Hibbs, The Political Economy of Industrial Democracies, Harvard Univ. Press 1987

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Trade Union Power, Wage Inflation, and Labor Militancy: A Comparative Analysis

Broadly speaking, two views have dominated the literature on post-war wage and price inflation: "demand-pull" and "cost-push."[1] Admittedly, the distinction is somewhat artificial, probably more so now than in the past. Indeed, the empirical results of excess demand models of inflation are easily rationalized in cost-push or "sociological" terms—a point I pursue further in the main body of this chapter. Conventional, demand-pull inflation models imply that the percentage rate of change of money wages depends essentially on the level of, and in some models the rate of change of, excess demand for labor. Historically, one of the principal theoretical controversies in the demand-pull literature (and one that has obvious policy implications) was whether there is a stable, long-run tradeoff between the demand for labor (usually proxied by a nonlinear function of the measured unemployment rate) and the rate of wage and/or price inflation. The neo-Keynesian position was that there is a long-run unemployment-inflation tradeoff (although this view was later abandoned in the light

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1. A third view should also be acknowledged: the monetarist, quantity theory. Models representing the quantity theory framework are not examined here. However, see the comparative study by W. F. Nordhaus, "The Worldwide Wage Explosion," *Brookings Papers on Economic Activity* (1972:2), 439, who concludes that "the strict monetarist hypothesis is rejected whenever the evidence is sufficient."

of experience), whereas the traditional neoclassical stance was that any such tradeoff is merely a short-run, transitory phenomenon due to lags in adjustment between expected and actual rates of inflation.

International factors aside, cost-push theories of wage inflation usually take a social conflict or collective bargaining orientation to wage formation and point to the influence of sociological variables—especially trade union militancy or labor aggressiveness. At the core of the cost-push view is the idea that trade union action exerts significant upward pressure on the rate of change of wages *independently* of excess demand for labor, that is, independently of market forces. Wage settlements following outbursts of strike activity (such as May–June 1968 in France, the "hot autumn" of 1969 in Italy, and nationwide strikes of coal miners in 1972 and 1974 in Great Britain) as well as the poor performance of conventional models in explaining the general wage inflation experienced by most Western industrial societies since the late 1960s appear to have enhanced the status of labor militancy, cost-push theories among orthodox economists.[2]

The main body of this chapter examines various demand-pull and cost-push models of wage inflation against annual postwar data on hourly compensation of manufacturing employees in four industrial societies: Italy, France, Great Britain, and the United States.[3] My principal purpose is to show that the "power" and "militancy" of trade unions play an important role in the dynamic process of wage determination in a diverse group of industrial societies. Contrary to the usual practice, I shall summarize my main assumptions, arguments, and conclusions here rather than at the end:

1. The existence of a long-run unemployment/wage inflation tradeoff (Phillips curve) requires money illusion on the part of labor and/or trade union weakness in wage bargaining.

2. Being persuaded on a priori grounds by the neoclassical-accelerationist position that widespread money illusion is implausible, I argue that less than full wage adjustment to nontrivial episodes of price inflation is most likely due to the weakness of organized labor in collective bargaining.

3. The empirical results show that the long-run coefficient of adjustment of manufacturing wage changes to price changes is less than unity only in the United States; that is, only in the United States is there any evidence of a nonvertical long-run Phillips curve.

4. Both the rate at which wages adjust to prices and the long-run magnitude of the adjustment coefficient are interpreted as a reflection of trade union power in wage bargaining. Rank ordering of the countries along these lines is consistent with the qualitative judgment of industrial relations specialists about the comparative power of the various trade union movements—particularly the comparative weakness of organized labor in the United States.

5. In all four countries trade union militancy (which should be distinguished from trade union power), as measured by strike activity, exerts sizable effects on the rate of change of manufacturing wages independently of market forces. However, in most cases trade union action has not systematically contributed to accelerating wages and prices, except perhaps in recent years, when "real wage resistance" has persisted in the face of changes in relative prices in favor of food and fuel producers.

6. Outside the United States (and other countries with relatively weak trade union movements) wage and price stability probably cannot be achieved without union acquiescence in some form of incomes policy—unless, of course, political authorities are willing to run the economy at a *very* low (and politically infeasible) level of activity. The postwar experience suggests that, barring major political changes, such union cooperation is not likely to be forthcoming in any of the countries examined here, with the partial exception of Great Britain; even there it has taken the conjunction of a Labour government facing an extraordinary economic crisis to elicit voluntary trade union restraint.

2. See, for example, G. L. Perry, "Determinants of Wage Inflation around the World," *Brookings Papers on Economic Activity* (1975:2), and the discussion in the second and third major sections of this chapter.

3. Throughout this chapter I use "wages" and "compensation" interchangeably, although they are of course distinct. All empirical results pertain to the latter.

Excess Demand Models

Simple Phillips Curve

The point of reference for most contemporary treatments of wage inflation is A. W. Phillips's seminal 1958 study of the relation between unemployment and the rate of change of money wages in the United Kingdom over the period 1861–1957. Phillips employed somewhat unorthodox statistical procedures in his analysis, but his plots of the percentage rate of change of wages against the unemployment rate revealed a nonlinear, inverse association (convex toward the origin) that was replicated in many subsequent studies and is now widely

known as the "Phillips curve." Phillips rationalized his empirical results with an excess demand argument that most work in this tradition has adopted:

> When the demand for labour is high and there are very few unemployed we should expect employers to bid wage rates up quite rapidly, each firm and each industry being continually tempted to offer a little above the prevailing rates to attract the most suitable labour. . . . On the other hand it appears that workers are reluctant to offer their services and less than prevailing rates when demand for labour is low and unemployment is high so that wage rates fall only very slowly. The relation between unemployment and the rate of change of wage rates is therefore likely to be highly nonlinear.[4]

Phillips also noticed a tendency for wages to respond to *changes* in the unemployment rate. Although he acknowledged the implications of this association for labor bargaining power, Phillips interpreted this relationship primarily in demand-pull terms as well: "Thus in a year of rising business activity, with demand for labour increasing and the percentage unemployment decreasing, employers will be bidding more vigorously for the services of labour than they would be in a year during which the average unemployment was the same but the demand for labour was not increasing."[5]

With U denoting the unemployment rate, the simple or "naive" Phillips curve model therefore takes the form:

$$w' = f(U, \Delta U), \tag{3.1a}$$

which, following conventional practice, is specified to be linear in $1/U$ and ΔU.

$$w'_t = b_0 + b_1(1/U_t) + b_2\Delta U_t, \tag{3.1b}$$

where w' = the percentage rate of change of wages (hourly compensation of employees in manufacturing) computed as 100 times the first backward difference of the natural logs,
U = the civilian unemployment rate,
ΔU = the first backward difference of U.

4. A. W. Phillips, "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957," *Economica*, 25 (1958), 283.
5. Ibid.

For purposes of comparison with the more realistic models introduced below, estimates of the simple Phillips curve model are reported in the first column of Tables 3.1 through 3.4. It will come as no surprise to those familiar with the contemporary wage determination literature that the simple excess demand, Phillips curve hypothesis does a poor job of explaining the postwar wage inflation. In all four countries the $\bar{R}^2$s are low, the regression standard errors relatively high, and ΔU_t has the wrong sign (positive). The level unemployment rate term, $1/U_t$, is properly signed (positive) in all regressions but reaches conventional statistical significance only in the equation for Italy.

The most obvious empirical shortcoming of the naive Phillips model is that no account is taken of movements in prices. Phillips did not ignore prices altogether; rather, he advanced a threshold hypothesis in which price changes affected the wage bargain only when they threatened to reduce real wages, that is, only when the rate of change of prices was greater than the rate of change of wages ($p' > w'$). Since in Phillips's sample real wages rarely fell over a sustained period, a price term was not explicitly incorporated into his wage equation.

Phillips Curve with Contemporaneous Price Changes

Among the first to build price changes directly into the wage equation was Lipsey.[6] However, Lipsey's most important contribution was his attempt to tie the inflation-unemployment (Phillips curve) tradeoff to conventional supply and demand economic analysis. Lipsey developed an argument showing that (1) the proportional rate of change of money wages is a linear function of the ratio of excess demand to total labor supply, and (2) the unobserved excess demand ratio is approximated by a negatively sloped, nonlinear function of the observed unemployment rate, U.

Lipsey's disequilibrium wage adjustment model was generally taken to be a strong theoretical rationalization of the empirical Phillips curve.[7] Lipsey also developed an ingenious explanation—which cen-

6. R. G. Lipsey, "The Relationship between Unemployment and the Rate of Change of Money Wages in the United Kingdom, 1862–1957: A Further Analysis," *Economica*, 27 (1960), 1–31.
7. Objections on theoretical grounds were, of course, raised. See, for example, Bernard Corry and David Laidler, "The Phillips Relation: A Theoretical Explanation," *Economica*, 34 (1967), 189–197. The accelerationist argument is treated in the next section.

Table 3.1. Italy: Manufacturing average hourly compensation (w') regressions, annual data, 1954–1972.

	(1)	(2)	(3)	(4)	(5)	(6a)	(6b)	(7)
Constant	−2.272	−1.019	1.697	23.055	—	3.333	3.463	2.55
	(−0.54)	(−0.45)	(0.83)	(3.35)		(2.90)	(3.76)	(1.20)
$1/U_t$	46.904	15.349	10.533	−2.421	—	0.518	—	—
	(2.96)	(1.50))	(1.30)	(−0.36)		(0.10)		
ΔU_t	0.442	—	—	—	—	—	—	—
	(0.50)							
$\sum_{i=1}^{2} U_{t-i}$	—	—	—	—	—	—	—	0.043
								(0.20)
p_t'	—	1.649	—	—	—	—	—	—
		(4.52)						
$\sum_{i=0}^{2} p_{t-i}'$	—	—	1.226	0.591	—	0.942	0.931	1.041
			(3.18)	(1.67)		(3.38)	(3.60)	(3.33)
$\Delta R/Y_t$	—	—	—	−0.104	—	—	—	—
				(−0.81)				
R/Y_t	—	—	—	−0.160	—	—	—	—
				(−3.02)				
Strike volume, $t-1$ (worker-days lost per worker in manufacturing)	—	—	—	—	—	1.910	1.953	2.108
						(3.99)	(4.34)	(3.85)
$\bar{R}^2$	.273	.690	.774	.888	—	.914	.917	.910
DW	1.85	2.00	1.85	2.18	—	1.99	2.01	1.94
SER	3.474	2.381	2.302	1.986	—	1.750	1.749	1.823
GLS[a]	$r_1 = +.500$	$r_1 = +.281$	—	$r_1 = -.372$	—	$r_1 = -.383$	$r_1 = -.406$	$r_1 = -.415$

Note: t-statistics are given in parentheses.
a. r_1 is an autoregressive coefficient from a generalized least-squares estimation.

Table 3.2. France: Manufacturing average hourly compensation (w') regressions, annual data, 1951–1972.

	(1)	(2)	(3)	(4)	(5)	(6a)	(6b)	(6c)	(7)
Constant	7.260	6.851	6.640	—	—	0.715	0.643	—	−1.741
	(1.35)	(3.77)	(3.17)			(0.31)	(0.40)		(−0.53)
$1/U_t$	2.421	−1.404	−1.411	—	—	−0.469	—	—	—
	(0.65)	(−1.05)	(−1.01)			(−0.04)			
ΔU_t	0.834	—	—	—	—	—	—	—	—
	(0.13)								
Dum 68	—	—	—	—	—	7.399	7.433	7.989	7.820
(= 1, 1968)						(3.05)	(3.31)	(4.60)	(3.29)
$\sum_{i=0}^{2} U_{t-i}$	—	—	—	—	—	—	—	—	2.012
									(0.59)
p_t'	—	0.889	—	—	—	0.664	0.663	0.681	—
		(6.34)				(5.40)	(5.64)	(6.38)	
$\sum_{i=0}^{2} p_{t-i}'$	—	—	0.927	—	—	—	—	—	0.683
			(4.95)						(3.12)
Strike volume, $t-1$ (worker-days lost per worker in manufacturing)	—	—	—	—	—	4.236	4.233	4.134	6.593
						(2.97)	(3.06)	(3.12)	(1.82)
Strike frequency (strikes per 10,000 workers economy-wide)$_t$	—	—	—	—	—	2.381	2.389	2.698	2.571
						(2.69)	(2.85)	(7.87)	(1.87)
$\bar{R}^2$	0.0	.645	.632	—	—	.826	.836	.845	.714
DW	1.93	1.72	1.91	—	—	2.00	2.00	1.99	1.86
SER	4.347	2.633	2.681	—	—	1.782	1.729	1.689	1.787
GLS[a]	$r_1 = +.600$	—	—	—	—	$r_1 = +.196$	$r_1 = +.198$	$r_1 = +.200$	$r_1 = +.613$

Note: t-statistics are given in parentheses.
a. r_1 is an autoregressive coefficient from a generalized least-squares estimation.

Table 3.3. Great Britain: Manufacturing average hourly compensation (w') regressions, annual data, 1951–1972.

	(1)	(2)	(3)	(4)	(5)	(6a)	(6b)	(7)
Constant	5.306	4.521	2.948	9.815	2.092	−2.874	−2.699	−5.287
	(1.57)	(2.46)	(1.41)	(1.09)	(1.04)	(−2.32)	(−1.84)	(−2.67)
$1/U_t$	4.432	−1.327	−0.763	1.221	1.157	6.721	6.637	6.694
	(0.92)	(−0.54)	(−0.34)	(0.42)	(0.48)	(4.54)	(4.07)	(2.76)
ΔU_t	0.504	—	—	—	—	—	—	—
	(0.36)							
$\sum_{i=1}^{2} U_{t-i}$	—	—	—	—	—	—	—	1.941
								(1.45)
Dum 68	—	—	—	—	—	—	1.013	—
(=1, 1968–72)							(0.24)	
Dum 68 × $(1/U_t)$	—	—	—	—	—	—	−2.585	—
							(−0.27)	
p_t'	—	0.843	—	—	—	0.683	0.669	—
		(4.30)				(7.41)	(5.59)	
$\sum_{i=0}^{2} p_{t-i}'$	—	—	1.207	1.080	1.090	—	—	0.710
			(4.17)	(3.44)	(3.90)			(4.33)
$\Delta R/Y_t$	—	—	—	0.417	—	—	—	—
				(1.08)				
R/Y_t	—	—	—	−0.371	—	—	—	—
				(−0.82)				
$\Delta T/L_t$	—	—	—	—	0.935	—	—	—
					(1.78)			
Strike volume, $t-1$ (worker-days lost per worker in manufacturing)	—	—	—	—	—	4.332	4.064	4.040
						(3.62)	(2.51)	(3.85)
Strike frequency, $t-1$ (strikes per 10,000 workers in manufacturing)	—	—	—	—	—	2.080	2.080	1.161
						(4.85)	(3.45)	(1.63)
$\bar{R}^2$	0.0	.451	.640	.662	.683	.911	.899	.938
DW	2.07	1.87	1.96	2.00	1.79	1.83	1.86	1.98
SER	2.514	1.90	1.754	1.785	1.646	1.152	1.220	.996
GLS[a]	$r_1 = +.720$	$r_1 = +.26$	—	$r_1 = -.100$	—	$r_1 = -.565$	$r_1 = -.555$	$r_1 = -.600$

Note: t-statistics are given in parentheses.

a. r_1 is an autoregressive coefficient from a generalized least-squares estimation.

Table 3.4. United States: Manufacturing average hourly compensation (w') regressions, annual data, 1951–1972.

	(1)	(2)	(3)	(4)	(5)	(6a)	(6b)	(6c)	(7)
Constant	2.471	1.816	1.753	1.991	2.100	−1.181	−1.190	—	−2.807
	(1.39)	(2.15)	(1.90)	(1.40)	(2.56)	(−1.48)	(−1.56)		(−1.01)
$1/U_t$	12.330	8.343	8.283	8.874	7.400	2.988	—	—	—
	(1.63)	(2.44)	(2.29)	(2.03)	(2.07)	(1.00)			
ΔU_t	0.034	—	—	—	—	—	—	—	—
	(0.13)								
$\sum_{i=1}^{2} U_{t-i}$	—	—	—	—	—	—	—	—	0.026
									(0.11)
P_t'	—	0.583	—	0.563	0.514	0.464	0.467	0.496	—
		(5.83)		(3.42)	(4.56)	(6.01)	(6.32)	(5.91)	
$\sum_{i=0}^{2} p_{t-i}'$	—	—	0.620	—	—	—	—	—	0.336
			(3.44)						(4.55)
$\Delta R/W_t$	—	—	—	−0.064	—	—	—	—	—
				(−0.57)					
R/W_t	—	—	—	−0.021	—	—	—	—	—
				(0.21)					
$\Delta T/L_t$	—	—	—	—	0.413	—	—	—	—
					(1.98)				
Strike frequency, $t-1$ (strikes per 10,000 workers in manufacturing)	—	—	—	—	—	3.514	4.050	3.062	5.520
						(4.18)	(6.23)	(14.74)	(3.47)
$\bar{R}^2$	.074	.684	.654	.647	.714	.855	.865	.822	.793
DW	2.13	2.06	2.06	2.11	2.08	2.03	2.07	2.09	2.17
SER	1.323	.792	.828	.875	.779	.674	.673	.687	.709
GLS[a]	$r_1 = +.484$	$r_1 = +.196$	$r_1 = +.203$	$r_1 = +.246$	$r_1 = +.275$	$r_1 = -.141$	$r_1 = -.191$	—	$r_1 = -.300$
	—	$r_2 = +.349$	$r_2 = +.355$	—	—	$r_2 = -.060$	$r_2 = -.094$	—	—

Note: t-statistics are given in parentheses.

a. r_1, r_2 are autoregressive coefficients from a generalized least-squares estimation.

tered on the consequences of aggregating individual market tradeoff curves across markets—for the aggregate association observed by Phillips between the rate of change of wages and the rate of change of unemployment, U'.[8]

The empirical form of Lipsey's model is simply the naive Phillips curve equation with a term for contemporaneous price changes:

$$w'_t = b_0 + b_1(1/U_t) + b_2 p'_t + b_3 U'_t, \tag{3.2}$$

where p' = the percentage rate of change of prices (computed by the log-difference method described previously) and all other terms are as defined earlier.

Since the Phillips curve argument does not depend heavily on U'_t and this term was insignificant in all regressions (studies using this class of models typically find $b_3 = 0$), the results reported in the second column of Tables 3.1 through 3.4 are based on equations omitting the term for the rate of change of unemployment. The estimates for this model yield little evidence in favor of the conventional Phillips curve argument. The coefficient of the unemployment or excess demand term $1/U_t$ has a perverse (that is, wrong) sign in the equations for France and Great Britain and is insignificant in the regression for Italy. Moreover, the coefficient of the contemporaneous price change term p'_t is not significantly different from unity in the regressions for France and Great Britain and is significantly *greater* than unity in the equation for Italy.[9] This result alone is sufficient to deny the Phillips curve thesis, for it implies that the wage bargain is struck in real rather than money terms, and therefore there cannot be a tradeoff between the nominal phenomenon of money wage inflation and a real quantity such as the unemployment rate.[10] This point

8. Lipsey used the proportional rate of change of the unemployment rate (U') in his study rather than the simple rate of change (U) used in Equation (3.1). Phillips appears to have had the latter in mind, but I found that it made little difference: regressions using U'_t produced results very similar to those reported in column 1 of Tables 3.1 through 3.4.

9. A similar estimate of the elasticity of manufacturing wages with respect to prices for postwar Italian data is reported by P. Sylos-Labini, *Trade Unions, Inflation, and Productivity* (Lexington, Mass.: Lexington Books, 1974), who surprisingly does not comment on its implications. As it turns out (see the following sections), the *long-run* elasticity is on the order of 1.0.

10. I am inclined to pay greater attention to the coefficient of p' than to that of U in evaluating the Phillips curve thesis, since it can be argued with some justification that during the estimation period unemployment and other measures of aggregate demand did not vary enough to permit a sharp estimate of the excess demand coefficient. For all of the countries treated in this chapter, the coefficient of variation of p' is substantially greater than that of U.

is pursued further in the next section. Only for the United States do the estimates for Equation (3.2) support the (wage) inflation-unemployment tradeoff view. The results in column 2 of Table 3.4 show a significant positive parameter estimate for $1/U_t$ and an estimate for p'_t (0.58) that is many standard errors less than unity.

Price Expectations Phillips Curves

The Phillips-Lipsey tradeoff model implies that high rates of inflation yield long-term benefits in the form of lower unemployment. This view is plausible on theoretical grounds only if one of the following conditions is satisfied:

1. Workers value, at least to some extent, nominal wage increases alone; that is, a significant fraction of the labor force suffers from "money illusion."
2. Other things being equal, labor organizations are not powerful enough relative to management to obtain full wage adjustment to price increases.

Among economists, the tradeoff debate has hinged largely on the plausibility of the first condition. For example, Tobin summarizes the theoretical foundation of the Phillips curve thus: "The Phillips curve idea is in a sense a reincarnation of the original Keynesian idea of 'money illusion' in the supply of labor. The Phillips curve says that increases in money wages—and more generally, other money incomes—are in some significant degree prized for themselves, even if they do not result in equivalent gains in real income."[11]

Economists working in the strict neoclassical tradition attack this idea, pointing out that even though wages are set in money terms, the wage determination process is essentially a bargain for real wages conditioned by the forecasts of buyers and sellers of labor of the behavior of prices over the contract period. Hence Friedman, Phelps, and others argued that any steady rate of inflation will eventually be anticipated fully by economic actors and that wage adjustment to

11. J. Tobin, "Unemployment and Inflation: The Cruel Dilemma," in *Prices: Issues in Theory and Public Policy*, ed. Almarin Phillips and Oliver E. Williamson (Philadelphia: University of Pennsylvania Press, 1968), p. 106. J. M. Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan Press, 1936), pp. 14–15, wrote: "The workers . . . resist reductions of money wages . . . whereas they do not resist reductions of real wages . . . Every trade union will put up some resistance to a cut in money-wages, however small. But since no trade union would dream of striking on every occasion of a rise in the cost of living, they do not raise the obstacle to any increase in aggregate employment which is attributed to them by the classical school."

expected price inflation will be complete; that is, the *long-run* elasticity of wages with respect to prices will be unity.[12] In this view the Phillips curve is merely a short-run, "statistical" phenomenon stemming from lags in adjustment between expected and actual rates of price (and/or wage) inflation. In Friedman's words: "There is always a temporary trade-off between inflation and unemployment; there is no permanent trade-off. The temporary trade-off comes not from inflation per se, but from unanticipated inflation, which generally means a rising rate of inflation. The widespread belief that there is a permanent trade-off is a sophisticated version of the confusion between 'high' and 'rising' that we all recognize in simpler forms. A rising rate of inflation may reduce unemployment, a high rate will not."[13]

The position of neoclassical, "expectations" theorists is, then, that the wage equation should be specified in the form:

$$w'_t = b_0 + b_1(1/U_t) + b_2 p^{*\prime}_t, \tag{3.3a}$$

where $p^{*\prime}$ = the expected rate of price inflation. b_2 can be interpreted as the parameter of money illusion. If $b_2 = 0$, Equation (3.3a) reduces to the simple Phillips curve model introduced earlier. For $0 < b_2 < 1$ we have what essentially is the Phillips-Lipsey model of the previous section, in which the long-run tradeoff between (wage or price) inflation and unemployment is steeper (less favorable) than the short-run Phillips curve. Friedman, Phelps, and other strict expectations theorists assert that $b_2 = 1$. There is no money illusion in the labor market, and the long-run Phillips curve is a vertical line crossing the U axis at the "natural rate" of unemployment. The only possible long-run tradeoff is therefore between the rate of change of *real* wages $(w' - p')$ and the unemployment rate and/or between the rate of *acceleration* of inflation and the unemployment rate.[14]

12. Milton Friedman, "The Role of Monetary Policy," *American Economic Review*, 58 (1968), 1–17; E. Phelps, "Phillips Curves, Expectations of Inflation and Optimal Unemployment over Time," *Economica*, 34 (1967), 254–281; E. Phelps, "Money Wage Dynamics and Labor Market Equilibrium," *Journal of Political Economy*, pt. 2, 76 (July/August 1968), 678–711.

13. Friedman, "The Role of Monetary Policy," p. 11.

14. If Equation (3.3a) is evaluated at steady state (that is, at $p' = p^{*\prime}$), $b_2 = 1$ implies: $(w' - p') = f(U)$. Any tradeoff is therefore between changes in real wages and unemployment (excess demand).

Passing a price function through (3.3a) illustrates the acceleration argument. Suppose p' follows the simple markup scheme $p' = w' - x'$, where x' = rate of change of labor productivity, and it is implicitly assumed that any asymmetry in the system (which is necessary for the existence of a conventional tradeoff) occurs in the wage equation. Hence we have: $p' = (b_0 - x') + b_1(1/U) + b_2 p^{*\prime}$, which for $b_2 = 1$ implies: $dp'/dt = (1/p)(d^2p/dt^2) = f(U)$. The tradeoff is therefore between the rate of acceleration of inflation and the employment rate and requires that workers be continually "surprised" by new bursts of inflation $(p' > p^{*\prime})$.

The "natural rate" of unemployment is given by the root of the equation: $p' - p^{*\prime} = 0 = (b_0 - x') + b_1(1/U) = -b_1/(b_0 - x')$.

Since price expectations are not measured directly, empirical testing of (3.3a) requires that $p^{*\prime}$ be specified in terms of observable variables. The conventional practice is to use some function of actual price changes, p'. For annual data the hypothesis

$$p^{*\prime}_t = p'_t \tag{3.3b}$$

is not unreasonable. Expectations may be fully embodied in actual price changes averaged over a twelve-month period. This hypothesis was effectively tested by the estimation of Equation (3.2). The results (in the second column of Tables 3.1 through 3.4) provided strong support for the neoclassical or strict expectations argument. The hypothesis $b_2 = 1$ was rejected only for the United States.

A second model for price expectations is the unconstrained, finite autoregressive scheme:

$$p^{*\prime}_t = \sum_{i=0} a_i p'_{t-i}, \tag{3.3c}$$

in which expectations are generated by the weighted, finite sum of current and lagged price changes.

The third model tried in this study incorporates the adaptive expectations hypothesis:

$$p^{*\prime}_t - p^{*\prime}_{t-1} = (1 - a)(p'_t - p^{*\prime}_{t-1})$$

$$p^{*\prime}_t = (1 - a) \sum_{i=0}^{\infty} a^i p'_{t-i}$$

$$p^{*\prime}_t = \frac{1 - a}{1 - aL} p'_t, \tag{3.3d}$$

where L is a lag operator.

In the adaptive model, price expectations are revised linearly each period in proportion to some fraction of last period's forecast error.

The model implies that expectations are governed by an exponentially weighted moving average of observed price changes.

Estimation of the price expectations Phillips curve models using the finite autoregressive and the adaptive schemes for $p^{*\prime}$ rendered essentially the same results; therefore, estimates of only the former scheme are reported in the third column of Tables 3.1 through 3.4.[15] The results for France, Great Britain, and the United States do not differ appreciably from the estimates of the Phillips-Lipsey model shown in column 2. The unemployment term again has the "wrong" sign in the regressions for France and Great Britain, and, more important, the sum of the price change coefficients is just about unity. However, in the case of Great Britain the sum of the autoregressive price coefficients (1.2) exceeds the contemporaneous price coefficient of Equation (3.2) (0.843) by a large enough margin to yield an increase in $\bar{R}^2$ and a decrease in standard error of the regression. The price expectations model estimates for the United States are essentially the same as those of the static Phillips-Lipsey equation: the parameter of the inverse of the unemployment rate is positive and significant, and the elasticity of wages with respect to prices is on the order of 0.6.[16]

The estimate of the sum of the price change coefficients for Italy represents the most important departure from previous results. The coefficient of contemporaneous price changes, p_t', in Equation (3.2) was 1.65, that is, substantially larger than unity. This, of course, implies that every burst of price inflation is followed by a sizable increase in real wages—an implausible result.[17] The sum of the coefficients of the p_{t-1}' in column 3 of Table 3.1 shows that the *long-run* elasticity of wages with respect to prices in Italy is not significantly different from 1.0. The time path of the price coefficients—substantially greater than unity at time (t), negative at times $(t-1)$ and $(t-2)$—does indicate, however, that in the Italian system prices are more or less continually chasing wages.[18] Clearly there is little evidence of neo-Keynesian money illusion.[19]

15. I tested the adaptive price expectations version by estimating the implied nonlinear equation: $w_t' = b_0(1-a) + aw_{t-1}' + b_1(1/U_t) - b_1a(1/U_{t-1}) + b_2(1-a)p_t'$. The estimate of b_2 was approximately unity in the regressions for Italy, France, and Great Britain. I experimented with lags of various lengths in the finite autoregressive expectations models; the tables report the best-fitting equation.

16. I ran a number of additional experiments for the United States to test the idea (which appears from time to time in the literature) that the coefficient of adjustment is closer to unity once a critical threshold in observed rates of price inflation is reached. I could find little support for this appealing hypothesis.

17. Adding the rate of change of labor productivity to the contemporaneous price change model for Italy does not appreciably alter this result: the parameter estimate of p_t' is 1.6 and the productivity term is insignificant. Adding productivity to the equations for the other countries did not yield anything worth reporting either.

Why is the United States the only industrial society of the four considered here to exhibit a viable Phillips curve?[20] I doubt that it is because workers and/or union leaders in the United States, unlike their Italian, French, and British counterparts, suffer from money illusion. In other words, I think it is unlikely, particularly in the manufacturing sector, that a sizable fraction of the labor force in any industrial society is fooled by (or prizes to a significant degree) money wage increases alone. A more plausible model would specify that the elasticity of *target* wages with respect to *expected* prices is unity, or very nearly so, at least in industrial labor markets. If this idea has merit, then international variation in the rate and equilibrium magnitude of the adjustment of *observed* wages to price inflation reflects to some extent differences in the power of trade unions to obtain target wage increases, rather than money illusion in labor markets.[21]

18. The period-by-period price coefficients are: $p_t' = 1.89$, $p_{t-1}' = -0.18$, and $p_{t-2}' = -0.48$.

19. As in other studies of wage inflation, there is some danger that the price coefficients reported here suffer from (simultaneous equations) bias. It is unlikely that this accounts for the pattern of results, but the only way to sort the matter out definitively would be to employ a correctly specified "large" econometric model in which wages, prices, and employment were jointly endogenous. I take heart in the fact that according to Ezio Tarantelli, economist at the University of Florence and consultant to the Bank of Rome, prices also "chase wages" in the bank's econometric model of Italy.

20. I do not mean to imply that the U.S. Phillips curve has been stable over the postwar period; there is a great deal of evidence that it has not. See, for example, the comparative analysis by R. J. Gordon, "Wage-Price Controls and the Shifting Phillips Curve," *Brookings Papers on Economic Activity* (1972:2), 385–421.

21. I am not saying that if trade unions did not exist the elasticity of wages in relation to prices would be zero. This is an absurd argument. Trade union power presumably makes a difference on the margin; but the margin may be important enough to determine whether there is a viable Phillips curve tradeoff. If equations in the form of (3.3) were estimated for a large number of countries (or sectors or industries—see note 22), then analyses of the following sort in principle could be undertaken: $a_i = A + g(X_{ki})$, where a_i = the long-run elasticity of observed wages with respect to prices in the ith country (sector or industry), A = pure "market" component, $g(X_{ki})$ = union "power" component, and X_{ki} = a vector of variables measuring the (relative) wage bargaining power of trade unions.

A similar model might be specified for the rate of wage adjustment, which might exhibit greater international (intersectoral, interindustry) variation. Obviously the job of identifying and measuring X_{ki} and specifying g would not be trivial. Until serious studies along these lines are undertaken, the argument in the text will remain largely speculative.

Recall that the pattern of results for the elasticity of wages with respect to prices across the four countries was:

Italy	full wage adjustment to price inflation in the long run; "prices chasing wages" in the short run
Great Britain and France	full and more or less instantaneous (annual) wage adjustment to price inflation
United States	less than full long-run wage adjustment; viable Phillips curve

If one adopts the hypothesis that wage adjustment dynamics in part reflect the power of organized labor in collective bargaining, these results imply that (in the manufacturing sector at least) trade unions are most powerful in Italy, strong in Great Britain and France, and comparatively weak in the United States.[22] Without attempting to discuss or reference the voluminous literature here, I think it is accurate to say that this rough rank ordering is consistent with the qualitative assessment of most industrial relations specialists about the comparative strength in wage bargaining of organized labor in these countries.[23]

Perhaps the best way to illustrate international differences in trade union power is to contrast briefly the situation in the two polar cases—Italy and the United States. In Italy it is extremely difficult for employers, even if hard pressed, to dismiss workers. Moreover, the wages of most workers (nearly all in the manufacturing sector) are pegged to the cost of living, and escalator wage adjustment (*scala mobile*) takes place every three months. More dramatic examples of institutionalized trade union power are difficult to find. By contrast, in the United States there are virtually no constraints on employers' rights to discharge workers for economic reasons, and only the strongest and most innovative unions have tried (with limited success) to bargain for cost-of-living wage escalator clauses. Wage adjustment takes place almost wholly via periodic contract renegotiation. It is hardly surprising, therefore, that the response of wages to price inflation in the United States is both less rapid and less complete than in Italy.

22. My interpretation of these results is compatible with intranational, cross-sectional studies finding that the elasticity of wages with respect to prices is higher in strongly unionized industries than in weakly organized sectors. See G. Pierson, "The Effect of Union Strength on the U.S. Phillips Curve," *American Economic Review*, 57, (1968), 456–467; J. Vanderkamp, "Wage and Price Level Determination: An Empirical Model for Canada," *Economica*, 33 (1966), 194–212; and R. L. Thomas, "Wage Inflation in the UK: A Multi-Market Approach," in *Inflation and Labour Markets*, ed. D. Laidler and D. Purdy (Manchester, England: Manchester University Press).

23. Note that in Italy and France, where the state is an important actor in the (private- as well as public-sector) labor market—that is, it is involved in setting wages, hours, and conditions of work—trade union power to a great extent consists in the ability to induce concessions from the government.

Sociological Cost-Push Models

It was noted at the beginning of this chapter that the excess demand class of wage inflation models is easily rationalized from a cost-push or collective bargaining theoretical perspective.[24] The empirical results presented in the previous section were to some extent interpreted from this point of view. The purpose of this section is to determine whether explicit indicators of union aggressiveness or labor militancy have significant influence on the rate of change of wages independently of price movements and unemployment—in other words, whether autonomous trade union actions exert significant upward pressure on money wages, or whether discrete expressions of union militancy merely represent a form of ritualized conflict ratifying outcomes that market forces would have produced in any case. A variety of direct and proxy measures have appeared in the sociological cost-push literature; the principal ones are:

1. the level and rate of change of profits
2. the rate of change of the proportion of the labor force in trade unions
3. subjective (ad hoc) estimates of labor militancy
4. strike activity

The relevant models and empirical results are presented below.

Profit-Augmented Wage Change Models

Among the first to challenge Phillips-type excess demand models of wage inflation and to propose an alternative collective bargaining theory in which profits played a central role was Kaldor. Kaldor ar-

24. A more sustained argument along these lines is given by A. Rees, "The Phillips Curve as a Menu for Policy Choice," *Economica*, 37 (1970), 227–238.

gued that "the rise in money wages depends on the *bargaining strength* of labor; and bargaining strength, in turn, is closely related to the prosperity of industry, which determines both the eagerness of labour to demand higher wages and the willingness and ability of employers to grant them."[25] By prosperity Kaldor clearly meant the rate of change of profits: "The rise in wages is prompted by the rise in profits."[26]

Kaldor's rather casually formulated theory was followed by a series of empirical studies testing the impact of profits and the rate of change of profits on the rate of wage inflation.[27] These studies produced rather mixed results; hence the thesis that movements in profits are an important influence on wage changes remains problematic.

Comparative results for a profits-augmented manufacturing wage inflation model are reported in the fourth column of Tables 3.1 through 3.4 and are based on the equation:

$$w'_t = b_0 + b_1(1/U_t) + \sum_i a_i p'_{t-i} + b_2 \frac{(R/Y_t)}{(R/W)} + b_3 \frac{(\Delta R/Y_t)}{(\Delta R/W)} \qquad (3.4)$$

where R/Y = manufacturing profits as a percentage of gross income produced (Italy, Great Britain),
R/W = manufacturing profits as a percentage of employee compensation (United States),
and all other terms are as previously defined.

The regression estimates give little or no support to the profits thesis.[28] The profit level term R/Y is significant but has the wrong sign

25. N. Kaldor, "Economic Growth and the Problem of Inflation," *Economica*, 26 (1959), 293.

26. Ibid., p. 294.

27. W. G. Bowen, *The Wage-Price Issue: A Theoretical Analysis* (Princeton: Princeton University Press); R. G. Lipsey and M. D. Stueuer, "The Relation between Profits and Wage Rates," *Economica*, 28 (1961), 137–155; R. J. Bahatia, "Unemployment and the Rate of Change of Money Earnings in the United States, 1900–1958," *Economica*, 28 (1961), 286–296; G. L. Perry, "The Determinants of Wage Rates Changes and the Inflation-Unemployment Tradeoff for the United States," *Review of Economic Studies*, 31 (1964), 287–308; and R. L. Bodkin, *The Wage, Price, Productivity Nexus* (Philadelphia: University of Pennsylvania Press, 1966). There is no unique measure of the level of profits. Profits as a percentage of stockholders' equity, the ratio of profits to wage income, and the ratio of profits to total income produced are all acceptable indicators. The various measures generally point in the same direction.

28. Because I was unable to find manufacturing profits data for France, no results are reported in column 4 of Table 3.2.

(negative) in the equation for Italy; elsewhere the level of profits and the rate of change of profits variables have negligible, perversely signed coefficients and very small t-statistics.[29]

Contrary to Kaldor's argument, these results indicate that in the presence of unemployment and (especially) price inflation variables, the profits terms have no systematic influence on the rate of wage inflation. Either union bargaining strength and militancy have no appreciable effect on wage movements or profits variables are poor proxies for these concepts. Evidence presented later in this chapter suggests the latter is true.

Wage Inflation and Trade Union Mobilization

Perhaps the most forceful and influential argument that trade unions affect the rate of change of wages independently of the demand for labor was made in a series of papers by A. G. Hines.[30] In his celebrated 1964 article on wage inflation in the United Kingdom over the period 1893–1961, Hines showed that one measure of union aggressiveness—the rate of change in the percentage of the labor force unionized—accounted for a sizable fraction of the variation in the rate of change of wages. Indeed, in the interwar and early postwar years, it appeared to be the most important explanatory variable.[31] Hines rationalized the use of changes in the density of unionization as a proxy for labor aggressiveness with the assumption that militancy is simultaneously manifested in union recruiting drives and pressure on wage rates: "a successful membership drive [is] a necessary accompaniment of success in the wage bargain."[32]

Hines's thesis implies a model of the form:

$$w'_t = b_0 + b_1(1/U_t) + \sum_i a_i p'_{t-i} + b_2 \Delta T/L_t, \qquad (3.5)$$

29. Models in which the profits terms were lagged performed no better. Notice also the large, implausible constants in the equations for Italy and Great Britain.

30. A. G. Hines, "Trade Unions and Wage Inflation in the United Kingdom, 1893–1961," *Review of Economic Studies*, 31 (October 1964), 221–252, and "Wage Inflation in the United Kingdom, 1948–1962: A Disaggregated Study," *Economic Journal*, 79 (March 1969), 66–89.

31. Hines's last postwar observation was 1961. The importance of this will become clear in the following discussion. Similar results were reported by O. C. Aschenfelter, G. E. Johnson, and J. H. Pencavel, "Trade Unions and the Rate of Change of Money Wages in United States Manufacturing Industry," *Review of Economic Studies*, 39 (1972), 127–154, a study of manufacturing wage changes in the United States during the period 1914–1963.

32. Hines, "Trade Unions and Wage Inflation," pp. 67–68.

where T/L = trade union membership (T) as a percentage of the labor force (L). Since union membership data for France and Italy are very unreliable, and, more important, the meaning of unionization in these countries is not comparable to that in other Western labor movements,[33] Equation (3.5) was estimated only for Great Britain and the United States. The results appear in column 5 of Tables 3.3 and 3.4.

The regression estimates yield only weak support for the trade union mobilization hypothesis: the coefficient of $\Delta T/L$ is properly signed in both regressions but is insignificant in the equation for Great Britain and only marginally significant in the U.S. model.

Why do these estimates contrast so sharply with the impressive results of the studies by Hines and by Ashenfelter et al.? The reason undoubtedly is that by the mid or late 1950s union mobilization was more or less complete and the small observed fluctuations in the density of union membership no longer served as a very good proxy for variations in labor militancy in wage bargaining. Models incorporating what I think are more direct indicators of labor militancy are introduced in the next section.

Strike Activity and Wage Inflation

Outbursts of strike activity since the late 1960s in Italy, France, Great Britain, and several other countries have led to renewed attempts to incorporate labor aggressiveness explicitly into models of wage inflation. The most recent effort is Perry's comparative study.[34] Perry called attention to the increased militancy over wage issues in the late 1960s and early 1970s, formulated a "battle over income shares" interpretation of labor unrest, and, on the argument that the shares hypothesis could not be captured by a continuous variable, introduced dummy variables for the years of wage explosions in the equations for the seven countries in his sample. Although the "shares" dummy variables generally increased the fits and enhanced the forecasting

33. In Great Britain, the United States, and most other Western systems union "members" include all workers covered by contract who merely pay dues, typically via an automatic checkoff (payroll deduction) method. In contrast, "members" of the largest (Communist) unions in France and Italy are usually militant activists (although in recent years French and Italian Communist trade unions have tried to become mass organizations). The strength of French and Italian unions is probably judged better by the number of workers they can mobilize for an activity rather than by the number of their official members.

34. G. L. Perry, "Determinants of Wage Inflation around the World," *Brookings Papers on Economic Activity* (1975:2).

performance of his wage models, Perry's approach is purely ad hoc and is therefore of limited scientific value.[35]

A more more straightforward measure of trade union militancy or aggressiveness in wage bargaining is strike activity. A number of earlier studies incorporated strike indicators into wage determination models and the results typically supported the militancy hypothesis.[36] The principal exception, and an important one, is the comparative study by Ward and Zis. They concluded from their analysis of postwar wage inflation in six countries that "the evidence . . . does not seem to support strongly the cost-push [strike] hypothesis."[37] Actually, Ward and Zis's conclusion is somewhat misleading: their regressions showed one or more strike indicators to be significant variables in three of the six countries. Moreover, the Ward and Zis study suffers from at least three important limitations:

1. An explicit scheme for strike measurement is never introduced, and there is heavy reliance on the arbitrary index developed by Galombos and Evans.[38]
2. Data on the strike indicators pertain to economywide aggregates, whereas the wage data are for the manufacturing sector.[39]

35. Predictably, the arbitrary character of Perry's test of the militancy-shares hypothesis was pointed out during the discussion of his paper. See the comments by Ackley and Nordhaus in the same issue. For an earlier attempt to build subjective estimates of trade union militancy into wage inflation models, see L. A. Dicks-Mireau and J. C. Dow, "The Determinants of Wage Inflation in the United Kingdom: 1946–1956," *Journal of the Royal Statistical Society*, 72 (1959).

36. See Aschenfelter, Johnson, and Pencavel "Trade Unions and The Rate of Change of Money Wages" (United States); K. G. Knight, "Strikes and Wage Inflation in British Manufacturing Industry 1950–1968," *Bulletin of Oxford University Institute of Economics and Statistics*, 34 (August 1972), 281–294; Sylos-Labini, *Trade Unions*, (Italy); J. Taylor, "Incomes Policy, the Structure of Unemployment and the Phillips Curve: The United Kingdom Experience: 1953–70," in *Incomes Policy and Inflation*, ed. M. Parkin and M. T. Sumner (Manchester, England: Manchester University Press, 1972); J. Taylor, *Unemployment and Wage Inflation with Special Reference to the USA* (London: Longman Press, 1974) (Great Britain, United States); and R. Swidinsky, "Trade Unions and the Rate of Change of Money Wages in Canada, 1953–1970," *Industrial and Labor Review*, 25 (1972). An extended qualitative discussion of the British case is provided by D. Jackson, H. A. Turner, and F. Wilkinson, *Do Trade Unions Cause Inflation?* (Cambridge: Cambridge University Press, 1972).

37. R. Ward and G. Zis, "Trade Union Militancy as an Explanation of Inflation: An International Comparison," *Manchester School*, March 1966, p. 55.

38. P. Galombos and E. W. Evans, "Work-Stoppages in the United Kingdom, 1951–1964: A Quantitative Study," *Bulletin of the Oxford University Institute of Statistics*, 28 (1966); see K. G. J. C. Knowles, "Work-Stoppages in the United Kingdom: A Comment," in the same journal for a thorough critique of the Galombos and Evans indices.

39. This is also true of other studies of strikes and wage inflation; see the sources cited in note 36.

3. Only contemporaneous strike activity appears in the wage equations, yet strike-induced wage increases are often not fully observed until a year or more has elapsed.

The first objection raised above suggests that it is important to develop a conceptual scheme for strike measurement before undertaking empirical analysis. The International Labor Office compiles and publishes data on three basic components of industrial conflict that are supplied by the national labor ministries: the number of strikes, the number of workers involved (strikers), and the number of worker-days lost in strike activity. Annual data on these components are reported for economywide totals and for nine separate sectors of economic activity. Here we are interested only in manufacturing strike activity.

As in Chapter 1,[40] the basic industrial conflict variables are used in conjunction with data on manufacturing wage and salary employment to form three theoretically distinct dimensions of strike activity: the average *size* of strikes (that is, the number of workers involved per strike), the average *duration* of strikes (that is, worker-days lost per worker involved), and a labor force–adjusted measure of strike *frequency* (that is, the number of strikes per number of manufacturing employees). Cost-push models incorporating these strike dimension variables as the indicators of labor militancy in wage bargaining were estimated in the following general form:

$$w_t' = b_0 + b_1(1/U_t) + \sum_i a_i p_{t-i}' + \sum_{ji} c_{ji} S_{jt-i}, \qquad (3.6)$$

where S_j = manufacturing sector strike dimension variables. Regression experiments based on Equation (3.6) were tried for various combinations of strike variables and time lags. On a priori grounds I expected strike volume (worker-days lost per number of manufacturing employees) and strike frequency (the number of strikes per number of manufacturing employees) to have the biggest effects on movements in wages—strike volume because it is the most comprehensive indicator of labor militancy, and strike frequency because it represents the number of aggressive labor actions of whatever duration

40. See K. Forchheimer, "Some International Aspects of the Strike Movement," *Oxford University Institute of Statistics Bulletin*, 10 (January 1948); K. G. J. C. Knowles, *Strikes—A Study in Industrial Conflict* (Oxford: Basil Blackwell, 1952); and Edward Shorter and Charles Tilly, "The Shape of Strikes in France, 1830–1960," *Comparative Studies in Society and History*, 13 (January 1971), 60–86. See also the text in Chapter 1 on the method used to compute strike volume in Figure 1.1.

and size.[41] Strike size depends largely on the scale of firms or, more important, on the scale of the bargaining unit; therefore, it was not anticipated to exhibit any systematic influence on wage inflation. Increases in strike duration beyond a certain (and probably rather low) threshold are unlikely to influence the wage settlement substantially and in most cases probably reflects the stubbornness of the parties in accepting the inevitable outcome. So I did not expect duration to be a very strong predictor of wage charges either.

Although the logic of these a priori hunches may be faulty, they were strongly supported by the empirical results: the coefficient estimates in column 6a of Tables 3.1 through 3.4 show that in each of the four countries strike volume or strike frequency or both had sizable and significant effects on the rate of wage inflation. In every case the strike equations yield a substantially higher corrected multiple correlation and a lower standard error of the regression than do the rival models discussed earlier. With the exception of the strike frequency variable in the regression for France, a one-year lag on the strike terms produced the best fits.[42] Because official statistics on French strike activity in 1968 have never been published, the model for France includes a dummy (binary) variable to pick up the effects of the great May–June 1968 general strike. The coefficient of the dummy variable implies that the 1968 strike wave produced an increase in manufacturing hourly wages between 7 and 8 percent greater than what would have otherwise been expected.[43]

The excess demand term, $1/U$, remained insignificant in the equations for Italy and France and dropped to insignificance in the U.S. regression.[44] Hence the inverse of the unemployment rate variable was deleted from the equations for these countries. (Estimates for the revised wage models are reported in columns 6b and 6c of the tables.) In the strikes model for Great Britain, however, the $1/U$ term (for the first time) achieves significance; that is, net of strike volume and

41. The occurrence of a strike depends of course to a certain extent on the behavior of both labor and management (and/or government), but the vast majority of strikes are labor initiated.

42. Frequency data for the manufacturing sector were not available for France; therefore, the economywide frequency is used as a proxy.

43. This estimate appears to be right on target. The agreement that ended the 1968 workers' strike, the Protocole de Grenelle, provided for wage increases of 4.5 to 5 percent on June 1, and another 2.5 to 3 percent on October 1.

44. Since large fractions of the Italian and French labor forces were until recent years employed in agriculture, a nonagricultural unemployment rate variable was also tried in the equations for these countries; however, this alternative measure of the demand for labor did not yield significantly different results.

strike frequency, the level of excess demand for labor appears to exert significant influence on the rate of wage inflation. It has been suggested that the breakdown of the unemployment–wage inflation connection in Great Britain, which was first noticed in the late 1960s, was due in part to upward adjustments in unemployment compensation initiated by the Labour government in the latter part of 1966.[45] However, the results for model 6b in Table 3.3 show that the location and slope of $1/U_t$ are stable over the post-1967 period. The reason for the revival of the $1/U_t$ term is, I believe, that the usual inverse association between unemployment and labor militancy[46] broke down in Great Britain in the mid-1960s (perhaps because of the change in unemployment compensation emphasized by Feldstein and others). Thus Great Britain experienced steadily increasing strike activity in the face of rising measured unemployment. Only after the effects of strike activity are netted out does the excess demand–wage inflation linkage in Great Britain show up in the regressions.[47] This implies that the tightness of labor markets (level of aggregate demand) has contributed to the postwar British inflation.

The coefficients of the rate of change of prices are generally smaller in the strike equations than in the expectations models discussed earlier. These results are not surprising in view of the sizable correlations among the strike and price variables (discussed in more detail later). What they suggest is that the more or less complete adjustment of wages to prices observed in the pure expectations models for France and Great Britain, as well as the partial adjustment estimated for the United States, depends importantly on labor militancy as well as on trade union "power." In other words, trade union strike action has been an essential mechanism for the adjustment of wages to prices in these countries.

In contrast, the results of the strike equations for Italy show that the sum of the price coefficients is still essentially unity—indeed, as noted earlier, prices typically are chasing wages.[48] This implies that full wage adjustment in Italy does not hinge directly on the incidence

45. See M. Feldstein, "The Economics of the New Unemployment," *Public Interest*, 33 (1973), 3–42.

46. On this point see Chapter 1 and the sources cited therein.

47. The correlation between measured unemployment and strike activity is strongly positive during the latter postwar years in Great Britain. The conclusion in the text is readily demonstrated by means of standard specification error algebra.

48. That is, the p_t' coefficient is substantially greater than 1.0 and the p_{t-2}' coefficient is sizable and negative.

of strike activity, which squares with the observations made earlier about the power of Italian trade unions.

Since strike activity is known to be influenced by current and lagged values of unemployment and prices, perhaps the strike terms in Equation (3.6) merely register the effects of these omitted economic variables. To guard against this possibility, quasi-reduced form regressions, including appropriately lagged unemployment and price inflation terms, were estimated.[49] The results appear in column 7 of Tables 3.1 through 3.4. Although the t-statistics of the strike variables are generally smaller in these regressions, it is clear that the strike activity coefficients are very robust in the face of a rather severe test.[50] It seems very unlikely, then, that the estimated influence of labor militancy on wage inflation merely reflects the effects of present or past states of aggregate economic activity.

Just how important are the labor militancy terms relative to the macroeconomic variables in explaining wage inflation? There are several ways to approach this question. One method is to look at the "beta" or standardized regression coefficients. (The square of these coefficients gives the proportion of the variance of the rate of change of wages that can be uniquely attributed to a particular variable.) Beta coefficients for each term in the best strike-augmented wage equation are reported in Table 3.5.[51] Although the beta coefficients of the strike terms are somewhat smaller than those of the macroeconomic variables, they are sizable and show that a nontrivial proportion of the variation in wage inflation is due to fluctuations in strike activity. However, this much was already fairly clear from earlier results—the strike wage equations exhibited substantially higher $\bar{R}^2$s than alternative models.

A better way of assessing the relative importance of labor militancy is to compute the products of ordinary regression coefficients and the

49. Because previous research indicates that the untransformed unemployment rate, U, is the best predictor of strike activity, this variable is used in the regressions. The time index on U corresponds to the time index, and the index lagged one period, of the strike variable(s). For example, if the strike variable appears in the original equation at time $(t-1)$, U_{t-1} and U_{t-2}, enter the quasi-reduced form regression. The price inflation variables are specified at time (t), $(t-1)$, and $(t-2)$.

50. Since strike activity responds to prior movements in real wages rather than to those in money wages, quasi-reduced form regressions in which real wage change terms replaced the price terms were also estimated. Again, the strike activity coefficients were robust.

51. The best strike models from Table 3.1 are (3.6b) for Italy, (3.6c) for France, (3.6a) for Great Britain, and (3.6c) for the United States.

Table 3.5. Relative importance of unemployment, prices, and strike activity in structural models of wage inflation (based on results of Equations 3.6–3.6c).

Country	F_t	F_{t-1}	V_{t-1}	$1/U_t$	p'_t	p'_{t-1}	p'_{t-2}
Italy							
beta coefficient	—	—	0.411	—	0.576	0.152	−0.302
$b_i\bar{X}_i$ (1955–64)	—	—	1.38	—	4.91	1.23	−2.12
$b_i\bar{X}_i$ (1965–74)	—	—	3.27	—	7.87	1.77	−3.54
France[a]							
beta coefficient	0.375	—	0.319	—	0.644	—	—
$b_i\bar{X}_i$ (1955–64)	4.51	—	0.900	—	3.09	—	—
$b_i\bar{X}_i$ (1965–74)	5.03	—	1.03	—	3.69	—	—
Great Britain							
beta coefficient	—	0.529	0.392	0.460	0.578	—	—
$b_i\bar{X}_i$ (1955–64)	—	1.28	1.27	4.48	2.04	—	—
$b_i\bar{X}_i$ (1965–74)	—	3.80	2.18	2.98	4.55	—	—
United States							
beta coefficient	—	0.406	—	—	0.591	—	—
$b_i\bar{X}_i$ (1955–64)	—	3.45	—	—	0.716	—	—
$b_i\bar{X}_i$ (1965–74)	—	3.71	—	—	2.30	—	—

Note: F = strike frequency; V = strike volume; p' = percentage rate of change of prices; U = employment rate; $b_i\bar{X}_i$ = regression coefficient × mean.

a. Excludes contribution of 1968 strike wave.

means of the associated variables over the time intervals of interest. The second and third rows of Table 3.5 show the resulting estimates, that is, the average impact of unemployment, prices, and strike activity on the rate of wage inflation, for two periods: 1955–1964 and 1965–74.

Again, it is obvious from the $b_i\bar{X}_i$ quantities that the strike variables have contributed importantly to the rate of increase of manufacturing wages during the postwar period. Contrary to what I had expected, though, there is no general sign that the strike terms have had greater relative effects on the upward movement of wages during the later period (1965–1974) than during the earlier one (1955–1964). However, the relative effects of the strike activity variables do exhibit a cross-national pattern that reinforces previous remarks concerning the role of labor militancy versus trade union power in the wage inflation process. The best way to reveal the pattern is to take the ratio of the strike activity average wage inflation effects to the average impact

attributed to the macroeconomic terms, that is, to calculate $b_i\bar{X}_i$ (strikes)/$b_i\bar{X}_i$ (macroeconomy).

Table 3.6 gives the results, which are based on the data in Table 3.5. The average impact ratios indicate that in both subperiods strike activity was more important than the macroeconomic variables in explaining wage inflation in the United States and less important in Italy. France and Great Britain fall between these extreme cases, although the French ratio implies that, as in the United States, strikes were more important than the macroeconomy in generating upward movements in manufacturing wages, whereas the British ratio, as in the case of Italy, implies the reverse.[52]

Since the impact ratios are essentially the ratio of strike effects to price effects,[53] if one accepts the interpretation presented earlier that the price coefficients reflect in part the power of trade unions in wage bargaining, then the ratios give a rough quantitative estimate of the influence of labor militancy relative to union power on wage inflation. Hence the country rank order in Table 3.6 is in *inverse* relation to trade union power: the greater the effect of (reliance on?) strike activity in wage determination, the less the power of trade unions, and vice versa.[54] Table 3.6 therefore implies that Italy > Great Britain > France > United States with respect to the relative power of trade unions in wage bargaining.

Cross-national differences aside, the influence of strike activity on wage movements may cause surprise. It is often pointed out, for example, that working time lost from illness is substantially greater than time lost from industrial disputes. Of course, time lost from sickness does not lead to upward movements in wages; time lost from strikes does. In a more serious vein, there are at least two reasons why strike activity exerts sizable effects on the rate of inflation.[55] First, wage settlements obtained by one union or unionized sector often become the wage bargaining targets of other unions, either in an absolute sense, or in a relative sense as other groups of workers

52. Unless the contribution of unemployment (excess demand) is excluded from the calculation of macroeconomic effects in Britain.

53. With the partial exception of Great Britain, where the strike model includes $1/U_t$.

54. The results in Table 3.6 are of course not altogether independent of the pattern in the price coefficient estimates. To a certain extent the table is just another way of making the earlier point about international differences in trade union power. (As one reviewer of this essay pointed out, it probably would have been better to view labor power and labor militancy as independent features of industrial relations rather than as competing dimensions, as I implicitly do here.

55. Taylor, *Unemployment and Wage Inflation,* covers similar ground.

Table 3.6. Average impact ratios from strike-augmented wage equations (ratio of strike effects to macroeconomic price effects).

Country	1955–1964	1965–1974
United States	4.81	1.61
France	1.75	1.64[a]
Great Britain	0.39	0.79
	(1.25)[b]	(1.31)[c]
Italy	0.34	0.54

Note: For method, see text.
a. 1968 strike wave not included in strike effects.
b. Excluding $1/U_t$ from macroeconomic effects.
c. Excluding $1/U_t$ from macroeconomic effects.

attempt to maintain established wage differentials. This has been emphasized in Eckstein and Wilson's "key industries" theory of wage movements in the U.S. manufacturing sector.[56] Wage settlements in one industry or sector of the economy therefore have proportional effects elsewhere through parity bargaining. Second, wage rates negotiated in unionized plants (strike-induced or not) are known to influence nonunion wage settlements. If employers of unorganized workers did not raise wages in line with the pattern established by union settlements, they would risk losing workers and, perhaps more important, expose themselves to the threat of unionization. This threat is particularly important in the United States, where nearly half of the manufacturing labor force remains unorganized.

The estimation range for the wage regressions in Tables 3.1 through 3.4 was not taken beyond the year 1972, so that the 1973–1975 observations could be used for forecasting. Actual, fitted, and forecast values of manufacturing wage changes in the four countries are plotted in Figures 3.1 through 3.4. Clearly, the fitted data points from the strike equations track the actual wage change observations rather well, reflecting the relatively high multiple correlations reported earlier. More important, the forecasting performance of the strike models is also reasonably good, especially in view of the fact that the forecast range coincides with exogenous inflationary shocks of unprecedented magnitude—the extraordinary rise in food prices and the OPEC-induced quadrupling of petroleum prices. No doubt

56. O. Eckstein and T. Wilson, "Determination of Wages in American Industry," *Quarterly Journal of Economics*, 76 (1962), 1379–1414.

Table 3.7. Forecast errors from expectations and strike-augmented wage equations, 1973–1975 (percentage per year).

	Expectations (Eq. 3.3)	Strikes (Eq. 3.6)
Italy		
Average error	−2.08	−0.78
RMSE	4.61	4.37
France (1973–74)		
Average error	1.04	2.13
RMSE	1.59	3.01
Great Britain		
Average error	−3.42	−1.03
RMSE	3.73	1.52
United States		
Average error	0.83	1.19
RMSE	1.68	1.34

Note: RMSE = root mean square error.

this is why the strike models for all countries except the United States (where the impact of international oil price increases was less severe than in Europe) generate comparatively large forecast errors in either 1973 or 1974; the 1975 forecasts are uniformly more accurate.[57]

A better way to evaluate the predictive performance of the strike-augmented wage equations is to make comparisons with the forecasts of an alternative model. The leading rival model is, of course, the price expectations Phillips curve of Equation (3.3). Table 3.7 reports the average and root mean square errors (RMSEs) forecast for each model. The strike models are clearly superior to the price expectations equations for Italy, Great Britain, and, in terms of RMSE, the United States. Only in the case of France does the expectations equation yield lower average and RMSE forecast errors. Perhaps the pure expectations model is a better approximation of the wage formation process in that country. My own belief (or, more accurately, prejudice) is that the particular forecast range (1973–74) and the fact that economywide strike frequency had to serve as a proxy for manufacturing strike frequency in the regressions for France underlies this outcome. Indeed, I was somewhat surprised that the strike equations generally

57. Because strike data for France were not available for 1975, it was not possible to generate a 1975 forecast.

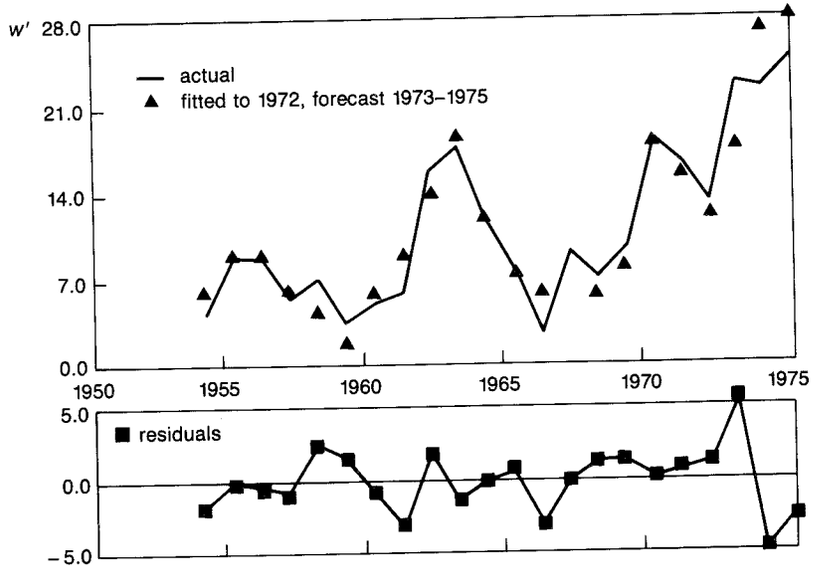

Figure 3.1. Italy: Actual, fitted, and forecast values of manufacturing money wage changes, 1954–1975. (From Equation 3.6b.)

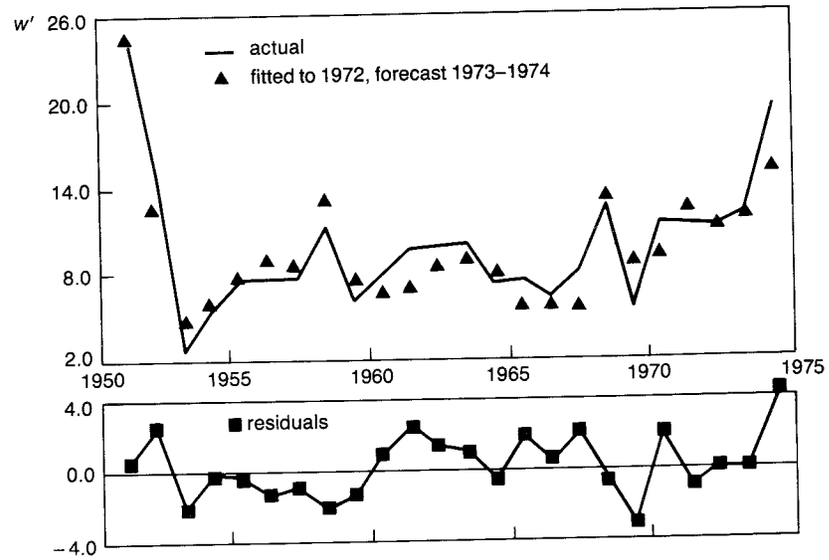

Figure 3.2. France: Actual, fitted, and forecast values of manufacturing money wage changes, 1951–1974. (From Equation 3.6c.)

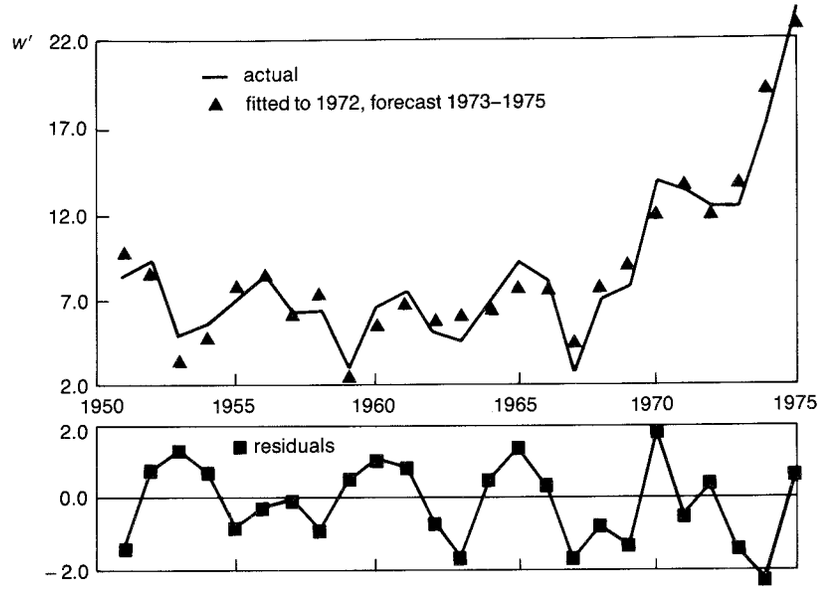

Figure 3.3. Great Britain: Actual, fitted, and forecast values of manufacturing wage changes, 1951–1975. (From Equation 3.6a.)

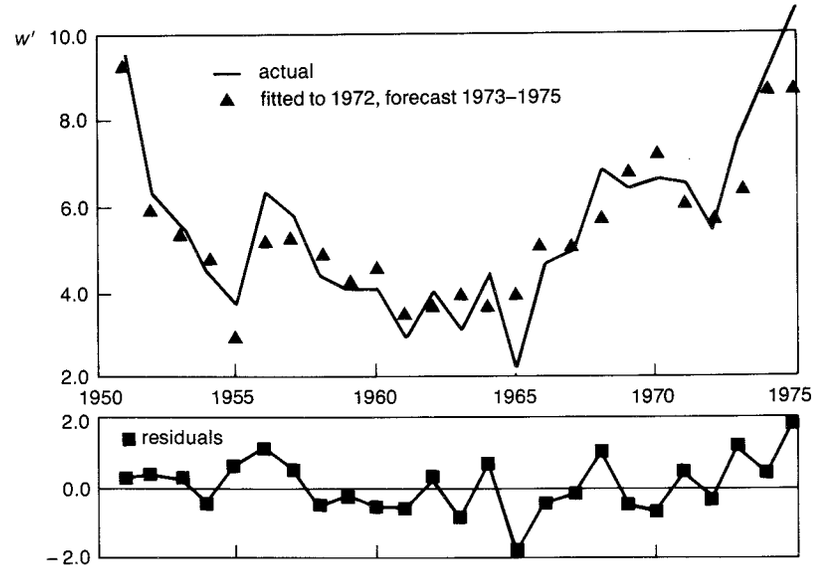

Figure 3.4. United States: Actual, fitted, and forecast values of manufacturing wage changes, 1951–1975. (From Equation 3.6c.)

outperformed the pure expectations equations for three of the four countries in forecasting over the period 1973–1975. The major inflationary impulse during these years came from international prices, which would seem to give considerable (short-run) predictive advantage to autoregressive price expectation models. Therefore, I take the forecasting performance of the strike equations to be rather strong evidence that labor militancy should be incorporated into structural models of wage inflation.

Implications for the Acceleration and Stability of Wages and Prices

Do the strike model regressions yield any evidence that labor militancy has contributed to the *acceleration* of wages and prices experienced by all four countries since the late 1960s? Insofar as the *domestic labor market* is concerned, a steady or declining rate of inflation can be maintained if the rate of change of money wages does not exceed the rate of change of prices plus the rate of change of labor productivity. In other words, barring changes in employment, nonlabor costs, and the factor distribution of income, a sustained escalation of the rate of inflation will occur when the rate of change of real wages chronically runs ahead of the rate of change of labor productivity.

Consider the following simple system. The rate of change of money wages is determined by the strike-augmented wage model discussed in the previous section:

$$w'_t = b_0 + b_1(1/U_t) + \sum_i a_i p'_{t-i} + \sum_{j,i} c_{ji} S_{t-i}. \tag{3.7}$$

Short-run price changes are assumed to follow the markup scheme:

$$p'_t = (w' - x')_{t-1} + m'_{t-1}, \tag{3.8a}$$

where x' = the rate of change of labor productivity,
m' = the rate of change of nonlabor costs, principally raw materials,
and other terms are as defined earlier.

Substituting for w' in the pricing model gives:

$$p'_t = b_0 + b_1(1/U_{t-1}) + \sum_i a_i p'_{t-i-1} + c_{ji} S_{t-i-1} - x'_{t-1} + m'_{t-1}. \tag{3.8b}$$

Moving $a_0 p'_{t-1}$ to the lefthand side and subtracting $(1 - a_0) p'_{t-1}$ from both sides of the equation yields an expression for the rate of acceleration of prices, $\Delta p'$:

$$\Delta p'_t = b_0 + b_1(1/U_t) - (1 - a_0) p'_{t-1} + a_1 p'_{t-2} + \cdots + a_k p'_{t-k-1} + \sum_{i,j} c_{ji} S_{t-i-1} - x'_{t-1} + m'_{t-1}. \tag{3.8c}$$

It will prove useful to rewrite the price acceleration function as follows:

$$\Delta p'_t = S^* + Z + m'_{t-1}, \tag{3.8d}$$

where $S^* = \Sigma_{i,j} c_{ji} S_{t-i-1}$
$Z = b_0 + b_1(1/U_t) - (1 - a_0) p'_{t-1} + \ldots + a_k p'_{t-k-1} - x'_{t-1}$.

It is now clear that labor militancy can be pinpointed as a source of *accelerating* prices if S^* (the strike activity wage change effect) is nonzero and $(S^* + Z) > 0$.[58] For example, suppose $\Sigma_i a_i = a_0$ and $m' = b_0 = b_1 = 0$, which leads to a price acceleration function:

$$\Delta P'_t = S^* + Z = \sum_{i,j} c_{ji} S_{t-i-1} - (1 - a_0) p'_{t-1} - x'_{t-1}. \tag{3.8e}$$

(The French and U.S. acceleration expressions would take this form.) Equation (3.8e) implies that trade union strike activity contributes to the acceleration of prices to the extent that the strike activity wage effect on average exceeds the sum of price changes not compensated for by the price adjustment coefficient, a_0, *and* the rate of change of labor productivity, x'. Put another way, labor militancy underlies accelerating prices if S^* pushes real wages up faster than x'.

The relevant data for assessing the direct contribution of strike activity to accelerating prices over the period 1963–1975 appear in Table 3.8. To smooth out cyclical fluctuations in wages, prices, productivity, and so on, the data have been averaged over three subpe-

58. $(S^* + Z) > 0$ does not necessarily lead to accelerating prices, $\Delta p' > 0$. Two other outcomes are possible: $R/Y < 0$ (falling profit share) or $U > 0$ (falling employment, rising unemployment). Also note that the argument concerning $(S + Z)$ and p' does not hinge on the precise form of the price markup scheme (3.8a). Related pricing equations—for example, the "normal" average cost model—would yield similar results for p' averaged over several periods.

Table 3.8. Average rates of change of wages, prices, labor productivity, and strike-induced inflationary impulses, 1963–1975.

Country	$\bar{w}'_{t-1}$	$\bar{p}'_{t-1}$	$\bar{r}'_{t-1}$	$\bar{x}'_{t-1}$	$(\bar{r}' - \bar{x}')_{t-1}$	$\overline{\Delta p}'_t$	$\bar{S}^*$	$\bar{Z}$	$\bar{S}^* + \bar{Z}$
Italy									
1963–67	11.09	5.59	5.50	7.07	−1.58	−0.71	2.29	−3.54	−1.25
1968–72	11.92	3.98	7.95	5.04	2.91	0.70	3.69	−1.49	2.19
1973–75	19.45	10.74	8.70	7.68	1.02	3.19	3.67	−2.47	1.20
France									
1963–67	8.12	3.60	4.52	5.51	−0.99	−0.42	4.63	−6.65	−2.02
1968–72	9.74	4.75	4.99	5.95	−0.96	0.67	6.63	−7.46	−0.83
1973–75	14.33	8.42	5.91	4.53	1.37	1.82	7.25	−7.23	0.03
Great Britain									
1963–67	6.71	3.54	3.16	4.24	−1.08	−0.32	3.16	−4.12	−1.03
1968–72	8.88	5.50	3.37	3.53	−0.16	0.88	5.76	−5.49	0.27
1973–75	13.92	10.18	3.73	3.57	0.17	4.95	8.09	−7.36	0.73
United States									
1963–67	3.65	1.65	2.01	4.27	−2.27	0.31	3.23	−6.29	−3.06
1968–72	6.20	4.41	1.79	1.98	−0.19	0.10	3.93	−5.39	−1.46
1973–75	7.32	6.58	0.74	1.33	−0.59	1.83	3.57	−5.84	−2.27

Note: $\overline{\Delta p}'$ = the first difference of p', the mean rate of acceleration of inflation; $\bar{w}'$ = mean rate of change of manufacturing hourly compensation; $\bar{p}'$ = mean rate of change of consumer prices; $\bar{r}'$ = mean rate of change of real manufacturing hourly compensation; $\bar{x}'$ = mean rate of change of manufacturing labor productivity; for $\bar{S}^*$ and $\bar{Z}$, see text.

riods: 1963–1967 (a period of decelerating prices in all countries except the United States), 1968–1972 (a period of accelerating prices in all four countries), and 1973–1975 (the period of the OPEC-induced inflationary burst).

The data presented in Table 3.8 show that during the first subperiod, 1963–1967, the rate of price inflation was falling in Italy, France, and Great Britain and rising by just under .33 percent per year in the United States (see column 6 of the table). However, in *all* countries the rate of change of real wages lagged behind the rate of change of labor productivity (the lag was dramatic in the United States—see column 5), and everywhere $\bar{S}^* + \bar{Z}$ was less than zero. Clearly, there is no evidence that labor militancy contributed to the steady acceleration of prices in the United States over the period 1963–1967.

For the second period, 1968–1972, the picture is mixed. Prices accelerated substantially in Italy, France, and Great Britain, modestly in the United States. $\bar{S}^* + \bar{Z}$ is negative in France and the United States

(as is $r' - x'$), which again implies that labor militancy did not generate the acceleration. In Great Britain $\bar{S}^* + \bar{Z}$ is greater than zero, but too small to explain fully the sharp rise in the rate of inflation.[59] However, the data in columns 5 and 9 of the table show that in Italy labor militancy was on average pushing up real wages much more rapidly than was the rate of growth of labor productivity. There is good reason to conclude, therefore, that the most important source of price acceleration in Italy during this period was trade union cost-push.

The 1973–1975 average annual rate of price acceleration was enormous: nearly 5 percent in Great Britain, more than 3 percent in Italy, and almost 2 percent in France and the United States. In view of the dramatic increases in the international prices of food and fuel since 1973, it comes as no great surprise that the data in Table 3.8 indicate that the general acceleration of prices cannot be attributed to labor militancy. For the United States the estimated net effect of strike activity on price acceleration, $\bar{S}^* + \bar{Z}$, is negative. In other words, the pressure on manufacturing money wages from trade union strike action was apparently not great enough in the United States to keep real wages growing as fast as labor productivity. $\bar{S}^* + \bar{Z}$ is positive for France and Great Britain, but it is not large enough to account for much of the price acceleration, especially the recent acceleration of British consumer prices.[60] In Italy the evidence again points to a different conclusion. Both $r' - x'$ and $\bar{S}^* + \bar{Z}$ are greater than 1.0, which suggests that strike-induced wage escalation was a significant component of the post-OPEC burst of inflation.

Admittedly, the calculations in Table 3.8 might yield conservative estimates of average strike-induced inflationary impulses. Wages and productivity pertain to the manufacturing sector, whereas prices are based on economywide consumer indices.[61] Since the prices of manufactured goods have generally increased less than the consumer price indexes in recent years, the strike activity inflation effects may be somewhat understated. Taken as a whole, however, the evidence strongly implies that only in Italy has trade union strike action systematically contributed to increasing rates of inflation over the period 1968–1975.[62] In order to explain the general acceleration of wages and

59. Also notice that $(r' - x')$ is negative.

60. Notice, however, that $r' - x'$ is substantially greater than zero in France.

61. Consumer prices are of course more relevant for modeling wage determination.

62. Italian unions are not only powerful but also among the most militant. For example, the postwar average of worker-days lost in strike activity per worker is higher for Italy than for any other major industrial, capitalist society. (See Chapter 2.)

prices in the late 1960s and 1970s one must look to other factors; macropolicy mismanagement, deficit financing of the Vietnam War, changes in the relative prices of fuel and agricultural commodities, and so on.

Although the results of this study indicate that manufacturing labor militancy has not been an important proximate cause of escalating rates of inflation,[63] the data in Tables 3.5 and 3.8 show that the combined effects of union power and union militancy effectively index manufacturing wages to prices in all four countries.[64] Two implications follow. First, any received rate of price inflation tends to be perpetuated. Second, and perhaps more important, inflationary shocks requiring *real* adjustments, such as changes in the relative prices of fuel and food redistributing income to the producers of oil and agricultural commodities, can generate accelerating inflation rates *if* both labor and capital are in the short run unwilling to accept the real income loss. Therefore an "imported" inflation can lead to a "home-grown" inflation as a result of what Hicks has called "real wage resistance."[65] Until the principal domestic actors acknowledge the shift in the terms of trade and settle the problem of allocating the decline in real income, increasing inflation is almost an inevitable interim outcome, particularly if political authorities attempt to maintain a steady level of output and employment and "validate" the inflation by expanding the money supply.[66]

If the perpetuation and in some circumstances the escalation of inflation are influenced by trade union action, what can be done to bring about wage and price stability? Perhaps nothing should be

63. Except in Italy to the extent noted above.

64. That is, the combined effects of price adjustment and strikes keep the rate of change of real wages positive. The only exceptions in the period 1950–1975 are 1969 in France (real wages fell by about 0.5 percent following a 13 percent increase the previous year) and 1974 in the United States (a decline of about 1 percent).

65. J. R. Hicks, "What is Wrong with Monetarism?" *Lloyds Bank Review* (October 1975), 51. As G. D. N. Worswick put it in testimony before the British House of Commons' Public Expenditure Committee: "If all of us just took the rise in the price of oil on the chin that would be one thing, but most of us do not; we say, 'Our income is unchanged and prices have risen. We wish to restore our real income'" (cited in M. H. Miller, "Can a Rise in Import Prices Be Inflationary and Deflationary?" *American Economic Review*, 66 [1976], 510).

66. A rough formalization of this idea has been worked out by Miller (see note 66), who builds on the work of J. D. Sargan, "Wages and Prices in the United Kingdom," in *Econometric Analysis for National Economic Planning*, ed. P. E. Hart, G. Mills and J. K. Whittaker (London: Butterworths, 1964).

done. As Tobin and others have observed, inflation is not the worst way of resolving group rivalries and social conflict.[67] Moreover, much if not all of the pain attributed to the recent inflation is actually due to the massive *real* income loss caused by the shift in *relative* prices in favor of producers of food, fuel, and raw materials. Had the real loss absorbed by urban, industrial societies (or sectors of society) taken place around a stable price level, the pain would not have been any less unpleasant.

A "do-nothing" posture may be viable in the United States. Inflation has been running at below double-digit figures (except for 1974), and trade unions are comparatively weak. In France, Italy, and Great Britain, however, inflation has reached almost ruinous proportions. For social as well as economic reasons it must be brought under control.

The results presented earlier showed that outside the United States there is little evidence of a Phillips curve and that the impact of strike action on wages is largely independent of market forces. Yet there is little doubt that if political authorities were willing to run the economy at *very* low levels of activity for a prolonged period the power of unions to obtain wage increases equal to or in excess of the rate of price inflation would be broken. This of course amounts to killing the patient to cure the disease. In any case policies of this sort are simply not politically feasible in modern capitalist democracies.[68]

If it is necessary to do something about inflation, and if orthodox deflationary macroeconomic policies are unlikely to be effective or politically acceptable, the only alternative is probably some form of national wages or incomes policy. In a democratic society the success of a national wages policy hinges on the voluntary cooperation of the trade unions. Headey's study of the postwar experience shows that two conditions are critical for trade union cooperation:[69]

1. Whether or not the state directly coordinates the wages policy, the government must command the confidence of the unions. In practice this means that trade-union-based (Socialist, Labor, Communist) political parties must control (or share in the control of) the government.

67. J. Tobin, "Inflation and Unemployment," *American Economic Review*, 62 (1972), 1–18.

68. Events since the late 1970s have proved this remark to be completely wrong.

69. B. Headey, "Trade Unions and National Wages Policies," *Journal of Politics*, 32 (1970), 407–439.

2. The trade union movement must be centralized to the degree that the peak organizations exercise effective control over the principal bargaining demands and strike decisions of the major constituent unions.

None of the countries treated in this study entirely satisfies Headey's conditions. However, the British Labour government has been able to sell wage restraint—indeed, severe wage restraint—to the trade unions for two successive years, even though the Trade Union Congress (TUC, the peak labor organization) does not exercise the kind of centralized authority outlined above.[70] To be sure it took an extraordinary domestic economic crisis, external pressure from the international economic community, and the promise of tax relief to low-wage groups to elicit the union's cooperation. Although a national wages policy probably does not have a long-run future in Britain, it has helped to alleviate the short-run, post-OPEC crisis. Perhaps this is all one should expect.

Even a policy of short-run restraint designed to reverse the post-1972 wage and price acceleration is not feasible in France and Italy *unless* the left opposition is brought into the government. The economic situation is particularly acute in Italy, where annual wage increases have exceeded 20 percent for four consecutive years. The Italian Communist party (PCI) pressed for participation in the government for several years (the "historic compromise"), but the ruling Christian Democrats rejected PCI overtures. If the Christian Democrats continue to oppose PCI government participation, trade union wage pressure is unlikely to abate, and Italy may slide from economic crisis into economic catastrophe.

70. In August 1975 the trade unions agreed to hold weekly wage increases to £6—a rise of about 10 percent. Wage restraint was even greater the following year: the August 1976 agreement held wage increases to an average of 4.5 percent. The increase in both years was substantially less than the rate of inflation. It is clear that a Conservative government could never have pulled this off.