

Union Retreat and Regional Economic Performance: the UK in the 1990s

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Abstract

This paper uses a panel of regional data to investigate the impact that the well-documented decline in trade unionism in the UK had on the economic performance of its regions. The analysis employed here departs from the traditional firm-level and cross-sectional analyses and looks at the economy-wide effects of unionism. Our findings provide evidence in line with theory that predicts unions to increase wages and reduce labour demand, leading to higher unemployment, but they also indicate that unionism is positively related to productivity and incomes, although in all cases the effects are non-linear. We conclude that unionism is not necessarily a burden for the economy, so long that the beneficial wage/productivity effects overbalance the negative effects on employment.

JEL classification: J51, R11, R23

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1. Introduction

Trade union membership in the UK has followed a remarkably stable declining path over the last two decades, a trend that was only recently halted (Metcalf, 2001). This decline was quite robust across different individual and workplace characteristics, including education, gender, industry and location (Bland, 1999). This so-called *union retreat* (Martin et al., 1996) has largely been welcomed by both policy-makers and academia. As unions are expected to impact adversely on labour effort and productivity, increase labour costs, and generate wage-inflation and unemployment, the decline in union membership has been taken to create a potential for enhanced flexibility and improved economic performance.

However, the empirics of the economic impact of unionism are not fully consistent with such a view. The voluminous empirical literature on the economic and labour market effects of trade unionism provides robust evidence for the wage-increasing role of unions, but reaches less clear conclusions regarding their impact on productivity, employment and investment.¹ Some studies have found unionism to have a positive impact on investment (Machin and Wadhwani, 1989) and productivity (Brown and Medoff, 1978; Nickell et al., 1989, 1991). Other studies, though, have reported a significant negative impact on output (DeFina, 1983), output growth (Nickell and Layard, 1998), employment growth (Blanchflower and Oswald, 1988), productivity (Clark, 1984; Lovell et al., 1988) and profitability

¹ A number of firm- and industry-level studies have shown that unions are associated with higher wages, especially for the lower tail of the wage distribution (Blanchflower, 1986; Freeman, 1980, 1991; Card, 1991; Blackaby and Murphy, 1991; Gosling and Manning, 1993). Also very robust are the findings about the effect of unions on wage inequalities. However, as the focus of this paper is on regional macroeconomic performance, we do not discuss this issue further.

(Freeman, 1983; Machin, 1991). The results obtained for the employment effects of unionism are equally diverse (Minford, 1982; Sinclair, 1987; Nickell and Wadhvani, 1988; Blanchflower and Millward, 1988), while more aggregate studies have also obtained inconclusive results (OECD, 1997; Nickell and Layard, 1998).

A plausible explanation for the existence of conflicting findings in the empirical literature can be found in the selection of the unit of analysis. More often than not cross-sectional firm-level studies find non-unionised firms to grow faster than their unionised counterparts (e.g., Blanchflower and Millward, 1988). In contrast, time-series and panel-data studies frequently observe insignificant or positive employment effects for unions (e.g., Nickel et al., 1989). Naturally, an explanation that could reconcile these findings would probably acknowledge that it is possible for a union to suppress employment in unionised firms but for unionism to have differentiated effects at the economy-wide level and over a period of time, plausibly by increasing economic dynamism.² Related to that, is the theoretical assertion that although in a perfect competition framework unions are a burden to the economy, once monopoly power and internal labour markets are allowed for, unions can be shown to improve economic performance thus constituting a second-best response to an imperfect world (Mayhew, 1983; Booth, 1991; Green et al., 1996; Booth and Chatterji, 1998; Amable and Gatti, 2001; Bassanini and Ernst, 2002). Thus, firm-level studies focusing on competitive sectors of the economy can plausibly observe different mechanics than those identified at the larger scale where market imperfections are more evident.

² This line of argument is similar to that regarding the employment effects of capital formation. At the firm level, physical investment is often found to induce some capital-labour substitution. However, at the economy-wide level investment is the main determinant of output growth and thus also employment growth.

In fact, the idea that unionism can have both positive and adverse effects in the economy has long been recognised in the relevant literature. In their influential work, Freeman and Medoff (1984) identified two faces for unionism, one related to wage increases and labour input rigidities, and another related to higher organisational efficiency, lower labour turnover (see also Miller and Mulvey, 1993) and more investment in physical and human capital.

This paper investigates empirically the impact that declining union membership in the UK and its regions had on regional economic performance in the 1990s.³ We adopt a macroeconomic perspective in order to examine the economy-wide union effects. The use of the region as the unit of analysis allows us to combine this macroeconomic perspective with the examination of a relatively homogenous set of (regional) economies for a short -and thus relatively homogenous- period (the 1990s). The question we ask is: to what extent has trade union density had an impact on regional economic performance during the period of sharp decline in unionisation rates? Further, we investigate whether this impact was regionally uneven and whether it helped reduce regional disparities. For the first question we examine the possibility of both linear and non-linear (concentration) effects.⁴ For the second, the focus is on the possible presence of spatial autocorrelation, which would indicate that a mechanism of spatial heterogeneity or of spatial dependence is in operation (Anselin, 1988). The next section reviews the

³ The empirical analysis uses a panel of regional UK data for the period 1989-1998. Data availability was the factor determining the time-span of the study, as regional data on union densities are only available for these years, with the exception of the estimates for 1980 and 1984 based on the Workplace Industrial Relations Surveys which are not, however, regionally representative. Three other potential sources of information (Certification Office, TUC and DTI) were also unable to help, despite efforts from some of their staff, for which I am thankful.

⁴ We also examined the role of *changes* in unionism for regional economic performance, but this was always insignificant. Thus, our empirical analysis focuses solely on the levels of union density.

regional evolutions that characterised the UK during this period. Section 3 makes some brief theoretical considerations, while section 4 presents the empirical investigation and discusses the obtained results. The last section concludes.

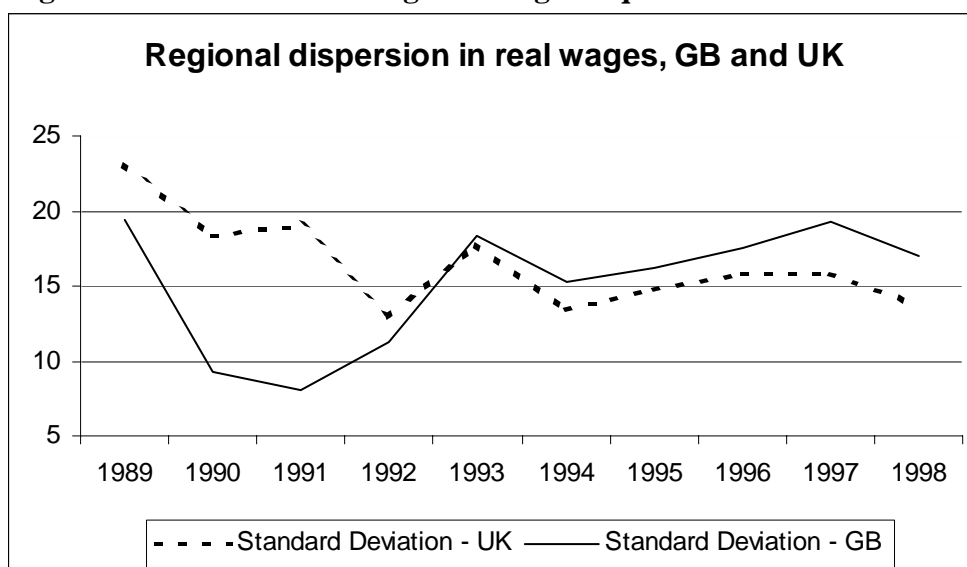
2. The UK regions in the 1990s

The 1990s saw a substantial decline in cross regional differences in unemployment rates, which can only partly be explained by the national trend of declining unemployment after 1993. Despite the well-documented regional persistence in unemployment in the UK (Martin, 1997), regional dispersions nearly halved between 1989 and 1998. In the same period, regional differences in employment opportunities (as measured by the employment-to-population ratio) declined by around 25%. Employment growth rates were more or less the same at the start and the end of the period of study, but between 1991 and 1994 all British regions experienced net job losses as a result of the economic recession of the early 1990s. On the other hand, real wages increased throughout the period in all regions and so did labour productivity. However, in contrast with the evolution of regional unemployment differentials, regional wages did not exhibit strong signs of convergence, while regional dispersions in productivity widened. In nominal terms, regional wage differentials increased substantially (Cabinet Office, 1999). Nevertheless, in real terms (i.e., when deflated by a regional price index⁵), regional real wages in the British regions have been rather stable, with the exception of the

⁵ We use a two-dimensional regional price index, derived from survey data collected by the Reward Group Ltd. The same index has been used in Duranton and Monastiriotis (2002), while the same data source has been used previously by Borooah et al. (1996).

period 1989-1993.⁶ However, when looking at UK data, this pattern is masked by the fact that wages in N. Ireland have been catching up with the rest of the country throughout the period (Figure 1).

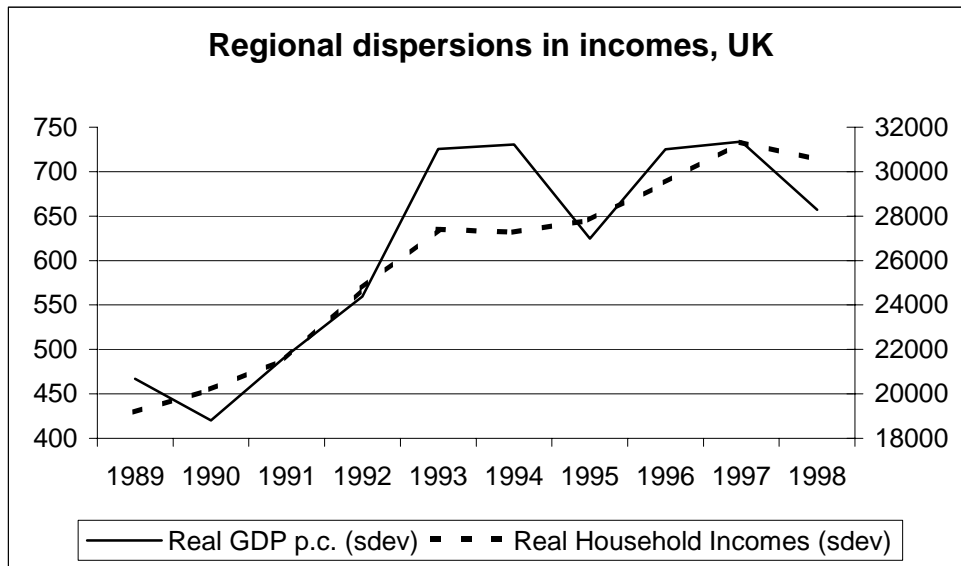
Figure 1: The evolution of regional wage inequalities in Britain and the UK



As with wages, real regional household incomes (per head) and gross per capita product increased substantially, by an average annual rate of 3.9% and 3.1%, respectively. Nevertheless, regional average annual growth rates of gross per capita products varied from 1.8% in Scotland to 4.7% in the South East (excluding Greater London). The corresponding figures for regional growth in household incomes were 1.7% (Scotland) and 6.2% (Greater London). Consequently, regional inequalities increased remarkably throughout the 1990s. The standard deviation for the two measures of regional incomes was increasing by an average annual rate of more than 5% in the 10 years of our study (Figure 2).

⁶ There is a strong reduction in regional wage dispersions in 1989-1991 -which is mainly due to the recession that hit particularly the service sector in the southern regions (Martin, 1993)- and then a sharp increase in 1991-1993.

Figure 2: The evolution of regional income inequalities in the UK



Trade union densities kept decreasing throughout the period of our study in all regions. This decrease was even more dramatic than in the 1980s, as national trade union density decreased by more than 10 percentage points, representing a remarkable absolute decline in union membership. Nevertheless, the regional pictures of union retreat are not identical (for a more detailed analysis on that, see Martin et al., 1996). Regional union density rates of decline vary from a “low” 1.8% p.a. in Wales and East Anglia to a “high” 3% p.a. in the Midlands. Moreover, the regional patterns of union decline show some -unexpected- randomness. Union retreat is not faster in high- (or low-) union density regions, is not related to the regional level of economic development and is not specific to declining (or growing) regions.⁷ Table 1 presents correlation coefficients and significance levels for the estimated correlations between regional union density decline and (i) the 1989

⁷ However, two of the poorest regions in the UK (N. Ireland and Wales) had the higher union densities and the slowest rates of union decline.

regional union densities, (ii) the 1989 level of real regional GDP per capita, and (iii) the 1989-1998 average annual growth rates of real regional GDP per capita.

Table 1: Union density decline and regional characteristics (UK)

Regional Characteristics	Correlation with rate of decline in union density	
	Correlation	Significance
Union density in 1989	-0.214	0.505
GDP per capita in 1989	-0.310	0.317
GDP growth 1989-1998	0.170	0.597

To summarise, the regional and national economic performance of the UK in the 1990s (effectively, after the recession at the beginning of this period) was rather satisfactory. Unemployment rates declined everywhere, while wages, incomes and productivity increased fast. However, this good economic performance was not evenly distributed across the regions. Although regional differences in employment and unemployment rates declined substantially, regional dispersions in incomes and productivity widened. These movements of convergence in measures of employment and divergence in measures of incomes reveal a picture of regional heterogeneity in economic performance. As the regional evolutions of union decline were similarly heterogeneous, it is interesting to ask to what extent the latter can contribute to the explanation of the identified regional heterogeneity in economic performance. Our empirical analysis of this issue follows after a few theoretical considerations, presented in the next section.

3. The impact of unionism on economic outcomes

In our analysis we view unionism as a socio-economic phenomenon which, as such, can influence any economic and socio-economic aggregate. Specifically,

unionism can affect or reflect attitudes towards work and employment participation. It can affect labour productivity and effort. Also, it can impact on labour demand and investment decisions from the side of the firm. Thus, unionism can be expected to be statistically associated with a large range of economic variables, like productivity, wages, household incomes, employment participation, employment and output growth, and investment.

The literature on the economics of unions does not provide a general equilibrium model that could capture the multiplicity of the effects that unionism can have on the economy. Rather, a number of micro-economic models exist that describe different aspects of these effects, mainly those related to productivity, wages and employment. Moreover, aggregate studies examining the union effects on these and other economic indicators (i.e., growth rates, investment, education levels and unemployment) rarely employ structural models, usually because of their cross-country focus and problems related to sample size (see for example Koedijk and Kremers, 1996; OECD, 1997; Nickell and Layard, 1998).

The most popular attempt to formally model the relationship between unionism and output or productivity originates from the work of Brown and Medoff (1978). In their production-function approach, unionism enters as a control variable for the productivity differences among unionised and non-unionised workers (see Monastiriotis, 2002, for a discussion of alternative production-function models of unionism). Although such a model can be used to derive a union-augmented labour demand, it is rather standard in the literature to investigate the employment effects of unionism by assuming that labour demand depends on workers' effort, which is in turn a function of union membership (see Machin and Wadhwani, 1991). Finally,

the union effects on wages are typically modelled by including union status as an exogenous variable in a Mincer (1974) type wage equation.

In this study we look at a large number of variables, in order to obtain as wide a picture as possible of the economic impact of unionism. We focus on productivity and unemployment, which are the two major areas where unionism is expected to have an impact, but we also examine the empirical relationship between unionism and wages, household incomes, output, employment participation, investment, and employment and output growth. By looking at such a large number of variables it is possible to make some inferences regarding the socio-economic mechanisms that underlie identified effects. For example, if unions are found to increase wages, one has to look further and investigate the impact that unions have on labour productivity, as well as on employment. If productivity and employment decline with unionism, the wage-increasing effect must be due to the bargaining power of unions. On the other hand, if employment and productivity expand together with unionism, then one would have to conclude that the productivity increases are more likely to be the direct union effect and that the wage increase is simply a (positive) side-effect.⁸

In a study similar to ours (which is to our knowledge the only aggregate panel-data study conducted at a regional level to date), Freeman (1988) examines the impact of unionism on incomes, output and employment (for US states), in order to estimate its wider economic effects. His analysis does not employ a structural model of the economy. Rather, simple regressions are used to associate unionism

⁸ An alternative explanation would be that unions generate some type of efficiency wages from which productivity increases follow. However, this would conflict with a possible positive employment effect.

with the three economic indicators, only controlling for fixed regional effects and the level of wages. Freeman (1988) suggests that the latter proxy for general economic conditions potentially corrects any omitted variables problems.⁹

Our analysis follows that of Freeman (1988) and examines the impact that the declining unionisation rates in the UK had on its regional economic performance. We avoid specifying a structural model for the economy. Instead, we select two empirical models for productivity and unemployment, controlling for fixed effects as dictated by the appropriate specification tests and the fact that we use a panel of cross-regional and time-series data. As the early 1990s were characterised by a small recession, while the late 1990s was a period of relative expansion, we also include time dummies (time-specific effects) where appropriate. To produce some results directly comparable to Freeman (1988), but also to check the robustness of our results, in section 4.3 we regress each economic variable on unionism and real wages, without adding any further controls.

Before closing this section, some econometric specification issues must also be considered. Often in panel data analyses, where one needs to control for spatial and time fixed effects, a two-way demeaning is applied to the estimating models.¹⁰

⁹ He also notes that the inclusion of real wages can additionally give information about “possible causal relations, as unions can be expected to affect unemployment, per capita income and employment largely through earnings” (p.710).

¹⁰ The procedure is as follows. Assume that unemployment (U) is made a function of unionism (T), wages (W), a vector of country-specific (constant-across-space) variables (X ; e.g., national unemployment and inflation rates, or national measures of international competitiveness) and a vector of region-specific (constant-over-time) variables (Z ; e.g., distance from the Capital, average temperatures, road and rail networks). Assuming a log-linear specification, then, yields

$$U_{it} = a + bT_{it} + cX_i + dZ_i + eW_{it} + \varepsilon_{it} \quad (1)$$

Aggregating over time (U_t), then across space (U_i) and finally across the whole sample (U : global mean) and then calculating $U_{it} - U_t - U_i + U$ yields

$$(U_{it} - U_t - U_i + U) = b(T_{it} - T_t - T_i + T) + e(W_{it} - W_t - W_i + W) + (\varepsilon_{it} - \varepsilon_t - \varepsilon_i + \varepsilon) \quad (2)$$

As long as one is only interested in the value of b in the original relationship, estimating (2) instead of (1) saves a significant number of degrees of freedom and also technically eliminates other possible econometric problems.

This transformation is crucial, especially when one of the two dimensions of the panel is particularly small, as it economises significantly on degrees of freedom and helps avoid possible specification problems (Baltagi, 1995). It is moreover necessary when constant-over-time or constant-across-space variables are included in the model, as such variables will be perfectly collinear with the fixed effects.

In our empirical analysis none of these considerations raise any problems. Our panel is close-to-square ($N=12$, $T=10$) and our estimating models do not include national or fixed-over-time regressors. More importantly, rather than imposing a two-way error component specification (spatial and temporal fixed effects) as would be the case in using the de-meaning transformation, we wanted to test for the presence of (fixed or random) temporal and regional effects. To do this, consistently with standard panel data analysis techniques, we employed the Breusch-Pagan and Hausman specification tests (testing for the existence of random region-specific effects versus no effects at all, and versus fixed regional effects, respectively). To test for the existence of time-specific effects as well as for the simultaneous existence of regional and time-specific effects, we conducted a number of F-tests for omitted variables.¹¹ Following this exploratory analysis, our final estimating models were specified as two-way error component models, that we estimated with dummy variables least squares (DVLS). This is equivalent to the two-way de-meaned specification, but allows direct estimation of the fixed effects and assessment of their significance.

¹¹ We do not report the process of model specification here, as this would only complicate the presentation of the results. All the relevant tests, however, are available by the author upon request.

4. Empirical findings

4.1. *Unionism and productivity*

For productivity, the original model we specify uses a number of variables that control for the business cycle, the gender, sectoral and occupational composition of employment, the level of human capital, and the dynamism of each regional economy. In particular, the original model includes the regional unemployment rate, the female labour force participation rate, the share of manufacturing and business services (banking and finance) to total regional employment, the share of professionals and managers in total employment, the net-immigration rate and a measure of within-regions wage inequalities.¹²

Unemployment controls for the business cycle but also for the possibility that, in an effort/threat rationale, productivity should increase when the probability of falling into unemployment increases. The employment composition variables (for gender, sectors and occupations) should control for possible differences in productivity across the different employment categories. The net immigration rate should capture some of the effect on productivity that could be due to the economic dynamism of each region. Finally, the level of wage inequalities could indicate the existence of premiums in the wage structure in each regional economy. The results from this regression are shown in the first column of Table 2. Despite the non-theoretical structure of the model, the regression performs reasonably well. Non-normality of the residuals and misspecification (RESET test) are both rejected at the 1% level, while heteroskedasticity is clearly not a problem. All coefficients have the

¹² We also experimented with the average years of schooling of full-time employees, but this variable was always highly insignificant and was thus excluded from the analysis. All data used have been obtained from the *Regional Trends* publications (ONS).

expected signs, with unemployment and immigration being strongly and positively associated with labour productivity. Manufacturing and, to a lesser extent, banking are also significant in explaining regional productivity levels, while female labour force participation is found to have a negative effect, albeit marginally insignificant. Wage inequality and professional employment are not significant and for the latter the obtained coefficient is counter-intuitive. However, many of the effects that could be attributed to these two variables could be captured by the regional and temporal fixed effects, or by the other employment composition variables, so that their poor performance is not necessarily a problem.

With this reasonable specification for productivity, the next step is to introduce the unionisation variable into the model. As stated earlier, we want to test the impact of unionism on productivity, but also investigate the possibility of non-linearities in this relationship, which could be due either to a concentration or to a spatial spill-over mechanism. The inclusion of the union density rate into the model changes little the results obtained for the control variables and the overall performance of the model. The estimated impact of unionism is positive, but significant only at the 10% level. The positive relationship between unionisation and labour productivity can be taken to support the approaches suggesting an efficiency-enhancing role for unions (see in this respect Sengenberger and Campbell, 1994), but it could also be due to a logistic effect where productivity increases are the artefact of the wage-increasing effect of unions (see on that Reynolds, 1986).

Table 2: Unionism and productivity

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Unemployment rate	0.949 (12.87)	0.901 (11.71)	0.742 (9.37)	0.194 (2.39)	0.789 (9.58)	0.724 (8.91)	0.193 (2.37)
Immigration rate	68.99 (2.80)	76.30 (3.10)	94.42 (4.13)	39.05 (2.25)	71.59 (3.03)	89.99 (3.86)	40.69 (2.33)
Manufacturing	28.11 (2.98)	23.82 (2.48)	33.63 (3.72)	9.761 (1.41)	18.37 (1.97)	30.16 (3.12)	11.54 (1.60)
Banking-finance	16.27 (2.00)	15.27 (1.90)	-3.128 (-0.37)	-9.877 (-1.62)	9.727 (1.23)	-2.465 (-0.29)	-10.50 (-1.71)
Female LF rate	-27.03 (-1.63)	-21.25 (-1.28)	-24.33 (-1.60)	-13.57 (-1.24)	-24.33 (-1.53)	-25.02 (-1.64)	-12.82 (-1.17)
Professionals	-1.113 (-0.63)	-1.040 (-0.59)	-1.048 (-0.65)	1.294 (1.11)	0.014 (0.01)	-0.656 (-0.40)	1.084 (0.91)
Wage inequality	1.964 (1.17)	2.521 (1.50)	2.493 (1.63)	0.750 (0.68)	2.967 (1.84)	2.663 (1.73)	0.589 (0.52)
Union density		8.899 (1.87)	-54.44 (-3.60)	-16.32 (-1.41)	18.754 (3.36)	-41.42 (-2.08)	-24.30 (-1.69)
Union density squared			76.23 (4.37)	20.57 (1.49)		64.96 (3.13)	26.91 (1.75)
Spatial lag of unionism					159.4 (3.06)	59.15 (1.00)	-40.66 (-0.93)
Real wage				0.052 (9.36)			0.053 (9.29)
Regional effects*	14.09 <i>0.000</i>	12.90 <i>0.000</i>	12.77 <i>0.000</i>	18.37 <i>0.000</i>	14.94 <i>0.000</i>	12.60 <i>0.000</i>	18.07 <i>0.000</i>
Temporal effects*	54.72 <i>0.000</i>	43.97 <i>0.000</i>	39.99 <i>0.000</i>	6.100 <i>0.000</i>	15.91 <i>0.000</i>	11.93 <i>0.000</i>	5.68 <i>0.000</i>
R-squared	0.960	0.962	0.969	0.984	0.966	0.969	0.984
Normality	5.51 <i>0.064</i>	5.48 <i>0.064</i>	4.28 <i>0.118</i>	1.54 <i>0.463</i>	3.33 <i>0.189</i>	3.43 <i>0.180</i>	2.06 <i>0.357</i>
Heteroskedasticity	1.21 <i>0.270</i>	2.00 <i>0.158</i>	0.15 <i>0.701</i>	12.57 <i>0.000</i>	3.46 <i>0.063</i>	0.47 <i>0.493</i>	11.72 <i>0.001</i>
Ramsey	3.51 <i>0.019</i>	3.86 <i>0.012</i>	0.27 <i>0.849</i>	1.04 <i>0.380</i>	2.39 <i>0.075</i>	0.16 <i>0.920</i>	1.22 <i>0.308</i>

Notes: t-statistics in parentheses. Figures in *Italics* show significance levels. *: this is an F-test for the joint significance of the fixed effects. The test for normality is a joint chi-square test for skewness and kurtosis. The test for heteroskedasticity is the Cook-Weisberg chi-square test. Ramsey is the RESET F-test for omitted variables. All regressions have been estimated with DVLS. The sample consists of 120 observations, across 12 regions and over 10 years (1989-1998).

To explore this possibility, we alternatively introduce a number of additional measures of unionism in our basic model, as shown in columns 3-7 of Table 2. The inclusion of a squared term for unionism shows that the productivity effects of unionism are non-linear (convex).¹³ The performance of the regression improves

¹³ The combined union effect becomes positive just below the average unionisation rate and increases thereafter.

further and this time both union variables are significant even at the 1%. We then introduce real wages as an additional explanatory variable, to test the possibility that the estimated union effect is due to the union effect on wages (column 4).

The inclusion of real wages into the model generates some heteroskedasticity in the residuals and, as expected, renders some of the control variables insignificant. Further, it reduces the value of the obtained coefficients for unemployment and migration, confirming that both of these variables are directly linked to wages.¹⁴ The most important impact, however, is the reduction in the significance of the union coefficients, which are now statistically not different from zero. This effect is confirmed also when the square of unions is removed from the model (not shown). This result leads us to conclude that the productivity effect of unionism operates through wages and is thus a logistic artefact. However, one cannot exclude the possibility of some direct convex union effects, as the union variables are still significant at the 20% level in the quadratic specification. In any case, such a direct effect cannot be taken to be dominant in any economic sense.

The next step towards the investigation of the productivity effects of unionism is to explore the presence of possible spatial effects. Columns 5 and 6 present a pair of spatially dynamic specifications, the first based on the linear model and the second based on the quadratic specification. As it can be seen, the linear specification produces significant spatial effects which are positive, i.e. in the same direction as the “local” union effect. Although this seems to suggest that unions do produce spatial spill-overs, the results obtained from the quadratic specification indicate that this spatial spill-over disappears when one controls for the non-linear

¹⁴ This, however, does not generate significant collinearity problems in our estimated regressions.

“local” effect. Since the spatial effect disappears in the quadratic specification, one is forced to conclude that its significance in the linear model is only due to a “spatial dependence” effect, where unionism is determined at a wider spatial scale than that of the administrative region. This finding, of course, is as expected and reinforces our confidence on the validity of the results we obtain.

Further, again as expected, the significance of the union effects declines when real wages are included again in the model. This time, however, the local union variables are marginally significant (at 10%), thus indicating that there are marginal (convex) union effects on productivity that cannot be attributed to the wage-increasing role of unions. In this case, the efficiency-enhancing role of unions cannot be rejected. To further examine this possibility, we ran a number of simple regressions for real wages, including unionism and the regional and temporal fixed effects as the short-list of explanatory variables. The results (see Table 4) suggest that unionism has a direct positive effect on wages, but also that part of this effect can be captured by the inclusion of productivity into the model (not shown). Thus, again, the presence of significant productivity effects of unionism cannot be rejected.

4.2. Unionism and unemployment

The next relationship we focus on is the impact of unionism on unemployment. As with productivity, we prefer an empirical specification in order to avoid data related problems arising from the regional structure of the data. Again, we include regional and temporal fixed effects, which control for unspecified constant-across-space and constant-over-time factors. As was the case with the

productivity regressions, this specification is strongly supported by the appropriate tests. Unemployment is made a function of the employment-to-population ratio, which acts as a proxy for contemporaneous labour demand conditions. Additionally, a number of variables controlling for the sectoral, occupational and gender structure of the labour force, as well as for the economic dynamism of each region, are introduced. These variables include the share of professionals to total employment, the employment shares of manufacturing and business services, the female labour force participation rate and the net immigration rate. Table 3 presents the results from the basic regression (first column) and from the specifications where unionisation variables are also introduced into the model.

The basic regression performs reasonably well, with no indication of misspecification problems at the 1% level. The labour demand and economic dynamism variables are highly significant and have the correct signs, while the most significant among the employment composition variables are those controlling for sectoral employment shares. The introduction of the union density variable (second column) changes little the results obtained previously. The overall performance of the model is now improved and unionism is found to have a positive impact on unemployment (significant at 10%).

Next, we examine the presence of non-linearities in the unemployment-unionism relationship. Column 3 in Table 3 presents the results from the model where unionism enters in a quadratic form. As it can be seen, the convex unionism effect found earlier for the case of productivity is also found here. However, the performance of the model is not significantly improved while the errors now become heteroskedastic. When real wages are plugged into the model (column 4),

the significance of the unionisation variables drops remarkably and this is true also in the case of the linear specification (results not shown). Wages are directly related to unemployment and clearly they are the vehicle via which unionism impacts on unemployment. We conclude that unionism does not affect labour demand and employment directly, but only through its impact on wages.

Table 3: Unionism and unemployment

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Employment-to-population	-89.01 (-11.68)	-85.66 (-11.10)	-76.25 (-9.94)	-46.54 (-5.86)	-77.65 (-10.08)	-74.68 (-9.71)	-46.56 (-5.82)
Immigration rate	-51.43 (-2.26)	-43.34 (-1.90)	-25.08 (-1.14)	-47.20 (-2.53)	-44.20 (-2.04)	-30.95 (-1.40)	-47.31 (-2.50)
Manufacturing	-16.54 (-1.96)	-19.38 (-2.29)	-9.709 (-1.16)	-22.12 (-3.05)	-22.02 (-2.73)	-14.01 (-1.60)	-22.22 (-2.94)
Banking-finance	-12.71 (-1.73)	-13.66 (-1.88)	-25.78 (-3.41)	-19.99 (-3.13)	-17.94 (-2.56)	-24.51 (-3.25)	-19.96 (-3.10)
Female LF rate	21.18 (1.38)	25.45 (1.66)	20.34 (1.41)	19.65 (1.62)	19.92 (1.36)	18.84 (1.31)	19.61 (1.61)
Professionals	1.814 (1.12)	1.848 (1.16)	1.616 (1.08)	2.433 (1.93)	2.671 (1.74)	2.133 (1.40)	2.445 (1.89)
Union density		8.005 (1.90)	-40.12 (-2.95)	-3.277 (-0.26)	16.13 (3.44)	-21.45 (-1.17)	-2.841 (-0.18)
Union density squared			56.67 (3.70)	4.366 (0.29)		39.89 (2.11)	4.015 (0.24)
Spatial lag of unionism					148.97 (3.35)	81.07 (1.49)	2.227 (0.05)
Real wage				0.032 (6.34)			0.032 (6.05)
Regional effects*	13.06 <i>0.000</i>	13.72 <i>0.000</i>	16.23 <i>0.000</i>	19.66 <i>0.000</i>	6.35 <i>0.000</i>	5.28 <i>0.000</i>	6.60 <i>0.000</i>
Temporal effects*	37.27 <i>0.000</i>	16.65 <i>0.000</i>	19.96 <i>0.000</i>	33.01 <i>0.000</i>	9.60 <i>0.000</i>	10.45 <i>0.000</i>	11.80 <i>0.000</i>
R-squared	0.964	0.966	0.970	0.979	0.970	0.971	0.979
Normality	1.17 <i>0.558</i>	2.06 <i>0.356</i>	2.38 <i>0.304</i>	0.25 <i>0.880</i>	4.64 <i>0.098</i>	3.87 <i>0.144</i>	0.26 <i>0.876</i>
Heteroskedasticity	2.10 <i>0.147</i>	4.53 <i>0.033</i>	14.80 <i>0.000</i>	9.79 <i>0.002</i>	12.30 <i>0.001</i>	16.43 <i>0.000</i>	9.79 <i>0.002</i>
Ramsey	3.27 <i>0.025</i>	2.76 <i>0.047</i>	4.31 <i>0.007</i>	4.24 <i>0.008</i>	2.79 <i>0.045</i>	3.81 <i>0.013</i>	4.69 <i>0.004</i>

Notes: See notes in Table 2.

The last three columns examine the presence of spatial spill-over effects in the relationship between unionism and unemployment. As it can be seen, the

evidence of a positive spatial spill-over effect is again strong and this time it is not totally removed when the concentration (quadratic) effect is also included. The fact that unionisation can increase unemployment in neighbouring regions points again, as was the case with the productivity regressions, to a spatial dependence effect, although this time the evidence of a spatial spill-over effect on unemployment is stronger. It must be noted, however, that when the “local” average wage is included in the spatially dynamic model (last column), any evidence of a unionisation effect on unemployment disappears, in the same way it does in the spatially static model.

4.3. Robustness and further results

The empirical findings obtained so far suggest that unionism affects the economy largely through its effects on wages. We want to investigate further this mechanism and also check the robustness of the results obtained. For this reason, in this subsection we widen our investigation, examining the relationship between unionism and a wider array of economic variables and allowing only one control variable (real wages) besides the regional and temporal fixed effects. As was the case before, we test again for the possibility of concentration and spatial effects. Tables 4 and 5 present the empirical findings.

As can be seen, for the unemployment and productivity regressions the results are pretty much in line with those obtained from the more complex models. Although for unemployment the residuals are heteroskedastic and not normally distributed, which might suggest possible misspecification, we still find a significant convex union effect and a marginally insignificant spatial effect. The concentration effect dominates over the spatial spill-over effect, while all union effects disappear

when we control for the deflated average regional wage (Table 5). For the productivity regressions heteroskedasticity and non-normality are much less of a problem. Again, unionism is found to have a convex effect and this time the spatial effect is stronger and persists even after controlling for the concentration effect. However, again all of the union effect on productivity disappears when we include real wages in the model.

Table 4: Unionism and the economy (concentration and spatial effects)

Model	Unemployment		Productivity		Investment share		Employment- population ratio	
Union	-61.87 (-3.71)	-39.75 (-1.83)	-80.57 (-4.33)	-37.14 (-1.57)	-0.263 (-1.93)	-0.324 (-1.80)	0.409 (2.62)	0.229 (1.12)
Union squared	89.47 (4.96)	70.15 (3.22)	120.27 (5.97)	82.35 (3.48)	0.326 (2.21)	0.379 (2.11)	-0.606 (-3.58)	-0.449 (-2.19)
Spatial lag of union		111.47 (1.56)		218.79 (2.82)		-0.307 (-0.52)		-0.905 (-1.35)
Regional effects*	21.26 0.000	20.19 0.000	18.31 0.000	18.91 0.000	11.86 0.000	11.54 0.000	40.83 0.000	40.73 0.000
Temporal effects*	66.36 0.000	67.76 0.000	30.80 0.000	21.11 0.000	18.66 0.000	16.36 0.000	21.57 0.000	20.62 0.000
R-squared	0.931	0.933	0.919	0.925	0.888	0.888	0.958	0.959
Normality	15.42 0.000	18.78 0.000	5.65 0.059	9.19 0.010	8.03 0.018	8.10 0.017	5.90 0.052	6.41 0.041
Heterosk.	17.06 0.000	19.31 0.000	0.62 0.432	0.93 0.334	25.57 0.000	23.66 0.000	0.01 0.910	0.63 0.429
Ramsey	3.72 0.014	3.23 0.026	4.06 0.010	10.10 0.000	1.74 0.164	1.75 0.162	2.37 0.076	2.55 0.060

Notes: See notes in Table 2.

Unionism is found to have a non-linear effect on investment (convex), wages (convex) and the employment-to-population ratio (concave).¹⁵ At high values of union density, the effect on investment and wages is positive, while the effect on labour force participation (labour demand) is negative. For average union densities, however, the effect on investment is also negative. Interestingly, the union effect on

¹⁵ The results obtained for the levels of real regional output per capita and household incomes were very similar to those obtained for productivity and are thus not presented here.

investment persists after controlling for wages (which are insignificant, suggesting that investment decisions are not directly linked to labour cost considerations at the regional level), whereas that on labour force participation disappears, as was the case with the productivity and unemployment effects. Finally, there is no evidence of a spatial effect for the cases of investment and labour force participation, while for wages a significant positive spill-over effect is obtained, pointing again to a spatial dependence mechanism (where economic outcomes that are due to unionism are determined in areas wider than that of the administrative region) as opposed to a possible spatial competition effect (spatial heterogeneity).¹⁶

Table 5: Unionism and the economy (wage effects)

Model	Unempl.	Prod/vity	Inv. Share	Emp/pop	Real wage	
Union	-8.131 (-0.59)	-2.607 (-0.26)	-0.333 (-2.20)	-0.038 (-0.27)	-12.12 (-4.79)	-4.12 (-1.33)
Union squared	8.271 (0.51)	2.483 (0.21)	0.432 (2.42)	0.070 (0.42)	18.31 (6.68)	11.32 (3.65)
Spatial lag of union						40.31 (3.97)
Real wage	0.044 (8.91)	0.064 (17.65)	-0.0001 (-1.06)	-0.0004 (-7.29)		
Regional effects*	33.19 <i>0.000</i>	70.97 <i>0.000</i>	9.00 <i>0.000</i>	64.67 <i>0.000</i>	11.76 <i>0.000</i>	16.64 <i>0.000</i>
Temporal effects*	60.48 <i>0.000</i>	7.23 <i>0.000</i>	9.01 <i>0.000</i>	10.47 <i>0.000</i>	42.49 <i>0.000</i>	39.20 <i>0.000</i>
R-squared	0.962	0.981	0.889	0.973	0.924	0.935
Normality	20.15 <i>0.000</i>	1.36 <i>0.505</i>	6.72 <i>0.035</i>	0.68 <i>0.711</i>	6.43 <i>0.040</i>	11.88 <i>0.003</i>
Heterosk.	16.28 <i>0.000</i>	11.30 <i>0.001</i>	20.84 <i>0.000</i>	0.24 <i>0.612</i>	2.97 <i>0.085</i>	1.87 <i>0.171</i>
Ramsey	2.08 <i>0.109</i>	0.62 <i>0.601</i>	2.95 <i>0.037</i>	1.20 <i>0.313</i>	6.01 <i>0.001</i>	6.31 <i>0.001</i>

Notes: See notes in Table 2.

The last set of relationships we looked at was about the possible impact that unionism may have had on regional growth in the UK, examining the relationship

¹⁶ We also experimented with non-linear terms for the spatial lags but these did not change the quality of the results presented in Tables 4 and 5.

between regional union densities and output growth, productivity growth, growth of household incomes, and employment growth. In none of the cases did unionism prove to be significant. Because this result was very consistent across different growth variables, we were forced to conclude that unionism did not affect the growth rates (and, thus, the patterns of regional convergence and divergence) of the UK regions during the 1990s.

5. Conclusions

This paper examined the economic effects of the decline in British union densities at the regional level. Based on a panel of 120 observations, covering a 10-year period for the Standard Statistical Regions of the UK, evidence was obtained suggesting that trade unionism is positively associated with labour productivity, incomes, wages and investment, although it is found to impact adversely on unemployment and labour force participation. These findings are very consistent with the ones derived by Freeman (1988), using a similar specification albeit for a different country and period. The effects of unionism have been found to operate at a scale wider than that of the administrative region and, more importantly, through wages. Moreover, these effects are clearly non-linear. Thus, low levels of unionism are found to be associated with lower levels of investment, productivity and wages, while they seem to have negligible (albeit beneficial) effects on employment. It is only at high union densities that the positive effects on productivity and investment are observed. Finally, the absence of negative spatial spill-overs indicates the absence of spatial competition related to unionism and, thus, that evolutions in the latter do not by themselves generate mechanisms of regional divergence.

Two of these findings have important implications for policy, in light of the recent reversal in the trends of union decline. First, to the extent that policy does not (and should not) rely on unions to achieve improvements in economic performance, it seems that there is an optimal level of unionisation where the economic impact (positive and negative) of unionism is minimised. Very strong unions increase productivity but also unemployment, whereas very weak unions have the opposite effect. The second implication for policy refers to the main mechanism via which unionism impacts on the economy, the wage-increasing role of unions. Although not directly in the hands of policy, this mechanism can be to a large extent controlled by it, mainly through arbitrage and consultations, as it is for example in the Dutch case (see in particular van der Laan, 1993, and Ozaki, 1999). Again, this suggests that maintaining average levels of union power (as proxied by union density) can help avoid the adverse economic effects of both very weak and very strong unions.

A last but very significant observation related to the empirical findings presented here relates to the differences in the effects of unions on investment and employment. Based on these findings, it seems that in high union density regions the need for expansion is met with higher investment in physical capital (and possibly an intensification of the production process), rather than with increased employment. This finding seems to support the view of unions as productivity-enhancing organisations where the presence of a strongly unionised labour force leads to higher investment and efficiency in production.

To summarise, there are three significant findings derived from the present analysis. First, unions impact on the economy mainly through wages. Second, this impact is non-linear, with significant deflating concentration effects. Finally, spatial

dependence does not translate into spatial competition and thus does not enforce regional disparities. For policy, these findings imply that reasonably strong unions are most likely not a burden to the economy. Although unionism cannot be seen as a policy tool for regional development and convergence (especially in terms of employment outcomes), its retreat does not necessarily promote economic prosperity. For theory, the most relevant finding is that related to the non-linearity of the identified effects. It seems that, at least at the economy-wide level, unionism produces differentiated economic outcomes, depending on its degree of concentration. Integrating this observation into the empirical and theoretical analysis of unionism can help us gain a deeper understanding of the economic role of unions and possibly bridge some of the contradictory findings reported in the literature.

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