Building Strategic Capacity: The Political Underpinnings of Coordinated Wage Bargaining

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Encompassing labor movements and coordinated wage setting are central to the social democratic economic model that has proven successful among the nations of Western Europe. The coordination of wage bargaining across many unions and employers has been used to explain everything from inequality to unemployment. Yet there has been limited theoretical and quantitative empirical work exploring the determinants of bargaining coordination. I argue formally that more unequally distributed resources across unions should inhibit the centralization of strike powers in union federations. Using membership as a proxy for union resources, I find empirical evidence for this hypothesis in a panel of 15 OECD democracies, 1950–2000. I then show that the centralization of strike powers is a strong predictor of coordinated bargaining.

“Peak associations frequently lack the unity needed to have any great influence on public policy, or even coherent and specific policies.”

—Olson (1982, 50)

“The central social democratic policy...was the policy of wage compression attained through highly centralized wage-setting institutions.”

—Moene and Wallerstein (2006, 148)

Encompassing labor movements and coordinated wage setting are central to the social democratic economic model that has proven so successful among the nations of Western Europe. The coordination of wage bargaining across multiple unions and employers is the linchpin of theories purporting to explain everything from price levels to inequality to unemployment. It is at the core of current theories of political control of the economy and the New Keynesian macroeconomics (Iversen and Soskice 2006). Furthermore, where labor unions represent a large portion of the workforce (and therefore the electorate), proportional electoral institutions are more common (Boix 1999; Cusak, Iversen, and Soskice 2007). Left and Social Democratic parties more frequently in government (Stephens 1979; Korpi 1983; Western 1997), social spending greater, and redistribution more profound (Bradley et al. 2003; Lee and Roemer 2005). The organization of labor interests—filtered through partisan politics and economic institutions such as the central bank—has an influence on economic outcomes from wage dispersion (Wallerstein 1990, 1999; Rueda 2008) to unemployment and inflation (Calmfors and Driffill 1988; Alvarez, Garrett, and Lange 1991; Garrett 1998; Iversen 1999; Nickell and Layard 1999). Although the robustness and magnitude of these relationships as well as the directionality of causation are contested (Flanagan 1999; Golden and Londregan 2006), there is broad consensus on the negative relationship between union centralization and wage dispersion. More coordinated bargaining is strongly associated with greater wage and disposable income equality.1

Coordinated bargaining requires that there be peak associations of labor and capital capable of acting as strategic bargaining agents, i.e., possessing what Iversen (1999) calls “strategic capacity.” Yet there has been limited theoretical work accounting for variation in labor movements’ organizational centralization. None of the existing thinking on union coordination takes seriously the internal politics of union federations as they relate not just to coordinated bargaining but to large-scale cooperative union activities more generally. This lack of theoretical progress reflects the gap between our models of current institutional arrangements and historical studies of their social preconditions. It runs counter to the strong current of endogenous institutions that has been pushing theoretical innovation in political economy over the last decade and a half.

Quantitative empirical work examining the underpinnings of bargaining coordination and union organizational structure is surprisingly sparse, notwithstanding the release of several major datasets on the subject. Most of the empirical literature consists of case studies or work describing variation in newly gathered data.

This paper addresses both the theoretical and empirical shortcomings. But rather than modeling bargaining coordination directly, I consider how a federation of independent unions might develop strategic capacity. Taking a cue from the federalism literature, I provide a theoretical model of confederal organizations focusing on the conditions under which affiliates will cede resources and authority to the confederation. To summarize the results: given some set of unions and some activity over which they can combine resources

1 Scheve and Stasavage (2009) challenge the centralized bargaining–inequality relationship using data for top income shares.

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for mutual gain, there generally exists some subset that will be willing to work together. The size of this subset and the amount affiliates contribute to the cooperative enterprise depends on the returns to cooperation, the heterogeneity of endowments, and the manner in which they take their decision, i.e., the identity of the pivotal voter. Unions better able to achieve their goals on their own are the most difficult to entice into the cooperative arrangement. To induce these more productive agents to contribute to the cooperative project, the group will need to allocate decision rights such that these more powerful agents have a disproportionate influence over group decision-making. The model predicts that where unions vary widely in their resources, confederations will be weaker and/or more unions will remain outside the confederal organization.

I use the model to explore the bargaining coordination problem. I assume that membership is a union’s fundamental resource and calculate the inequality of membership across unions for a panel of 15 OECD countries, 1950–2000. I find that centralized control over strike funds is less likely where membership is more unequally distributed across affiliated unions once we account for other plausible relationships. I then consider to what extent centralized strike funds have any bearing on coordinated wage bargaining. I find that countries with more powerful union and employer federations are, in turn, more likely to have more highly coordinated wage bargaining. Furthermore, I show that variables others claim affect bargaining levels only influence coordinated wage bargaining via their relationships with union centralization. Once the degree of centralized union strike powers is accounted for, these other variables show little in the way of discernable direct relationships with bargaining coordination.

Labor Movement Centralization and Coordinated Wage Bargaining

Nowhere are federations of labor unions of more explicit importance than in models of wage/price bargaining and political control of the macroeconomy. Building on arguments about encompassing groups (Olson 1971, 1982), the well-developed literature on the consequences of bargaining centralization attempts to link the ability of unions and employers to coordinate wage bargaining at the national level with unemployment and inflation outcomes (Lehmbruch 1979; Schmitter 1979; Cameron 1984; Lange 1984; Calmfors and Driffill 1988; Alvarez, Garrett, and Lange 1991; Iversen 1999; Franzese 2001; Adolph 2006). The argument goes more or less as follows: In densely unionized economies, unions in aggregate can affect the evolution of nominal wages economywide. In making its wage settlements with employers, each union considers the unemployment costs of its wage demands on its members, disregarding the spillovers that its wage-employment settlement might have for other workers in other unions. Furthermore, because each union’s wage demands affect producer and, ultimately, consumer prices, nominal wage gains will be inflated away, yielding unchanged real wages but imposing higher inflation and unemployment. Coordinated bargaining involves aggregating workers across firms, industries, sectors, or even the entire economy into larger bargaining units. The bargains struck at the peak level set the parameters for any additional lower-level bargaining. Highly coordinated bargaining, it is argued, will generate the “public good” of wage restraint, with the attendant benefits of low unemployment and inflation with the same (average) real wages as under decentralized bargaining.

Real wage restraint in centralized bargaining often focuses on the highest-wage unions through an explicit policy of “solidaristic bargaining.” Even in the absence of an official solidaristic bargaining stance, however, centralized bargaining generates a distributive tension. Centralized bargaining flattens the wage distribution, both by increasing wages for those at the bottom and by restraining wage growth for those at the top (Wallenstein 1990, 1999). This then poses a puzzle: what induces high-wage workers to go along with a centralized arrangement in the first place?

Early attempts to answer the question viewed centralized bargaining as a standard collective action problem (Olson 1982; Cameron 1984; Lange 1984). To overcome this problem, the neocorporatist literature of the 1970–1980s argued that centralized unions must be compulsory and union leaders must be “insulated” from rank-and-file wage demands. In this traditional approach, the high-wage bargaining area is the cooperative project, with union leaders and powerful agents having a disproportionate influence over group decision-making. The model predicts that where unions vary widely in their resources, confederations will be weaker and/or more unions will remain outside the confederal organization.

2 These spillovers could take the form of higher product prices in the first unions’ industry, reducing the purchasing power of other unions (Calmfors and Driffill 1988), general price inflation (Iversen 1999), or unemployment insurance costs borne by those outside the given union’s bargaining area.

3 Note that this argument linking wage bargaining and economic outcomes has been expanded to include an important role for the monetary authority. See Iversen (1999); Franzese (2001); Adolph (2006).
view of the labor peak associations (at least in highly unionized economies), the role of the federation is explicitly antidemocratic in the sense that leaders are meant to be a conservatizing influence on the presumably more radical, strike-prone rank and file.4

Nevertheless, few countries, even among the most centralized, have mandatory union membership; government-granted bargaining monopolies only exist in a handful of cases. Noting this, current theories of wage bargaining have looked away from the state-imposed arrangements explicitly or implicitly driving the earlier arguments. In a fascinating paper, Agell and Lommerud (1992) argue that wage compression might actually provide a justification for centralized bargaining. They provide a model in which centralized wage bargaining provides insurance to workers who are ex ante uncertain as to whether they will be “skilled” or “unskilled” once the labor market opens under the (very plausible) assumption that insurance markets for human capital are missing. This model, however, fails to account for all but the most extreme levels of union coordination. Freeman and Gibbons (1995) provide a different model of centralized bargaining. They rely on informational asymmetries between local bargaining agents and the central confederations to highlight the reasons for wage drift and the restrictions on lower-level bargaining that may cause centralized bargaining to break down. When the bargaining groups become more heterogenous or the value of wage restraint declines, centralized bargaining becomes less likely. Separately, other theorists have relied on the active support—indeed, insistence via coordinated lockouts—of employers in the tradeables sector (Katzenstein 1985; Wallerstein 1985; Swenson 1989, 1991; Iversen 1999). These authors argue that export-oriented and import-competing employers cannot pass along increased wage costs to consumers; they support centralized bargaining to rein in the wage demands of workers in the nontradable sectors. But this just kicks the can a little further down the road: it begs the question of why employers were able to coordinate. What’s more, the employers’ lockout weapon was so potent in Sweden because the union federations had already acquired an obligation to support locked out affiliates by dipping into their central strike funds. The AFL-CIO, in contrast, has never been able to develop a strike fund, despite repeated attempts early on.

In general, then, there has been relatively little work attempting to explain how unions might (endogenously) develop the capacity to coordinate and make strategic group decisions. That said, there are several insights I take from prior work. First, even if there exists some mechanism to solve the free rider problem, the distributional conflict between unions can be even more serious. Second, information and uncertainty can provide a fundamental justification for the existence of a multitiered organization. Third, the role of external actors such as employers and governments can affect the willingness and/or ability of union federations to centralize decisions in certain policy domains.

The empirical literature to date has primarily relied on case studies of a handful of northern European nations, most commonly Denmark, Germany, and Sweden.5 Rigorous historiography has generated important insights into the role of employers and the dynamics of institutional change (Swenson 1991; Thelen 1993, 2004; Iversen 1996), but these insights have not been examined in a broader spatial-temporal context. Ebbinghaus and Visser (2000), Traxler, Kittel, and Blaschke (2001), Golden, Wallerstein, and Lange (2009), and Visser (2009) have invested terrific effort in providing broadly comparable time series data on unions, employers, and government involvement in wage bargaining and economic management for the major OECD economies, leading to important work describing the variation in union centralization and bargaining coordination (Golden, Wallerstein, and Lange 1999; Ebbinghaus and Visser 2000; Traxler, Kittel, and Blaschke 2001). Kenworthy (2001, 2003) offers surveys of the many datasets floating around purporting to offer empirical measures “corporatism”, bargaining centralization, union structure, and associated concepts. Nevertheless, these measures of centralization and coordination almost always appear on the right-hand side of regression equations.6 To my knowledge, the only places where something akin to union centralization or wage bargaining coordination has been analyzed in any depth are Marks (1986), Western (1997), and Wallerstein and Western (2000). The first presents rank correlations, whereas the other two use union and employer centralization to explain the level of wage bargaining (firm-level, industry, or economywide). Wallerstein and Western (2000) find that more centralized employer peak associations are associated with centralized wage bargaining, whereas concentration of unionists in a relatively small number of unions negatively affects the level of wage bargaining. But these findings can be criticized on a number of grounds. First, bargaining coordination rather than level is generally held to be more important, as Wallerstein and Western recognize. Second, they do not account for the authority of union peak associations, a central concern of this paper. Third, their measure of concentration (a Herfindahl index, discussed below) is difficult to interpret when the number of affiliates varies over time and across countries.

THEORETICAL MODEL

I look to insights from the federalism literature to gain theoretical traction. Authors in this literature have developed several models attempting to explain the existence, allocations of authority, policy outcomes, and

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4 But see Baccaro (2000) for a reevaluation of this thesis in the Italian case.

5 There is, of course, a large literature examining American “exceptionalism” in labor issues. See Kimeldorf and Stepan-Norris (1992) and Levi (2003) for reviews.

6 E.g., Alvarez, Garrett, and Lange (1991); Garrett (1998); Iversen (1999); Nickell and Layard (1999); Wallerstein (1999); Bradley et al. (2003); Traxler (2003); Rueda (2008).
welfare implications of federally organized states. The model I propose here is similar to that analyzed by Alesina, Angeloni, and Etro (2005) and Hafer and Landa (2007).

There is a set of N agents— independent unions in this application. Each union i has a fixed endowment, \( r_i \geq 1 \), that it can allocate to two different tasks. The first generates purely local returns whereas the second has positive returns to scale; i.e., there are spillovers across unions and possible gains from cooperation. I refer to the first activity as the local activity and the second as the confederal activity. Cooperative union activities can include protest marches, sympathy strikes, boycotts, political lobbying, organizing drives, get-out-the-vote campaigns, and coordinated wage bargaining.

Unions can join a federation in which their contributions to the confederal activity are pooled; I refer to these unions as affiliates. Those remaining outside the confederation do not receive any of the benefits of group production. Each union’s utility is given by

\[
u_i = (1 - t_i)r_i + \gamma \log \left( \sum_{t \in C} r_t t \right), \quad (1)
\]

where \( t_i \in [0, 1] \) is i’s allocation to the confederal activity, \( \gamma \) is a known productivity factor, and \( C \) denotes the set of unions (along with i) in the confederation \( C \). We can interpret \( \gamma \) as summarizing how valuable or productive confederal cooperation is.

The basic game is played as follows:

1. Each union decides if it wants to affiliate with a confederation.
2. Affiliated unions then decide on the common contribution level, i.e., \( t_i = t \quad \forall i \in C \), according to some decision rule. For the moment, the decision rule is taken to be exogenous.
3. Contributions are made and outcomes realized.

To focus on the distributive tension engendered by this setup, I assume that decisions on the common contribution level for affiliates are binding and enforceable; i.e., there is no collective action problem.

I begin by defining each union’s outside option. On its own, i.e., when \( C = \{i\} \) \( \forall i \), each union picks \( t_i \) to maximize (1). The first-order condition necessary and sufficient for a maximum defines the union’s optimal \( t_i \) as

\[
t^*_i = \min \left( 1, \frac{\gamma}{r_i} \right). \quad (2)
\]

It is clear that \( t^*_i \) is (weakly) decreasing in \( r_i \), implying that, for fixed \( C \), (1) unions’ preferences are single-peaked around \( t^*_i \) and (2) unions can be ordered by \( r_i \). This, in turn, implies that the median voter theorem holds for voting games over common \( t \). Substituting \( t^*_i \), an agent’s utility for remaining outside the federation is

\[
u^\text{out}_i = u_i(t^*_i \mid i \notin C) = \begin{cases} r_i + \gamma(-1 + \log \gamma) & \gamma < r_i \\ \gamma \log r_i & \gamma \geq r_i. \end{cases}
\]

It will also be useful to define the total endowment of unions affiliated to a confederation with membership \( C \) as

\[
\bar{r}_C \equiv \sum_{j \in C} r_j.
\]

The game will be solved by backward induction. Because unions can be ordered by \( r_i \), we can define the \( \alpha \)-decision rule to be one in which the \( \alpha \)th quantile of the affiliates is the pivotal voter; if \( \alpha = 0.5 \) then the median affiliate is decisive. At the voting stage, affiliates vote for their most preferred \( t \). Let \( t_\alpha \) denote the winning \( t \) under decision rule \( \alpha \) and let \( C_\alpha \) be the confederation with decision rule \( \alpha \).

Define the utility of an affiliate to confederation \( C_\alpha \) as

\[
u^\text{in}_i = u_i(t_\alpha \mid i \in C_\alpha) = (1 - t_\alpha)r_i + \gamma \log(t_\alpha \bar{r}_{C_\alpha}).
\]

Then an agent’s net utility of joining a \( C_\alpha \) confederation is \( \Delta u_i = u^\text{in}_i - u^\text{out}_i \). More precisely, letting \( r_\alpha \) be the affiliate such that quantile \( (r_\alpha) = \alpha \),

\[
\Delta u_i(C, t, \alpha, \gamma \mid r_\alpha > \gamma) = \begin{cases} (1 - t_\alpha)r_i + \gamma \log \left( \frac{t_\alpha \bar{r}_{C_\alpha}}{r_i} \right) & \gamma \geq r_i \\ -t_\alpha r_i + \gamma \left( \log \left( \frac{t_\alpha \bar{r}_{C_\alpha}}{r_i} \right) + 1 \right) & \gamma < r_i. \end{cases}
\]

7 I assume spillovers to be positive. Results are easily extended to incorporate negative spillovers from the actions of other unions.

8 On its face this assumption may seem extreme and counter to the notion of spillovers, but allowing all contributions to the confederal activity to spill over to all unions only serves to weaken the incentive to join a federation, especially for those with a lower relative valuation on the confederal good—the best endowed unions. The interpretation of the major propositions is therefore unchanged. From an applied perspective, the output of some confederal activities (e.g., organizing nonunion workers) is clearly excludable. Others like political lobbying might have benefits that spill over outside the federation, but outsiders are excluded from formulating the actual policy demanded or implemented. I retain this assumption here to draw a brighter line between those in the confederation and those outside.

9 The separable preferences and logarithmic confederal production function make exposition simpler but are not strictly necessary. Alesina, Angeloni, and Etro (2005) and Hafer and Landa (2007) work with more general versions of a similar model and derive similar results.

10 A confederation of this sort is “rigid” in the language of Alesina, Angeloni, and Etro (2005). The welfare benefits of relaxing this rule by, e.g., having the confederation set some minimum contribution to the group effort and allowing unions to allocate more to public goods provision if they prefer to do so (mandates) is the subject of several papers (Cremer and Palfrey 2000; Alesina, Angeloni, and Etro 2005; Hafer and Landa 2007).

11 Different values of \( \alpha \) might be achieved by assigning voting weights to affiliates. Note that it cannot be achieved by simply requiring a coalition of size \( \alpha \) to decide on a value of \( t \); all a supermajority requirement will do is bias the confederal decisions toward the status quo; but any policy in \([2t_\alpha - t_\alpha, t_\alpha]\), where \( t_\alpha \) is the median affiliates’ \( t^*_i \), is in the core.
\[ \Delta u_i(C, t, \alpha, \gamma \mid r_\alpha \leq \gamma) \]

\[
\begin{cases}
\gamma \log \frac{\bar{r}_j}{\bar{r}_i} & \gamma \geq r_i \\
r_i + \gamma \left( \log \frac{\bar{r}_i}{\gamma} + 1 \right) & \gamma < r_i.
\end{cases}
\] (4)

Lemmas 1 and 2 follow directly from the comparative statics of \( \Delta u_i \):

**Lemma 1.** If \( r_{a, i}, r_t > \gamma \) and \( r_{i/a} > 1 + \log \bar{r}_{C_{t}} - \log r_\alpha \) then \( \Delta u_i \) is decreasing in \( \gamma \). Otherwise \( \Delta u_i \) is weakly increasing in \( \gamma \).

**Proof.** See Appendix A.

Intuition would suggest that as the returns to the confederal activity increase, cooperation would automatically be more likely. Lemma 1 shows that this is not necessarily the case. If the difference between an agent’s endowment and that of the decisive affiliate is greater than the difference between the mean and the decisive member’s endowment, the attractiveness of the confederation is actually declining in the productivity of the confederal activity. Put another way, if, for fixed \( \alpha \), an agent (potentially) looms large in confederal production, the likelihood that this richest union will cooperate with the poorest declines as the confederal activity becomes more productive. The intuition here is reminiscent of the logic behind the Meltzer and Richard (1981) inequality and redistribution result. If the median affiliate is pivotal, i.e., \( \alpha = 0.5 \), then the RHS of the antecedent is the (log) difference between the mean and median endowments. As \( \gamma \) increases (up to the point where \( \gamma = r_\alpha \)), the relatively poor affiliates want to “tax” more heavily for confederal activity. But the rich union is so big relative to the poorer ones that their contributions matter little to it and the rich union is less inclined to find affiliation profitable.

**Lemma 2.** For fixed \( \gamma \) and assuming that an instantaneous change in \( r_t \) does not change the identity of the decisive affiliate, if \( \gamma \leq \bar{r}_C \) then \( \Delta u_i \) is weakly decreasing in \( r_t \) for all \( i \).

**Proof.** See Appendix A.

In words, the profitability of being an affiliate of a fixed confederation decreases the bigger the endowment, holding all other endowments fixed. An increase in an agent’s endowment has two effects. It increases the amount of overall resources devoted to the confederal activity, but it also increases that union’s relative contribution. This lemma says that the latter effect outweighs the former. Only when the returns to confederal activity are very high does not utility increase in the endowment.

Unions will join \( C_\alpha \) iff \( \Delta u_i \geq 0 \). If \( \gamma < r_\alpha \), then we can substitute \( \gamma/r_\alpha \) for \( t_\alpha \), yielding the following condition:

\[ \frac{r_i}{r_\alpha} \leq 1 + \log \frac{\bar{r}_C}{r_\alpha}. \] (5)

Whereas, if \( \gamma \geq r_\alpha \), then we substitute 1 for \( t_\alpha \) and get

\[ r_i \leq \gamma \left[ 1 + \log \frac{\bar{r}_C}{\gamma} \right]. \] (6)

Note that both conditions always hold for all \( i \) such that \( r_i \leq r_\alpha \). This follows directly from the insights of Lemma 2: all unions with endowments smaller than the decisive affiliate’s endowment will find joining the confederation increasingly attractive, once again reinforcing the redistributive aspect of confederal organization.

Define an equilibrium confederation under decision rule \( \alpha \) as one in which (1) \( \Delta u_i \geq 0 \ \forall i \in C_\alpha \) and (2) \( \Delta u_i < 0 \ \forall i \notin C_\alpha \). We can also say that unions \( i \) and \( j \) have weakly contingent endowments and hence weakly contingent preferences if either (1) \( r_i = r_j \) or (2) \( r_i \leq r_j \) and \( \bar{r}_C \) an agent \( k \) such that \( r_i \leq r_k \leq r_j \). I can now state the following proposition:

**Proposition 1.** For fixed \( \alpha, \gamma \) there exists a unique equilibrium confederation composed of affiliates with contingent preferences. The size of the confederation is weakly increasing in \( \gamma \).

**Proof.** See Appendix A.

There are two immediate implications. First, as the returns to the confederal activity increase (decrease), the size of the federation will increase (decrease). Combining Proposition 1 with Lemma 2, we have a second substantive claim: the more an agent’s endowment exceeds that of the pivotal union, the less likely it is for that richer union to find it in its interest to join the confederation. Put differently, the more skewed the distribution of endowments, the less likely the best endowed or most productive unions will join a confederation. By submitting to the collective choice procedure inherent in a confederation, the weaker affiliates borrow strength from the stronger. If these differences in endowments are sufficiently large, the weaker unions will demand a contribution by the stronger beyond what the stronger finds profitable. The strongest unions foresee this and will refuse to join.

Whenever the equilibrium confederation falls short of full integration, there is a tension between the \( t_\alpha \) and the fact that the poorer affiliates would generally prefer that the better endowed unions outside the confederation join. Those remaining outside the federation see \( t_\alpha \) as too high a price to pay. Is there some lower contribution rate that would make confederal membership worthwhile for an agent outside the federation while not making any of the current members worse off? Formally, for some \( i \in N, \Delta u_i(t_\alpha; C) < 0, \) but \( \Delta u_i(t_\alpha; C) \geq 0 \) for some \( t_\alpha < t_\alpha \), where \( C \) is the confederation including \( i \). It must also be the case that for all \( j \in C_{-i}, u_j(t_\alpha; C) \geq u_i(t_\alpha; C_{-i}) \), where \( C_{-i} \) is the confederation excluding \( i \).
Proposition 2. Assuming \( \gamma < r_{max} \), given some \( i \) such that \( \Delta u_{i}(t_{i};C) < 0 \), there exists some \( \alpha' > \alpha \) such that \( \Delta u_{i}(t_{i};C) \geq 0 \) and \( u_{i}(t_{i};C) \geq u_{i}(t_{i};C_{i}) \) \( \forall j \in C_{-i} \) if and only if the following condition holds:

\[
 r_{j} \left( \frac{t_{w} - t_{a}}{r_{C}} \right) \geq \gamma \left( \log \frac{r_{C_{i}} - \log r_{C}}{r_{w}} \right) \quad \forall j \in C_{-i},
\]

where \( r_{w} \) solves \( t_{w} r_{i} = \gamma(1 + \log t_{w} r_{C}/\gamma) \).

Proof. See Appendix A.

Condition 7 describes the rationality constraint for those already in the confederation. If it were not met then \( j \) would be better off in the \( \alpha \)-rule confederation without \( i \) even if \( i \) were made exactly indifferent toward affiliation \( (t_{a} - t_{w}) \) is as small as possible. The size of the difference in endowments and \( \gamma \) govern the extent to which these conditions are met for different potential affiliates. Put another way, it is not clear that confederal rules will be changed to attract a bigger potential affiliate. If the concessions required to attract them are not outweighed by the net benefit to those already in the confederation, these larger unions end up outside the federation. If they are attracted into the federation, the proportion of resources ceded to the center must be lower than in the less encompassing federation.

In the model, unions are heterogeneous in the amount of resources they control. All, however, can benefit from cooperating with one another on some projects. Tension arises because the amount each union wants to contribute to the cooperative enterprise depends negatively on the union’s resources; because of spillovers to some activities (such as organizing, political contributions, or wage bargaining), weaker unions prefer higher contribution levels and stronger unions prefer lower. The greater the difference between the preferred contribution of the pivotal affiliate and that of the strongest unions, the more this tension complicates interunion cooperation, and the less likely we are to observe confederations engaging in highly redistributive activities on a large scale. Proposition 1 shows that even in the absence of collective action problems, there is no guarantee that all unions will join together for cooperative activity. Distributional concerns can get in the way. Furthermore, when some unions do not affiliate with the confederation, it is the best endowed ones that remain alone. This has implications for the strategic capacity of “bottom up” federations. Where unions are unable to coalesce into one federation, it is likely that the most powerful will stand alone. Proposition 2 highlights the importance of the internal decision process in determining which unions will be part of the confederation and the extent of resource centralization. Whether a confederation can include all its potential members is driven by how internal organizational rules determine the pivotal affiliate. Where union resources are more unequally distributed, there is an increasingly stark trade-off between high contributions levels (centralization) and a governance structure that induces the best-endowed unions to affiliate.

When taking this theoretical proposition to the data, I have to make some assumptions. The first involves specifying the union’s activities. Arguably the key function of a union is collective bargaining. A union’s bargaining power is driven by its ability to effectively impose costs on employers, ultimately through strikes. Centralized control of strikes is likely the most redistributive of confederal activities. Confederation-level strike powers can prevent unions capable of winning more immediate concessions on their own from doing so, usually in the name of price stability. Possessing centralized strike funds makes the confederation’s strike veto power more meaningful, raises the costs of confederal secession for any one union, and gives the federal leadership leverage over affiliates that is most effective precisely when affiliates are most vulnerable. Yielding strike powers to a confederal organization is a key extension of the confederation’s scope of activity. It tends to benefit weaker unions at the expense of the industrially strong.

The second assumption involves operationalizing union resources. I assume membership to be a union’s fundamental resource, i.e., \( r_{i} \) represents \( i \)’s membership. Thus where unions are more unequally distributed across unions, it will be more difficult to entice the most powerful unions to join the confederation. If they do join, it is unlikely that highly redistributive powers will be ceded to the central organization. The empirical hypothesis I investigate is the more unequal the distribution of unionists across affiliated unions, the lower the likelihood that the union confederation controls strike funds.

**EMPIRICAL ANALYSIS**

The empirical analysis proceeds in two steps. First I focus on examining the hypothesis relating membership inequality to the likelihood that affiliates will cede major redistributive powers to the confederal organization. The dependent variable is the Golden–Wallerstein–Lange indicator of whether a country’s largest union federation controls strike fund. In the second step I see what leverage centralized strike powers give us in explaining coordinated wage bargaining. Whether unions (Windmuller 1975; Schmitter 1979; Olson 1982; Lange 1984) or employers (Swenson 1989, 1991; Wallerstein and Western 2000), are emphasized, coordinated bargaining depends on the ability of peak associations to enforce discipline on their affiliates; i.e., there is a collective action problem. By assuming away collective action problems, the theoretical model demonstrates how distributional concerns affect the extent to which confederal organizations will be able to subsequently solve free rider problems. The centralization of union strike funds should, by all

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12 Although membership is not a perfect proxy for union strength, it is the only one for which any reliable cross-national data are available. From an empirical standpoint, inequality in mean income across unions clearly cannot be used to measure of union resources because it is a function of the degree of wage bargaining coordination.

13 Results are similar if I use Visser’s index of confederal authority instead (Visser 2009).
accounts, improve the prospects for coordinated wage bargaining. Until now this assertion has not been established empirically.

Data

I have pieced together an (unbalanced) panel time series of annual observations covering 1950–2000 for 15 OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States. Data definitions and sources are collected in Appendix B. I draw heavily on the dataset constructed by Golden, Wallerstein, and Lange (2009), henceforth GWL. Some of the variables used here are measured only intermittently, typically at five-year intervals. To maximize the number of country-years available, I linearly interpolate the intervening years but do not extrapolate past a country’s last observed value or before its first. Other instances of missing data are for variables pertaining to union federations and wage bargaining and are generally missing for entire countries. Because cross-sectional variation dominates temporal, I do not impute missing values (either country means or multiple imputation).

These data present a substantial modeling challenge. We have data for a relatively small number of countries, some potentially endogenous and collinear variables, and relatively coarse categorical time series. Even more challenging is the fact that cross-sectional variation swamps within-country fluctuations over time, particularly for the dummy variables indicating whether unions and employer federations have centralized decision making over strikes and lockouts. This stickiness in the data is not entirely surprising. The theoretical model takes the distribution of unionists and the set of unions as fixed and given, i.e., determined exogenously. I find this assumption relatively unproblematic; there is evidence that the craft vs. industry basis for unionism, union recognition laws, and federalism affect whether unions are fragmented into numerous smaller unions or concentrated into larger ones. These factors are exogenous to the decisions of modern unions and rarely change. Thus we also expect the political organization of union federations to be relatively stable.

From a theoretical standpoint, the key covariate measures the degree of inequality of union membership across unions affiliated to the largest union confederation. Unfortunately, cross-nationally comparable union-level membership data do not currently exist, preventing recovery of the higher moments of the union membership distributions. Nevertheless, the GWL dataset reports the number of affiliated unions in the largest confederation and the Herfindahl index of member concentration in those confederations. Neither of these measures alone captures inequality (Davies 1979, 1980). To see this, note that a Herfindahl index can be interpreted as the probability that any two randomly selected unionists will be members of the same union. This number will be high if there are a small number of unions or if there are many unions but membership is highly concentrated in a few. A completely equal distribution of membership would give a Herfindahl value of 1/\(a\), where \(a\) is the number of affiliated unions, telling us nothing about inequality when the number of affiliates varies across countries and over time, as it does here. But if we are willing to assume that union members are distributed lognormally across unions, Hart (1975) shows that \(H = a^{-1} \exp \eta^2\), where \(H\) is the Herfindahl index of membership concentration and \(\eta^2\) is the variance in log membership. Thus, for each country \(i\) in year \(t\), \(\eta^2_i = \log a_i \cdot H_i\). Given \(H\) and \(a\) from the GWL dataset, I calculate \(\eta^2\) to measure membership inequality.

\(\eta^2\) is certainly an imperfect proxy. The model—coupled with the assumptions described above—predicts that if union membership is sufficiently unequal and the union federation controls strike funds, then the biggest unions will not affiliate. Thus we might observe a confederation with a strike fund and relatively equal distribution of resources across affiliates because the overall distribution of unionists was highly unequal and the biggest unions remained outside the federation. Unfortunately, we do not have data on the number of unions in the whole country and the concentration of members across them. But this problem is not as bad as it seems. To the extent that this endogeneity problem exists, it biases findings against me; i.e., I am less likely to find \(\eta^2\) negatively related to confederal strike funds as the theory predicts. Furthermore, all countries in the dataset in which the biggest federation controls a centralized strike fund also have a very high proportion of unionists in confederally affiliated unions. It does not appear that the biggest unions “exit” (or refrain from affiliating) in the cases where federations have strong strike powers. Nevertheless, I also include a control variable for the total number of union confederations in a country to account for the possibility that workers in stronger unions might still in fact secede to form a separate organization.

In analyzing the data, I also want to account for other plausible relationships discussed in the literatures on wage bargaining, working class formation, and interest groups. Although there is little in the way of theories of confederal strike powers, the literature does contain several assertions about coordinated wage bargaining. I will treat these arguments for the latter as relevant to the former.

14 Results are qualitatively similar if we only analyze years for which we have all data.

15 France is absent from the sample because the GWL variable “APHRIF1” has no data for France. Obviously France is an important case in its own right; however, it is generally an outlier in matters of industrial relations. I therefore exclude it rather than attempt to impute values for a long time span for a case known to be unusual in other ways.

16 Specifically, there is only one instance of within-country change in whether the confederation has a strike fund: Finland in 1972.

17 A Herfindahl index is given by \(\sum s_i^2\), where \(s_i\) is the share of the confederation’s membership belonging to the \(i\)th affiliate.

18 The share of unionists organized into confederations averages 94% for country-years with confederal strike funds compared to 84% for country-years without.
Coordinated bargaining is often contrasted as one extreme on a continuum where the other pole is a totally nonunionized labor market (Olson 1982; Calmfors and Driffill 1988; Iversen 1999). Coordinated bargaining is more important the more unionized the economy. I therefore include union density as a covariate.

Scholars focusing on employers (Swenson 1991, Thelen 2004) argue that more coordinated wage bargaining is a function of more coordinated employers. To measure employer coordination, I use a dummy variable indicating whether the employer federation has authority to veto its affiliates’ wage agreements.

Existing theories of coordinated wage bargaining point to several important structural variables. A common claim is that coordinated bargaining is more valuable the more a country is open to international markets via trade; both employers and unions in the tradeable sector have strong incentives to contain wage costs across the economy (Wallerstein 1985; Swenson 1991; Iversen 1999). I include (imports + exports)/GDP in both sets of regressions.

Bigger countries are generally more complex, more economically diversified, and less reliant on trade. Several arguments have been proffered linking country size and the organization of labor unions. Wallerstein (1989) argues theoretically and finds empirically that economies with bigger labor forces are less unionized. Martin and Swank (2008) find that geographically larger countries are less likely to have highly coordinated employers. Both these findings resonate with older claims that large, diversified work forces undermine working class formation (Stephens 1979; Korpi 1983). Similarly, several generations of labor scholars focusing on the United States have argued that the country’s geographic size led to weak and decentralized unions (Commons 1926a, 1926b; Ulman 1955; Laslett and Lipset 1974). I therefore include (log) population as a measure of size, with the expectation that it is associated with lower probability of central strike funds and less coordinated wage bargaining.19

In the literature there are conflicting arguments linking union peak associations and political parties. Left parties have their electoral fortunes bound more tightly to the ability of the labor movement to coordinate in both their political and economic (i.e., wage bargaining) behavior than those of the Center or Right. Where unions can coordinate effectively, Left parties are more likely to hold office, and when the Left are more frequently in office, they have both the incentive and ability to use their position to further strengthen unions. Headey (1970) argues explicitly that frequent Socialist government is required to sustain the confederal authority of union organizations and concomitant incomes policies. Similarly, Hartmann and Lau (1980, 370) argue that “confederations seem to be ‘sponsored’ by their environment: employers, political parties, and the government lend their support to confederate status by treating confederations as quasi-autonomous and cooperating parties.” But Stephens (1979), Korpi (1983), and others following in the power resources tradition claim that causality works the other way around: strong, centralized union movements produce frequent Left governments. Empirically speaking, there is evidence of both occurring: unions founding political parties and parties founding affiliated union organizations (Ebbinghaus and Visser 2000). I include the proportion of government-controlled seats in the lower house held by Leftist parties to account for this relationship but am agnostic about its expected relationship with confederal strike funds and coordinated bargaining.

Scholars of labor market institutions have likewise studied the role of party systems and electoral rules without achieving consensus. On the one hand, more proportional electoral institutions are strongly associated with more frequent Left party governance (Sartori 1976; Cox 1997; Cusak, Iversen, and Soskice 2007). Martin and Swank (2008) focus on the role of electoral institutions in engendering coordination among employers, finding coordination increasing in the proportionality of the electoral system. But a fragmented party system may also result in less union coordination, as the multiple party-aligned union confederations in Italy, Spain, and Portugal can attest (Headey 1970; Marks 1989). I account for either possibility by including the (log) effective number of political parties to measure partisan fragmentation. Making statements about the “effects” of partisanship and partisan fragmentation will be hampered by the known endogeneity between the two.20

Separate from the wage bargaining literature, there is a venerable series of arguments from political science and sociology that explicitly link the organization of interest groups and other “voluntary associations” with political institutions, specifically the centralization or dispersion of political authority. The existence of multiple venues in which interest groups can make policy demands—state and national legislatures as well as courts and the administrative bureaucracy at both the national and state levels—impedes the development of centralized interest group organizations. With a decentralized political system, there are strong reasons to maintain a decentralized confederal structure for interest groups (Wilson 1973; Skocpol, Ganz, and Munson 2000). I therefore include an indicator for federalism in the expectation that it takes a negative regression coefficient.

Finally, the argument that linguistic, racial, and religious cleavages impede the organization of a unified working class is at least as old as Marx. There are those who trace union fragmentation back to primordial cleavages of religion and language or the historical development of social democratic parties (Ebbinghaus

19 I use population as it varies within countries; it also has slightly better data coverage than labor force size even though the two correlate at better than 0.99. Findings are unchanged if I include log square kilometers of area in place of population, though this variable exacerbates problems associated with time-invariant covariates.

20 Including these variables separately or excluding them all together does not alter the fundamental findings of the paper, i.e., the negative relationship between membership inequality and the centralization of strike funds coupled with the positive relationship between centralized strike funds and bargaining coordination.
and Visser 2000; Agell 2002). There is some direct evidence of this: in the Netherlands and Italy, union federations split along confessional lines. Scholars of the American labor movement have looked to racial divisions and immigration to explain its weakness and fragmentation (Commons 1926a; Laslett and Lipset 1974). I use Fearon’s measure of cultural fractionalization (Fearon 2003) to account for this hypothesis, in the expectation that cultural fractionalization will impede both the centralization of confederal strike powers and coordinated bargaining.

**Modeling Framework**

In political science, the now-standard approach to modeling Time Series Cross Section (TSCS) data is OLS regression with either a lagged response variable or autoregressive error correction to account for temporal dependence along with some type of ex post sandwich estimator to address concerns about heteroscedasticity. This approach has not been extended to accommodate discrete response data. Additionally, although these data contain repeated measurements for each country along several dimensions, the within-country, over-time variation is negligible relative to the cross-country variation. What is more, for some covariates there is perfect separation. For example, there is no country variation. What is more, for some covariates over-time variation is negligible relative to the cross-sectional variation. Clearly the lack of cross-sectional variance in the outcome is a challenge, but it does not imply we should not consider within-country variation over time. I therefore take a population-averaged (or marginal) rather than a country-specific (or conditional) approach (Zorn 2001; Diggle, Liang, and Zeger 1986). Taking advantage of the (asymptotic) consistency and normality of the GEE estimates for \( \beta \), the WSEV estimator accounts for temporal and spatial dependence in the error process by generating “subsamples that are nearly independent between clusters then averaging variances over clusters” (Heagerty, Ward, and Gleditsch 2002, 311). This is achieved by breaking the time series into (overlapping) blocks and assigning an observation \( y_{it} \) to cluster \( k \) if \( t_k \leq t \leq t_k+1 \). Specifically, in the logit case

\[
\text{Var}(\hat{\beta}) = P^{-1} \Sigma P^{-1}
\]

\[
P = X^T (\hat{\mu}(1 - \hat{\mu})) X
\]

\[
\Sigma = \frac{1}{T} \sum_{t=1}^{M} \sum_{k \in \mathcal{W}_m} (X_k(y_k - \hat{\mu}_k))(X_l(y_l - \hat{\mu}_l))^T,
\]

where \( \hat{\mu} = \mu \) evaluated at \( \hat{\beta} \), \( r \) is the number of time periods, \( m \) is the length of the time window, \( \mathcal{W}_m \) is the \( j \) th window, and \( M \) is the number of windows. The trick is to choose a window length such that observations are nearly independent across clusters. Heagerty and Lumley (2000) argue that windows should be set to length \( \approx 4t^{1/3} \). I use windows of length 10.

**Confederal Strike Funds**

I model the probability that the largest union federation controls a central strike fund. Results are displayed in Table 1. Model 1 excludes the time-invariant covariates federalism and cultural fractionalization. Model 2 includes these two variables but removes the time trend. The last model include all the variables. In all specifications the coefficients on the theoretically relevant variables are negative, as expected, and distinguishable from 0 at standard significance levels.

Before considering the magnitude of these relationships I examine model fit. Figure 1 displays “separation plots” (Greenhill, Ward, and Sacks 2009) for evaluating models’ in-sample predictive power and visualizing the importance of including \( \eta^2 \). In each plot, observations are sorted by the predicted probability of having a confederal strike fund. Dark vertical bars represent actual country-years with confederal strike funds. We can evaluate a model’s predictive power by gauging the extent to which the actual instances are concentrated to the right of the plot whereas nonevents are to the left. A poorly performing model would generate an even distribution of vertical bars across the whole plot, whereas a perfect model would produce

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21 Fitting simple cross-sectional logit models for each year recovers a consistently negative coefficient for \( \eta^2 \), though this coefficient does not attain traditional levels of significance in every year—hardly surprising in models with 10–15 observations.

total separation, with all dark bars (1s) on the right and all nonevents (0s) on the left. For Models 1–3, I present a separation plot and then repeat the exercise using the same model but excluding \( \eta^2 \). It is easy to see that Model 3 is the best-performing model, but omitting the theoretically important variable \( \eta^2 \) significantly degrades performance across all specifications. Models including \( \eta^2 \) are preferable to those without.

To get a better idea of the magnitude of the model’s implied relationships, I present a graphical depiction of “first differences.” Figure 2 displays changes in the expected probability of a strike fund for changes in each of the covariates, holding all others at their mean levels (for interval-scaled covariates) or modal values (for categorical variables). Interval-scaled variables move across their interquartile ranges and indicators are toggled. All predictions use estimates from Model 3. Bars represent 95% confidence intervals. The directionality of findings is largely in line with expectations. More unequal distribution of membership resources across unions is clearly negatively associated with centralized strike powers; the probability of centralizing conflict funds is lower by 0.2, on average, for countries with third-quartile levels of membership variance compared to those in the first; Also, contrary to the Martin and Swank (2008) findings for employers, I find that more fragmented political party systems impede the development of centralized strike funds. Open economies are substantially more likely to have union federations with centralized strike powers. Other covariates show more uncertain relationships.

### Bargaining Coordination

Does the central control of strike funds matter for bargaining coordination? We examine that relationship here. The response variable for these models is Visser’s (Visser 2009) recent revision of Kenworthy’s five-point scale of bargaining coordination (Kenworthy 2001).\(^{23}\) I use this variable rather than any of the numerous measures of wage setting or coporatism for two reasons. First, as Soskice (1990), Golden (1993), and Kenworthy (2001) observe, bargaining coordination is a more meaningful concept than the actual level at which bargaining takes place. There are countries in which bargaining may officially take place at the industry or plant level but where pattern setting is quite strong and coordination in contract expirations, wage demands, and even strikes is quite high. Japan is one example. The centralized control of a strike fund need not imply centralized bargaining, but it certainly implies some degree of coordination and centralized control over strikes. Because coordination is the more analytically meaningful concept for researchers looking at the effects of bargaining structure, I examine coordination empirically. Second, there are some notable differences when the Visser/Kenworthy variable and GWL measures of bargaining centralization are compared. The Visser/Kenworthy data show substantially more variability than GWL in the Italian and

\(^{23}\) Results for the variables of theoretical interest are similar if we substitute Visser’s five-point scale of bargaining centralization for the coordination variable. I report only coordination results due to space considerations.
FIGURE 1. In-Sample Predictive Performance: Excluding $\eta^2$ Significantly Impairs Model Performance across Specifications

Observations sorted in ascending order of predicted probability. Vertical bars represent observed “successes.”

Australian cases, comporting better with my understanding of events in both countries, particularly in the 1980s. Visser/Kenworthy also, and in my mind correctly, identifies Japan as having relatively coordinated wage bargaining for the period under study, even if bargaining takes place at a lower level. The same holds for Austria, where wages are set at the industry level, but in a rigidly organized and coordinated fashion.

As an ordered categorical variable, it is most common to model these data using ordered logit or probit regression. GEE models for ordered categorical responses do exist (Heagerty and Zeger 1996; Parsons, Edmondson, and Gilmour 2006). But even in the GEE world these models rely on the strong and frequently untested assumption of “proportional odds” or “parallel regressions,” i.e., \[ \log \left( \frac{P(y_{it} \leq c_j)}{P(y_{it} > c_j)} \right) = \beta' X_{it}, \]
where the $c_j$ are the cutpoints between categories. Substantively, this amounts to assuming that the effects of covariates are the same across different levels of the response variable. For the data here, both the Brant (1990) test for conventional MLE ordered logit and the Wald test for GEE logit (Stiger, Barnhart, and Williamson 1999) show this assumption to be unsustainable. Ignoring this and fitting an ordered model anyway can induce inconsistent estimates of the slope parameters across levels of the response. I therefore break the response variable into a sequence of binary variables, $y_{ijt}, j = 1, 2, 3, 4$, which takes on a value of 1 if $y_{it} > j$ and 0 otherwise. Results for these models describe the (log odds) of exceeding a certain level of bargaining coordination. Breaking the variable apart in this way retains the ordering information and avoids imposing the strong interval assumptions of a Gaussian linear model while also enabling the use of the GEE/WSEV estimator.

In these models I include the predicted probability that the union federation controls a strike fund, taken from Model 2. I also endeavor to include all the other covariates used above: (log) population, trade, (log) parliamentary parties, Left government, cultural fractionalization, federalism, and whether the employer federation can veto wage contracts. Following Wallerstein and Western (2000), I include a linear time trend. For some models, it proved impossible to include

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24 I use model 2 rather than 3 because I am also including a time trend in the models for coordination.
FIGURE 2. Predicted Change in the Probability of the Biggest Confederation Controlling a Strike Fund

Changes in predicted probabilities

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Changes in Predicted Probabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \eta^2 )</td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td></td>
</tr>
<tr>
<td>No. confed</td>
<td></td>
</tr>
<tr>
<td>Left gov't</td>
<td></td>
</tr>
<tr>
<td>ENPP</td>
<td></td>
</tr>
<tr>
<td>Cultural frac.</td>
<td></td>
</tr>
<tr>
<td>Federal</td>
<td></td>
</tr>
<tr>
<td>Emp. cntrct veto</td>
<td></td>
</tr>
</tbody>
</table>

Indicator variables are toggled and continuous variables move across their interquartile ranges. Bars represent 95% CIs. Values calculated from Model 3.

certain covariates, due to perfect separation\(^ {25} \) or insufficient variance to calculate WSEV standard errors. I exclude these variables in the tables below in order to report consistent estimates and standard errors, but substantive findings for the theoretically key variables are not affected by this choice. Because I include the predicted probability of a strike fund and the variables used to generate that prediction in the same model, coefficient estimates for the other variables represent additional direct associations with bargaining coordination above and beyond their relationships through union organizational centralization.

Table 2 reports findings. Coefficients on the strike fund variable are positive across all levels of the response and attains significance at all levels save the lowest. Also worth noting is that, although employer contract veto is not a useful predictor of coordination at the high end of the scale, it is a perfect predictor at the low end: we do not observe country-years with both uncoordinated bargaining and strong employer federations.

I interpret these findings using a plot of first differences in predicted probabilities, as displayed in Figure 3. For each variable, \( j \) increases from top to bottom. For \( j = 1 \), we use open dots. Solid triangles represent \( j = 2 \). Open squares represent \( j = 3 \) and solid circles are for \( j = 4 \). As before, indicator variables are toggled and continuous variables move across their interquartile ranges. The centralization of union authority, as proxied by the predicted probability of centrally controlled strike funds, has a consistent positive association across levels of the response variable; indeed it is the only covariate that has any consistent effect in these models. Countries in the third quartile of predicted central strike funds are nearly 42% more likely to have bargaining coordinated at level 3 or higher, almost 60% more likely to have bargaining coordination at level four or five, and over 35% more likely to be in the highest category compared to those in the first quartile. This is not to say that other covariates are not meaningful—cultural fractionalization in the third quartile decreases the probability of being in the

\(^ {25} \) E.g., there were no country-years in which the employers could veto wage agreements and bargaining coordination took values of 1 or 2.
TABLE 2. Sequentially Ordered Binary GEE Logit Results for Bargaining Coordination

<table>
<thead>
<tr>
<th></th>
<th>Coordination</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strike fund</td>
<td></td>
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<td>5.09</td>
<td>3.48</td>
<td>2.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.47)</td>
<td>(2.03)</td>
<td>(1.56)</td>
<td>(0.61)</td>
</tr>
<tr>
<td>η^2</td>
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<td>1.88</td>
<td>1.93</td>
<td>2.06</td>
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<tr>
<td></td>
<td></td>
<td>(5.17)</td>
<td>(1.39)</td>
<td>(0.90)</td>
<td>(0.50)</td>
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<td>0.53</td>
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<tr>
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<td>(1.30)</td>
<td>(0.36)</td>
<td>(0.39)</td>
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<td>(0.05)</td>
<td>(0.04)</td>
<td>(0.02)</td>
<td>(0.01)</td>
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<td>(0.03)</td>
<td>(0.05)</td>
<td>(0.02)</td>
<td>(0.02)</td>
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<tr>
<td>No. confed</td>
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<td>1.96</td>
<td>1.43</td>
<td>0.49</td>
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<td></td>
<td></td>
<td>(0.87)</td>
<td>(0.53)</td>
<td>(0.30)</td>
<td>(0.28)</td>
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<td>Left government</td>
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<td>0.01</td>
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<td>(0.04)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>ENPP</td>
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<td>4.34</td>
<td>1.78</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(2.44)</td>
<td>(2.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural frac.</td>
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<td>-21.65</td>
<td>-7.48</td>
<td>-5.46</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(10.07)</td>
<td>(2.85)</td>
<td>(3.15)</td>
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</tr>
<tr>
<td>Federal</td>
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<td>1.68</td>
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<tr>
<td></td>
<td>(2.95)</td>
<td>(1.46)</td>
<td>(1.01)</td>
<td>(0.73)</td>
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<td>Employer contract veto</td>
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<td>-1.27</td>
<td>-0.85</td>
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<td></td>
<td>(1.56)</td>
<td>(0.93)</td>
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<tr>
<td>Time trend</td>
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<tr>
<td></td>
<td>(1.95)</td>
<td>(2.08)</td>
<td>(1.51)</td>
<td>(1.20)</td>
<td></td>
</tr>
</tbody>
</table>

N (no. countries) = 574(15)

Constant estimated but not reported. WSEV standard errors in parentheses. See Appendix B for details on the data.

highest category by .13, of being in the top two categories by .3, and of being in the top three categories by .34, relative to the first quartile. Interestingly, η^2 seems to have a slight positive relationship with bargaining coordination once its effects on confederal strike funds is taken into account.26 The other variables do not show a consistent relationship with bargaining coordination independent of their influence on the centralization of union confederal authority. The findings provide evidence that organizational factors, especially pertaining to unions, are important for sustaining coordinated wage bargaining.

Taken together, the findings here are consistent with expectations generated from the model. I find that the likelihood of union confederations controlling the strike decisions of their affiliates is decreasing in the inequality of membership across affiliated unions. Trade exposure also shows a consistent influence on the structure of the union movement. When we turn to bargaining coordination, we find empirical corroboration for the assertion that coordinated bargaining depends on union peak associations able to influence the strike behavior of their affiliates. Interestingly, my findings show that most of the influence of other covariates on bargaining coordination flow through their effects on the organizational capacity of peak associations, particularly labor. Central control of strike funds appears as the most consistent predictor of bargaining coordination, though strong employer groups are also important.

CONCLUSION

Encompassing peak associations play a critical role in our understanding of economic policy and outcomes across rich democracies in the post-War era. How the internal politics of these organizations affect their “encompassingness” is less well theorized. In this paper I developed a model of the internal politics of confederal organizations and applied it to peak associations of labor. The model’s chief prediction is that the more unequally distributed resources are across unions, the less we expect a confederation to encompass the most powerful unions and/or witness a confederation with central control over strongly redistributive activities. The anticipated distributional effects of cross-union cooperation can work to undermine union centralization; effective cooperation is enhanced by relatively egalitarian distribution of the key union resource—members. I argue that control over strikes is bound up in interunion distributive politics and expect strike powers to be centralized where union members are more equally distributed across affiliates to the confederation.

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26 This relationship is consistently negative in models using bargaining centralization as the dependent variable.
I examined this hypothesis empirically, finding that centralized union control of strikes is more likely where unionists are equally distributed across affiliates. I then examine the extent to which centralized strike powers affect bargaining coordination. I find that highly coordinated bargaining is associated with more centralized control of strikes. I also find evidence congruent with other assertions in the wage bargaining literature. Trade exposure tends to improve chances, whereas larger economies tend to be more decentralized. On the political side, partisanship, electoral institutions, and federalism all appear to affect union centralization, but precise inference of these parameters is hampered by the likely endogeneity of government partisanship to electoral institutions. Political structure and the actions of politicians “matter” for the organization of labor interests. But there is a noteworthy caveat: these variables’ relationships to bargaining coordination appear to flow through their associations with the organizational capacity of peak associations, especially labor.

One implication of the findings is particularly striking: it may be that the standard argument that centralized bargaining induces a more egalitarian distribution of wages and income has the story backwards; where workers (and the organizations that represent them) are not too unequal in their resources and interests they are more likely to cooperate in a centralized fashion.27 This comports with Scheve and Stasavage (2009)’s finding that income and wage inequality in Sweden had already fallen substantially and was declining at the time centralized bargaining was instituted. Decisively addressing this issue will require us to continue the work of explaining the complexion of unionism—and other labor market institutions—across countries. Why did some countries develop more balkanized craft-based unions as opposed to industrial unions? How much influence must be attributable to deep historical forces such as the legacy of guilds, the timing of industrialization, and the extension of the franchise (Ingham 1974; Iversen and Soskice 2009)? What is the role of changing job market risks (Beramendi 2007)? Is there a pivotal role for ideologies or even particular individuals? Ultimately, whether social democracy is a feasible developmental strategy for countries beyond a 60-year window in northwest Europe remains an open question.

More settled is the notion that social democracy must evolve if it is going to continue to generate

27 I thank David Soskice for emphasizing this point.
egalitarian economic growth. Unions themselves are no longer generating the political and economic pressure they did in the 1950s–1980s. Strikes in the OECD have become less common and less disruptive in the years since 1990; labor markets have a notable insider–outsider character; and union density is declining in many places. Where unions find themselves embedded in auspicious institutional settings that they initially helped create (strong, centralized federations, the Ghent system, etc.), they have been able to remain an important part of the economic and political landscape. Unions may substitute political activity for strikes as the latter have become a less potent and less frequently used weapon. The extent to which political coordination overlaps with cross-union coordination in bargaining and industrial disputes is a wide-open empirical question. But unions have fared poorly in recent years in places where they failed to effectively pool their strength early on. Federations are fragmenting, as in the United States, and many smaller unions are merging into larger unions or simply disappearing. Thus unions now seem bound together by their common weakness rather than divided by their strengths.

APPENDIX A: PROOFS

Proof of Lemma 1

The proof proceeds through each case of \( \Delta u_i \).

\( r_a \geq r_i \geq r_a \): The derivative with respect to \( \gamma \) of the top half of equation (3) is

\[
1 - \frac{r_i}{r_a} + \log \frac{\gamma}{r_i} + \log \frac{\bar{r}_C}{r_a},
\]

which is nonpositive if and only if \( r_i/r_a \leq \log(\bar{r}_C/r_a) + 1 \).

\( r_a \geq \gamma \geq r_i \geq 1 \): The first two terms sum to a non-negative number and the third term is nonnegative. Because \( r_a \leq \bar{r}_C \forall C \neq \emptyset \), the last term is nonnegative. The derivative with respect to \( \gamma \) of the bottom half of equation (3) is

\[
1 - r_i/r_a + \log(\bar{r}_C/r_a),
\]

which is nonnegative if and only if \( r_i/r_a \leq \log(\bar{r}_C/r_a) + 1 \).

\( r_a \geq r_i \geq r_a \): The derivative with respect to \( \gamma \) of the top half of equation (4) is \( \log(\bar{r}_C - \log r_i) \geq 0 \) \( \forall i \), because \( \bar{r}_C \geq r_i \) by construction.

\( r_a \leq \gamma < r_i \): The derivative with respect to \( \gamma \) of the bottom half of equation (4) is \( \log \bar{r}_C - \log \gamma \geq 0 \rightarrow \) the derivative is positive.

Proof of Lemma 2

The proof proceeds through each case of \( \Delta u_i \).

\( r_a \geq \gamma \geq r_i \): The derivative with respect to \( r_i \) of the top half of equation (3) is

\[
\frac{\partial \Delta u_i}{\partial r_i} = \frac{\gamma}{r_i} + \frac{\gamma}{\bar{r}_C} - \frac{\gamma}{r_a} + 1 \leq 0.
\]

\( r_a \leq \gamma, r_i \leq \gamma \): The derivative with respect to \( r_i \) of the bottom half of equation (4) is

\[
\frac{\partial \Delta u_i}{\partial r_i} = \frac{\gamma}{\bar{r}_C} - \frac{\gamma}{r_i} \leq 0.
\]

\( r_a \leq \gamma < r_i \): The derivative with respect to \( \gamma \) of the bottom half of equation (4) is

\[
\frac{\partial \Delta u_i}{\partial \gamma} = \frac{\gamma}{r_i} - 1 \leq 0 \Leftrightarrow \gamma \leq \bar{r}_C.
\]

If \( i \) is decisive, i.e., \( r_i = r_a \) and a change in \( r_i \) changes \( r_a \), then \( \Delta u_i \) simplifies to \( \gamma \log(\bar{r}_C/r_a) \), the derivative of which is \( \gamma(1/\bar{r}_C - 1/r_a) \), which is nonpositive because \( r_a \leq \bar{r}_C \) by construction. Note that all weak inequalities above become strict when \( |C| > 1 \).

Proof of Proposition 1

Fix some \( \alpha \) and some membership \( C \). If condition 5 or 6 holds for \( r_a \) then, by Lemma 2, they hold \( \forall i \) such that \( r_i \leq r_a \). Each such \( i \) benefits by joining the confederation. Denote by \( \tilde{r} \) the value of \( r_i \) for which either condition 5 or 6 holds with equality. Any union \( j \) outside the confederation for which \( r_a < r_j \leq \tilde{r} \) can do better by joining, because doing so moves the decisive member closer to \( i \)'s preferred \( i^* \) and adds resources, thereby increasing the returns from the confederal activity. Thus, in equilibrium, there is a (compact) set of unions with contiguous preferences around the \( \alpha \)th union satisfying either condition 5 or 6.

By Lemma 1, in all cases but one, \( \Delta u_i \) is increasing in \( \gamma \), implying more unions, not fewer. Thus it suffices to show that in the remaining case where this does not always hold those with net utility decreasing in \( \gamma \) would not join in the first place. I.e., it suffices to show that when \( \gamma < r_a, r_i \) members with \( r_i > r_a(1 + \log \bar{r}_C - \log r_a) \) will find it unprofitable to join. If \( \tilde{r} = r_a(1 + \log \bar{r}_C - \log r_a) \) then, substituting for \( r_i \) and \( \gamma/r_a \) for \( r_a, \Delta u_i = -\gamma(1 + \log \bar{r}_C/r_a) + \gamma(1 + \log \bar{r}_C/r_a) = 0 \). Thus any union with \( r_i > \tilde{r} \) will have \( \Delta u_i < 0 \) and will therefore not be a member of \( C_a \). Thus the equilibrium confederation will not shrink and may increase in size for any increase in \( \gamma \).

Proof of Proposition 2

For \( r_a \) to exist, it must be the case that \( i \) would join the confederation at some value of \( t \). Because \( i^* \) is \( i \)'s most preferred contribution level and, by assumption, there is some \( i \) for which \( \gamma < r_a \), we can substitute \( \gamma/r_i \) for \( t^*_i \) into \( \Delta u_i \), leading to the condition that \( \gamma \log \bar{r}_C/r_i \geq 0 \), which will always be true for nonnegative \( \gamma \).

The value of \( t \) that makes \( i \) indifferent between joining and not joining \( \Delta u_i = 0 \Leftrightarrow tr_i = \gamma(1 + \log \bar{r}_C/r_i) \). Denote this value of \( t \) as \( i_o \). It must also be the case
that all \( j \) would prefer that \( i \) be in the confederation. For this to be the case, there must exist some value of \( t \) that satisfies \( s \)'s participation constraint while making all \( j \) at least as well off as they were without \( i \). This value exists if \( u_t(t_u; C_{-i}) \leq u_t(t_w; C_{-i}) \Leftrightarrow \gamma (\log r_{C_{-i}t_u} - \log r_{C_{-i}t_w}) \leq 0 \). Rearranging terms gives condition 7.

**APPENDIX B: DATA**

\( \eta^2 \) (interunion membership variance): The variance in log union membership across affiliates of the largest union confederation, derived by taking the log of the product of the Herfindahl index of membership concentration for the largest federation (APPHRF1, interpolated to the annual level) and its number of affiliates. The former is from Golden, Wallerstein, and Lange (2009) whereas Miriam Golden provided the latter.

**bargaining coordination**: The Visser (2009) revision of Kenworthy’s wage bargaining index, taking values in \( \{1,2,3,4,5\} \), where \( 1 \) = fragmented wage bargaining, confined largely to individual firms or plants…; \( 2 \) = 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…; \( 3 \) = industry-level bargaining with somewhat irregular and uncertain pattern setting and only moderate union concentration…; \( 4 \) = government wage arbitration; \( 5 \) = centralized bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, without a peace obligation…; informal centralization of industry- and firm-level bargaining by peak associations…; extensive, regularized pattern setting coupled with a high degree of union concentration; \( 5 \) = centralized bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, with a peace obligation…; informal centralization of industry-level bargaining by a powerful, monopolistic union confederation…; extensive, regularized pattern setting and highly synchronized bargaining coupled with coordination of bargaining by influential large firms” (Kenworthy 2003, 41).

**confederal strike fund**: Indicator of whether the largest union confederation controls a central strike fund, CON14 (Golden, Wallerstein, and Lange 2009).

**cultural fractionalization**: Cultural-linguistic fractionalization taken from Fearon (2003).

**ENPP**: Natural log of the effective number of parliamentary parties from Goldner (2005).

**employer contract veto**: Dummy variable indicating whether the employer federation can veto affiliates’ wage agreements, EMCONV2 from Golden, Wallerstein, and Lange (2009).

**federal**: Indicator for federal governmental system taken from Beck et al. (2001)

**Left government**: Proportion of the total number of legislative seats controlled by the government parties that are due to Left parties taken from Swank (2006).

**number of confederations**: The number of labor confederations, taken from Golden, Wallerstein, and Lange (2009).

**population**: Log population in millions taken from the Penn World Tables (Heston, Summers, and Aten 2006); henceforth PWT.

**trade**: (Exports + imports)/GDP in current US$ from PWT.


**REFERENCES**


