

IMF WORKING PAPER

© 1994 International Monetary Fund

This is a Working Paper and the author would welcome any comments on the present text. Citations should refer to a Working Paper of the International Monetary Fund, mentioning the author, and the date of issuance. The views expressed are those of the author and do not necessarily represent those of the Fund.

WP/94/152

INTERNATIONAL MONETARY FUND

European I and Western Hemisphere Departments

Shocks and Structural Breaks: Labor Market Reforms in the United Kingdom

Prepared by Ramana Ramaswamy and Eswar Prasad ^{1/}

Authorized for Distribution by Martin Fetherston and Jorge Márquez-Ruarte

November 1994

Abstract

This paper analyzes the effects of the labor market reforms launched in the early 1980s by the Conservative government led by Mrs. Thatcher. It is argued that the increase in the growth of labor productivity in manufacturing after 1980 as well as the improvement in the responsiveness of employment to variations in output can be largely attributed to the success of the reforms in reducing industrial disputes and removing a number of structural impediments in the labor market. However, the reforms did not succeed in moderating real wage growth or improving the tradeoff between wage inflation and unemployment. This is attributed to certain aspects of the wage bargaining system and the influence of relative wage norms in the process of wage determination.

JEL Classification Numbers:

E0, J3, J5

^{1/} Numerous colleagues at the IMF provided useful comments on earlier versions of this paper. We are also grateful to the participants in the European I seminar for their comments. Fritz Pierre-Louis assisted ably with the data collection.

<u>Contents</u>	<u>Page</u>
Summary	iii
I. Introduction	1
II. Labor Productivity	3
III. Labor Adjustment	8
IV. Wage Inflation	10
V. Conclusions	18
Appendix: Causality Tests	19
 Text Tables	
1. An Equation for Productivity Growth in Manufacturing	5
2. Estimates of a Labor Adjustment Equation	9
3. Estimates of a Simple Phillips Curve Equation	13
 Appendix Table: United Kingdom - Granger Causality Tests	20
 Charts	
1. Productivity in Manufacturing	4a
2. Hourly Earnings for Whole Economy	12a
3. Hourly Earnings for Manufacturing	12b
 References	21

Summary

Radical labor market reforms were initiated in the United Kingdom in the early 1980s. These reforms included legislation to curb industrial disputes and measures to decentralize wage bargaining. This paper evaluates the impact of these reforms on the growth of labor productivity, the responsiveness of employment to variations in output, the rate of wage inflation, and the trade-off between wage inflation and unemployment. The effects of the reforms on the aggregate economy and on the manufacturing sector are analyzed separately. The manufacturing sector is of particular interest as the legislation concerning unions had the most direct impact in manufacturing--where unions have traditionally had a stronger presence--than in other sectors.

The labor market reforms resulted in a significant increase in the rate of growth of labor productivity in manufacturing, but not in the aggregate economy. This paper argues that the increase in the growth rate of manufacturing productivity after 1980, as well as the improved speed of labor adjustment to variations in output, can be attributed largely to the success of the reforms in reducing industrial disputes and removing a number of structural impediments in the labor market.

However, the labor market reforms did not succeed in moderating real wage growth or improving the trade-off between wage inflation and unemployment. This is attributed to two main factors. First, unlike a fully market-based system, a decentralized wage-bargaining system with unions is unlikely to produce wage moderation. Second, when relative wage comparisons are an important part of the bargaining norms, decentralized bargaining may prove more inflationary than a system with some implicit coordination. Both standard econometric techniques and recent developments in labor market theory are used to support these arguments.

I. Introduction

Far-reaching reforms of the labor market were instituted in the early 1980s in the United Kingdom soon after the advent of the Conservative government led by Mrs. Thatcher. These reforms fundamentally altered important aspects of the labor market by changing the laws concerning industrial disputes and altering the way in which wage bargaining was conducted. There has been an extensive debate in the United Kingdom ^{1/} about the effectiveness of these reforms in enhancing the efficiency and flexibility of the labor market and avoiding the problem of "Eurosclerosis" ^{2/} that has bedeviled most European countries. This paper evaluates the debate by analyzing how the labor market reforms have impinged on the growth of labor productivity in manufacturing, the responsiveness of employment to variations in output, the rate of wage inflation, and the tradeoff between wage inflation and unemployment.

The legislative measures in the early 1980s radically altered the nature of industrial relations in the United Kingdom. In particular, the Employment Acts of 1980 and 1982 and the Trade Union Act of 1984 made it difficult for unions to negotiate over wages and working conditions at the national or even the industry level. ^{3/} The ostensible reason for this was to decentralize the process of wage determination to the firm level as a strategy for curbing wage inflation. In addition, the trade union legislation of this period also attempted to reduce the incidence of industrial disputes by raising the costs to unions of unofficial strikes and banning "secondary action," so that workers could not participate in the industrial disputes of enterprises to which they were not directly connected. The practice of "closed shops," whereby union membership was a prerequisite for employment, was made illegal. Secret balloting of employees was made mandatory before going on strike. In addition, the labor market reforms introduced changes in the administration of unemployment benefits and other income support measures in order to increase the incentives for seeking employment. The scope of the labor market reforms in the United Kingdom was

^{1/} See Nickell (1987), Layard and Nickell (1989), Bean and Symons (1989), and Mayhew (1991).

^{2/} "Eurosclerosis" has been used to describe the phenomenon of persistent unemployment in the European context arising from rigidities in the labor market. See Blanchard and Summers (1986).

^{3/} See Brown and Wadhvani (1990) for a detailed analysis of the trade union legislation enacted in the United Kingdom in the 1980s.

so far reaching that it can be usefully viewed as a case study of the Olson hypothesis. ^{1/}

The emphasis of this paper is on the macroeconomic impact of the labor market reforms. In particular, the focus is on analyzing whether the reforms acted as an institutional shock leading to "structural breaks" in the growth of manufacturing productivity, the responsiveness of employment to variations in output and the tradeoff between wage inflation and unemployment. The effects of the reforms on the aggregate economy and on the manufacturing sector are analyzed separately. The manufacturing sector is of particular interest since the legislation concerning unions had the most direct impact in manufacturing--where unions have traditionally had a stronger presence than in other sectors. Other related issues concerning the labor market, such as the impact of training programs or the response of labor supply to changes in benefit programs, are not taken up for analysis in this paper.

The main findings are that the labor market reforms resulted in a significant increase in the rate of growth of labor productivity in manufacturing but not in the aggregate economy. This is in large part attributed to the impact that the reforms had in reducing the incidence of industrial disputes and easing a number of structural impediments in the labor market, such as hiring and firing rules. The latter reforms were particularly important in improving the responsiveness of employment to changes in output for both manufacturing and the aggregate economy. However, the reforms do not seem to have made a significant dent in controlling wage inflation and reducing structural unemployment. Although nominal wage growth slowed after the reforms, real wages grew faster both in manufacturing and in the aggregate economy during this period. More significantly, simple econometric tests indicate that the tradeoff between wage inflation and unemployment did not improve as a consequence of the labor market reforms. We argue that there are two main reasons for this. First, unlike a completely market-determined system, a decentralized-bargaining system in which unions play an important role is unlikely to produce wage moderation. Second, when relative wage comparisons are an important part of the bargaining norms, as is the case in the United Kingdom, decentralized bargaining

^{1/} See Olson (1980) and Quiggin (1992). This hypothesis is based on the notion that the accumulation of power over time in the hands of interest groups such as trade unions retards economic performance because they tend to focus primarily on issues of redistribution rather than growth. Accordingly, it is argued that political shocks which succeed in breaking the power of certain narrow interest groups could enhance economic performance; Japan and Germany after World War II are cited as examples consistent with the Olson hypothesis. In the case of the United Kingdom, the political shock took the form of far-reaching labor legislation in the early 1980s that curbed the power of the unions significantly. In this sense, testing the long-run impact of the U.K. labor market reforms could also be viewed as analogous to testing the validity of the Olson hypothesis.

may prove more inflationary than some form of implicit macro coordination. This part of the analysis draws heavily on recent developments in labor market theory.

The next section of the paper analyzes developments in manufacturing productivity. Standard econometric tests are presented initially to support the hypothesis about the impact of strikes on productivity growth; this is followed by an analysis of the theoretical basis of the relationship. Section III provides simple tests for capturing possible changes in the speed of labor adjustment following the labor market reforms. Section IV discusses the effects of the labor market reforms on wage inflation and the wage-unemployment tradeoff. The final section of the paper summarizes the findings and concludes.

II. Labor Productivity

There was a marked increase in the average growth rate of labor productivity in manufacturing following the labor market reforms. ^{1/} In contrast to an average growth rate of 2.6 percent per annum between 1960 and 1979, labor productivity in manufacturing grew at an average annual rate of over 4 percent between 1980 and 1993. ^{2/} Chart 1 shows that the growth of productivity in manufacturing in the United Kingdom has been significantly higher than the average for the other major industrial countries through most of the 1980s. For the aggregate economy, however, productivity growth declined marginally to 1.8 percent between 1980 and 1993 as compared to an average annual rate of 2 percent between 1960 and 1979.

We argue that the rapid growth of productivity in manufacturing in the 1980s was driven mainly by the new labor legislation that fundamentally altered the confrontational industrial relations climate that had traditionally prevailed in the United Kingdom. It did so primarily by changing the rules of the game and the behavior of economic agents through legislation and incentives which placed a premium on cooperation rather than conflict. This structural change reduced strike activity significantly and also fostered a substantial reorganization of working practices.

The new legislation made it extremely difficult for workers to strike by mandating compulsory balloting of union members in industrial disputes

^{1/} Labor productivity is defined here as output per employee. This measure was used in order to compare productivity growth in manufacturing with that in the aggregate economy, for which a consistent time series of aggregate hours worked was not available. Using output per manhour rather than output per employee in manufacturing made little difference to any of the econometric estimates reported below.

^{2/} A set of univariate tests confirmed that there was a statistically significant break around 1980 in the rate of growth of trend productivity in manufacturing.

involving work stoppages. Moreover, the state now acquired the power to impose fines and place restrictions on the use of union assets in the case of illegal work stoppages. Consequently, there was a dramatic decline in the number of working days lost due to industrial disputes in the 1980s as compared to the 1970s. The strike rate, defined as the number of working days lost per thousand employees, dropped from an average of 447 during 1973-82 to 249 during 1983-92. In fact, the latter average understates the actual improvement in industrial relations because it includes the miners' strike in 1984--a one-off event. The reduction in the strike rate recently has been even more noticeable. During the 5 year period 1988-92, the strike rate was almost 75 percent lower than during 1984-88, and the total number of working days lost due to stoppages in 1992 was the lowest since records began in 1891. The United Kingdom has also fared well in international comparisons. Between 1982 and 1992, the strike rate in the United Kingdom was lower than the European Union average for almost every year except 1984. ^{1/}

To examine the evidence for the effects of strike activity on productivity growth, the following regression was estimated:

$$DPROD_t = \alpha + \sum_{i=0}^j \beta_i (DKL)_{t-i} + \sum_{i=0}^k \gamma_i STRK_{t-i} + \sum_{i=1}^l \mu_i DPROD_{t-i} + \epsilon_t \quad (1)$$

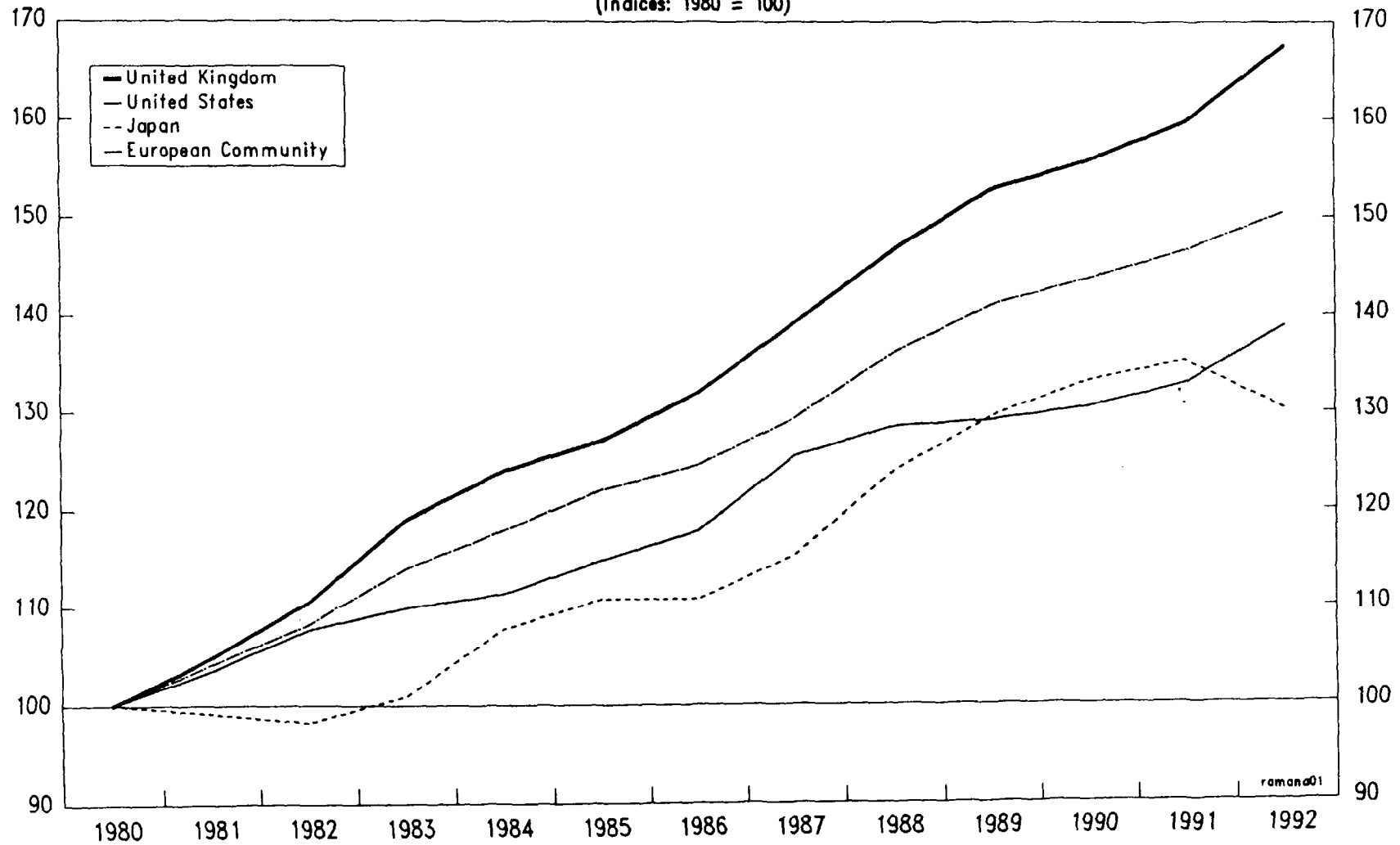
where DPROD indicates manufacturing productivity growth (calculated as the first difference of the logarithm of productivity), DKL indicates the change in the capital-labor ratio, and STRK is the ratio of mandays lost on account of strike activity to total employment in manufacturing. ^{2/} The variable STRK uses aggregate strike activity as a proxy for strike activity in manufacturing, given data constraints and the apparent strong presence of unions in manufacturing relative to other sectors. Since the effects of labor disputes on productivity growth may not be instantaneous, the current and four lagged values of STRK were included in the regression. Similarly, the current and four lagged values of DKL were included in the regressions since investment in fixed capital, as reflected in an increase in the capital-labor ratio, may affect productivity only with a lag. Lagged productivity growth was also included in the regressions to allow for other exogenous influences. The regression was estimated on quarterly data for the United Kingdom over the period 1960:1-1993:1. The results are reported in Table 1.

^{1/} The data on industrial disputes are taken from various issues of the Department of Employment's "Employment Gazette."

^{2/} The relationship between labor productivity growth and the change in the capital-labor ratio can be justified using a standard CRS production function.

CHART 1
UNITED KINGDOM
PRODUCTIVITY IN MANUFACTURING

(Indices: 1980 = 100)



Source: IMF, World Economic Outlook.

Table 1. United Kingdom: An Equation for
Productivity Growth in Manufacturing
(Dependent Variable--Labor Productivity Growth)

	1960:1-1993:1	1960:1-1979:4	1980:1-1993:1
Change in capital- labor ratio	0.6365 (0.001)	0.9073 (0.001)	0.3374 (0.461)
Strike activity	-0.0009 (0.000)	-0.0001 (0.000)	-0.0011 (0.000)
R ²	0.47	0.51	0.56
DW statistic	1.84	1.98	1.56

Notes: The strike activity variable used here is the ratio of mandays lost to total employment in manufacturing. The numbers reported above are the sums of the coefficients on the contemporaneous and four lagged values of each variable. In parentheses below each sum is the significance level of the test statistic for the exclusion restriction on that set of coefficients.

We tested the joint significance of the coefficients on the contemporaneous and lagged values of both DKL and STRK in the above regression. 1/ Both sets of variables were strongly significant over the full sample period. The sum of the lagged coefficients on STRK was significantly negative, indicating that a decline in strike activity has a positive effect on productivity growth. Adding the STRK variable increased the explanatory power of the regression, as measured by the R^2 , from 27 percent to 47 percent. Sub-sample regressions over 1960:1-1979:4 and 1980:1-1993:1 confirmed the robustness of these findings. 2/ However, the sum of the lagged coefficients on the capital-labor ratio was smaller in the 1980-93 period and the exclusion restriction on these coefficients could not be rejected. Thus, the relative contribution of the decline in strike activity to manufacturing productivity growth appears to be stronger after 1980.

Including a dummy for the miners' strike in 1984 strengthened the result that the reduction in strike activity contributed significantly to productivity growth in the second sub-period. We also experimented with augmented equations that included the real exchange rate and the real price of oil. Although these variables were significant, their effect on the coefficients estimated from the specification in equation (1) were not large; the results reported above were qualitatively unaffected by the inclusion of any or all of these variables. Thus, even though these other variables also have an effect on long-term productivity growth, our hypothesis that the reduction in strike activity was an important contributor to productivity growth in manufacturing after 1980 continues to hold.

To further examine the validity of these findings, a set of standard bivariate causality tests was performed on two sets of variables: investment and productivity, and strike activity and productivity. The methodology for the two tests and the actual regression results are presented in the appendix. The tests indicate that the ratio of gross fixed investment to employment (or output) in manufacturing has a uni-directional causal relationship with productivity growth over the period 1960-79. The key finding of the causality tests is that strike activity (as a ratio of employment) has a causal relationship with productivity growth in manufacturing in the 1980-93 sub-sample but not in the earlier period. This is consistent with other evidence that the reduction in strike activity was an important contributor to the increase in manufacturing productivity growth after 1980.

While the econometric results support the hypothesis of the importance of better industrial relations in increasing the growth of manufacturing productivity after the reforms, the theoretical basis of this relationship

1/ Lagged productivity growth turned out to be insignificant in the regressions and excluding these lags affected the other coefficients only marginally.

2/ A split sample Chow test for coefficient stability indicated that the vector of coefficients did not remain stable over the two sub-periods.

needs to be examined. It is not intuitively obvious that a decline in the strike rate should necessarily increase the growth of productivity; it might be argued that the increase in output due to a reduction in work disruption should be simultaneously matched by an increase in labor input, with no perceptible effect on labor productivity. Nevertheless, there are a number of reasons to believe that a less confrontational industrial relations climate is indeed conducive for increasing labor productivity. Strikes are normally preceded by periods in which workers are extremely demotivated. Consequently, there is likely to be a sharp decline in the level of effort expended in production, with a consequent adverse impact on productivity. Moreover, the costs of strikes are much larger than just the withdrawal of labor input accompanying the dispute. When workers go on strike, machinery and equipment cannot be maintained properly and this leads to either accelerated depreciation or damage to machinery, which could affect productivity growth adversely when work is eventually resumed. 1/ There is yet another consequence of strikes that is analogous to the "beachhead" effect noted in the international trade literature. For example, when production is frequently interrupted by industrial disputes, domestic firms lose out to foreign competitors who can offer a more stable stream of output. This, in turn, can reduce the outward orientation of firms, and reduce the incentives to invest in new technology to increase productivity growth. 2/ Thus, there is a strong theoretical case for labor productivity to grow faster when there is a marked reduction in industrial disputes.

Further, by curbing the contentious nature of industrial relations and strengthening management prerogatives, the reforms had the added effect of creating an environment in which radical changes in working practices could be implemented without running into opposition from unions. In particular, trade unions were forced to give up past practices, rooted in the earlier craft tradition, which strictly defined the tasks that each worker was allowed to perform (see Purcell, 1991). By constraining the power of trade unions, the labor market reforms created the conditions for improving functional flexibility in the workplace. For instance, productivity could now be enhanced by making employees perform a wide range of tasks where this was optimal. 3/

1/ See Ramaswamy and Rowthorn (1991) for a formal analysis of these arguments in an efficiency wage framework.

2/ See Hart (1989) for a discussion of the long-term implications of strikes.

3/ A study by the OECD (OECD, 1986) provides some supporting evidence regarding the increase in functional flexibility. A survey conducted in 1985 of 72 large firms in the United Kingdom in food and drink, automobiles, engineering, retail distribution and financial services showed that, since 1980, 90 percent of the firms had introduced changes that increased functional flexibility. It has been suggested that these changes in working practices proved particularly useful in the context of adapting to Japanese investments in the automobile industry.

Recent microeconomic studies provide additional support for the hypothesis that reorganization of working practices resulting in increased functional flexibility helped to raise the growth of labor productivity in manufacturing in the 1980s. ^{1/} The Workplace Industrial Relations Survey (WIRS), in 1984, interviewed managers about organizational change. Organizational change was defined as changes in working practices not involving the introduction of new plant, equipment or machinery. The 1984 WIRS reported that unionized establishments reported bigger changes in the organization of work as compared to non-unionized companies. After controlling for a variety of factors, it was found that in the period 1980-84, unionized firms experienced higher productivity growth than non-unionized firms. This stands out in contrast to the period 1975-79, when the differentials in the growth of productivity between unionized and non-unionized firms was almost negligible.

III. Labor Adjustment

We have so far analyzed the impact that the reorganization of working practices had on productivity growth. It is interesting, in this context, to provide a direct test of the effects of the labor market reforms on the labor adjustment process. Specifically, we examine the extent to which the reforms affected the sensitivity of employment to variations in output. In order to estimate the elasticity of employment with respect to output, a standard Koyck model of the dynamic demand for labor was estimated. The specification used here allows us to simultaneously estimate the speed of labor adjustment. Under a set of assumptions regarding the nature of labor adjustment costs, expectations formation, and the exogeneity of output (see Abraham and Houseman (1993)), the labor adjustment equation can be written as follows:

$$\ln E_t = \alpha + (1-\lambda) \phi \ln Y_t + \lambda \ln E_{t-1} + \delta_1 t + \delta_2 t^2 + \epsilon_t \quad (2)$$

where E represents employment, Y represents output, t is a time trend and ϵ is the error term. The parameter λ , which lies between zero and unity, is inversely related to the speed of labor adjustment.

Table 2 presents estimates of the parameters λ and ϕ for aggregate employment and for two alternative definitions of labor input in

^{1/} See Brown and Wadhvani (1990).

Table 2. Estimates of a Labor Adjustment Equation 1/

	<u>Employment</u>		<u>Total Hours</u>	
	1960:1-1979:4	1980:1-1993:1	1960:1-1979:4	1980:1-1993:1
Manufacturing				
$\phi(1-\lambda)$	0.132 (0.014)	0.230 (0.030)	0.229 (0.037)	0.293 (0.044)
λ	0.885 (0.026)	0.789 (0.036)	0.733 (0.064)	0.722 (0.043)
Mean lag for labor adjustment	7.69	3.74	2.75	2.60
Aggregate economy				
$\phi(1-\lambda)$	0.115 (0.028)	0.181 (0.023)		
λ	0.936 (0.033)	0.828 (0.027)		
Mean lag for labor adjustment	14.63	4.81		

1/ Standard errors are in parentheses.

manufacturing: employment and total hours. The results are also broken up by sample period. 1/ The first two columns in the upper panel of the table show that the short-run sensitivity of employment to output in the manufacturing sector has increased after 1980 as the speed of labor adjustment has risen sharply. The implied mean lag in adjustment falls from 7.7 quarters to 3.7 quarters. 2/ The sensitivity of total hours to output has risen in the second sub-period in manufacturing, although the speed of adjustment of total hours remains the same. These results are intuitively appealing for they indicate that, following the reforms, a greater proportion of the short-run adjustment in labor input in manufacturing occurs through adjustments in employment rather than in average hours. Similar results are obtained for the aggregate economy, as reported in the lower panel of Table 2. The short-run sensitivity of aggregate employment to the level of aggregate output increased after 1980 as the speed of labor adjustment rose sharply, with the implied mean lag for labor adjustment declining from 14.6 quarters to 4.8 quarters. In short, following the labor market reforms, lags in employment adjustment have been substantially reduced and measures of labor input have become more sensitive to the level of output in manufacturing as well as in the aggregate economy.

IV. Wage Inflation

The United Kingdom had experienced very high rates of wage inflation in the 1970s. Between 1970 and 1979, average earnings grew at an annual rate of about 15 percent, reaching a peak of 20 percent in 1979-80. The labor market reforms sought to control the high wage inflation by decentralizing wage bargaining and giving a greater role to the operation of market forces in wage determination. In particular, an attempt was made to move towards decentralized bargaining by discouraging the use of the National Joint Industrial Councils which had been instrumental in administering both national-level and multi-employer agreements. Consequently, there was a

1/ We experimented with other finite distributed lag models of labor adjustment and obtained similar results. The inclusion of variables such as real interest rates and real wages in order to account for the effects of changes in the relative prices of labor and capital did not affect the results.

2/ Following Abraham and Houseman (1993), the mean lag in adjustment, which is the weighted average of the lag lengths $t=0,1,2,\dots$ with the weight for each t equal to the share of adjustment occurring at that lag, can be calculated as $\lambda/(1-\lambda)$.

sharp decrease in the number of multi-employer wage agreements following the labor market reforms. 1/

Despite the success in shifting to decentralized wage bargaining in the 1980s, aggregate nominal earnings grew at more than 8 1/2 percent per annum between 1980 and 1993. Moreover, as pointed out earlier, average real wages in both manufacturing and the aggregate economy grew faster after the implementation of the reforms. Charts 2 and 3 show that the United Kingdom had the highest rate of growth of both nominal and real wages among the major industrial countries in the 1980s. At the same time, the average rate of unemployment between 1980 and 1992 was almost 9 percent, in contrast to about 3 percent between 1970 and 1979. That is, the move towards decentralized bargaining appears not to have secured a favorable tradeoff between unemployment and wage inflation in the United Kingdom.

To test for changes in the wage-unemployment tradeoff, we estimated the following simple version of a Phillips-curve type equation:

$$DLNOMWG_t = \alpha + \beta_1(U_t - U^*) + \beta_2 DU_t + \sum_{i=0}^j \gamma_i \pi_{t-i} + \nu DPROD_t + \eta_t \quad (3)$$

where DLNOMWG indicates the growth rate of average nominal wages, U is actual aggregate civilian unemployment, U^* is a measure of the equilibrium or natural rate of unemployment, DU is the change in the unemployment rate, and π is a measure of inflation. The Hodrick-Prescott filter, a two-sided linear transformation widely used in recent business-cycle literature, was applied to the unemployment rate series to obtain a univariate measure of structural unemployment. The resulting series for U^* indicates an element of hysteresis in the unemployment rate and behaves in a fashion quite similar to more sophisticated measures of structural unemployment. The specification that was implemented included four lags of CPI inflation as a measure of inflationary expectations, with the lag coefficients constrained to sum to unity. 2/

1/ In 1979, about 47 percent of the manufacturing establishments in the Confederation of British Industries (CBI) survey conducted multi-level bargaining. By 1986, a matched sample survey conducted by the CBI found that multi-employer bargaining had come down sharply to 13 percent of those surveyed, with a preponderant number of manufacturing establishments now being covered by single-employer bargaining (see Purcell (1991)).

2/ The constraint that the coefficients on lagged inflation sum to unity imposes a form of rational expectations, i.e. the absence of a long-run tradeoff between inflation and unemployment. Coefficients on lagged productivity growth were insignificant in these regressions. Including lagged productivity growth had little effect on the coefficients reported in the table.

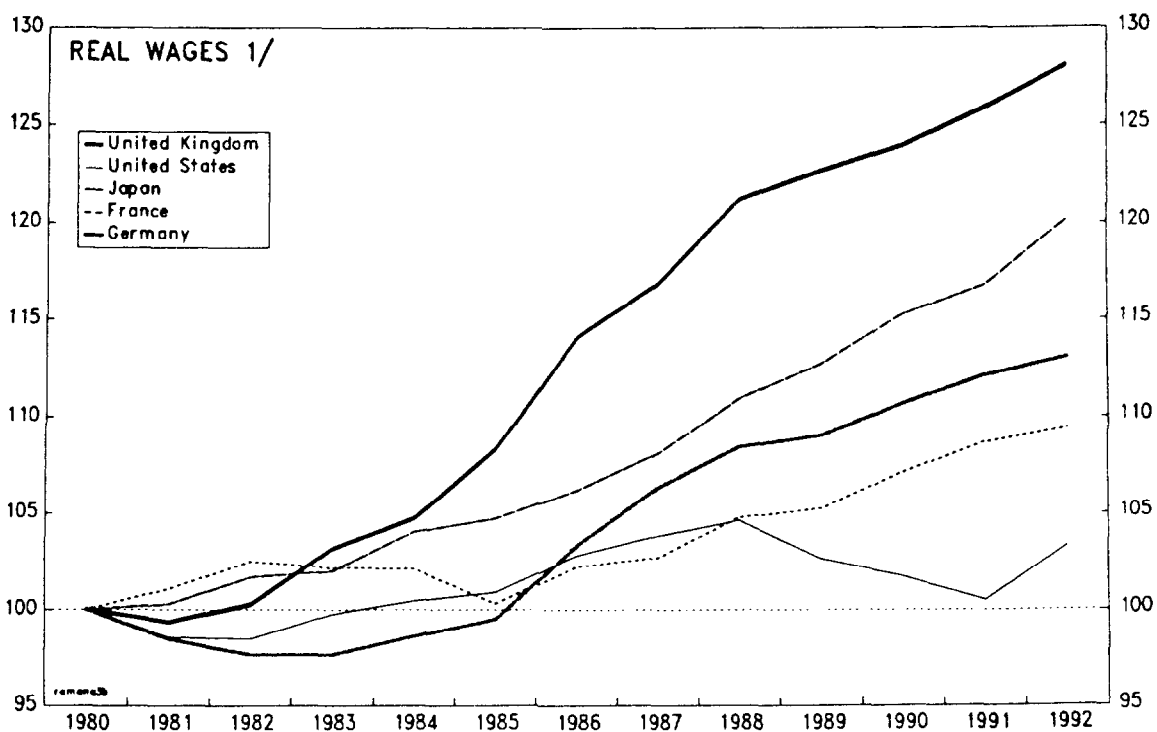
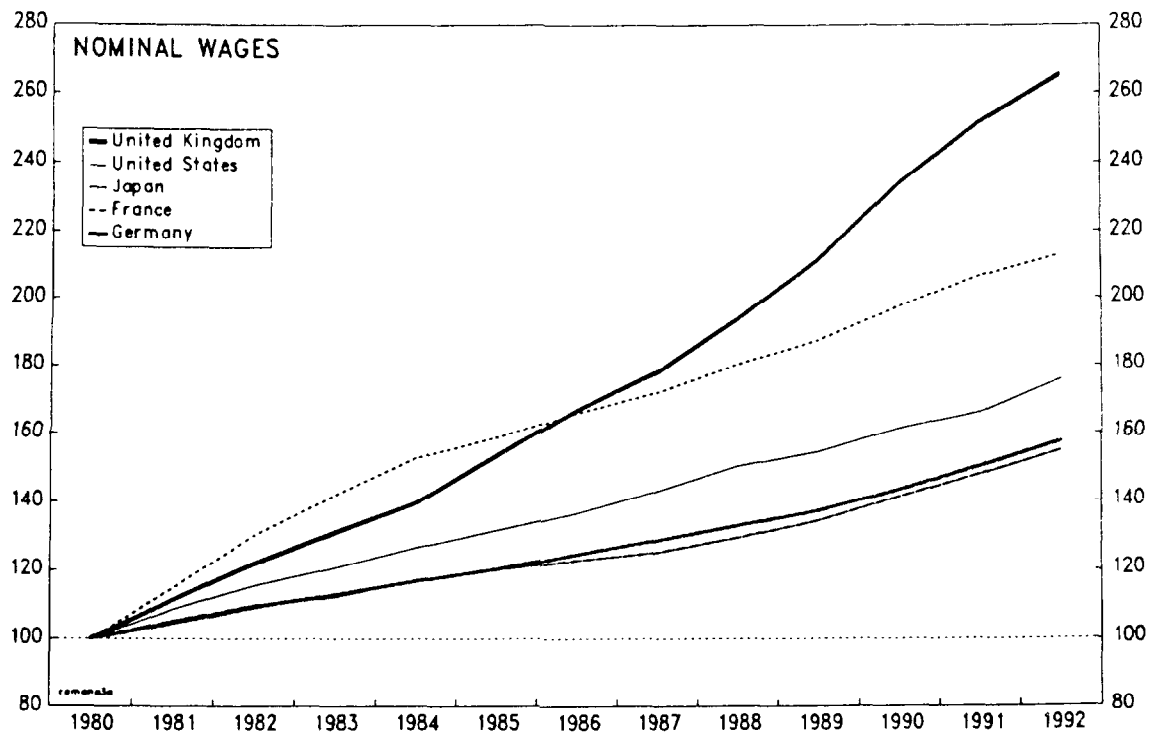
Estimates from equation (3) are reported in Table 3. The full sample estimates for the period indicate that the level of cyclical unemployment as well as the rate of change of unemployment affect wage inflation in the United Kingdom. The estimated coefficients on both these variables are negative over the full sample. Over the period 1960-79, the coefficient on cyclical unemployment is strongly negative. However, while the coefficient on the change in unemployment is also negative over this period, it is significant only at the 10 percent level. When the equation is estimated over the period 1980-93, the coefficient on cyclical unemployment becomes insignificant, suggesting the absence of a short-run tradeoff between wage inflation and unemployment. ^{1/} Further, the negative coefficient on the change in unemployment becomes more strongly significant in the post-1980 sample. In other words, these estimates suggest that the inflation-unemployment tradeoff appears not to have improved after 1980 as wage inflation remained high despite an increase in the cyclical (and structural) component of unemployment. These results also indicate a strong element of hysteresis in unemployment since they imply that a reduction in unemployment could lead to an increase in wage inflation even if cyclical unemployment is high.

There are a number of reasons why the tradeoff between wage inflation and unemployment did not improve in the 1980s. One set of reasons could be related to factors that are not directly connected with the design of the labor market reforms itself. This includes, for instance, unemployment hysteresis emerging from the monetary and fiscal shocks of 1979-81. ^{2/} Another possible reason for the relatively high wage inflation in the post-reform period could be a shortage of workers with the required skills to match the structural changes in the economy. This hypothesis is, in fact, to some extent consistent with the observed rise in relative wages for skilled workers. Annual real wage growth for non-manual adult workers rose from 0.7 percent in the 1970s to an average of 3 percent from 1980 to 1992. However, real wage growth for manual adult workers also increased despite rising unemployment in the 1980s, although the increase--from 1.1 percent in the 1970s to 1.3 percent from 1980 to 1992--was smaller than for non-manual

^{1/} It is important to note that these coefficients should be interpreted as conditional on expected inflation remaining constant.

^{2/} The high unemployment that followed the fiscal and monetary shocks in 1979-81 also led to an increase in long-term unemployment. Long-term unemployment as a percentage of total unemployment increased from 30 percent in 1979 to 49 percent in 1985 and remained at roughly that level during the latter half of the 1980s. It has been argued that the long-term unemployed do not exert a significant downward pressure on wages as they gradually lose their skills and become demotivated over time (see Layard, Nickell, and Jackman (1991)).

CHART 2
UNITED KINGDOM
HOURLY EARNINGS FOR WHOLE ECONOMY
(Indices: 1980=100)

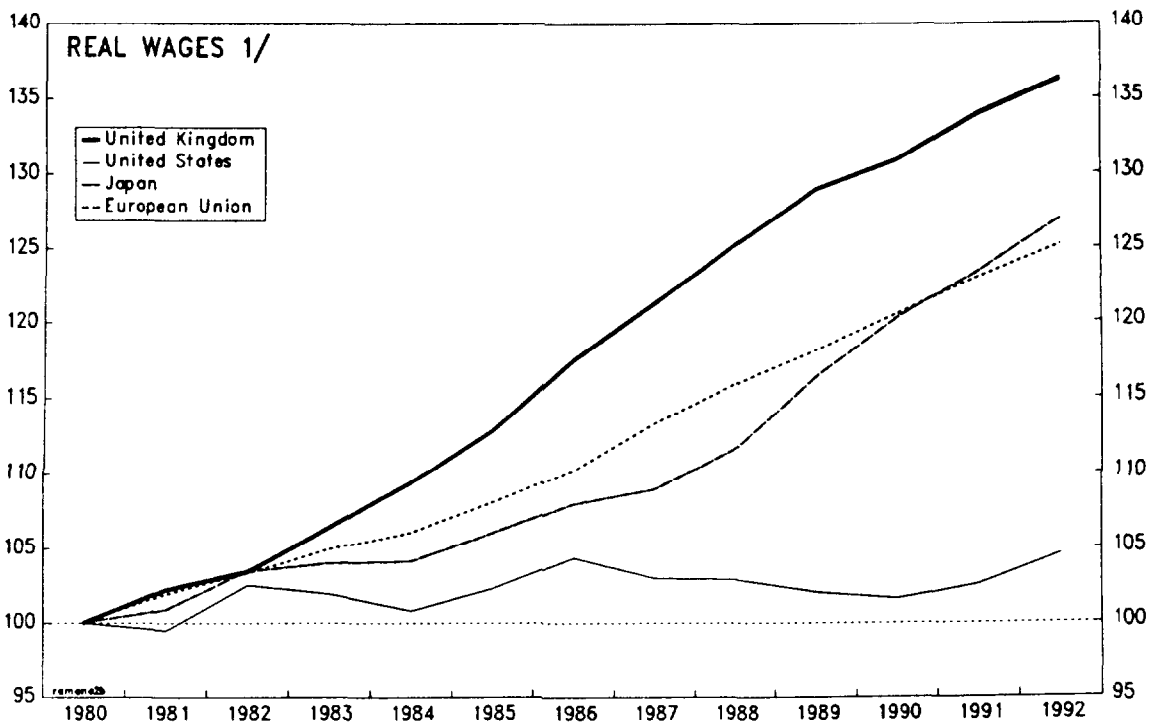
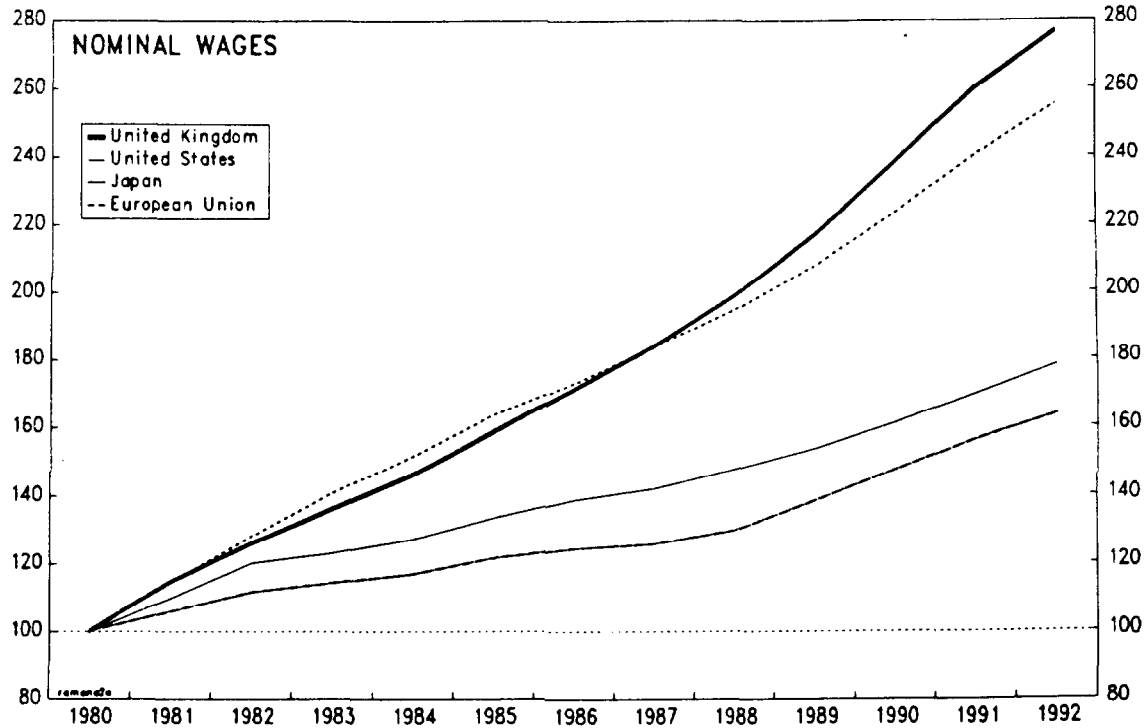


Source: OECD, Analytical Database.

1/ Deflated by the CPI.

CHART 3
UNITED KINGDOM

HOURLY EARNINGS IN MANUFACTURING (Indices: 1980=100)



Source: IMF, World Economic Outlook.

1/ Deflated by the CPI.

Table 3. Estimates of a Simple Phillips Curve Equation 1/
(Dependent variable: Nominal wage growth)

	1960:1-1993:1	1960:1-1979:4	1980:1-1993:1
Constant	0.005 (0.001)	0.005 (0.002)	0.004 (0.001)
Cyclical unemployment	-0.002 (0.002)	-0.009 (0.004)	0.001 (0.001)
Change in unemployment	-0.009 (0.004)	-0.017 (0.010)	-0.008 (0.003)
Sum of coefficients on current & lagged inflation	1.0	1.0	1.0
Productivity growth	0.150 (0.120)	0.142 (0.165)	0.140 (0.147)

1/ Standard errors are reported in parentheses.

workers. 1/ Thus, although compositional effects may have played a role in increasing real wage growth, they do not explain much of the increase in average real wage growth that occurred despite rising unemployment in the 1980s.

Apart from the effects of skill mismatches in the labor market and hysteresis-related factors, it is possible that the absence of an improvement in the tradeoff between wage inflation and unemployment after 1980 is intrinsically and importantly related to the very design of the labor market reforms. 2/ For instance, it is possible that decentralization of wage bargaining, under the institutional context prevailing in the United Kingdom, may not be the best way to control wage inflation. We now turn to the issue of whether there is in fact a sound theoretical basis for expecting the tradeoff between wage inflation and unemployment to improve with the kind of decentralization of wage bargaining which took place in the United Kingdom.

While the labor market reforms succeeded in shifting the level at which wages were negotiated from a multi-employer based bargaining structure to a more decentralized system of wage determination, it did not have the same impact in curbing the role of trade unions in these negotiations. Even though the power of trade unions did weaken and union membership declined from 53 percent of the employed labor force in 1979 to 40 percent in 1990, the degree of unionization at the end of the 1980s in the United Kingdom was still high by international standards. 3/ As discussed earlier, the capacity of the unions to go on strike was severely curtailed by legislation, but no such legal or political constraint was placed on the extent of wage increases that unions could demand. In the changed circumstances of the post-reform period, the unions downplayed the role of political confrontation which had characterized part of their activities in the 1970s, and appear to have concentrated more narrowly on the job of obtaining high wages for their employed members or "insiders" in order to maintain legitimacy with their members. The unions had, of course, to be willing to accept reorganization of working practices as part of the bargain of obtaining high wages for the "insiders." In other words, the labor market reforms effectively transformed the wage determination process in the United Kingdom from one in which unions bargained at either the industry or regional level to

1/ The experience in the United States over the last two decades has been different. Although skill-biased technological change led to an increase in the absolute and relative real wages of skilled workers, the average real wage remained roughly unchanged because of a concurrent decline in the absolute real wages of unskilled workers.

2/ Of course, the labor market reforms could help address problems such as skill mismatch by focusing on training and other search related measures.

3/ For instance, the union density in the U.S. private sector is just 12 percent. See Metcalf (1991) for further details.

that of the firm level, without necessarily eliminating the degree of "insider-power" in wage determination to a significant extent. 1/

Unlike a completely market-determined system for setting wages in which unions have a negligible role, a decentralized wage-bargaining system, in which unions play an important role, is not particularly conducive for achieving wage restraint. 2/ In fact, when unions have a significant influence on the wage determination process, a centralized wage-bargaining system has the intrinsic institutional capacity to secure a greater degree of wage moderation than decentralized wage bargaining. This is due to the fact that centralized bargaining "internalizes" a variety of "externalities" of decentralized wage bargaining. A proper theoretical understanding of externalities is crucial for evaluating the consequences of the move to decentralized bargaining. 3/

Consider the case when a firm has some degree of control over its prices; then, any money wage increase secured by the firm-level decentralized union will increase the real wages of its members more than the product wage (real wages are determined by the general price level while product wages are determined by the firm's own pricing decision). Since employment at the firm level is determined by the product wage, a decentralized union acting on its own can increase the real wages of its members without sustaining a disproportionate loss in employment (assuming reasonable demand elasticities in the product market). This relatively favorable tradeoff between wages and employment is, however, only secured by a decentralized union at the expense of passing the negative price externality of its actions on to other unions. If all decentralized unions act on the basis of a similar reasoning process, we have a collective action problem, resulting in a higher wage inflation for the entire economy and consequently, none of the unions actually succeed ex-post in securing a better wage-employment tradeoff.

A centralized union, in contrast, cannot pass the price externality arising from high nominal wage demands on to anybody else. Real and product wages move roughly in proportion under centralized bargaining. Further, a centralized union is also likely to internalize the fiscal externalities of

1/ "Insider-power" refers to the capacity of workers to obtain wages above market-clearing wages because of the hiring, firing, and training costs associated with replacing existing workers. The existence of unions serves to enhance the degree of insider-power. For a more detailed discussion of these issues, see Lindbeck and Snower (1988).

2/ A high degree of unionization is not a necessary condition for unions to play a significant role in the wage determination process of the economy. When unions have an important presence in strategic sectors, non-union firms may also offer wages above market-clearing levels as a strategy for keeping unions out.

3/ See Calmfors (1993) for a detailed documentation of the various types of externalities that arise in the course of decentralized wage bargaining.

decentralized bargaining; it cannot pass the burden of funding additional unemployment benefits arising from high wage demands on to other unions. Consequently, the institutional structure of centralized bargaining is intrinsically more conducive for achieving a lower nominal wage inflation than under decentralized bargaining.

However, these arguments do not necessarily constitute a policy recommendation for shifting towards centralized bargaining in the United Kingdom. While centralized bargaining may succeed in moderating the average wage increases in the economy, it simultaneously introduces a number of rigidities at the micro-level, such as denying firms the flexibility to alter relative wages according to changing circumstances. The difficulty of making relative wages adapt to sectoral shocks under centralized bargaining can have a strong adverse impact on productivity. 1/ This discussion suggests that decentralization of wage bargaining, when unions are important players, does not by itself constitute an effective strategy for controlling wage inflation.

Increased product-market competition can, however, offset the propensity for high wage inflation under decentralized bargaining. Consider, for instance, the case when there is perfect competition in the product markets. Then, prices are given exogenously to each firm. Under these circumstances, the price externality ceases to be operational under decentralized bargaining. No single union can secure a better inflation-unemployment tradeoff for its members by acting unilaterally because real wages will increase at the same rate as product wages when all prices are given exogenously. An important policy implication which follows is that high wage inflation under decentralized bargaining can be curbed by increasing effective product-market competition through a more liberal trade policy. 2/

There is, nevertheless, one particular circumstance in which high wage demands may arise under decentralized bargaining even where there is adequate competition in the product market. When workers are highly concerned about relative wages, unions may be willing to sustain disproportionate losses in employment by demanding high wages in order to preserve existing or "adequate" wage relativities for their "core" membership. This type of behavior can arise especially when workers' dissatisfaction from being paid less than their reference group is more intense than their

1/ This has been a particular problem in the Swedish economy. See Ramaswamy and Rowthorn (1993) for a discussion of the tradeoff between macro and micro flexibility under different bargaining arrangements.

2/ There is some evidence for this hypothesis in the case of the United Kingdom. On the basis of their analysis of panel data for the period 1982-88, Gregg and Machin (1990) conclude that increased product market competition in the case of unionized firms had a role in decreasing the wage differentials between unionized and non-unionized firms.

satisfaction from being paid more than similarly placed workers. 1/ It is then optimal for unions, given the preference structure of the workers, to trade off higher wages for a disproportionate loss in employment in order to preserve wage relativities. 2/ While it is difficult to estimate empirically the precise extent to which such competitive wage increases contributed to high wage inflation in the United Kingdom, the extensive survey evidence documented in the industrial relations literature does point to its importance. In fact, the survey evidence suggests that the importance given by workers to relative wages seems to often override other concerns that they have about real wages, unemployment, and other factors. 3/

An important policy conclusion emerges from this discussion. Whenever pay comparability, or concern about relative wages, is an important norm of the collective bargaining process in the labor market, changes in wage inflation can be driven solely on the basis of the nature of expectations. For instance, when each union, for whatever reason--including that of rational expectations--expects its reference group to negotiate relatively high wages, it will also demand higher wages, irrespective of the labor market conditions prevailing in that particular sector. Thus, a favorable technology or taste shock in one particular sector may set off high wage demands in other sectors, even when there is no "real" basis for it in terms of the product market criteria. Consequently, when concern about relative wages is a dominant norm of the bargaining process, providing an anchor for expectations formation may have an important role in controlling wage inflation. Such an anchor could be provided either by some form of synchronized or coordinated wage bargaining as in the case of Japan, Germany, and Switzerland, 4/ or be based on the inflation credibility of a monetary authority which has wide-ranging institutional acceptance. The two can, in fact, complement each other in moderating wage inflation.

1/ There is considerable empirical evidence that in practice people evaluate gains and losses in an asymmetric manner. Experimental studies suggest that people dislike losses (both absolute and relative) much more intensely than they like making gains--see Kahneman and Tversky (1979) and Kahneman, Knetsch, and Thaler (1986).

2/ Technically, the importance given by workers to relative wages implies that the utility function of the unions (defined over wages and employment) has a discontinuity. See Bhaskar (1990) and Lee and Pesaran (1993).

3/ In a review of this literature, Brown and Nolan (1988) describe a number of interviews conducted with both workers and shop stewards, where there is an overwhelming concern expressed about the importance of avoiding a decline in their wages relative to that of the reference group with which comparisons are traditionally made. Also see Brown and Sisson (1975).

4/ Soskice (1990) provides a discussion of the institutional structure and the mechanics of synchronized bargaining. The coordination normally takes place through a leading sector or industry taking the lead in setting wage increases, which are based to an extent on considerations of macro viability. Other industries follow this lead as a basis or starting point for their own wage negotiations.

V. Conclusions

This paper has evaluated the labor market reforms launched by the Thatcher government in the early 1980s. The main conclusions are that the reforms succeeded in increasing the growth of manufacturing productivity and improved labor adjustment but did not improve the tradeoff between wage-inflation and unemployment.

The fact that the decline in industrial disputes and reorganization of working practices has contributed in large part to the increase in productivity growth in manufacturing has important implications. It suggests that this source of stimulus for productivity growth is unlikely to continue for much longer; as mentioned earlier, the strike rate in 1992 was the lowest since records began in 1891--and there is little scope for it to decline much further. Further increases in productivity growth may, therefore, have to come from a faster growth of investment in physical capital and improvements in the quality of the British labor force--which currently lags behind the rest of Europe in training.

The improvement in the responsiveness of employment to changes in output suggests that the economy is better able to adjust to shocks, possibly by enhancing the inter-sectoral reallocation of labor. However, the higher cyclical variation of employment may have a negative effect on the formation of long-term relationships in the workplace.

The lack of improvement in the tradeoff between wage inflation and unemployment remains a source of concern. However, the institutional solutions for tackling wage inflation are not straightforward. While decentralized unions are unlikely to produce wage moderation, centralized-wage bargaining is neither institutionally feasible in the United Kingdom nor is it desirable on economic grounds. A possible solution may either be to move closer to the U.S. system--where unions are not very important, or to have coordinated bargaining of the German, Swiss, or Japanese variety. Both solutions suggest the need for further institutional change in the labor market. As the discussion in this paper suggests, the effects of labor market reforms are far more complex than popularly perceived.

Causality Tests

This appendix presents a set of bivariate Granger causality tests for certain variables in the U.K. manufacturing sector. The test procedure involves running the following regression by OLS:

$$X_{1,t} = \alpha + \sum_{i=1}^t \beta_i X_{1,t-i} + \sum_{j=1}^t \gamma_j X_{2,t-j} + \varepsilon_t \quad (A1)$$

The joint significance of the coefficients on the lagged levels of the variable X_2 indicates whether that variable contains significant information about the variable X_1 over and above the information contained in the lagged values of X_1 itself. In the regression results reported in this appendix, eight lags of each variable were included.

The upper panel of Table A1 presents results from tests of a causal relationship between investment and productivity growth in manufacturing. In these regressions, the investment variable was normalized by the level of employment. 1/ The table reports the sum of the lagged coefficients on the investment variable and the joint significance of these lag coefficients (a smaller value indicates greater significance). Over the period 1960-79, the level of investment has a significant positive effect on productivity growth. However, over the full sample, investment does not appear to Granger cause productivity growth in manufacturing. This result is echoed for the period 1980:1-1993:1 when the sum of the coefficients on lagged investment is essentially zero.

The lower panel of Table A1 tests for Granger causality between strike activity and manufacturing productivity growth. Over the full sample, an increase in strike activity does appear to have a significant negative effect on productivity growth. Strike activity does not Granger cause productivity growth in the 1960:1-1979:4 period but does have a causal effect on productivity growth in the post-1980 period.

We interpret these results as providing added evidence for the hypothesis that the reduction in strike activity was an important contributor to the increase in manufacturing productivity growth after 1980. 2/

1/ Normalizing by the level of output did not have much impact on the results.

2/ Fortunately, there was no evidence of reverse causality from productivity growth to the other variables.

Table A1. United Kingdom: Granger Causality Tests

	1960:1-1993:1	1960:1-1979:4	1980:1-1993:1
Does investment cause productivity growth	0.0002 (0.219)	0.0012 (0.024)	-0.0001 (0.258)
Does strike activity cause productivity growth	-0.0000 (0.033)	-0.0002 (0.540)	-0.0003 (0.079)

Notes: The coefficients reported in this table are the sums of the lagged coefficients on investment (upper level) and strike activity (lower level). The joint significance level of these lagged coefficients is in parentheses (smaller values indicate greater significance).

References

- Abraham, Katharine G., and Susan N. Houseman, "Does Employment Protection Inhibit Labor Market Flexibility? Lessons from Germany, France, and Belgium," W.E. Upjohn Institute Working Paper 93-16 (Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research, May 1993).
- Bean, Charles, and James Symons, "Ten Years of Mrs. T.," *National Bureau of Economic Research Macroeconomics Annual* (Cambridge, MA: MIT Press, 1989).
- Bhaskar, V., "Wage Relativities and the Natural Range of Unemployment," *Economic Journal*, Vol. 100, Supplement (1990).
- Blanchard, Olivier, and Lawrence Summers, "Hysteresis and the European Unemployment Problem," *National Bureau of Economic Research Macroeconomics Annual* (Cambridge, MA: MIT Press, 1986).
- Brown, W., and P. Nolan, "Wages and Labor Productivity: The Contribution of the Industrial Relations Literature to the Understanding of Pay Determination," *British Journal of Industrial Relations*, Vol xxvi, No. 3 (November 1988).
- Brown, W., and K. Sisson, "The Use of Comparisons in Workplace Wage Determination," *British Journal of Industrial Relations*, Vol. xiii, No. 1 (1975).
- Brown, W., and S. Wadhwani, "The Economic Effects of Industrial Relations Legislation Since 1979," *The National Institute Economic Review*, No. 131 (February 1990).
- Calmfors, Lars, "Centralization of Wage Bargaining and Macroeconomic Performance: A Survey," Seminar Paper No. 536, Institute for International Economic Studies, Stockholm, (April 1993).
- Gregg, P., and S. Machin, "Unions, The Demise of the Closed Shop and Wage Growth in the 1980s," National Institute of Economic and Social Research, Discussion Paper No. 195.
- Hart, Oliver, "Bargaining and Strikes," *Quarterly Journal of Economics*, Vol. civ, Issue 1 (February 1989).
- Kahneman, D., J. Knetsch, and R. Thaler, "Fairness as a Constraint on Profit-Seeking: Entitlements in the Market," *American Economic Review*, Vol. 76, No. 4 (September 1986).
- Kahneman, D., and A. Tversky, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica*, Vol. 47, No. 2 (March 1979).

- Layard, P.R.G., and S.J. Nickell, "The Thatcher Miracle," *American Economic Review*, Papers and Proceedings (May 1989).
- Layard, Richard, Stephen Nickell, and Richard Jackman, *Unemployment: Macroeconomic Performance and the Labor Market*, (Oxford: Oxford University Press, 1991).
- Lee, Kevin, and Hashem M. Pesaran, "The Role of Sectoral Interaction in Wage Determination in the U.K. Economy," *Economic Journal*, Vol. 103, No. 416, (January 1993).
- Lindbeck, Assar, and Dennis Snower, *The Insider-Outsider Theory of Employment and Unemployment* (Cambridge, MA: MIT Press, 1988).
- Mayhew, Ken, "The Assessment: The UK Labor Market in the 1980s," *Oxford Review of Economic Policy*, Vol. 7, No. 1 (Spring 1991).
- Metcalf, David, "British Unions: Dissolution or Resurgence?," *Oxford Review of Economic Policy*, Vol. 7, No. 1 (Spring 1991).
- Nickell, Stephen, "Why is Wage Inflation in Britain So High?" *Oxford Bulletin of Economics and Statistics*, Vol. 49, No. 1 (February 1987).
- Olson, Mancur, *The Rise and Decline of Nations: Economic Growth, Stagflation and Social Rigidities*, (New Haven, CT: Yale University Press, 1980).
- Organization for Economic Cooperation and Development, *Flexibility in the Labor Market: The Current Debate* (1976).
- Purcell, John, "The Rediscovery of Management Prerogative: The Management of Labor Relations in the 1980s," *Oxford Review of Economic Policy*, Vol. 7, No. 1, (Spring 1991).
- Quiggin, John, "Testing the Implications of the Olson Hypothesis," *Economica*, 59, No. 235 (August 1992).
- Ramaswamy, Ramana, and Robert Rowthorn, "Efficiency Wages and Wage Dispersion," *Economica*, Vol. 87, No. 2 (November 1991).
- Ramaswamy, Ramana, and Robert Rowthorn, "Centralized Bargaining, Efficiency Wages and Flexibility," IMF Working Paper 93/25 (Washington: International Monetary Fund, March 1993).
- Soskice, David, "Wage Determination: The Changing Role of Institutions in Advanced Industrialized Countries," *Oxford Review of Economic Policy*, Vol. 6 (1990).