

Institutional Dimensions of Coordinating Wage-Bargaining and Monetary Policy

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Few propositions are more widely accepted today among policy makers and economists than the assertion that, by making its central bank more independent from the national government, a nation can secure better levels of economic performance. The financial press has concluded that “the argument for central bank independence...appears overwhelming,” and many nations have made their central banks more independent during the 1990s.¹ Even the new monetary union now being established in Europe is organized around a central bank designed to be highly independent of political control (Goodhart 1995; Fratianni and von Hagen 1992; Gros and Thygesen 1992).

The argument for central bank independence rests on three pillars. First, a body of economic theory has been developed to explain why the independence of the central bank enhances economic performance (Persson and Tabellini 1994; Cukierman 1992). Second, several national cases are cited to support this view, of which the most prominent is the Federal Republic of Germany whose Bundesbank also provides the model for the new European Central Bank (Canzoneri, Grilli, and Masson 1993; Fratianni, von Hagen, and Waller 1992). Third, an influential set of empirical studies seems to confirm that, by making the central bank more independent, a nation can secure lower rates of inflation without any adverse economic effects (Alesina and Summers 1993; Grilli, Masciandaro, and Tabellini 1991).

The object of this chapter is to question the current consensus in favor of central bank independence. We proceed by examining each of the pillars on which the case for it rests, beginning with the theoretical rationale, following with a reconsideration of the German case, and concluding with the reanalysis of cross-national data. We close by discussing the implications for economic performance under European Monetary Union.

Our analysis begins from the contention that monetary policy-making involves a signaling process between the central bank and economic actors. We argue (a) that the advantages of

independence turn on the effectiveness of this signaling process and (b) that the effectiveness of the signaling process is conditioned, in turn, by the organization of the broader political economy and, most notably, the extent of coordination in wage bargaining. Although increasing the independence of the central bank will lower the rate of inflation, it will not always do so without adverse economic consequences. Instead, the character of a nation's wage-bargaining system will affect the efficiency of the signaling mechanism and therefore the unemployment cost of the inflation gains secured via central bank independence.

With this argument, the chapter integrates two well-developed bodies of literature that have long been separated from each other: the literature on central bank independence and the literature on the coordination of wage bargaining (Soskice 1990; Calmfors and Driffill 1988; Lange and Garrett 1985; Cameron 1984; Bruno and Sachs 1985). There is strong evidence that the key variables highlighted in both literatures independently affect economic performance, but we show that they also interact with each other in the determination of performance.

I. THE THEORY OF CENTRAL BANK INDEPENDENCE

Underpinning the literature on central bank independence is a standard neoclassical model, which assumes that the rate of inflation is determined primarily by the rate of growth of the money supply, which is controlled by the central bank, while the rate of unemployment is affected by unanticipated changes in policy and the level of real wages.² Within this framework, several advantages can be adduced for central bank independence. A central bank independent of political control may be better placed to stimulate the economy because economic actors are less likely to anticipate that it will engage in monetary expansion (Cukierman 1992). Similarly, there may be more muted political business cycles when control over monetary policy rests with an independent central bank (Clark, Reichert, Lomas, and Parker 1998; Alesina 1988; Beck 1982).

We focus here, however, on the claim most frequently cited in favor of central bank independence, which turns on the time-inconsistency problems that occur when nominal wage and price contracts of some duration must be fixed before the trajectory of monetary policy is known with certainty. In such contexts, which are common in the industrialized world, wage and price contractors will agree on nominal wages and prices higher than the real levels they seek in order to allow for the possibility that future inflation will lower their real wages and returns. As a consequence, wage and price settlements will be more inflationary than they might otherwise be.

The central bank can reduce the “inflation increment” that wage and price bargainers build into their contracts by promising to pursue antiinflationary policies, but these assurances may not be credible if the bank is known to be responsive to politicians for whom expansionary policy is often more electorally attractive. Thus, making the central bank more independent of political control will enhance the credibility of its assurances about the future course of monetary policy, thereby allowing wage and price contractors to agree on less-inflationary settlements. In this way, increasing the independence of the central bank may lead to a lower rate of inflation without any other adverse economic consequences (Cukierman 1992; Lohmann 1992; Rogoff 1985; Barro and Gordon 1983a, b; Kydland and Prescott 1977).

This is a powerful theory, now widely accepted in economics, whose basic logic we also accept (cf. Posen 1995a, b). Notice that, at its heart, this is a theory about signaling and coordination. The premise is that, by signaling its intentions with regard to the future course of monetary policy, the central bank can lead wage and price contractors to alter their behavior and, notably, to coordinate on lower nominal wage and price contracts. The independence of the bank can affect this process in two ways. First, since more independent central banks are likely to pursue more restrictive monetary policies, independence can depress wage and price settlements

via what might be termed a “conservatism effect”. Second, because greater independence confers greater credibility on the signals the bank sends, it can reduce wage and price contracts by rendering the bank’s assurances about the course of monetary policy more believable. How well this “credibility effect” operates, however, depends on the propensity of wage and price contractors to respond to signals from the bank relative to other pressures on them and on their ability to coordinate on appropriate behavior.

It is with regard to this last set of issues that the conventional theory of central bank independence is deficient. As a theory, it has the great advantage of drawing our attention to the importance of signaling to monetary policy making, to the importance of the credibility of the signals sent from the central bank, and to the significance of independence for such credibility. Conventional analyses of central bank independence, however, pay little attention to the broader complexities of the signaling process itself. In general, they adopt a rational-expectations perspective that assumes that all the relevant economic actors will have very high levels of information and, more critically, high levels of confidence about the behavior of other actors. In brief, it is assumed that each wage and price contractor can predict not only the effects of an announced monetary policy on the economy but also the behavior of all other relevant actors in the face of such an announcement and the effects of that behavior. Under these assumptions, rationality alone should lead the actors to coordinate on optimal forms of behavior.

There are good reasons, however, for thinking that such assumptions may not be adequate to the real world. First, the precise effects of monetary policy can rarely be predicted with complete confidence, even by experts (Eichengreen 1996). Second, and of greater theoretical significance, even if some actors can make accurate predictions, the presence of others with a capacity to affect the economy who may be operating from different predictions interferes with

the ability of all to coordinate on an equilibrium specified by the monetary announcement. Given the large number of wage and price bargainers in the economy, it is unlikely that all will be able to predict the effects of monetary policy with precision, let alone predict the predictions and behavior of others. The conventional theory of central bank independence is one that assumes that full information and rationality alone will produce effective coordination but, in most settings to which it is applied, information is not full enough to induce such coordination.

Indeed, the settings associated with wage bargaining are widely recognized to be ones afflicted by collective action problems that arise when the actors have some bargaining power and so must condition their wage and price settlements on expected settlements elsewhere but enjoy less-than-complete information about what other actors are likely to do (Calmfors 1993; Layard, Nickell, and Jackman 1991; Carlin and Soskice 1990). In such instances, effective coordination requires the presence of the kind of institutional arrangements to which the “new political economy” draws our attention, namely institutions that provide the actors with a basis for monitoring behavior, deliberating with each other, and making credible commitments (Milgrom and Roberts 1992; Alt and Shepsle 1990).

These considerations suggest that the effectiveness of the signaling and coordination process between the central bank and economic actors will depend on the presence of institutions for resolving the collective action problems that wage bargainers face. The limitation of most theories of central bank independence is that, by focusing on the characteristics of the central bank, they neglect the contribution that other institutions may make to the overall signaling and coordination process on which many of the advantages of central bank independence depend. Conversely, theories of coordinated wage bargaining often neglect the contribution that monetary policy and central bank independence may make to the achievement of effective wage

coordination. In what follows, we seek to rectify these problems by constructing an analysis that appreciates the interactive effects between the institutions of central bank independence and those associated with wage-bargaining coordination.³

II. THE COORDINATION OF WAGE BARGAINING

We focus here on “the coordination of wage bargaining”, a term that refers to the degree to which the determination of wage settlements is actively coordinated across the economy by trade union and employer organizations. That, in turn, depends heavily on the organizational structures for wage bargaining, which can vary from country to country.

The full set of institutional arrangements required for coordinated wage bargaining is complex because they must support cooperative outcomes in five nested sets of strategic interactions (Thelen 1991; Scharpf 1988, 1991; Tsebelis 1990). The first is the interaction that takes place inside each dyad of bargainers between the organizations representing workers and those representing employers. A second takes place between the leaders of bargaining organizations and the rank and file members whose support they must retain. We focus here on the third interaction, between the bargainers in each dyad and their counterparts in other dyads, and on a fourth interaction, between wage bargainers as a group and the authorities controlling economic policy. A fifth interaction occurs between the authorities controlling monetary policy and those controlling fiscal policy.

With regard to the interactions examined here, an early literature associated wage coordination entirely with highly centralized trade union movements bargaining with employer confederations at the peak level. In recent years, two amendments have been made to this view. First, it has been shown that employer organizations can play a role in the coordination of wage bargaining as important as that of trade unions (Thelen 1994; Soskice 1990; Swenson 1989).

Second, it has been noted that effective coordination can take place within either of two organizational structures. In one, the principal locus of bargaining is at the economy-wide or peak level, where negotiations occur among highly centralized trade union and employer confederations. In the other, wage negotiation takes place primarily among trade unions and employer organizations highly concentrated at the sectoral level but equipped with sufficient economy-wide linkages to transmit the settlement reached in a leading sector across the economy (Iversen 1994; Golden 1993).

The impact of variation in the level of wage coordination on the economy as a whole, and on the effectiveness of the signaling process between wage bargainers and the central bank in particular, can best be appreciated by comparing two polar cases.

Consider, first, the case in which wage bargaining is largely uncoordinated. Here, each bargaining unit, generally a dyad of employer and union, must reach a settlement in the context of considerable uncertainty about what the settlements reached by other bargaining units will be. Three effects follow from this structural context.

First, the union in each dyad will be tempted to seek a nominal wage settlement that exceeds its real-wage target to offset the real-wage losses it will suffer if other settlements are more inflationary than its own, and employers may well accede, anticipating that inflation will erode some of their nominal wage concessions. Where inflation expectations are high, these “inflation increments” are likely to be correspondingly high.

Second, in such settings, the actors in any one bargaining unit are unlikely to let considerations about the effect of their settlement on the overall economy influence their decision making, because any one bargaining unit is normally too small for its settlement to have a large impact on the economy. This posture will be reinforced by the fact that other bargaining units can

be expected to take a similar view; hence, if one union moderates its nominal-wage settlement in the interest of the national economy, it may suffer real-wage losses from the failure of other units to do so.

Third, when the economy-wide level of wage settlements proves inflationary, the fiscal or monetary authorities may respond with deflationary policies. In an uncoordinated setting, however, the actors in any one of the many bargaining units are unlikely to let the prospect of such a policy response influence their own settlement much because they know that the government will be producing a policy in response not to it but to settlements across the economy, which they cannot control. Again, if any one bargaining unit moderates its nominal wage settlement with this in mind, it may suffer from the failure of other units to do so. Thus, in uncoordinated settings, wage bargainers are unlikely to be highly responsive to threats from the fiscal or monetary authorities to respond to inflationary settlements with deflation.

Compare now the case in which wage bargaining is coordinated. In such settings, a central or lead bargain has great influence over the level of wage settlements in the economy as a whole, and subsequent bargains generally follow the pattern it sets with small adjustments for local conditions. Several implications follow from this.

First, since the members of each bargaining unit, and especially the one negotiating the lead settlement, know what the level of subsequent wage settlements is likely to be once they have settled on their own, they need not build an increment for anticipated inflation arising from other settlements into their own agreement.

Second, because the lead bargaining unit knows that its settlement is likely to be generalized to the whole economy, the actors within it have strong incentives to take the impact of their settlement on the overall economy into account when negotiating it. After all, they can

predict that impact because their settlement is likely to produce similar settlements elsewhere; and the aggregate economic effects will fall on their own members. For this reason, we can expect concerns about the aggregate levels of inflation, unemployment, and competitiveness in the national economy to influence individual wage settlements more strongly in coordinated systems of wage bargaining. This suggests that, where wage bargaining is more coordinated, we should see lower rates of inflation, whether or not the central bank is independent.

Most central to our argument, however, is the way in which the coordination of wage bargaining can lend force to the signals sent from the central bank. Because the lead settlement is likely to be copied with clear effects for the whole economy, those negotiating it know that the central bank is likely to respond directly to it. This renders the principal wage bargainers highly sensitive to signals sent from the central bank about the appropriateness of pending wage settlements and the likely stance of monetary policy in the face of them. In short, the signals sent from the central bank are more likely to affect the level of wage settlements in settings where wage bargaining is coordinated than in settings where it is not.

The important implication of this is that, where wage bargaining is coordinated, the central bank may be able to induce wage moderation and reduce the rate of inflation by signaling its policy intentions to wage bargainers, without any need to resort to policies that raise the level of unemployment. Where wage bargaining is uncoordinated so that the many small bargaining units are not especially sensitive to signals sent from the central bank, the latter may be able to reduce the rate of inflation only by pursuing restrictive monetary policies that encourage wage and price moderation by dampening the level of economic activity and raising the level of unemployment.

In sum, we have argued that the system of wage bargaining is a key component of the

overall signaling mechanism that links the central bank to economic actors and that this mechanism will be more effective where wage bargaining is coordinated than where it is not. Although increasing the independence of the central bank is likely to reduce the rate of inflation in any setting, through a combination of “conservatism” and “credibility” effects, its ability to do so without corresponding increases in unemployment is likely to depend on whether wage bargaining is coordinated. Conversely, although a higher level of wage coordination may lower the rate of unemployment in any setting, by facilitating coordination on wage levels appropriate to prevailing monetary policy, its effects are likely to increase with the independence of the central bank for two reasons. First, when the central bank is highly independent, the greater likelihood that it will be firmly committed to a strict monetary target means that any failure of wage bargainers to coordinate on appropriate wage levels is more likely to result in higher levels of unemployment than it would if the bank were subject to greater political control and less committed to tight monetary policy.⁴ Second, in at least some cases, the presence of a highly independent central bank may improve the effectiveness of a wage coordination system because its more credible promises/threats about the course of monetary policy will help to push subsequent wage bargains into line with the lead bargain.

In the next section, we explore the applicability of this theory to the case most often adduced in support of central bank independence, that of Germany.

III. THE GERMAN MODEL

The German Bundesbank is the most independent central bank in the world and, for most of the postwar period, the Germany economy achieved low rates of inflation at relatively low rates of unemployment (Lohmann 1994). Thus, many advocates of central bank independence invoke the German case as a model, most recently for the design of the new European Central Bank (Alesina

and Grilli 1993; Eichengreen 1992). A closer examination of Germany, however, reveals that its economic performance benefits not only from an independent central bank but also from a highly coordinated system of wage bargaining.⁵ In fact, the German case exemplifies how coordinated wage bargaining can enhance the effects of central bank independence and vice versa.⁶

Consider first the institutions that underpin wage bargaining in Germany. The German work force is organized into 17 large unions, often covering entire industries, which also belong to an overarching union confederation, the *Deutschegewerkschaftsbund* (DGB).⁷ These unions bargain with employers' associations, also organized by industrial sector, representing 80 percent of German employers. Thus, collective bargaining is relatively centralized at the industry level. Both the unions and the employers' associations are strongly positioned vis-à-vis their rank and file by virtue of the control they exercise over a range of resources important to their members, such as skill certification and vocational training schemes.

The system is supported by a legal framework that regulates many aspects of the bargaining process, specifies that only legally recognized unions can conclude collective wage agreements, and allows industry settlements to be extended to cover all companies in a sector by agreement between the union, the employers' association, and the regional governments. At the plant level, the system is underpinned by a system of elected works councils on which the unions are generally influential, which can negotiate local working conditions and, less formally, local pay structures (Thelen 1992; Berghahn and Karsten 1987; Katzenstein 1987; Markovits 1986; Streeck 1984a).

Equally central to the operation of the system is the less-formal arrangement whereby the settlements of most industries follow the precedent set by the bargain reached in a leading sector each year. For most of the postwar period, these leading bargains have been concluded between

IG Metall, the massive metalworkers union that organizes a range of industries including automobiles, engineering and steel, and the corresponding employers federation, Gesamtmetall.⁸ A variety of factors converge to give IG Metall this role and to ensure that other industries will follow its lead. Since it is the largest and one of the strongest German unions, the others can follow its lead knowing they would be unlikely to improve on its settlement, and both DGB and centralized employers' associations act as powerful coordinators of sectoral agreements (Thelen 1991; Markovits 1986; Flanagan, Soskice, and Ulman:ch. 5).

It is clear that this system tends to promote low rates of inflation. Since the lead bargainers in the metalworking industries know that their settlement is likely to be generalized to the whole economy, IG Metall need not seek an additional increment to guard against unanticipated levels of inflation that might follow from subsequent settlements. Both IG Metall and the corresponding employers' federation also have strong incentives to take the overall economic impact of any potential settlement into account when determining it. Thus, the system of wage coordination itself tends to reduce rates of inflation.

In addition, we also find a particular kind of interaction between wage bargainers and the central bank in Germany. The highly public *pas de deux* between the Bundesbank and the principal wage bargainers, which occurs at the time of every wage round in Germany, is a prominent feature of politics. The bank often issues pointed comments on the initial wage demands made by the union involved in the leading settlement, accompanied by detailed commentary about the state of the economy and warnings about the policy consequences of overly inflationary wage settlements. Because bargaining is relatively centralized, the principal negotiators are not left in much doubt about whether the bank intends to respond to their particular settlement; and it is not uncommon for them to issue counter statements about the

likely effect of their demands on the state of the economy (Scharpf 1988, 1991:ch. 7; Berghahn and Karsten 1987; Streeck 1984a, b). Notice that this kind of dialogue between wage bargainers and the central bank is completely absent from U.S. economic politics. From our theoretical perspective this difference in political discourse is entirely understandable: The Federal Reserve and the Bundesbank speak differently because they have audiences with different institutional structures.

In sum, the coordination of German wage bargaining renders the process of signaling that takes place between the central bank and wage bargainers highly effective. The bank can respond directly to a leading settlement; and it behooves those negotiating it to take seriously the bank's threats to do so. The system does not work perfectly: At times, wage bargainers defy the bank, whether to test its resolve or to satisfy their rank and file; but there can be no doubt that over the long run they have paid careful attention to its threats. Those pressures that have arisen from time to time for wage bargainers to defect from relative restraint have usually been defused because the likely strong response of the Bundesbank was known to the wage bargainers who in turn had the institutionally determined capacity to respond. It is clear that, as a result, the Bundesbank has been able to use this signaling mechanism on many occasions to induce more moderate wage settlements without having to resort to draconian monetary policies or sharply higher levels of unemployment.

The independence of the Bundesbank also enhances the effectiveness of this signaling process, as conventional theory suggests, by rendering the threats that the bank issues more credible than they might be if monetary policy were controlled by elected politicians. Indeed, as Iversen (1994, 1996), and Iversen and Soskice (1997) have suggested, central bank independence may have special importance for enhancing the effectiveness of wage coordination in systems,

like the German, where bargaining is coordinated but the locus of bargaining is at the industry-level. Here, effective coordination depends on other industry bargains following the lead settlement, and the added credibility that independence confers on the threats emanating from the central bank may help to ensure that they do so.

The German case also suggests that the effectiveness of such signaling mechanisms may be enhanced when the export sector is large and plays a pivotal role in wage bargaining (Franzese 1994, 1996, 1999). The metalworking sector, which produces the lead bargain in most years, has a high export concentration. In itself, this induces lower settlements because wage bargainers in export sectors are especially concerned to maintain unit labor costs at internationally competitive levels. Actors in such sectors are also especially sensitive to signals from the central bank, however, because the restrictive monetary policies that the bank wields not only depress the level of economic activity but also tend to appreciate the exchange rate, thereby threatening export sectors especially severely by rendering their products more expensive in world markets.

In sum, there are good reasons for thinking that the capacity of postwar Germany to secure low rates of inflation at low rates of unemployment is not attributable solely to the independence of the Bundesbank. Germany also has a highly coordinated system of wage bargaining that is itself conducive to lower rates of inflation and that renders the signaling mechanism between the bank and wage bargainers highly effective. It is the *combination* of central bank independence and coordinated wage bargaining that is so conducive to effective economic performance in Germany.

IV. CROSS-NATIONAL EMPIRICAL ANALYSIS

Much of the current enthusiasm for central bank independence stems from a set of influential empirical studies, based on cross-national comparison of average rates of inflation and

unemployment, which conclude that, when the independence of the central bank is increased, the rate of inflation will fall without any adverse economic consequences. One such article concludes “having an independent central bank is almost like having a free lunch; there are benefits but no apparent costs in terms of macroeconomic performance” (Grilli et al. 1991:375).

If our theoretical argument is correct, however, most of these studies suffer from a serious specification problem. In keeping with a neoclassical model that portrays the economy as largely homogeneous across nations, virtually the only institutional variable included in such analyses is one reflecting the degree of independence of the central bank.⁹ We propose including a further institutional variable representing the degree to which wage bargaining is coordinated. Once it is added, two new possibilities arise: We may find that some of the inflation effects hitherto attributed to the central bank are actually attributable to the wage-bargaining system, and/or it may be that the precise impact of increasing the independence of the central bank depends on the character of wage bargaining. Three specific hypotheses follow from the theory developed in preceding sections.

First, nothing in our account contradicts the conventional proposition that an increase in the independence of the central bank will lower the rate of inflation experienced by a nation. Thus, we expect to see a negative relationship between central bank independence and the rate of inflation in cross-national data.

Second, for the reasons adduced in Section II, individual bargaining units face more institutional incentives to avoid inflationary wage settlements in settings where wage bargaining is coordinated. Accordingly, we expect increases in the level of wage coordination to have an independent effect that lowers the rate of inflation.

Finally, our theoretical perspective suggests that there should be interaction effects

between the level of central bank independence and the level of wage coordination, most notably with respect to unemployment. In nations where wage bargaining is highly coordinated, increasing the independence of the central bank should reduce the rate of inflation without substantially increasing unemployment because the signaling system linking the bank to economic actors will be highly effective there. By contrast, in nations where wage bargaining is less coordinated, increasing the independence of the central bank may lower the rate of inflation only at the cost of higher levels of unemployment because the signaling system in such settings is not efficient enough to allow the bank to reduce the rate of inflation without implementing real monetary policies that increase the rate of unemployment. Thus, we expect the unemployment cost of central bank independence to increase as the coordination of wage bargaining decreases. The corollary is that the unemployment benefit of coordinated wage bargaining should increase with the independence of the central bank. As noted above, the reasoning behind the corollary is that, when the central bank is more independent, it can reinforce the level of coordination secured by institutions for wage coordination and, in the context of a highly independent central bank dedicated to monetary rigor, slippages in wage coordination are more likely produce higher levels of unemployment than they will when the central bank is more accommodating.

We test these hypotheses with a data set covering all the OECD nations for which comparable data could be secured for the period from 1955 to 1990.¹⁰ To measure central bank independence, we use an average of five indices, which assess both the legal status of the central bank and its reputation for independence.¹¹ To measure the degree to which wage bargaining is coordinated, we construct an index based on the one devised by Soskice (1990), extrapolated to a wider range of cases using the assessments Layard et al. (1991) make of trade union and employer coordination and standard accounts of industrial relations systems.¹² This index codes

each nation at one of five points (0, .25, .50, .75, 1.0) based on the degree to which wage bargaining has been coordinated by trade unions or employer associations over the course of the 1955—90 period. Our dependent variables are the average rates of inflation and unemployment for this period as portrayed by (internationally comparable) OECD measures.

We have deliberately taken a cross-sectional approach to the data analysis. Although this limits the degrees of freedom, we think it especially appropriate for assessing the impact of structural variables, such as central bank independence and the coordination of wage bargaining, which are long-lived and do not change dramatically over the period.¹³ Our premise is that the effects of such variables show up most clearly when assessed over a long period of time and that greater confidence can be placed in any relationships that are revealed if they persist over a variety of different economic contexts, extending from the years of postwar growth when inflation and unemployment were generally low, through the high-inflation period of the 1970s, to the high-unemployment decade of the 1980s.

Moreover, the empirical analyses from which the central bank independence literature has drawn its most influential support have been based almost entirely on this kind of cross-sectional analysis of the average postwar experience of the 15 to 21 developed democracies examined here. We adopt the same approach to ensure comparability with such analyses. In recognition of the limited degrees of freedom, we apply a variety of tests assessing the robustness of our findings.¹⁴

We begin with some simple cross-tabulations that display the basic patterns in the data. Because the presence of country-specific factors beyond the present theory may affect the precise levels of inflation and unemployment in any one nation, we should not expect the hypothesized relationships to show up in every pairwise comparison of cases. If operative, however, they

should be more likely to appear, *ceteris paribus*, when the cases are broadly aggregated, as they are in Table 6.1, where we divide the OECD nations into four groups according to whether they have a low or high level of central bank independence and low or high levels of coordination in wage bargaining, reporting the average rates of inflation and unemployment for the countries in each cell.

As our first hypothesis and conventional analysis predict, Table 6.1 indicates that countries with more independent central banks tend to have lower rates of inflation. In addition, as our second hypothesis predicts, increases in the level of wage coordination are also associated with lower rates of inflation. Note that the effect of coordination (independence) on inflation is greater in nations with low levels of central bank independence (coordination). This stands to reason. If increases in wage-bargaining coordination and central bank independence both lower the rate of inflation, the independent impact on inflation of each of them is likely to be somewhat greater when the other is not operative.

Most important from the perspective of our analysis are the results for unemployment displayed on the right-hand side of the table, which provide some evidence in support of our third hypothesis. In nations where the level of wage coordination is high, an increase in the independence of the central bank is associated with a relatively small increase in unemployment (0.5 points). In nations where the coordination of wage bargaining is low and the signaling mechanism between the central bank and economic actors correspondingly less effective, however, an increase in the independence of the central bank is associated with substantially higher levels of unemployment (1.4 points or nearly three times as much). Conversely, where central bank independence is high, coordination lowers unemployment by more (3.3 points) than where central bank independence is low (2.4 points).

To examine the empirical record regarding these hypotheses in a more systematic and thorough way, we also apply multiple-regression analysis, which can assess the effects of these structural variables (CBI and CWB) while controlling for a number of other economic and political variables that might be expected to influence the level of inflation or unemployment. Specifically, we control for (a) the economic openness of the economy, on the premise that more open economies may experience greater pressure to moderate the level of inflation as well as more unemployment induced by fluctuations in the international economy; (b) the level of real per capita gross domestic product, on the premise that less-developed nations may be more tempted to rely on seignorage for revenue and be more susceptible to high levels of unemployment; (c) the representation of left parties in the cabinet to reflect the widely accepted view that social democratic governments are more likely to tolerate inflation than their conservative counterparts; and (d) union density, to reflect the common argument that the collective-bargaining power of labor, controlling for (net of) its coordination, has a deleterious effect on wage restraint and therefore inflation and unemployment.¹⁵

The basic format of the regressions to be reported here is:

$$\pi = C' \mathbf{a}^p + \mathbf{b}_{cbi}^p CBI + \mathbf{b}_{cwb}^p CWB + \mathbf{b}_{cc}^p CBI \cdot CWB + \mathbf{e}^p$$

$$U = C' \mathbf{a}^u + \mathbf{b}_{cbi}^u CBI + \mathbf{b}_{cwb}^u CWB + \mathbf{b}_{cc}^u CBI \cdot CWB + \mathbf{e}^u$$

where π is inflation and U is unemployment, C is a vector of controls (described above) plus the constant, \mathbf{a} is a vector of coefficients on those controls and constant, and CWB and CBI are our measures of coordinated wage bargaining and central bank independence, respectively. It should be noted that in regressions with an interaction term like this, the *effects* of CBI and CWB on the dependent variable are given, *not* by the *coefficients* on each of those terms alone, but by $b_{cwb} + b_{cc} CBI$ and $b_{cbi} + b_{cc} CWB$, respectively. Likewise the statistical significance of these *effects*

must be assessed, *not* with regard to the standard error of the individual *coefficients*, but according to the standard error of the *effect*, which is different for each level that the other variable assumes.

The principal results, displayed in Table 6.2, provide strong confirmation for our first and second hypotheses.¹⁶ The level of central bank independence and the level of wage coordination both display an independent and statistically significant negative relationship to the average rate of inflation experienced by nations over the 1955—90 period.¹⁷ For example, holding CWB fixed at 0.5 (the level of the Netherlands and Belgium), an increase in central bank independence of 0.25 points (roughly the distance between Norway and the United States) reduces inflation by about 0.75 percentage points. Likewise, holding CBI fixed at 0.5 (about the level of Finland, Denmark, and Australia), an increase in the coordination of wage bargaining of 0.25 points (one interval on our 5-point scale) reduces inflation by about 0.66 percentage points.¹⁸

Similarly, our third hypothesis—that the unemployment costs of central bank independence depend negatively on the degree of coordination of wage bargaining and that the unemployment benefits of coordinated wage bargaining depend positively on the independence of the central bank—receives strong support here: The coefficient on the interaction term is large, negative, and statistically significant.

The net effects of central bank independence can be seen most clearly in Table 6.3 which reports contingent coefficients, displaying the impact of a unit increase in the level of central bank independence in settings characterized by different levels of wage coordination. The effect of an increase in central bank independence on inflation is negative at all levels of wage coordination but strongest in systems in which wage coordination is too low to have a major impact of its own on inflation. Even more important, the effect of an increase in central bank

independence on the rate of unemployment is relatively small and even marginally negative in settings where wage bargaining is coordinated but large and positive in settings where wage bargaining is relatively uncoordinated. We interpret this as following from the “conservatism effect” noted above: more independent central banks attach greater weight to securing low levels of inflation relative to low levels of unemployment but, when wage bargaining is uncoordinated, are unable to do so via “credibility effects” alone, that is, without monetary policies that, in combination with the level of wage and price contracts, tend to raise the level of unemployment.

Table 6.4 provides the analogous information regarding the estimated effects of coordination in wage bargaining on inflation and unemployment in settings characterized by different levels of independence of the central bank. The impact of coordination on inflation is, as we have argued, generally negative; in fact, when central bank independence is low, coordination in wage bargaining can itself lower inflation by a significant amount. The impact of wage coordination on inflation is smaller and the effect less statistically significant, however, when central bank independence is high, presumably because the latter has already achieved much of the feasible reduction in inflation. Finally, Table 6.4 confirms that increases in the coordination of wage bargaining tend to reduce the rate of unemployment and do so more strongly as central bank independence increases.

Finally, Table 6.5 summarizes these results by reporting the estimated rates of inflation and unemployment that can be expected to occur at different levels of central bank independence and wage coordination and at the sample means of the other variables. The first columns in the table indicate that, when wage bargaining is entirely uncoordinated, a 0.25 increase in central bank independence (about the gap from Australia to the United States) reduces the rate of inflation by about 1.16 points but at the cost of increasing the rate of unemployment by about

2.88 points. By contrast, as the last two columns indicate, in settings where wage bargaining is highly coordinated, a similar increase in the independence of the central bank brings smaller marginal reductions in the rate of inflation (-.36) but does so without increasing the rate of unemployment (in fact it may lower unemployment a little: -.38).

V. IMPLICATIONS FOR COMPARATIVE POLITICAL ECONOMY

These findings have important implications for our understanding of the political economy. First, they lend strong support to the contention, long prominent in comparative political economy, that economic performance is deeply affected by the institutional organization of the political economy. It may be difficult at best, and misleading at worst, to explain economic performance without reference to cross-national variation in the institutional structures of the political economy.

Second, this analysis speaks to the problem of how coordination is secured in the economy. Many neoclassical models assume that the behavior of economic actors will be coordinated by competitive market mechanisms and that nonmarket institutions should be seen primarily as factors that interfere with effective coordination. However, our analysis suggests that, in many contexts, nonmarket institutions make an important, and sometimes indispensable, contribution to the coordination of economic behavior. That is precisely what institutional frameworks for coordinating wage bargaining do in the context of the signaling process between central banks and economic actors. In many settings, it may be unrealistic to assume that economic coordination will be secured solely via rational action in competitive markets in the context of full information. More attention must be devoted to the way in which diverse institutional arrangements resolve the coordination problems of the economy.

Third, our analysis also suggests that, when exploring the impact of institutional

variables, we should be especially attentive to the presence of interaction effects among them (cf. Beck et al. 1993; Alvarez, Garrett, and Lange 1991; Soskice 1991). The impact of central bank independence, for instance, seems to depend heavily on the character of a nation's wage-bargaining system.

It is on these grounds that we challenge the influential claim that, by increasing the independence of its central bank, a nation can improve its rate of inflation without any adverse economic effects. Once the character of the wage-bargaining system is incorporated into the analysis, we find that this proposition holds true only for nations with relatively coordinated wage-bargaining systems. In nations where wage bargaining is not coordinated, increasing the independence of the central bank may lower the rate of inflation only at the cost of significant increases in unemployment. In support of this contention, we provide a theoretical rationale, evidence from close inspection of the critical German case, and results from an analysis of cross-national data.

In this context, it should be noted that our analysis departs to some extent from an older literature in comparative political economy that saw the presence of an independent central bank as an impediment to the achievement of effective economic performance (cf. Scharpf 1991). In some measure, that is because these studies defined economic performance largely in terms of the rate of unemployment whereas ours considers both unemployment and inflation.

There are more important respects in which our analysis differs from these antecedents, however. The latter were driven primarily by a Keynesian reasoning that saw demand stimulus as an effective way to lower rates of unemployment and independent central banks as an obstacle to such stimuli. By contrast, we begin from "new" classical assumptions, which dictate more skepticism about the likelihood that a demand stimulus will reduce unemployment and more

attention to strategic interactions in the whole economy. On this basis, we have developed a multifaceted rationale for why increases in central bank independence may generate higher levels of unemployment in some settings while enhancing inflation performance without substantial unemployment effects in others.

In general, the movement from these older lines of analysis to ours can be seen as one that shifts from an emphasis on interaction between the fiscal and monetary authorities toward an emphasis on the interaction between the monetary authority and wage and price contractors. We see this as a step forward but want to emphasize that the interaction between fiscal and monetary authorities continues to remain important and deserves more scrutiny than space has allowed us to provide here.

Finally, these findings have important implications for national policy makers. In particular, they suggest that enhancing the independence of the central bank may not be the economic panacea that many believe it to be. Central bank independence may provide the full gains promised for it only when it is combined with coordinated wage bargaining. But, unlike central bank independence, which can be legislated relatively easily, wage coordination is difficult to secure and substantially beyond the control of government policy. A nation's capacity for wage coordination depends on the character of a variety of social organizations, such as trade unions and employer confederations, which emerge out of a long historical process and may not be immediately amenable to political engineering (Levy 1993; Regini 1984). Thus, many governments that enhance the independence of their central bank may find the results somewhat disappointing.

VI. IMPLICATIONS FOR EUROPEAN MONETARY UNION

This analysis also has substantial implications for the monetary union that Europe is now

entering. European Monetary Union (EMU) is built around a central bank whose general structure and level of independence is modeled on the German Bundesbank. Many hope that, as a consequence, the new monetary union will achieve levels of economic performance equivalent to historic levels in Germany.

Our findings suggests that such aspirations are unlikely to be realized, because German levels of performance have depended not only an independent central bank but also on a coordinated wage-bargaining system that was responsive to it. The European Union (EU) is unlikely ever to acquire community-wide institutions for such coordination of wage bargaining. On the one hand, its leaders have yet to show any real interest in acquiring such institutions, as the halting nature of their steps toward a Social Charter indicates (Lange 1993; Leibfried and Pierson 1995; Streeck and Schmitter 1991; Streeck 1995). On the other hand, even if they sought more coordinated labor market institutions, the latter would be difficult to secure. Wide disparities in the way in which workers and employers are organized across the nations of the EU make it difficult to imagine how wage bargaining could be coordinated across the continent without large-scale reorganization; and the few efforts made by trade unions or employers to reorganize wage bargaining on a European level have been singularly unsuccessful (George 1992; Streeck and Schmitter 1991). As a result, to secure low rates of inflation, a European central bank may have to resort to relatively high levels of unemployment because it will lack the effective signaling process provided by a continent-wide system of wage coordination.¹⁹

More important yet, the common view that all nations will gain from European Monetary Union may be wrong (cf. European Commission 1990; Gros 1996:26 et passim.). Our analysis suggests that the move to EMU may improve the economic performance of some nations relative to their past experience but could erode the performance of others. The precise effects

experienced by each nation will be conditioned by the effectiveness of its existing institutions relative to those it acquires by virtue of joining the monetary union.

Some sense of these effects can be gleaned from Table 6.6, which reports the average postwar performance of nations possessing different combinations of institutions. Although realized performance under EMU will differ from these historical levels, the table does suggest how performance under the institutional conditions it provides is likely to compare with the performance that can be secured under the different institutional conditions found in its member states.²⁰ EMU will create an economic unit characterized by a highly independent central bank and uncoordinated wage bargaining. That is the situation represented by quadrant II in Table 6.6. Whether a nation will gain or lose over the long run from entry into EMU, in terms of inflation and unemployment, will depend on the quadrant of the table from which it is moving. Nations that have long had relatively dependent central banks and uncoordinated bargaining systems, such as Britain, Ireland, and France (in quadrant I), may gain slightly, at least as judged by the Okun misery index (i.e., the sum of inflation and unemployment rates), by virtue of acquiring a more independent central bank. Although they are not included in our empirical analysis, Greece, Portugal and Spain probably also fall into this category. If they expect to replicate Germany's historic levels of performance, however, even these countries may be disappointed because they are moving to quadrant II rather than to quadrant IV, where Germany has been located.

By contrast, Table 6.6 suggests that virtually all other member states in the EU will experience pressures tending toward a deterioration in economic performance as a result of the move to monetary union because they are shifting from the institutional conditions of quadrants III or IV to those of quadrant II. Ironically, one of the biggest potential losers will be Germany, a prime mover behind the establishment of EMU. It has long benefited from the smooth interaction

between its independent central bank and its coordinated wage-bargaining system. But this interaction will be disrupted because the Bundesbank will be replaced by a European central bank that faces a wide range of organizationally disparate and uncoordinated wage-bargaining units. That bank cannot be expected to respond directly to German bargainers any more than to Danish or Spanish bargainers. Indeed, most nations that once had a coordinated wage-bargaining system may suffer because they will become part of a common currency area with a multiplicity of uncoordinated bargaining units. In the German case, Table 6.6 predicts a movement from an Okun score of about 7 to one that is closer to 11. Thus, the move to EMU may not be an unmitigated blessing, and its effects on national economic performance will be distributed unevenly across countries.

In addition to these national effects, the establishment of EMU may also have significant distributive consequences across different social groups inside each nation. It is well-established that changes in the rate of inflation and the rate of unemployment have more adverse effects on some social groups than on others. Although it is difficult to identify all of these effects with precision, lower-skilled manual and clerical workers tend to suffer disproportionately from rising rates of unemployment (Wood 1994; Hibbs 1977). Thus, it is important that, even when the move to EMU improves the aggregate economic performance of a nation, as measured by the Okun index, it may shift the mixture of inflation and unemployment experienced there. Even those nations in quadrant I that should gain the most from entry can expect to experience higher levels of unemployment as a result. Indeed, from an institutional perspective, there is reason to expect EMU to conduce toward rates of unemployment higher than those most of its member nations have historically enjoyed, either because the new European central bank will be more independent than their own has been (and thus more likely to privilege inflation over

unemployment) or because it will seek rates of inflation commensurate with past experience but without the efficient signaling mechanism provided by systems of coordinated wage bargaining. This suggests that those at the margins of the labor market may bear the greatest costs associated with the creation of European Monetary Union.

Of course, we emphasize that one must treat these inferences with caution. EMU is likely to have other economic effects not modeled here that could offset some of the distributive consequences on which we focus; and because the figures in Table 6.6 are based on historical levels of performance, the actual levels of economic performance realized in the EMU are likely to diverge from them for a wide variety of reasons. In particular, since the inflationary increment built into wage bargains is greater in times of widespread inflation than in times of high unemployment, of the sort currently seen in Europe, both the credibility gains that can be secured via central bank independence and the corresponding costs of forgoing coordinated wage bargaining may be relatively low in the short term, showing up only if the European economy moves in a more inflationary direction. In the long run, however, the theory and evidence provided here suggest that European Monetary Union should have more uneven distributive effects within and across countries than is conventionally acknowledged.

To return finally to the German case, it may be that the best guide to what we can expect from EMU is not the familiar image of *Modell Deutschland* but the experience that Germany has had with unification after 1989. After all, the creation of a European monetary union is analogous in some respects to the process of German unification. High-wage and highly skilled economies will be joined to less-developed regions under a single monetary authority. That authority will have to cope with a greater variety of economic shocks than did its national predecessors. New modalities for wage bargaining and fiscal coordination across the disparate regions of the union

will have to be developed; and the various kinds of economic integration that should follow from monetary integration may generate substantial economic dislocation, as they did in Germany, albeit to a lesser degree because all member states are advanced capitalist economies.

In this context, the lessons that follow from the example of German unification are not altogether encouraging. The German system itself experienced severe strain as a result of unification. Two sources of strain deserve emphasis here. First, efforts to incorporate East Germany into the existing industrial relations system proved highly taxing and only partly successful. One result was high levels of industrial conflict, notably in the spring of 1993 when employers challenged the extension of the wage-bargaining system to the East (Locke and Jacoby 1995; Webber 1994; Silvia 1994). Second, unification also provoked conflict between the federal government and the Bundesbank, which customarily responds not only to wage bargains, as we have emphasized here, but also to the fiscal policies of the government. When the efforts of the latter to finance unification resulted in fiscal expansion, the Bundesbank responded with high interest rates to encourage fiscal restraint and dampen inflationary pressures. The consequences were far from ideal for the German or European economies.

European Monetary Union will pose similar, if less severe, challenges. It will disrupt the processes of signaling and coordination long established between central banks and wage bargainers in some nations, which may inspire broader changes in industrial relations systems (Soskice 1997). It will require the development of new relationships between the European central bank and the fiscal authorities of each nation, which have already been the subject of considerable controversy.²¹ Moreover, in the context of continuing high unemployment, many member governments may seek more expansionary policies precisely when the new European central bank is seeking to establish its credibility with relatively rigorous monetary policies. One

effect is likely to be higher levels of unemployment than many proponents of European Monetary Union currently envisage.²² Another may be intensified pressure for institution-building to cope with the dilemmas of coordinating wage bargaining or fiscal and monetary policy in the new environment.

The larger point here is that the creation of a European monetary union will generate a variety of new coordination problems that will not automatically be resolved by the presence of an independent central bank. The principal argument of this chapter is that the resolution of such problems depends on the development of a larger system of institutional arrangements. An independent central bank trying to impose its will on a reluctant government or recalcitrant work force is only a second-best solution to problems that could be tackled more effectively through a broader range of institutions. When contemplating institutional reform, it would be wise for national governments and European policy makers alike to consider the complete set of coordination problems they confront and the full range of institutional solutions that can be brought to bear on them.

Data Appendix

We list here summary statistics and all the data necessary to replicate the postwar-average results presented in the text. Data analysis conducted in *Econometric Views* 2.0; *Stata* 5.0; and *Gauss-386i* v. 3.01. All data available from <http://www-personal.umich.edu/~franzese>.

Country	MI	UE	Infl.	CBI	CWB	GDP	Open	Uden	Lcab
United States	10.17	5.76	4.41	0.75	0.00	9.43	0.11	0.24	0.00
Japan	6.34	1.97	4.42	0.41	0.75	8.49	0.20	0.32	0.00
Germany	6.80	3.13	3.68	0.93	0.75	8.92	0.39	0.34	0.29
France	10.79	4.16	6.63	0.43	0.25	8.91	0.29	0.18	0.17
Italy	14.19	5.576	8.62	0.37	0.25	8.72	0.30	0.34	0.18
UK	12.25	4.88	7.37	0.42	0.00	8.95	0.37	0.43	0.33
Canada	11.49	6.43	5.06	0.61	0.00	9.25	0.39	0.30	0.00
Austria	6.57	2.18	4.39	0.65	1.00	8.71	0.46	0.55	0.65
Belgium	9.94	5.48	4.46	0.41	0.50	8.88	0.95	0.48	0.24
Denmark	11.51	4.85	6.65	0.53	0.75	8.94	0.52	0.67	0.64
Finland	10.75	3.10	7.66	0.49	0.75	8.78	0.43	0.54	0.39
Ireland	16.10	8.10	8.00	0.46	0.00	8.38	0.79	0.51	0.09
Netherlands	9.05	4.27	4.78	0.56	0.50	8.91	0.93	0.34	0.16
Norway	8.00	2.23	5.76	0.23	1.00	8.96	0.54	0.55	0.72
Sweden	8.46	1.73	6.73	0.30	1.00	9.03	0.45	0.73	0.85
Switzerland	5.00	0.89	4.11	0.84	0.75	9.32	0.53	0.32	0.23
Australia	10.56	3.95	6.61	0.47	0.25	9.10	0.28	0.46	0.22
New Zealand	9.22	1.34	7.88	0.14	0.25	8.97	0.43	0.58	0.27
Mean	9.96	4.01	5.96	0.50	0.49	9.15	0.46	0.44	0.31
Std. Dev.	2.88	2.038	1.578	0.20	0.37	0.20	0.23	0.15	0.24
Maximum	16.5	8.46	8.62	0.93	1.00	9.51	0.95	0.73	0.83
Minimum	4.98	0.87	3.68	0.15	0.00	8.60	0.11	18.3	0.00

Notes: MI = misery index; UE = unemployment; Infl. = inflation; CBI = central bank independence; CWB = coordination of wage bargaining; GDP = natural log of real GDP per capita; Open = (exports + imports)/GDP; Uden = fraction of labor force unionized; Lcab = fraction of cabinet seats held by left parties. See notes in the text for sources.

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Table 6.1. Average inflation and unemployment rates secured in OECD countries under alternative institutional arrangements, 1955-90

Inflation rates				Unemployment rates			
Coord- inated	Central Bank Independence			Coord- inated	Central Bank Independence		
		Low	High			Low	High
Wage	Low	7.5 (6)	4.8 (2)	Wage	Low	4.7 (6)	6.1 (2)
Barg.	High	6.2 (4)	4.8 (4)	Barg.	High	2.3 (4)	2.8 (4)

Notes: Cases were coded as follows: CWB: low = 0 and 0.25, high = 0.75 and 1; CBI: low = below 0.50, high = above 0.50. Cases where CWB = medium (0.5) are omitted here but retained elsewhere. The number of countries in each category is given in parentheses after the postwar-average inflation or unemployment.

Table 6.2. Cross-sectional estimates of the inflation and unemployment effects of central bank independence, coordinated wage bargaining, and their interaction

Independent variables (range of values)	Dependent variables	
	Inflation	Unemployment
Intercept	+27.13	+43.25
(1)	<i>(13.6)^{.07}</i>	<i>(12.9)^{.01}</i>
Union density	+3.156	+8.553
(.183—.726)	<i>(2.75)^{.28}</i>	<i>(3.11)^{.79}</i>
Left cabinet strength	+1.875	+2.296
(0—.833)	<i>(2.72)^{.51}</i>	<i>(1.35)^{.12}</i>
Trade openness	-1.790	+2.036
(.112—.952)	<i>(1.38)^{.23}</i>	<i>(.971)^{.06}</i>
ln (real GDP per capita)	-2.045	-4.846
(8.60—9.52)	<i>(1.47)^{.19}</i>	<i>(1.44)^{.01}</i>
Coordination of wage bargaining (CWB)	-4.238	+1.004
(0—1)	<i>(1.73)^{.03}</i>	<i>(1.53)^{.53}</i>
Central bank independence (CBI)	-4.635	+11.53
(.146—.931)	<i>(2.28)^{.07}</i>	<i>(2.75)^{.002}</i>
Interaction (CWB x CBI)	+3.224	-13.05
(0—.699)	<i>(2.65)^{.25}</i>	<i>(3.25)^{.003}</i>
Number of observations (° freedom)	18 (10)	18 (10)
Adjusted R ² (S.E. of regression)	.548 (1.06)	.806 (.896)

Notes: Coefficient estimates in bold; coefficient standard-errors in italics; approximate p-level at which the null hypothesis that the coefficient is zero can be rejected superscripted to that. Equations estimated by OLS with White's robust standard errors. Sample range of the independent variables in parentheses below their names.

Table 6.3. The estimated impact of a unit increase in central bank independence at various degrees of coordination in the wage-bargaining system

Level of wage bargaining coordination	Conditional parameter estimates for the effect of a unit increase in central bank independence on...	
	Inflation	Unemployment
0.00 (United States, UK, Ireland)	-4.63 (2.28) ^{.03}	+11.5 (2.75) ^{.00}
0.25 (France, Italy, New Zealand)	-3.83 (1.82) ^{.03}	+8.26 (2.04) ^{.00}
0.50 (Belgium, Netherlands)	-3.02 (1.51) ^{.04}	+5.00 (1.44) ^{.00}
0.75 (Japan, Germany, Denmark, Finland, Switzerland)	-2.22 (1.45) ^{.04}	+1.74 (1.15) ^{.08}
1.00 (Austria, Norway, Sweden)	-1.41 (1.69) ^{.21}	-1.52 (1.37) ^{.15}

Notes: Estimated effect of a unit increase in CBI at that level of CWB ($b_{cbi} + b_{cc}CW B$) in bold; conditional standard-errors of the effects at that level of CWB in parentheses; p-level of one-sided t-test at that point superscripted in italics.

Table 6.4. The estimated impact of a unit increase in coordination of wage bargaining at various degrees of independence of the central bank

Level of central bank independence	Conditional parameter estimates for the effect of a unit increase in coordinated wage bargaining on...	
	Inflation	Unemployment
0.14 (New Zealand)	-3.79 (1.48) ^{.01}	-8.22 (1.12) ^{.24}
0.37 (Italy)	-3.04 (1.20) ^{.01}	-3.82 (.620) ^{.00}
0.56 (Netherlands)	-2.43 (1.18) ^{.03}	-6.30 (.714) ^{.00}
0.75 (United States)	-1.82 (1.37) ^{.11}	-8.78 (1.18) ^{.00}
.93 (Germany)	-1.24 (1.67) ^{.24}	-11.1 (1.72) ^{.00}

Notes: Estimated effect of a unit increase in CWB at that level of CBI ($b_{cwb}+b_{cc}CBI$) in bold; conditional standard-errors of the effects at that level of CBI in parentheses; p-level of one-sided t-test at that point superscripted in italics.

Table 6.5. Estimated inflation and unemployment rates at different levels of central bank independence and wage coordination (at means of other variables)

Central bank independence	Level of coordinated wage-bargaining					
	0.00		0.50		1.00	
	Infl	Unem	Infl	Unem	Infl	Unem
0.00	9.55	.948	7.43	1.45	5.31	1.95
0.25	8.39	3.83	6.67	2.70	4.96	1.57
0.50	7.23	6.71	5.92	3.95	4.60	1.19
0.75	6.07	9.59	5.16	5.20	4.25	.811
1.00	4.91	12.5	4.40	6.45	3.90	.431

Table 6.6. National economic well-being under different institutional structures by assessed the inflation rate, the unemployment rate, and the Okun misery index, 1955—90

		Level of central bank independence			
		Low		High	
Degree of coordination in wage bargaining	Low	I	MI: 12.2 π : 7.5 UE: 4.7	II	MI: 10.9 π : 4.8 UE: 6.1
		III	MI: 8.9 π : 6.2 UE: 2.3	IV	MI: 7.6 π : 4.8 UE: 2.8
	High				

Notes: MI = misery index, π = inflation rate (%), UE = unemployment rate (%). See note to Table 6.1 for coding of CBI and CWB.

Notes

In the course of our research on this topic, which dates back to 1992—93, we have accumulated far more debts than we can enumerate here, notably to those who provided us with comments on various papers stemming from this research. We want to thank them and to acknowledge, in particular, Torben Iversen and David Soskice for many stimulating discussions in recent years. Finally, the reader should note that earlier versions of this paper appeared in the working paper series of the Berkeley Center for German and European Studies and the Wissenschaftszentrum Berlin and that some passages in this paper draw on Hall and Franzese (1998) where a more extended data analysis is presented.

1 *The Financial Times* 12 November 1992:20.

2 Although some of these postulates may be contentious, we do not take issue with them here as our own arguments hold under a variety of economic assumptions including those of the standard neoclassical framework.

3 For an early formulation see Hall (1994). Franzese (1994, 1996, 1999) expands the analysis, considering also the impact of the sectoral-structural position of the bargainers in a model similar to the more informal framework presented here. Iversen (1994, 1996) considers the role of labor's goals with regard to wage equalization in a somewhat different model. Iversen and Soskice (1997) demonstrate that real effects of monetary conservatism can stem from market power even given rational expectations, complete information, and perfect credibility. Cukierman (1997) adds unions with a direct distaste for inflation to an otherwise neoclassical model and

now holds several conclusions in common with those derived by Hall, Franzese, Iversen, and Soskice.

4 The reasoning here is that failures in wage coordination commonly lead to higher nominal wage levels. When the central bank pursues policies that are nonaccommodating, these are likely to translate into higher real wage levels and higher levels of unemployment. When the central bank is more accommodating, the results may vary. In some cases, the results may be higher levels of unemployment. In others, however, higher levels of inflation may offset nominal-wage gains to limit real-wage increases and the unemployment associated with them, and/or currency devaluation may be used to offset the impact of higher nominal wages. The institutional assumption, as noted above, is that more independent central banks tend to pursue firmer commitments to monetary and exchange-rate targets or, loosely speaking, more rigorous monetary policy.

5 Although the focus of this analysis is on the organization of the political economy, other factors may also have contributed to Germany's inflation performance, including perhaps a cultural aversion to inflation born of the hyperinflation experience in the 1920s. We are inclined to see the latter as a minor contributor to the outcome, but others accord it a more prominent role. See Hirsch and Goldthorpe (1978) and Lindberg and Maier (1985).

6 For analyses that explore the German case more fully than we can here, see Soskice (1990), Scharpf (1991), and Streeck (1984a, b). See also Hall (1986:ch. 9) for an early formulation of similar arguments.

7 Two smaller union confederations, the DAG and DBB, are not in a position to have much influence on the overall outcomes. The former is very small, and the DBB represents civil

servants whose pay is set by legislation (but cf. Franzese 1994, 1996, 1999 and Garrett and Way 1995 on the public sector in this context).

8 The notable exception occurred in 1974 when ÖTV, the public-sector union, took the lead in a negotiating round with less-than-ideal results. For a description of the events, see Goodman (1992:71); for a discussion of the implications, see Garrett and Way (1995) and Franzese (1994, 1996, 1999).

9 For notable exceptions, see Havrilesky and Granato (1993), Bleaney (1996), and Al-Marhubi and Willett (n.d.). For a useful survey, see Eijffinger and De Haan (1996).

10 These 18 cases represent all the major developed democracies from which Greece, Spain, and Portugal are excluded because they had nondemocratic regimes for substantial portions of the period and it is difficult to assess a central bank's "independence" from an authoritarian regime. Obviously, the credibility of any nominal/legal degree of central bank independence ought to be discounted in authoritarian regimes relative to democracies, but it is not clear by how much. Similar considerations plague the coding of wage-bargaining systems comparably across authoritarian and democratic regimes.

11 The five indices are those most commonly employed in the literature: LVAU, an unweighted average of several legal characteristics, and QVAU, an unweighted average of survey results for CBI, from Cukierman (1992); EC, the rating of the economic independence of the central bank, and POL, the rating for political independence from Grilli et al. (1991); and the original index from Bade and Parkin (1982).

12 For example, Soskice (1990:55), Layard et al. (1991:52), Flanagan et al. (1983), Ferner and Hyman (1992), Baglioni and Crouch (1990), and Crouch (1993). Some scholars prefer an index

based on union organization but this violates the important observation of Soskice (1990), Swenson (1989), and others that employers' associations also contribute to wage coordination.

13 Alesina and Summers (1993) employ a similar approach and offer a similar defense. Close inspection of such time-sensitive indices of central bank independence and trade-union characteristics as do exist suggests that these variables did not shift substantially in the 1955—90 period. (The recent widespread movement toward more independent central banks came after our sample ends in 1990.) For example, 96.6% of the country-decade variance in Cukierman's (1992) LVAU index (the only time-variant index available) is solely cross-sectional (cross-country). Since time-variant measures of wage-/price-bargaining coordination do not exist, we can look only at rough proxies such as Golden and Wallerstein's (1999) annual-level data for union confederation involvement in wage bargaining in six high-coordination countries. Only 33% of the variation in this index is unique to country-year. Variation in the effective coordination of wage bargaining over this period is likely to be lower than variation in union—confederal involvement and far lower in low-coordination countries than in these six. Thus, 33% might serve as a very generous estimate of the upper bound on the share of total variation of coordination in wage/price bargaining that is country-time unique.

14 These included sequential deletion of cases and reestimation, checks of robustness to alternative measures of bargaining coordination and/or central bank independence, cross-validation of model selection by out-of-sample predictive power (Beck and Katz 1995), checks of robustness against alternative (to OLS plus White's standard errors) means of estimating the regression, running the regressions without any control variables (to maximize degrees of

freedom), etc. The results are quite robust to these sorts of perturbations; details are available from the authors on request.

15 Economic openness is measured by exports plus imports as a percentage of gross domestic product (data from IMF, International Financial Statistics). The representation of the left in the cabinet is based on data from Lane, McKay, and Newton (1991) and Woldendorp, Keman, and Budge (1994) and classification of left parties as in Swank (1989). Per capita GDP is from the Penn World Tables version 5.6. Union density is taken from Golden and Wallerstein (1999), who, in turn, are working from Visser (1992). Unemployment and inflation are the internationally comparable figures compiled from OECD sources by Layard et al. (1991).

16 Dropping insignificant variables and reestimating reduced models, as is often done, is inadvisable as such a procedure tends to overestimate significance levels. If we did so here, our results would be strengthened further.

17 The effects of CBI and of CWB on inflation are both estimated to be negative over the entire range of the other variable, and both are statistically significantly so (.10 level or better) over around three-fourths of that range.

18 At these points, the effect of CWB is significant at the .05 level while that of CBI is significant at the .07 level.

19 This conclusion is reinforced by the finding that economies with more independent central banks tend to have higher sacrifice ratios. See, e.g., Walsh (1995).

20 Since we focus here on the economic effects of institutional context *ceteris paribus*, this analysis ignores other effects, both positive and negative, that the move to EMU may have, such

as those following from lower transaction costs or the need to adjust to asymmetrical demand and supply-side shocks. On these and other effects, see Eichengreen (1992) and Kenen (1995).

21 At least some national governments have supported monetary union in the hope that it will allow them to implement more expansionary policies than were possible under a European Monetary System dominated by the Bundesbank, whereas others insist on greater fiscal and monetary strictness. See Fratianni and Von Hagen (1992:chs. 8, 9), Gros (1996:88 ff.), Frieden et al. (forthcoming), and Eichengreen (1992).

22 The case of the United States in the early 1980s, when the government ran high deficits while the Federal Reserve Bank pursued a tight monetary policy, suggests that significant employment effects, lasting up to ten years, can follow from this combination. See Krugman (1989), on the political economy of American monetary policy more generally, see Mayer (1990) and Wooley (1984), and on potential fiscal/monetary conflict under EMU, Kenen (1995:ch. 4) and Gros and Thygesen (1992:ch. 8).