union successfully negotiates a 30 percent wage increase in a given year, as long as other industries, firms, and plants more or less follow suit. Nor does wage restraint necessarily imply coordination. Pay increases are uniformly low in the United States in some years, but there is little *intentional* harmonization of wage settlements across companies. Wage coordination also does not imply that all or most workers get the same rate of pay increase. Consider again a prototypical centralized case. The peak-level settlement could specify that chemical workers get a 20 percent wage increase while hotel employees get a 2 percent increase. As long as lower-level bargainers follow along, wage setting should be considered coordinated. Wage restraint and/or compression may be more likely in countries with a high degree of wage coordination, but neither is presupposed by the concept itself.

An alternative strategy for measuring wage coordination is to focus on coordinating activities by the major players, rather than on the degree of coordination actually achieved. Traxler, Blaschke, and Kittel have done this.³⁰ Since these activities, or “modes of coordination,” are qualitatively different from one another, TBK create a categorical coordination indicator. In their view there are six principal modes of coordination: interassociational coordination by the peaks of unions and employer associations (classic bargaining centralization), intra-associational coordination by the peaks (what I have called “informal centralization,” as in Austria and Switzerland), pattern bargaining, state-sponsored coordination (bargaining centralization that includes formal participation by government representatives), state-imposed coordination, and uncoordinated bargaining. TBK code their coordination scores based on activities by major players that are aimed at securing coordination, “regardless of whether these efforts were successful in terms of their coordination effects.”³¹ The one exception to this coding procedure is pattern setting, which does not necessarily require active harmonizing efforts by the pattern setter(s).³² Nevertheless, it is relatively easy to identify the countries for which pattern setting is the main coordination mode.

What are the options for researchers who wish to focus on the degree, rather than the type, of coordination? One is to use the Soskice-type

³⁰ Traxler, Blaschke, and Kittel (fn. 10), chap. 10.

³¹ *Ibid.*, 148.

³² *Ibid.*

measures discussed above. Their chief drawback is that they are relatively impressionistic and therefore may suffer from substantial measurement error. An alternative is to create scores based on a set of expectations about which institutional features of wage setting arrangements *are likely to generate* more or less coordination. This avoids the problem of limited information about the intentions of various actors in the wage-setting process and the difficulty in ranking such intentions even if such information were readily available. I have attempted to create such a variable, in the form of an index with five categories. The scores are as follows:³³

—1: fragmented wage bargaining, confined largely to individual firms or plants (Canada, Ireland 1960–69 and 1981–87, New Zealand since 1988, United Kingdom since 1980, United States)

—2: mixed industry- and firm-level bargaining, with little or no pattern setting and relatively weak elements of government coordination such as setting of basic pay rate or wage indexation (Australia since 1992, France, Italy in most years)

—3: industry-level bargaining with somewhat irregular and uncertain pattern setting and only moderate union concentration (Denmark in most years since 1981, Finland in a few years, Sweden since 1994)

government wage arbitration (Australia prior to 1981, New Zealand prior to 1988)

—4: centralized bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, without a peace obligation (Belgium and Finland in most years, Ireland 1970–80 and 1987–93)

informal centralization of industry- and firm-level bargaining by peak associations (Italy since 1993, Netherlands since 1983, Norway in some years, Switzerland)

extensive, regularized pattern setting coupled with a high degree of union concentration (Germany, Austria since 1983)

—5: centralized bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, with a peace obligation (Denmark 1960–80, Ireland since 1994, Norway in some years, Sweden 1960–82)

informal centralization of industry-level bargaining by a powerful, monopolistic union confederation (Austria prior to 1983)

extensive, regularized pattern setting and highly synchronized bargaining coupled with coordination of bargaining by influential large firms (Japan)

Note, however, that this variable is not a *measure* of wage coordination per se. It is, instead, a *hypothesis* or *prediction* about the degree of coordination that is likely to be generated by various wage-setting institu-

³³ Lane Kenworthy, "Wage Setting Coordination Scores" (Manuscript, Department of Sociology, Emory University, <http://www.emory.edu/SOC/lkenworthy>, 2001). These scores revise and extend the wage coordination scores in Alexander Hicks and Lane Kenworthy, "Cooperation and Political Economic Performance in Affluent Democratic Capitalism," *American Journal of Sociology* 103 (May 1998), 1642.

tions. In focusing strictly on institutional features, it is similar to Iversen's centralization measure. The difference is that, because his indicator is based on organizational authority and union concentration, Iversen is able to rank wage-bargaining arrangements more or less unambiguously in terms of their degree of centralization. That is impossible to do for coordination, because coordination is generated by qualitatively different institutional arrangements.

The advantages of this wage-coordination index for use in empirical analysis are two. First, because it focuses on the structural characteristics of the wage-setting process, it is considerably easier to measure than is the degree of coordination the process actually generates. It is thus less likely to suffer from extensive measurement error than are existing scale measures of wage coordination. But are informal centralization and pattern setting institutional structures, or are they behavioral outcomes? In informal centralization, union and/or employer confederations tacitly centralize the bargaining process by suggesting and/or approving wage agreements that are formally negotiated at lower levels or sometimes simply by sharing information and fostering a climate of consensus. Pattern setting exists where bargaining is formally decentralized but in practice one or a few wage settlements (the metalworkers' settlement in Germany, for example) are seen by all or most other bargaining parties as determining the outcome they will follow. In a literal sense, both of these modes of coordinating wage bargaining are behaviors. However, the notion of an institutional structure refers not merely to formal rules and procedures but also to regularized patterns of action, or legitimated and widely accepted ways of doing things, which may have as much or more force than formal rules in determining behavior.³⁴ A well-developed, regularized system of informal centralization or pattern setting should thus be viewed as a structural characteristic of the wage-setting process. Minor players follow along because that is the way things are done and because it has proven effective in the past. Pattern setting and informal centralization are behaviors, to be sure, but they are, in this sense, also institutional structures that influence behavior.

Second, unlike the Traxler-Blaschke-Kittel categorical indicator, this index focuses on the degree of (likely) coordination, rather than the type of coordination activities or efforts. It thereby allows for the possibility that there is variation *within* each bargaining mode in the degree of coordination generated. Let me elaborate on this point. There is rea-

³⁴ See, e.g., Walter W. Powell and Paul J. DiMaggio, eds., *The New Institutionalism in Organizational Analysis* (Chicago: University of Chicago Press, 1991).

son to expect (as the Iversen and Golden-Lange-Wallerstein measures of bargaining centralization implicitly do) that peak-level bargaining accompanied by a peace clause will yield greater coordination than in the absence of such a clause. The same is true for state-imposed centralization. With respect to what I have termed informal centralization (what Traxler, Blaschke, and Kittel call intra-associational coordination), my sense is that the type that obtained in Austria prior to the early 1980s ought to be expected to generate greater harmonization in the wage-setting process than that in Switzerland, in the Netherlands since 1983, and in Italy since 1993. This is for two reasons: first, there was only one major player in Austria, a monopolistic union confederation, as opposed to several peak union and/or employer associations in these other countries; second, bargaining in Austria occurred mainly at the industry level, whereas in Switzerland, the Netherlands, and Italy there is a mix of industry- and firm-level bargaining. Pattern setting, I would argue, can reasonably be separated into three hierarchically ordered types. Japanese-style pattern setting is likely to yield the greatest degree of harmonization, because it is highly synchronized (via the annual spring offensive). Pattern setting led by a single industry has been the chief mode of coordination in both Germany and, in recent years, Sweden. But in Germany this practice has existed for a long time, and in almost every year it is clear which industry will be the pattern setter; in addition, the union for that industry, the metalworking industry, covers a relatively large share of the unionized workforce. The process is more uncertain where it is less regularized and institutionalized and/or where the pattern-setting union is less influential, as in Sweden. In my view the former wage-setting process ought to be predicted to generate more coordination than the latter process.

It is more difficult to decide how to rank formally centralized wage-setting arrangements in comparison with informally centralized ones and those oriented around pattern setting. My view on this is suggested in the scores shown above. For instance, I suspect that peak-level bargaining without a peace clause is likely to generate roughly the same degree of wage coordination as the informal centralization that has characterized countries such as Switzerland, the Netherlands, and Italy in recent years. But other researchers might well differ in their predictions. Subjectivity will by definition play no small role here, as the scores are based on judgment that an observable bargaining structure will yield behavior with some (unobserved) probability.

That being so, can such an index legitimately be used in empirical analysis? Yes, but it is important to clearly specify the nature of the vari-

able—that is, the fact that it is not a measure of the actual degree of wage coordination. The same status applies to a variety of other important variables in comparative political economy, such as political partisanship, central bank independence, and employment protection. Each of these is fundamentally a behavioral concept, but each tends to be measured on the basis of observable features that cannot be rank ordered unambiguously.³⁵

Some researchers may be interested in the effects of wage coordination but at the same time be skeptical about the reliability of existing scale measures and uncomfortable with an index based on structural characteristics. There are, however, a variety of alternative strategies for operationalization. One option, employed by Traxler and Kittel in their analysis of the impact of wage-setting arrangements on wage restraint and macroeconomic performance, is to use a set of dummy variables representing various modes of coordination.³⁶ One drawback to this approach is that it collapses centralization into a dichotomous measure. An alternative would be to use a scale indicator of bargaining centralization (such as the Iversen or Traxler-Blaschke-Kittel measure) and three dummy variables: one representing informal centralization, a second representing pattern setting, and a third representing state-imposed centralization (with uncoordinated bargaining as the omitted category). Other options are obviously possible.

Among the wage-coordination variables, only the Traxler-Blaschke-Kittel measure and the Kenworthy index are time varying with annual scores. The former is available from 1970 to 1998, the latter from 1960 to 2000. As noted earlier, the Soskice scores are available for only eleven countries. Otherwise, the only coordination measure that is deficient in country coverage is the OECD's, which does not include Ireland (though, like the Hall-Franzese and TBK measures, it does provide scores for Portugal and Spain).

HOW SIMILAR OR DIFFERENT ARE THE SCORES?

How much similarity or difference is there among wage-setting measures in the scores they assign? Table 1 shows the correlations between

³⁵ See Ian Budge, "Expert Judgements of Party Policy Positions: Uses and Limitations in Political Research," *European Journal of Political Research* 37 (January 2000); James Forder, "Some Methodological Issues in the Statutory Characterization of Central Banks," *West European Politics* 24 (January 2001); Giuseppe Bertola, Tito Boeri, and Sandrine Cazes, *Employment Protection and Labour Market Adjustment in OECD Countries: Evolving Institutions and Variable Enforcement*, Employment and Training Paper no. 48 (Geneva: International Labour Organization, 1999).

³⁶ Traxler and Kittel, "The Bargaining System and Performance: A Comparison of Eighteen OECD Countries," *Comparative Political Studies* 33 (November 2000).

the measures. For the time-varying indicators I use a period average over the years 1974–89, since this is the approximate period covered by most of the time-invariant indicators. Table 2 shows correlations between the time-varying measures using annual data. Of course, many of the correlations in these tables reflect a degree of dependence among the creators of the measures; each is bound to be aware of other existing measures and is likely to be influenced by them to some extent. This is particularly true for the coordination indicators. Hence the correlations cannot be interpreted as though these measures represented independent judgments.

As noted earlier, the Golden-Lange-Wallerstein, Iversen, and Traxler-Blaschke-Kittel measures are superior to earlier centralization indicators. Among these, the most directly comparable with one another are the GLW measure of centralization by union confederations and the Iversen and TBK measures, since each of these focuses on centralization of wage *bargaining* (rather than wage *setting*). The Calmfors-Driffill measure has been by far the most widely used in empirical research. It correlates with these three newer measures at .62, .86, and .62. Two of these three correlations are only moderately strong, which suggests some cause for skepticism regarding findings based on the Calmfors-Driffill measure. The same conclusion can be drawn about the OECD centralization measure, which in the past several years has replaced Calmfors and Driffill's as the most popular. It correlates at only .65, .75, and .66 with the three newer measures.

The correlations among the GLW, Iversen, and TBK measures themselves are .75, .79, and .74 using the period averages and .70, .62, and .68 using the annual scores. As these correlations are less than overwhelmingly strong, they suggest a nontrivial amount of disagreement in scoring, which is not surprising given the conceptual differences among these three measures. Do the differences in scores reflect varying assessments of centralization levels in certain countries, of trends over time in certain countries, or of broad trends over time among the group of countries as a whole? Figure 1 (above) helps us to explore this question. It shows the scores from 1970 forward for the sixteen countries covered by all three of these indicators: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States. I adjusted the measures so that each ranges from 0 to 1. (The figure also shows the trend for the Kenworthy index of wage coordination, to which I turn below.)

There do not appear to be noteworthy discrepancies in the descrip-

TABLE 1
CORRELATIONS BETWEEN WAGE-SETTING MEASURES^a

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Cameron centralization													
2 Calmfors-Driffill centralization	.81												
3 OECD centralization	.80	.75											
4 Golden-Lange-Wallerstein confederation involvement	.55	.62	.65										
5 Golden-Lange-Wallerstein government involvement	.49	.54	.48	.63									
6 Golden-Lange-Wallerstein overall centralization	.57	.59	.63	.79	.75								
7 Iversen centralization	.74	.86	.75	.75	.71	.72							
8 Traxler-Blaschke-Kittel centralization	.66	.62	.66	.79	.63	.85	.74						
9 Crouch coordination	.69	.70	.54	.31	.22	.34	.68	.40					
10 Soskice coordination	.34	.52	.27	.37	.33	.38	.71	.37	.64				
11 Layard-Nickell-Jackman coordination	.61	.86	.64	.58	.34	.52	.79	.44	.83	.82			
12 OECD coordination	.34	.64	.41	.32	.24	.32	.71	.37	.62	.91	.78		
13 Hall-Franzese coordination	.52	.74	.51	.47	.23	.46	.75	.35	.82	.94	.94	.87	
14 Kenworthy coordination	.44	.64	.46	.43	.42	.52	.76	.37	.63	.96	.77	.90	.88

^aN varies from 11 to 18 depending upon the indicators being correlated. For time-varying measures a period average over 1974-89 is used. The Traxler-Blaschke-Kittel coordination measure is not included here because it is categorical. For indicator descriptions, see the appendix.

TABLE 2
CORRELATIONS BETWEEN TIME-VARYING MEASURES, USING ANNUAL DATA^a

	1	2	3	4	5
1 Golden-Lange-Wallerstein confederation involvement					
2 Golden-Lange-Wallerstein government involvement	.54				
3 Golden-Lange-Wallerstein overall centralization	.75	.72			
4 Iversen centralization	.70	.52	.59		
5 Traxler-Blaschke-Kittel centralization	.62	.42	.66	.66	
6 Kenworthy coordination	.45	.47	.63	.70	.43

^aN varies from 320 to 528 depending upon the indicators being correlated. The Traxler-Blaschke-Kittel coordination measure is not included here because it is categorical. For indicator descriptions, see the appendix.

tion of trends over time for the group of countries as a whole. Indeed, according to each of the three measures, no universal trends are observable. The degree of centralization has been virtually or completely unchanged in Austria, Canada, France, Germany, Japan, Switzerland, and the United States. In Belgium, Denmark, Sweden, and the United Kingdom there was a decentralization of bargaining in the 1980s that, except in a few isolated years, has not been reversed. In the remaining countries—Australia, Finland, Italy, the Netherlands, and Norway—the degree of centralization has fluctuated over time but without any consistent trend.

One source of variation among the indicators is the scoring of the degree of centralization in certain countries. For example, the GLW measure stands apart from the other two on Austria, Belgium (in the 1970s), Denmark, Germany, the Netherlands, and Switzerland. Industry-level bargaining has played a key role in each of these countries. Since the GLW measure focuses on involvement only by peak-level confederations, which has sometimes been minimal in these nations, it is likely to understate the true degree of centralization.

The Iversen and TBK measures differ from one another to a noteworthy degree on Australia, Austria, Finland, and France. What is perhaps more striking, however, is how similar the scores for these two measures are for many countries, given that one is based on institutions while the other is based on actual behavior. This may stem in part from an ambiguity in the Iversen indicator. Although one of this measure's two components is said to be the bargaining authority accorded to each level, the scores are assigned based on the "level(s) at which bargaining

takes place.”³⁷ These two criteria are likely to yield similar scores in most countries in most years. Yet suppose peak-level union and employer confederations have full authority to negotiate a central settlement but one of the two parties refuses to bargain. This has been the case in several countries, such as Sweden and Finland, in various years. Conceptually, the Iversen index should score such a case as highly centralized, but it appears that the scoring is based instead on the actual bargaining level. In this respect the Iversen measure is closer to the Traxler-Blaschke-Kittel measure in practice than it is in design.

There are several countries for which the GLW, Iversen, and TBK measures provide differing assessments of trends over time. The GLW measure suggests no change for Australia, while the Iversen and TBK measures show an increase in centralization in the mid-1970s, a temporary drop in the early 1980s, another increase between 1983 and the early 1990s, followed by another drop. Reports on the Australian case tend to be consistent with the latter assessment.³⁸ For Italy from the early 1980s to the early 1990s, the TBK measure suggests a sizable increase in centralization whereas the Iversen measure shows no change and the GLW measure suggests a decline. Italy has always been a puzzling case for students of wage setting. It has featured strong elements of both centralization and decentralization in its wage-bargaining arrangements.³⁹ Moreover, assigning a score to Italy is complicated by three labor-market schisms that are relatively unique among affluent nations, in terms of their extensiveness: between large and small firms, between the regular and the underground economies, and between the north and the south. Thus, it is not surprising to find some disagreement in the coding of Italy’s wage-setting centralization. This disagreement could just as easily be a product of differing judgments as of conceptual differences. Finally, the TBK measure suggests much less fluctuation over time than do the other two measures for Denmark, Finland, the Netherlands, Norway, and Sweden. However, this apparently is due largely to the fact that the scores shown in these charts for the TBK measure are based on averages for periods of three to five years’

³⁷ Iversen (fn. 9), 49, 51, 83.

³⁸ Russell Lansbury and John Niland, “Managed Decentralization? Recent Trends in Australian Industrial Relations and Human Resource Policies,” in Richard Locke, Thomas Kochan, and Michael Piore, eds., *Employment Relations in a Changing World Economy* (Cambridge: MIT Press, 1995); Herman M. Schwartz, “Internationalization and Two Liberal Welfare States: Australia and New Zealand,” in Fritz W. Scharpf and Vivien A. Schmidt, eds., *Welfare and Work in the Open Economy*, vol. 2, *Diverse Responses to Common Challenges* (New York: Oxford University Press, 2000).

³⁹ Ida Regalia and Marino Regini, “Italy: The Dual Character of Industrial Relations,” in Anthony Ferner and Richard Hyman, eds., *Changing Industrial Relations in Europe*, 2d ed. (Oxford: Blackwell, 1999).

duration. The annual scores, which are not yet publicly available, indicate more fluctuation.⁴⁰

Turning to measures of wage coordination, Table 1 shows the correlations among the five noncategorical measures along with my index. They tend to correlate fairly strongly with one another. In particular, each of the six correlations among the Soskice, Layard-Nickell-Jackman, OECD, and Hall-Franzese measures is .78 or better, and three of the six are greater than .90. Among these four indicators the Layard-Nickell-Jackman measure tends to be the least strongly correlated with the others, largely because it assigns lower scores to Japan and Switzerland. The Layard-Nickell-Jackman measure is a sum of two separate measures, one of coordination by unions and the other of coordination by employers. Since union confederations play little role in wage coordination in Japan and Switzerland, this measure yields lower scores for these two countries than do the other measures, which appear to treat coordination generated by union and employer confederations as functional substitutes. The Kenworthy coordination variable also correlates strongly with most of the coordination measures.

Tables 1 and 2 also show correlations between the centralization and coordination measures. In general these correlations are moderate, and some are relatively weak. For instance, in Table 1 none of the correlations between the GLW measure of confederation involvement, the GLW overall centralization index, or the TBK centralization measure and any of the wage-coordination measures is larger than .60, and many of them are below .40. In Table 2 the Kenworthy coordination index correlates at less than .50 with three of the five time-varying centralization measures.

Figure 1 includes the over-time trends for the Kenworthy coordination index, as it is the only noncategorical coordination variable that varies over time and is measured annually. The main source of the differences between this index and the indicators of bargaining centralization lies in the assessment of *levels* in certain countries rather than of trends over time. In particular, for Austria, Belgium, Germany, Italy (from 1993 on), Japan, the Netherlands (from 1983 on), and Switzerland, the coordination scores are much higher than the centralization scores. These are countries with wage-setting institutions other than formal bargaining centralization that can be expected to yield a relatively high degree of coordination. For countries in which coordination is achieved via formal bargaining centralization and those in which

⁴⁰ Personal communication with Bernhard Kittel.

there are few or no coordination-generating institutions of any kind, the scores for the coordination and centralization indexes are very similar.⁴¹

It has been fairly common among researchers analyzing the effects of wage restraint on macroeconomic performance to use measures of the structural characteristics of union and/or employer associations, such as union centralization or concentration.⁴² I do not include such measures in this survey because they are conceptually distinct from measures of wage-setting arrangements. When the theoretical interest is in the effects of organizational encompassingness⁴³ rather than of wage setting per se, the use of this type of indicator may be perfectly appropriate. Measures of interest-group organization should not, however, be used as proxies for wage centralization or coordination. A high level of union (or employer) centralization and/or concentration by no means guarantees that the wage-setting process itself will be centralized or coordinated.

Union centralization and concentration remained relatively stable in Sweden through the 1970s and 1980s,⁴⁴ for example, yet bargaining centralization in Sweden declined in the 1980s (see Figure 1). Union concentration has been perhaps the most commonly used indicator of organizational structure. The best available data on this are from the Golden-Lange-Wallerstein data set, which provides measures for two dimensions of union concentration.⁴⁵ One is concentration within confederations, which refers to the extent to which the membership of union confederations is concentrated within a small number of affiliates rather than being spread out across a large number of affiliates. The other is concentration across union confederations, which refers to the extent to which union members belong to a single confederation rather than being divided among multiple confederations. The average correlation between these measures and the fourteen wage-setting measures

⁴¹ The coordination index assigns very high scores to the United States and Canada in certain years in the 1970s, whereas the centralization measures are consistently low for these two countries. That is because the U.S. and Canada each briefly imposed wage-price controls accompanied by a peace clause—a form of state-imposed coordination.

⁴² E.g., Michael Bruno and Jeffrey D. Sachs, *Economics of Worldwide Stagflation* (Cambridge: Harvard University Press, 1985); Garrett and Way (fn. 3); Miriam Golden, "The Dynamics of Trade Unionism and National Economic Performance," *American Political Science Review* 87 (June 1993); Bruce W. Headey, "Trade Unions and National Wage Policies," *Journal of Politics* 32 (May 1970); Kenworthy (fn. 11, 1996).

⁴³ Mancur Olson, *The Rise and Decline of Nations* (New Haven: Yale University Press, 1982).

⁴⁴ Lange, Wallerstein, and Golden, "The End of Corporatism? Wage Setting in the Nordic and Germanic Countries," in Sanford Jacoby, ed., *The Workers of Nations* (New York: Oxford University Press, 1995), 80–87.

⁴⁵ Golden, Lange, and Wallerstein (fn. 8).

included in Table 1, using 1974–89 period averages, is only .37 for within-confederation concentration and $-.16$ for across-confederation concentration.

SENSITIVITY OF EMPIRICAL FINDINGS TO THE CHOICE OF MEASURE

How much does the choice of measure matter in empirical analyses? A large portion of the empirical research on wage setting since the early 1980s has consisted of attempts to assess its effects on macroeconomic performance outcomes. One of the striking features of this literature is a lack of attention to the impact of indicator choice. In this section I examine the sensitivity of findings to the choice of wage-setting measure. I regress the most commonly analyzed performance outcome in the literature—unemployment—on each of the wage-setting indicators and a set of control variables over the period 1974–89. Since the time-invariant indicators were intended to apply to the late 1970s and/or the 1980s and since most of the time-varying indicators extend only through the early 1990s, this is the most reasonable time period on which to focus. Ireland and New Zealand are not included, as a number of the wage-setting measures do not provide scores for these countries. The same group of sixteen countries is thus included in all of the regressions—except for those with Soskice's coordination measure, which is available for only eleven nations.

Many researchers have assumed a linear relationship between wage-setting centralization, or coordination, and unemployment. However, some have proposed that the effect is hump shaped or interactive with central bank independence, left government, union density, or public sector union density.⁴⁶ Others hypothesize that the effect is both hump shaped and interactive with central bank independence or the monetary regime.⁴⁷ Since the aim here is simply to examine the sensitivity of empirical findings to indicator choice, I will not attempt to sort out the relative theoretical merits of these contending models. I use two speci-

⁴⁶ Calmfors and Driffill (fn. 6); Hall and Franzese (fn. 27); R. Michael Alvarez, Geoffrey Garrett, and Peter Lange, "Government Partisanship, Labor Organization, and Macroeconomic Performance," *American Political Science Review* 85 (June 1991); Garrett, *Partisan Politics in the Global Economy* (New York: Cambridge University Press, 1998); Bernhard Kittel, "Trade Union Bargaining Horizons in Comparative Perspective: The Effects of Encompassing Organization, Unemployment, and the Monetary Regime on Wage Pushfulness," *European Journal of Industrial Relations* 6 (June 2000); Garrett and Way (fn. 3).

⁴⁷ Alex Cukierman and Francesco Lippi, "Central Bank Independence, Centralization of Wage Bargaining, Inflation, and Unemployment: Theory and Some Evidence," *European Economic Review* 43 (June 1999); Iversen (fn. 9).

fications for each of the wage-setting indicators: a linear one and one in which wage setting is interacted with central bank independence. Because their model is relatively simple and their data are easily accessible, I use the control variables in Hall and Franzese's analysis: central bank independence, real GDP per capita (logged), trade openness (exports plus imports as a share of GDP), left cabinet participation (share of cabinet seats held by left parties), and union density.⁴⁸

The regressions are pooled time-series cross-section analyses based on yearly data. For the time-invariant wage-setting measures the scores for any given country are, by necessity, the same in each year. Following common practice in recent comparative political economic research, I estimate the models using ordinary least squares (OLS) with panel-corrected standard errors.⁴⁹ I use a common-rho AR1 adjustment for serial correlation (rather than a lagged dependent variable).⁵⁰ Year dummy variables are included but country dummies are not, since a time-invariant wage-setting measure will be perfectly collinear with a set of country dummies. The best course of action in this circumstance is to focus the analysis entirely on the cross-sectional variation by including year dummies without country dummies.⁵¹ This is consistent with the cross-country focus of most research on this issue.

One need not agree with the model specification or estimation technique I use for these regressions. The aim here is to draw conclusions about the sensitivity of results to indicator choice, not about the substantive impact of wage-setting arrangements on unemployment outcomes. The key, therefore, is simply that the same (not necessarily the "correct") model and estimation procedure be used for all of the wage-setting measures.

The main coefficients of interest are displayed in Figures 2 and 3. Figure 2 shows the coefficients for the wage-setting measures in the regressions that use a linear specification. Figure 3 shows the coefficients for the principal variable of interest in the interactive specification: the interaction term for wage-setting and central bank independence.⁵² I

⁴⁸ Hall and Franzese (fn. 27). These variables and their original data sources are described in the Hall and Franzese article, and the data are available at http://www-personal.umich.edu/~franzese/h&f_data.TXT. The unemployment data are also from this source.

⁴⁹ Nathaniel Beck and Jonathan N. Katz, "What to Do (and Not to Do) with Time-Series Cross-Section Data," *American Political Science Review* 89 (September 1995).

⁵⁰ See Christopher Achen, "Why Lagged Dependent Variables Can Suppress the Explanatory Power of Other Independent Variables" (Manuscript, Department of Political Science, University of Michigan, 2000); Beck and Katz (fn. 49), 645.

⁵¹ Nathaniel Beck and Jonathan N. Katz, "Throwing Out the Baby with the Bath Water: A Comment on Green, Kim, and Yoon," *International Organization* 55 (Spring 2001); Traxler, Blaschke, and Kittel (fn. 10), 27–28.

⁵² For discussion, see Hall and Franzese (fn. 27).

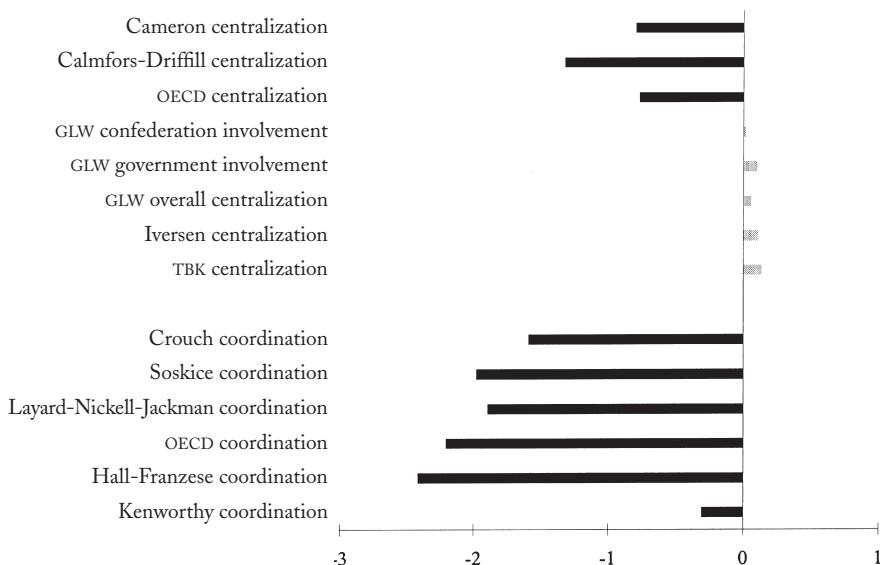


FIGURE 2
REGRESSION COEFFICIENTS FOR WAGE-SETTING MEASURES USING
LINEAR SPECIFICATION^a

^aCoefficients statistically significant at the .10 level (one-tailed test) are shown in bold.

standardized each of the wage-setting variables in order to make the size of the regression coefficients directly comparable. The bars for coefficients that reach statistical significance at the .10 level or better (one-tailed test) are shown in bold.

The results suggest that empirical findings may be fairly robust across some wage-setting measures in some model specifications but quite sensitive in other instances. In Figure 2, which shows the results using a linear specification, three of the eight centralization coefficients have the expected negative sign and are easily statistically significant, while the other five are positively signed but nonsignificant. The split here is between the older and newer measures. For the coordination indicators the signs are consistently negative, and all of the coefficients are statistically significant at the .01 level. The five time-invariant coordination measures yield fairly similar estimates of the magnitude of the effect. However, the coefficient for the Kenworthy index (-0.31) is only

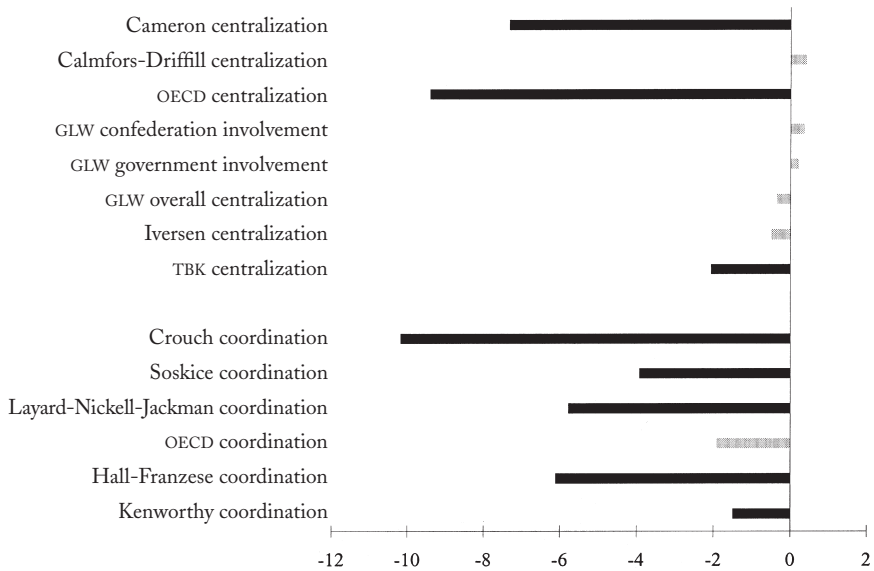


FIGURE 3
REGRESSION COEFFICIENTS FOR WAGE SETTING–CENTRAL BANK
INDEPENDENCE INTERACTION TERM USING INTERACTIVE SPECIFICATION^a

^aCoefficients statistically significant at the .10 level (one-tailed test) are shown in bold.

about one-fifth the size of the smallest of the coefficients produced by these five measures (-1.59). The correlations in Table 1 suggest that the Kenworthy variable is very highly correlated with several of the time-invariant coordination measures, but those correlations were calculated using a period average for the Kenworthy index, which hides the variation within countries over time. The regressions pick up this over-time variation, which likely accounts for the difference in coefficient size.

Turning to the interactive specification in Figure 3 we find more heterogeneity within the older and newer groups of centralization measures than in the linear specification. Thus, two of the coefficients among the time-invariant centralization measures are negative and statistically significant, while the other is positive and nonsignificant. Among the five newer time-varying centralization measures, four generate what amount to estimates of zero effect, but the coefficient for the TBK measure is negative and significant (though at only the .10 level). As in the linear specification, the wage-coordination variables each produce negative coefficients (consistent with the theoretical expectation of Hall and Franzese), but again the magnitude of the estimated

effect varies considerably. In addition, the coefficient for the OECD measure is not statistically significant, and that for the Kenworthy index reaches significance at only the .10 level.

It is also worth noting the difference in results yielded by the measures of centralization compared with those of coordination. In both specifications the coordination measures tend to generate negative coefficients, almost all of which reach conventional levels of statistical significance. By contrast, the centralization indicators generate mainly nonsignificant coefficients with mixed signs. This does not prove that wage coordination reduces unemployment but centralization does not. Again, the models here may be misspecified, effects may vary across periods or countries in ways that are hidden by these analyses, and so on. The point is merely that these two concepts do not appear to be interchangeable. Thus, it may matter a great deal in empirical analyses which of the two is used.

CONCLUSIONS

Quantitative research on wage setting and its effects is a relatively well developed field—one of the most influential in comparative political economy over the past two decades. Yet in some respects it is still in its infancy. Theoretical development has advanced considerably in recent years, but a number of uncertainties and disagreements persist.⁵³ Since the early 1990s there has also been a great deal of improvement in measures of wage-setting arrangements, though none of the existing measures is without flaws. The principal conclusions that emerge from this survey are as follows:

The two best available measures of centralization of wage *bargaining* are the Iversen and Traxler-Blaschke-Kittel indicators. The former is based on structural features, while the latter aims to measure behavior.

There is currently only one available measure of wage-*setting* centralization: the GLW overall centralization index, which is based on the GLW measures of confederation involvement in wage bargaining and government involvement in the wage-setting process. An important limitation of this measure is that it focuses on centralization-related *activities* by interest group confederations and governments, rather than on the actual degree of centralization.

Most coordination measures have been based on behavior, but meas-

⁵³ Flanagan (fn. 1); Robert J. Franzese, Jr., "The Interaction of Credibly Conservative Monetary Policy with Labor- and Goods-Market Institutions: A Review of an Emerging Literature" (Manuscript, Department of Political Science, University of Michigan, 1999); Iversen (fn. 9).

uring and ranking the degree of actual coordination in the wage-setting process is extremely difficult, so such measures may be plagued by extensive measurement error. Traxler, Blaschke, and Kittel instead have developed a categorical measure centered around the different types of coordination. Another option is to create a variable that ranks wage-setting arrangements in terms of the degree of harmonization they can be *expected* to generate. Such a variable is not a genuine measure, and it is bound to be relatively subjective. However, my skepticism regarding the practical possibility of creating a reliable measure of the degree of actual wage coordination leads me to think that this is the only real possibility if a variable representing the degree (rather than type) of coordination is desired for empirical analyses.

The conceptual differences between wage-setting measures lead to some noteworthy differences in scoring of certain countries and years, as evidenced by the correlations between the measures in Tables 1 and 2 and the plots of country scores in Figure 1.

Given that there has been a substantial amount of change in wage-setting arrangements over time in a number of countries, there is now little rationale for relying on time-invariant measures in empirical analyses. This does not mean that researchers are obliged to exploit—fully or even partially—the longitudinal component of the data in their research. Pooled analyses using period averages and single-period cross-section analyses continue to play an important role in comparative political economic research, and deservedly so.⁵⁴ However, to ensure greater accuracy, period averages should be created using time-varying measures. The newer time-varying measures of wage centralization also tend to be more firmly grounded in objective data.

An important drawback of the Iversen bargaining centralization measure is its somewhat limited coverage of countries and years: it provides no scores for Ireland or New Zealand and it extends only up to 1993. The TBK centralization scores cover all of the OECD-18 nations (plus Portugal and Spain) and are available through 1998. At the moment, however, the data for the TBK measure are available for public use only in three- to five-year period averages. There are only two wage-coordination variables that vary over time and are measured annually: the TBK categorical measure and my index.

The regression results shown in Figures 2 and 3 point to a worrisome degree of sensitivity of empirical findings to the choice of wage-setting measure. This suggests a need for caution in trusting results

⁵⁴ E.g., Traxler, Blaschke, and Kittel (fn. 10); and Western (fn. 1).

from earlier studies in this field and for heightened attentiveness in future studies to the impact of indicator choice. Of course, theoretical concerns should drive a researcher's choice of wage-setting measure. However, where conceptually similar and reasonably valid and reliable alternative measures are available, checks for robustness across indicators would seem the most judicious course of action.

Finally, in terms of future research on wage setting and its effects, a potentially problematic gap is the lack of any measure of wage setting at the subnational level. This is likely to be particularly relevant in countries without nationwide central-level bargaining. As national economies become more closely integrated, regional and/or local economic institutions may come to play a more important role in determining economic outcomes.⁵⁵ The early corporatist literature paid a good deal of attention to "mesocorporatism,"⁵⁶ but to my knowledge there has been no attempt to construct an indicator of wage setting at the subnational level.

APPENDIX: WAGE-SETTING MEASURES

1. *Cameron bargaining centralization*. Index ranging from 0 to 1. "Nations were assigned values between 0 and 1.0 on a seven-point scale that, in ascending order, moves from restricted collective bargaining (as in Spain in the Franco era), to highly decentralized company-level bargaining with company unions, to decentralized bargaining with national unions, to partially centralized bargaining with company and regional or multi-employer negotiations, to partial industry-wide bargaining, to full industry-wide bargaining, and finally to industry-wide bargaining with economy-wide formally negotiated agreements." Time invariant. Time period covered: 1965–80. Missing OECD-18 countries: New Zealand (also includes Spain). Source: Cameron (fn. 4), 164–65; variable = scope of collective bargaining.

2. *Calmfors-Driffill bargaining centralization*. Rank ordering (I reversed the scores so that higher scores indicate greater centralization) based on the degree of coordination within central organizations of labor and business and the degree of cooperation between such organizations. Time invariant. Time period covered: none specified. Missing

⁵⁵ OECD, "Disparities in Regional Labour Markets," in *OECD Employment Outlook* (Paris: OECD, 2000); Wolfgang Streeck and Philippe C. Schmitter, "From National Corporatism to Transnational Pluralism: Organized Interests in the Single European Market," *Politics and Society* 19 (June 1991).

⁵⁶ Alan Cawson, ed., *Organized Interests and the State: Studies in Meso-Corporatism* (Beverly Hills, Calif.: Sage, 1985).

OECD-18 countries: Ireland. Source: Calmfors and Driffill (fn. 6), 18, 52–53.

3. *OECD bargaining centralization*. Index ranging from 1 to 3. Varies over time; measured in 1980, 1990, and 1994. Time period covered: 1980s and 1990s. Missing OECD-18 countries: Ireland (also includes Portugal and Spain). Source: OECD (fn. 7, 1997), 71.

4. *Golden-Lange-Wallerstein (GLW) involvement by union and employer confederation(s) in wage setting*. Index with eleven categories: (1) confederation(s) uninvolved in wage setting in any of the subsequent ways; (2) confederation(s) participates in talks or in formulation of demands for some affiliates; (3) confederation(s) participates in talks or in formulation of demands for all affiliates; (4) confederation(s) negotiates nonwage benefits; (5) confederation(s) negotiates a part of the wage agreement, such as the cost-of-living adjustment; (6) confederation(s) represents affiliates in mediation with centralized ratification; (7) confederation(s) represents affiliates in arbitration; (8) confederation(s) bargains for affiliates in industry-level negotiations; (9) confederation(s) negotiates national wage agreement without peace obligation; (10) confederation(s) negotiates national wage agreement with peace obligation; (11) confederation(s) negotiates national wage agreement with limits on supplementary bargaining. Varies over time; measured annually. Time period covered: 1950–92. Missing OECD-18 countries: Ireland, New Zealand. Source: Golden, Lange, and Wallerstein (fn. 8); variable = CONINV. For discussion, see Wallerstein (fn. 1).

5. *Golden-Lange-Wallerstein (GLW) government involvement in wage setting*. Index with fifteen categories: (1) government uninvolved in wage setting; (2) government establishes minimum wage(s); (3) government extends collective agreements; (4) government provides economic forecasts to bargaining partners; (5) government recommends wage guidelines or norms; (6) government and union negotiate wage guidelines; (7) government imposes wage controls in selected industries; (8) government imposes cost-of-living adjustment; (9) formal tripartite agreement for national wage schedule without sanctions; (10) formal tripartite agreement for national wage schedule with sanctions; (11) government arbitrator imposes wage schedules without sanctions on unions; (12) government arbitrator imposes national wage schedule with sanctions; (13) government imposes national wage schedule with sanctions; (14) formal tripartite agreement for national wage schedule with supplementary local bargaining prohibited; (15) government imposes wage freeze and prohibits supplementary local bargaining. Varies over time; measured annually. Time period covered: 1950–92. Missing

OECD-18 countries: Ireland, New Zealand. Source: Golden, Lange, and Wallerstein (fn. 8); variable = GOVIN. For discussion, see Wallerstein (fn. 1).

6. *Golden-Lange-Wallerstein (GLW) overall wage-setting centralization*. Index with four categories: (1) plant-level wage setting; (2) industry-level wage setting; (3) centralized wage setting without sanctions; (4) centralized wage setting with sanctions. Varies over time; measured annually. Time period covered: 1950–92. Missing OECD-18 countries: Ireland, New Zealand. Source: Golden, Lange, and Wallerstein (fn. 8), variable = BARGLEV. For discussion, see Wallerstein (fn. 1).

7. *Iversen bargaining centralization*. Index ranging from 0 to 1 (actual range of scores is from .071 to .654). Calculated as $\sum(w_j p_{ij}^2)^{1/2}$, where w_j is the weight accorded to each bargaining level j ($\sum w_j = 1$) and p_{ij} is the share of workers covered by union (or federation) i at level j . (The square root is used simply to heighten somewhat the difference in scores between decentralized cases.) The index combines a measure of the prevalent level of bargaining (w_j) with a measure of union concentration (p_{ij}). There are seven weight scores for bargaining level (each with a weight for centralized, intermediate, and decentralized, respectively); these are listed in the text. Varies over time; measured annually. Time period covered: 1973–93. Missing OECD-18 countries: Ireland, New Zealand. Source: Iversen (fn. 9), 48–57, 83–85; data at <http://www.people.fas.harvard.edu/~iversen/centralization.htm>.

8. *Traxler-Blaschke-Kittel (TBK) bargaining centralization*. Index of centralization of bargaining level, with ranking based on the most important level and special scores in case of equally important levels. There are twelve categories; these are listed in the text. Varies over time; measured in three- to five-year periods. Time period covered: 1970–98. Missing OECD-18 countries: none (also includes Portugal and Spain). Source: Traxler, Blaschke, and Kittel (fn. 10), 114, 307; variable = BCEN.

9. *Crouch coordination*. Dichotomous measure: 0 = uncoordinated (“liberal”); 1 = coordinated (“neocorporatist”). Time invariant. Time period covered: none specified. Missing OECD-18 countries: none. Source: Crouch (fn. 26), 117.

10. *Soskice coordination*. Index ranging from 0 to 5. Scores are listed in the text. Time invariant. Time period covered: mid- to late 1980s. Missing OECD-18 countries: Australia, Belgium, Canada, Denmark, Finland, Ireland, New Zealand. Source: Soskice (fn. 25), 55.

11. *Layard-Nickell-Jackman coordination*. Index ranging from 2 to 6. Sum of index for coordination by unions and index for coordination by

employers, each of which ranges from 1 to 3. Varies over time; measured in 1983 and 1989. Time period covered: 1983–88 and 1989–94. Missing OECD-18 countries: none (also includes Portugal and Spain). Source: Layard and Nickell (fn. 27), 277; Nickell (fn. 27), 63. Both draw on Layard, Nickell, and Jackman (fn. 27), Annex 1.4.

12. *OECD coordination*. Index ranging from 1 to 3. Varies over time; measured in 1980, 1990, and 1994. Time period covered: 1980s and early 1990s. Missing OECD-18 countries: Ireland (also includes Portugal and Spain). Source: OECD (fn. 7, 1997), 71.

13. *Hall-Franzese coordination*. Index with five categories: 0, .25, .50, .75, 1.0. Time invariant. Time period covered: 1955–90. Missing OECD-18 countries: none (also includes Greece, Portugal, and Spain). Source: Hall and Franzese (fn. 27); data at http://www-personal.umich.edu/~franzese/h&f_data.TXT, variable = HCWB); for discussion, see Hall and Franzese (fn. 27), 516.

14. *Traxler-Blaschke-Kittel (TBK) coordination mode*. Categorical classification of the “mode of macro-coordination of wages”: 1 = interassociational coordination by the peaks of unions and employer associations; 2 = intra-associational coordination by the peaks; 3 = pattern bargaining; 4 = state-imposed coordination; 5 = uncoordinated bargaining; 6 = state-sponsored coordination. Varies over time; measured in three- to five-year periods. Time period covered: 1970–98. Missing OECD-18 countries: none (also includes Portugal and Spain). Source: Traxler, Blaschke, and Kittel (fn. 10), 150, 308; variable = BMO.

15. *Kenworthy coordination*. This variable represents a set of predictions about the degree of coordination likely to be generated by wage-bargaining arrangements in various countries. Index with five categories; scores are listed in the text. Varies over time; measured annually. Time period covered: 1960–2000. Missing OECD-18 countries: none. Source: Kenworthy (fn. 33).