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**A STUDY IN STRUCTURAL CHANGE: RELATIVE EARNINGS
IN WALES SINCE THE 1970S**

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A Study in Structural Change: Relative Earnings in Wales since the 1970s

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Abstract: The Welsh economy has undergone rapid structural change in recent years. This paper uses data from the New Earnings Survey to examine how earnings in Wales changed relative to those of Great Britain between 1975 and 1994. There are five main findings. First, earnings of workers in Wales have declined relative to those in Great Britain. Second, the shift away from full-time men has been an important factor in the fall in average relative earnings. Third, the decline in the relative earnings of full-time men is mostly explained by falling relative earnings in construction, distribution, and transport, as well as the failure of workers in banking and financial services in Wales to keep up with their counterparts in Great Britain. Fourth, the shift in full-time employment to health, education and other services has tended to support relative earnings. Fifth, the decline in full-time men's earnings seems to be an equilibrium phenomenon that will not naturally reverse itself.

JEL Classifications: C33, E24, J3, R23.

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1. Introduction

The Welsh economy has been in decline for most of the post-War period.¹ There was a particularly harsh burst of structural change in the 1970s and 1980s, during which the coal industry virtually disappeared and employment in the steel industry fell dramatically. Since then, the Welsh economy has diversified into high-technology industries and services and its unemployment rate is close to the UK average.² However, many commentators are concerned that the new flexible Welsh economy is still poor relative to the rest of the UK, with more job insecurity, lower participation rates and large numbers of people on long-term sickness benefits.³ The purpose of this paper is to examine whether this rhetoric is supported by hard evidence, and to discuss the policy implications.⁴

This paper examines the relative performance of the Welsh economy from the perspective of the earnings of those in work. To do so, it draws upon New Earnings Survey data kindly supplied by the Office of National Statistics (see Cameron and Muellbauer, 2001, for further details). This dataset contains data on the gross weekly earnings and numbers of full-time and part-time, men and woman, for the ten regions of Great Britain, by 1 digit industry group for the period 1975 to 1994. The data is based upon a sample of around 140,000 employees conducted in April of each year, with just fewer than 6,000 of those being employed in Wales.⁵

In terms of regional convergence, earnings are arguably the most important indicator of regional success, both because they are the largest component of regional income and because they should reflect the underlying productivity of the workforce. In terms of economic policy, other measures of regional income may also be important, such as personal income, gross domestic product (see Cameron and Muellbauer, 2000, for a discussion of some problems with the UK regional accounts data), or quality of life measures. The great advantage of the dataset used by this paper is that it can be used to examine how changes in relative earnings have been affected by changes in the composition of the workforce, both in terms of types of workers and the industrial structure. This paper does not consider either the fortunes of those outside of employment or the social implications of structural change.

The paper comprises seven sections. The second compares various measures of aggregate regional income, such as GDP per capita and earnings per employee. The third examines whether relative Welsh earnings performance can be explained by shifts between different types of worker, such as the decline of full-time men and the rise of part-time women in the workforce. Having established that the fall in relative earnings of full-time men has been important, the fourth section examines the role played by changes in the industrial composition of full-time men. The fifth section develops a simple dynamic econometric model to examine the steady-state properties of relative Welsh full-time men's earnings. Section six reviews the empirical results. Section seven draws conclusions for policy.

2. Aggregate Patterns

A brief summary of the main structural changes in the Welsh economy follows. First, the proportion of women in the workforce rose from 38 per cent in 1975 to just under 50 per cent in 1994. Second, the proportion of part-timers in the workforce rose from 17 per cent in 1975 to 29 per cent in 1994; four-fifths of these part-timers are women. Third, the proportion of workers in manufacturing fell from 36 per cent in 1975 to 25 per cent in 1994, while the proportion in services rose from 49 per cent in 1975 to 67 per cent in 1994. Fourth, the number of people employed by foreign-owned firms in the manufacturing sector rose from 45,000 in 1981 to 68,000 in 1993, about 30 per cent of Welsh manufacturing employment compared with a GB figure of about 18 per cent. Fifth, the proportion of the workforce who were members of trade unions fell from over 70% in the early 1980s to about 45% in 1993, but remained the highest of any UK region.⁶

Figure 1 presents some aggregate data on Welsh regional income relative to Great Britain. GDP per capita in Wales is consistently low, partly due to its lower participation rate. Turning to the measures of income per employee, Regional Accounts personal income per employee is fairly similar to the GB average, although it shows signs of falling away after 1987. However, this is also a misleading measure of regional earnings since it includes social security payments as well as the activities of non-profit making bodies serving persons (such as unions and churches) and life assurance and pension funds.⁷ Regional Accounts wages

per employee (which are very similar to household wages data) are rather lower and decline significantly during the 1980s.

The most disquieting pattern in Welsh earnings is shown by the New Earnings Survey. In 1975, Welsh earnings were just slightly below the British average. By 1995, they had declined by over 11 percentage points, with most of the fall occurring between 1977 and 1990 and a slight recovery thereafter. In contrast, the Regional Accounts measure of wages is slightly more volatile, begins to fall rather later in the 1980s, and shows less of a trend decline.

3. Shifts between types of worker

Figure 2 examines the NES data in more detail by comparing the earnings of the four types of workers (full-time men, part-time men, full-time women, and part-time women) with their GB counterparts.^{8,9} The figure shows that full-time men, and all women in Wales have seen their relative earnings fall over the period. Although the relative earnings of all workers appears to follow the fortunes of full-time men quite closely, it has often been suggested that the decline in the fortunes of full-time men have adversely affected Wales in particular.

We can examine whether this is true in a number of ways. First, we can construct a decomposition for the change in relative earnings which allows for the changing fortunes of the four types of workers and their changing proportions in employment. If we define relative earnings as

$$(1) \quad \frac{E_t^{ww}}{E_t^{GB}} = \sum_j \omega_j \frac{E_{j,t}^{ww}}{E_t^{GB}} \quad \text{where} \quad \omega_j = \frac{L_{j,t}^{ww}}{L_t^{ww}}$$

where the weights ω_j are equal to the shares of each type of worker in employment, E is gross average weekly earnings and L is employment. Taking the total differential in discrete time, we can express the rate of growth of regional earnings as the sum of two components, 'within' sector growth which is the change in relative earnings in each sector holding

employment shares constant, and 'between' sector growth, which is the change in the employment share of each sector holding relative earnings constant.

$$(2) \quad \Delta \left(\frac{E^{WW}}{E^{GB}} \right) = \sum_j \Delta \left(\frac{E_j^{WW}}{E^{GB}} \right) \omega_{j,t-1} + \sum_j \Delta \omega_j \left(\frac{E_{j,t-1}^{WW}}{E_{t-1}^{GB}} \right)$$

'Within Effect' 'Between Effect'

Table 1 shows the results of just such a decomposition.¹⁰ First, note that full-time men and part-time women suffered a decline in their relative earnings, while part-time men and full-time women experienced a rise. The table also shows that full-time men fell from about two-thirds of the workforce to about one half, with women largely replacing them. The results of the 'within-between' decomposition are startling - the fall in average relative earnings has largely been driven by the fall in full-time male employment.¹¹ The fall in full-time male relative earnings also made a significant contribution, partly offset by the rise in full-time female relative earnings.¹²

Table 1 Within-Between Decomposition for Types of Workers, 1975 to 1994

		Full-Time Men	Part-Time Men	Full-Time Women	Part-Time Women	Total
Within		0.373	-0.008	-0.280	0.012	0.097
Between		1.586	-0.047	-0.385	-0.251	0.903
Total		1.960	-0.056	-0.665	-0.239	1.00
Relative Earnings	1975	1.185	0.283	0.735	0.352	0.998
	1994	1.114	0.367	0.850	0.334	0.889
Employment Share	1975	0.667	0.007	0.236	0.090	1.00
	1994	0.519	0.020	0.291	0.171	1.00

Figure 3 also sheds some light on this issue. It shows three measures of Welsh relative earnings for all workers. First, the actual NES data. Second, relative Welsh earnings as they would be if Wales had GB average earnings in each industry and type of worker but retained the Welsh structure of industries and types of worker. Third, relative Welsh earnings as they would be if Wales had Welsh earnings in each industry and type of worker, but had the GB average structure of industries and workers. Formally, the decomposition is

$$(3) \quad \frac{(E^{ww} - E^{GB})}{E^{GB}} = \underbrace{\sum_j (\omega_j^{ww} - \omega_j^{GB}) \frac{E_j^{GB}}{E^{GB}}}_{\text{Composition}} + \underbrace{\sum_j (E_j^{ww} - E_j^{GB}) \frac{\omega_j^{GB}}{E^{GB}}}_{\text{Earnings}} + \underbrace{\sum_j (\omega_j^{ww} - \omega_j^{GB})(E_j^{ww} - E_j^{GB})}_{\text{Covariance}}$$

and the covariance term is not reported in Figure 3. The decline in the second measure shows that Wales began the period with an advantageous industrial structure - if it had GB average earnings in each industry and type of worker it would have had average earnings above those of the GB. However, this advantage erodes significantly over the period. The decline in the third measure shows that Welsh earnings started the period below GB levels for comparable industries and types of worker and have subsequently declined. This evidence supplements that of the 'within-between' analysis to suggest that the decline in the fortunes of full-time men has been an important factor behind the decline in Welsh relative earnings.

4. The Earnings of Full-Time Men and Women

Turning now to Welsh full-time men, figure 4 repeats the analysis of figure 3 but only considers full-time men. The two alternative measures are now the relative earnings of Welsh full-time men if they had GB average earnings for full-time men but the Welsh industry structure, compared with their relative earnings if they had Welsh earnings but the GB industry structure. Figure 4 shows that Wales initially benefited from an advantageous industrial structure and that this deteriorated over the period, flattening in 1988, but that this was swamped by the large fall in Welsh earnings given GB industry structure.

We can also consider a 'within-between' decomposition for full-time men, similar to that of equation (2) except that the j subscripts now refer to ten industries rather than four types of worker. As table 2 shows, relative earnings fell in every industry except energy and water, with very large falls in distribution, hotels and catering along with transport and communications. These falls in relative earnings were accompanied by significant changes in employment.

What is particularly interesting is that despite large changes in relative employment levels, the net effect of between sector employment shifts is fairly small - accounting for just over one quarter of the fall in total full-time men's relative earnings. Falling relative earnings in three sectors (construction, distribution, and transport) accounted for almost two-thirds of the 'within' effect. Falling employment in energy & water and metals & chemicals dominated the 'between' effect, but was largely offset by rising employment in distribution, banking & financial services, and health, education and other services. Overall, the 'between' effect shows that the shifts in employment were generally towards less well paid sectors.

Table 2 Within-Between Decomposition for Full-Time Men, 1975 to 1994

	Industry (SIC 1980)	Within	Between	Total
Agriculture	0	0.011	0.012	0.023
Energy & Water	1	-0.004	0.784	0.780
Metals and Chemicals	2	0.058	0.937	0.995
Engineering	3	0.080	-0.104	-0.024
Other Manufacturing	4	0.039	-0.241	-0.202
Construction	5	0.115	0.154	0.269
Distribution, Hotels, Catering	6	0.139	-0.316	-0.177
Transport and Communications	7	0.199	0.234	0.433
Banking and Financial Services	8	0.013	-0.387	-0.375
Health, Education, Other Services	9	0.090	-0.813	-0.723
Total		0.740	0.260	1.00
Actual Change		-0.069	-0.029	-0.099
		1975	1994	Change
Level (relative to GB ft men)		0.971	0.873	-0.099

The fate of banking and financial services (industry 8) is especially interesting. At first glance it appears to be a relative success since earnings remained about the same relative to average GB earnings of all full-time men and it increased its share of employment from 5.6 per cent to 12.6 per cent of Welsh full-time men.

However, during the period, full-time men working in banking and financial services in the whole of Great Britain did much better relative to other workers - their relative wages rose from 7 per cent above average to 31 per cent above average. In contrast, Welsh full-time men in banking and financial services saw their wages relative to GB full-time men in banking and financial services fall from 86 per cent of the national average to 71 per cent of the national average.¹³ Therefore, although banking and financial services is the second

highest paid sector for full-time men in Wales, it is the worst paid region relative to banking and financial services in other regions of the UK.

We can use these data to construct the counterfactual - what would have happened to Welsh full-time men's earnings if the banking and financial services sector had remained only 14 per cent below the national average for banking and financial service wages? In which case, the earnings of all Welsh full-time men would have fallen to 88.8 per cent of the GB average rather than the 87.3 per cent actual figure. Note also, that in 1975, banking and financial services represented 3.5 per cent of Welsh ft men's jobs compared with 5.6 per cent in the GB. By 1995, it was 7.3 per cent in Wales and 12.6 per cent in the GB. Therefore, the smaller relative rise in the sector has also penalised Welsh earnings.

Table 3 Within-Between Decomposition for Full-Time Women, 1975 to 1994

	Industry (SIC 1980)	Within	Between	Total
Agriculture	0	0.032	0.090	0.122
Energy & Water	1	-0.001	0.086	0.085
Metals and Chemicals	2	0.068	0.455	0.523
Engineering	3	0.237	0.622	0.859
Other Manufacturing	4	0.143	0.580	0.723
Construction	5	-0.031	0.071	0.040
Distribution, Hotels, Catering	6	0.178	0.518	0.696
Transport and Communications	7	0.010	0.136	0.146
Banking and Financial Services	8	0.019	-0.860	-0.841
Health, Education and Other Services	9	0.680	-2.032	-1.353
Total		1.334	-0.334	1.000
Actual Change		-0.064	0.016	-0.048
Level		1975	1994	Change
		0.967	0.919	-0.048

Turning to full-time women, table 3 shows that although Welsh full-time women improved their earnings relative to all GB workers, they did not do as well as did GB full-time women, so their earnings fell relative to GB full-time women. Once again at this level, the 'within' effect dominates, with big contributions from falling relative earnings in engineering, other manufacturing, distribution, and health, education and other services. The 'between' effect went some way to compensating for falling relative earnings with a striking shift towards banking and financial services and health, education and other services.¹⁴

One further aspect of the 'within-between' decompositions for full-time men and full-time women is that increasing employment in health, education and other services has been such an important factor in maintaining relative earnings in Wales (for full-time men in Wales, this sector has the third highest average earnings and for full-time women it is the best paid sector). Overall, 38.5 per cent of the NES sample of workers in Wales work in this sector, compared with 32.3 per cent in the whole of Great Britain. Moreover, in Wales the proportion of full-time women working in the sector rose from 41.4 per cent in 1975 to 52.1 per cent in 1994, compared with 35.9 per cent of full-time women in Great Britain in 1975, rising to 41.6 per cent in 1994.

5. Steady-State Earnings of Welsh full-time men

Consider a simple model where relative earnings in each region i may grow either as a result of region-specific factors or as a result of *equilibrium-correction* with Great Britain as a whole. Therefore, we can write a dynamic model as follows:

$$(4) \quad \Delta \text{lrme}_{it} = \gamma_i - \alpha_1 \text{lrme}_{it-1} \quad \text{with } \alpha_1 \geq 0$$

where lrme_{it} is the log ratio of full-time men's earnings in region i at time t relative to GB, γ_i parameterizes the rate of region-specific growth relative to Great Britain, and α_1 is the rate at which *equilibrium-correction* occurs. Re-writing equation (4) in terms of the level of relative earnings yields the following first-order difference equation:

$$(5) \quad \text{lrme}_{it} = \gamma_i + (1 - \alpha_1) \text{lrme}_{it-1}$$

from which we may solve for the steady-state level of relative earnings in each region:

$$(6) \quad \text{lrme}_{it}^* = \gamma_i / \alpha_1$$

where, for an initially backward region to remain so in steady-state, we require that $\gamma_i < 0$. In the long run, the model implies that earnings in all regions grow at the same steady-state rate. An important implication of the model is that, after controlling for determinants of steady-state earnings growth, regions with low initial levels should experience the highest

rates of growth of relative earnings. That is, the model implies that 'conditional β -convergence' should be observed across regions.

In this section we draw upon the econometric model of Cameron and Muellbauer (2001) to discuss the steady-state level of relative Welsh full-time men's earnings and its determinants. The dynamic econometric model takes the form:

$$(7) \quad \Delta lrme_{it} = \alpha_i - \alpha_1 lrme_{it-1} + \alpha_{11} \Delta lrme_{it-1} + \alpha_{21} \Delta ru_{it-1} + \alpha_{22} lru_{it-1} \\ + \phi(Z_{it-1}) + \phi(\Delta Z_{it-1})$$

where

$lrme_{it}$ is the log ratio of full-time men's earnings in region i at time t relative to GB;

lru_{it} is the log ratio of unemployment in region i at time t relative to GB;

Δru_{it} is the change in relative unemployment.

The vector Z_{it-1} contains various other variables intended to capture the dynamics and steady-state properties of relative earnings, assumed to be weakly exogenous. These are:

relative long-term unemployment rates;

relative participation rates;

relative full-time women's earnings;

relative house prices;

relative shares of production workers in total workers;

relative shares of banking and financial services workers in total workers;

relative shares of part-time women in total employment of women.

Table 4 reports various results of estimating equation (7) for the ten regions of Great Britain over the period 1972 to 1995 using the Seemingly Unrelated Regressions estimator.¹⁵ The first model reports the results of a simple model where the change in relative earnings depends upon the lagged level of relative earnings; the lagged log level of relative unemployment; the lagged change in relative unemployment; the lagged level of relative house prices interacted with the UK owner-occupation rate; the lagged level of the relative

mortgage debt to income ratio weighted by the mortgage interest rate, and the lagged change in the relative mortgage debt to income ratio weighted by the mortgage interest rate. There is a significant and fairly large equilibrium-correction term, which implies that relative earnings return to their steady-state levels fairly quickly. Regions with high relative unemployment tend to have lower earnings in equilibrium, while regions with high house prices (which are a major component of price differences across regions, as well as reflecting congestion and other externalities) and high levels of relative mortgage debt tend to have higher earnings.

The second model adds some composition effects that help to control for the determinants of regional steady-states. They suggest that regions will tend to have high earnings for full-time men if they have a low female part-time participation rate, and high proportions of workers employed in the production sector or banking and financial services. The third model interacts the proportion of workers in the production sector with the real exchange rate and the proportion of workers in banking and financial services with an index of financial liberalization which is zero up to 1980 and rises to a peak of unity in 1989-90.¹⁶ These interactions are rather more successful empirically than using the employment proportions alone and imply that regions with high proportions employed in banking and financial services benefit more from financial liberalization but that regions with high proportions in the production sector suffer more from losses of competitiveness (that is, when the log real exchange rate rises).

The fourth model explores a familiar theme in the earnings literature (see Blackaby and Manning, 1990, for example), that the existence of long-term unemployment reduces the overall negative impact of unemployment on earnings. Although the long-term unemployment terms have the predicted sign, neither is significant in our regressions.

Table 4 Men's Full-Time Earnings Model

Parameter	Model 1	Model 2	Model 3	Model 4
Relative log earnings (it-1)	.226 (.030)	.349 (.035)	.444 (.036)	.437 (.036)
Relative log unemployment (it-1)	-.014 (.004)	-.005 (.004)	-.009 (.004)	-.008 (.004)
Δ Relative unemployment(it-1)	-.008 (.001)	-.005 (.001)	-.004 (.001)	-.004 (.002)
Relative log house prices(it-1) *UK % owner-occupied(t-1)	.056 (.008)	.046 (.008)	.049 (.007)	.047 (.007)
Relative log long-term unemployment (it-1)				0.0004(0.0008)
Δ Relative long-term unemployment(it-1)				0.003 (0.003)
Weighted relative mortgage debt/income ratio (it-1)	.003 (.0005)	.002 (.0005)	.001 (.0004)	.001 (.0004)
Weighted Δ relative mortgage debt/income ratio (it-2)	-.007 (.001)	-.006 (.001)	-.007 (.001)	-.007 (.001)
Relative % part-time women in total women(it-1)		-.341 (.048)	-.296 (.052)	-.268 (.052)
Relative % production workers(it-1)		.068 (0.048)		
Relative % banking workers(it-1)		.324 (.110)		
Relative % production workers(it-1)*log real ex rate(t-1)			-.281 (.075)	-.311 (.081)
Relative % bank workers(it-1)*financial liberalization(t-1)			.335 (.066)	.343 (.066)
North	-.005 (.003)	-.004 (.003)	-.004 (.003)	-.004 (.003)
North-West	-.001 (.002)	-.006 (.002)	-.006 (.002)	-.006 (.002)
Yorkshire & Humberside	-.001 (.002)	-.004 (.003)	-.003 (.003)	-.004 (.003)
West Midlands	-.009 (.002)	-.021 (.003)	-.021 (.003)	-.021 (.003)
East Midlands	-.008 (.003)	-.022 (.003)	-.023 (.003)	-.022 (.003)
East Anglia	-.009 (.003)	-.017 (.003)	-.017 (.003)	-.017 (.003)
South East	.013 (.003)	.027 (.003)	.027 (.003)	.027 (.003)
South West	-.020 (.003)	-.019 (.004)	-.019 (.004)	-.019 (.004)
Wales	-.009 (.003)	-.018 (.002)	-.019 (.002)	-.018 (.002)
Scotland	-.003 (.002)	-.009 (.003)	-.010 (.003)	-.009 (.003)
Equation Standard Error	0.00877719	0.00833399	0.00797164	0.00795382
Autocorrelation Test (F)	1.38 [0.25]	1.93 [0.15]	1.495 [0.23]	2.04 [0.13]
Jarque-Bera Normality (χ^2)	2.44 [0.30]	1.23 [0.54]	2.17 [0.34]	2.33 [0.32]
Augmented Dickey-Fuller (t)	-10.7 [0.00]	-11.7 [0.00]	-11.6 [0.00]	-11.8 [0.00]

Notes: Number of observations= 240. Sample Period= 1972-1995. Heteroscedasticity-Consistent Standard Errors in parentheses. Dependent Variable is Δ RLME_i, that is, the change in log relative men's earnings. Estimation is by SUR in TSP (Hall, 1996). Equation standard error is the unweighted average of all the residuals.

In terms of determining the steady-state relative earnings of any region, the effects can be divided into three main types. First, in the housing market, higher relative house prices and higher ratios of mortgage debt to income put upward pressure on earnings through the effect on local wage bargaining of the higher cost of living in a region, expectations, increased labour mismatch and less inward migration. Second, in the labour market, higher relative unemployment tends to reduce earnings through a wage-curve effect as envisaged by Blanchflower and Oswald (1994). Lastly, there are the composition effects. Regions with high proportions of part-time women have lower relative full-time men's earnings, suggesting an element of substitution between these groups of workers.¹⁷ Men's earnings in regions with more production workers suffer more when competitiveness falls (that is, when the real exchange rate rises) and men's earnings in regions with more banking and financial sector workers do better when there is financial liberalisation.

Table 5 Steady-State Men's FT Earnings - relative to GB

	Actual	Steady-State
1972	0.97	0.96
1975	0.96	0.97
1979	0.97	0.96
1989	0.89	0.88
1995	0.87	0.88

Table 5 presents the estimated steady-state levels of relative Welsh full-time men's earnings between 1972 and 1995, along with the actual values.¹⁸ The results suggests that earnings are fairly close to their equilibrium levels at any one time (technically, there is a large and significant *equilibrium-correction term* in the regression). The standard error of the steady-state estimates (calculated from the variance-covariance matrix of the estimated parameters) is 0.029.

Of the 8 percentage point decline in the steady-state earnings of full-time Welsh men, about one-third is associated with falling relative house prices and the other two-thirds to the composition effects, with virtually no contribution from changes in relative unemployment.¹⁹ Of the composition effects, about four-fifths is associated with the smaller size and worsening position of the Welsh banking and financial services sector, and about one-fifth

to the rise in female part-time participation, with a small negative effect from a rise in the real exchange rate on the relatively large Welsh production sector.

6. Empirical Results

This short paper has examined the fortunes of the Welsh economy since the early 1970s by looking at various measures of regional income, particularly the earnings of those in work. Our results apply to the whole of Wales and do not take into account the many disparities in economic performance within Wales itself. There are five main findings:

First, the New Earnings Survey earnings of all workers in Wales have declined relative to those in Great Britain. This deterioration in Welsh performance is not so apparent from the Regional Accounts data since these are contaminated by factors such as the low participation rate in Wales, the high proportion of social security income, and increased out-commuting from Wales, as well as by serious mistakes in the allocation of income across regions during the 1980s (see Cameron and Muellbauer, 2000).

Second, there have been important shifts between the four different types of worker in the NES (that is, full-time men, part-time men, full-time women, and part-time women). Most notably, the fall in the proportion of full-time men in the Welsh workforce from about two-thirds to just over one half has been an important factor behind the fall in relative earnings of all workers. In addition, the fall in the relative earnings of Welsh full-time men has only been partly compensated for by a rise in relative full-time women's earnings.

Third, although there were significant changes in the industrial structure of full-time men in Wales, they account for only about a quarter of their fall in relative earnings. That is, jobs have tended to disappear in well-paid industries to be replaced by jobs in lower-paid industries. Most important, though, has been the decline of relative earnings in just three industries - construction, distribution, and transport. Moreover, Wales has also suffered from having relatively few full-time men in banking and financial services. Although banking and financial services is the second highest paid sector for full-time men in Wales, it is the worst paid relative to bankers in the rest of Great Britain. Unfortunately, the NES one

digit industry data do not tell us anything about the earnings of the different groups contained within the banking and financial services sector.

Fourth, Wales has become increasingly dependent upon jobs in the traditional public sector (health, education and other services). Over 38 per cent of workers in the Welsh NES sample in 1994 worked in this sector, compared with 32 per cent in Great Britain as a whole. Over half of all full-time women in Wales worked in this sector in 1994, compared with just over two-fifths in Great Britain. The shift towards relatively well-paid jobs in this sector has been an important factor in preventing Welsh relative earnings from falling further, but an increasing reliance on non-market service-sector employment may be a cause for worry.²⁰

Fifth, the available econometric evidence suggests that the decline in relative earnings of full-time men in Wales is an equilibrium phenomenon. That is, it is not something that will naturally reverse itself. Of the eight percentage point fall in relative steady-state earnings, about one-third is associated with falling relative house prices, about one-half with the decline in the Welsh banking and financial services sector as financial liberalisation has progressed, and most of the remainder with rising substitution in favour of part-time female workers.

7. Concluding Remarks

At first sight, the data in this paper suggest that the industrial structure of Wales in the mid-1970s was comparatively sound and therefore that much of the subsequent industrial and regional policy was mistargetted since it was based upon flawed assumptions about the nature of the Welsh economy. There are two reasons why this argument is suspect. First the strength of unionized labour during this period maintained a favourable industrial structure but was not supported by economic fundamentals. Secondly it is impossible to assess the situation prior to 1975 since the data is not available. Thus it is difficult to tell whether the favourable industrial structure was part of a sustained trend or not.

In general, the paucity of data on the economies of the constituent nations of the UK is a matter of some concern. Statistical designations continue to be politicised. Two significant

examples include the creation of a new statistical area, 'West Wales and the Valleys' in order to obtain Objective 1 funding from the EU, a change that proved highly successful. Similarly the Labour Force Survey statistics were altered in April 1998 as EU administrators worried about the quality and robustness of unemployment data. While researchers might be grateful to the EU for providing an incentive for the UK government to improve economic statistics, in order to improve the quality of regional economic policy and forecasting, a general improvement in data quality ought to take place.

Such an improvement is essential if we are to understand the significance of the role of the EU in the regions. The recent growth experience of the Irish economy has suggested that an independent Wales or Scotland might possibly be able to follow the Irish example. However, since Wales and Scotland are treated as regions in the national accounts, it is very difficult to compare their statistics with Ireland. There may be a political rationale for holding back on data improvement. British governments like to take the credit for economic upturns. The mainstream parties do not wish to foster an economic argument that favours further political devolution. Finally, the Eurosceptic British public may not wish to learn about any putative 'Europe Effect'.

The evidence suggests that the populations of Scotland and Wales are less Eurosceptic, thus keeping such news from the English public may be the essential factor. There is also a 'discourse duality' evident here. The UK government seeks to champion the Welsh economic 'miracle' to the local populace whilst at the same time emphasizing Welsh deprivation to EU officials in order to secure funding. Thus the government may wish to use the Regional Accounts data for the former, and the NES data for the latter.

More seriously, the empirical results reveal that the much vaunted 'Welsh Economic Miracle' of the 1990s belies significant and persistent relative deprivation. In many ways, the form this deprivation takes is distinctive and peculiar to Wales. For instance, inward investment and the increasing significance of the service sector has not provided the source of growth that many predicted. This appears to be caused by a lower lack of innovative effort and lower wage rates in Wales. It should be noted that the Welsh Development Agency

championed Wales as a low wage rate economy in order to secure FDI during the 1980s; perhaps this type of promotion ought to be reconsidered.

Logic suggests that distinctive policy solutions specifically geared to the Welsh economy would be beneficial. The instrumental and economic case for such policies is difficult to refute. Theoretically, the creation of the Welsh Assembly and the devolution of power to Wales provides an institutional, administrative and political context in which such policies can be successfully promulgated. However, the lack of a capacity to alter Primary Legislation and the political context of the UK, despite devolution, entails that degrees of policy autonomy will also depend on the approval of political and administrative elites in London.

Moreover, even if these elites are unwilling to divest authority, and there is little evidence to show that they are, the kind of policy required to address Welsh imbalances is extremely unfashionable amongst policymakers and policy influencing networks in the UK. Moreover the distorting effects of regional policy as practised in the 1970s continues to have a profound effect on Wales today.

A further and curious duality emerges here. On the one hand the style of government since 1979, regardless of party, can be summed up by one word – impositional,²¹ on the other what is being imposed is an orthodoxy, New Regionalism, which embraces, at least in its discourse, concepts of autonomy and freedom (Lovering, 1999). A situation akin to that prevailing in the US during the 1980s has emerged when New Federalism meant that States were mandated to do all sorts of innovative things by federal government without having the resources to do so. This is unsurprising on one level since, arguably, Labour members of Cabinet are even more centralist in outlook than their Conservative predecessors. They are not well disposed to allowing the regions of the UK to become centres of policy innovation or ‘policy laboratories’ despite what they may feel obliged to say in order to placate clamouring policy networks. This situation is reinforced by the perspective of administrative elites in the higher civil service, who appear determined to retain a unified and centralized bureaucracy.

Lovering (1999) argues that the New Regionalism underlying much of UK regional policy during the past decade is based on inadequate foundations. The findings here provide empirical evidence for this claim, at least for Wales.

Bibliography

- Armstrong, D. and Blackaby, D. (1998) 'Regional Labour Markets and Institutions in the United Kingdom', in van der Laan, L. and Ruesga, S., eds., *Institutions and Regional Labour Markets in Europe* (Aldershot: Ashgate).
- Armstrong, H. (1991) 'Regional Problems and Policies' in Crafts, N. and Woodward, N. *The British Economy Since 1945*, (Oxford: OUP).
- Baker, M. and Fortin, N. (1999) 'Women's Wages in Women's Work: A US/Canada Comparison of the Roles of Unions and 'Public Goods' Sector Jobs', *American Economic Review*, 89, pp. 198-203.
- Blackaby, D., Clark, K., Leslie, D. and Murphy, P. (1997) 'The Distribution of Male and Female Earnings 1973-1991: Evidence for Britain', *Oxford Economic Papers*, pp. 256-272.
- Blackaby, D. and Manning, A. (1992) 'Regional Earnings and Unemployment – A Simultaneous Approach', *Oxford Bulletin of Economics and Statistics*, 54, pp. 481-501.
- Blackaby, D. and Murphy, P. (1995) 'Earnings, Unemployment and Britain's North-South Divide: Real or Imaginary?', *Oxford Bulletin of Economics and Statistics*, 57, pp. 487-512.
- Blanchflower, D. and Oswald, A. (1994) *The Wage-Curve* (Cambridge, MA: MIT Press).
- Cameron, G. (1998) 'Economic Growth in the Information Age: From Physical Capital to Weightless Economy', *Journal of International Affairs*, 51, 2, pp. 447-471.
- Cameron, G. and Muellbauer, J. (1998) 'The Housing Market and Regional Commuting and Migration Choices', *Scottish Journal of Political Economy*, vol. 45, no. 4, pp. 420-446.
- Cameron, G. and Muellbauer, J. (2000) 'Earnings Biases in the UK Regional Accounts: Some Economic Policy and Research Implications', *Economic Journal*, vol. 110, pp. F412-F429.
- Cameron, G. and Muellbauer, J. (2001) 'Earnings, Unemployment, and Housing in Britain', forthcoming, *Journal of Applied Econometrics*.
- Central Statistical Office (1981 and 1991) *Population Census: Workplace and Travel to Work Survey* (London: HMSO).
- Hall, B. (1996) *Time Series Processor version 4.3*, (Palo Alto, CA: TSP International).
- Lovering, J. (1999) 'Theory led by policy: the inadequacies of the New Regionalism', *International Journal of Urban and Regional Research*, pp. 379-395.
- Morris, J. (1995) 'McJobbing a Region: Industrial Restructuring and the Widening Socio-Economic Divide in Wales', in Turner, R. *The British Economy in Transition* (London: Routledge).
- Muellbauer, J. (1997) 'Measuring Financial Liberalisation in the UK Mortgage Market', mimeo (Oxford University: Nuffield College).
- Muellbauer, J. and Murphy, A. (1997) 'Booms and Busts in the UK Housing Market', *Economic Journal*, vol. 107, pp. 1701-27.

- Richardson, J. (1994) 'Doing less by doing more: British government 1979-1993', *West European Politics*, 17(3): 178-197.
- Rowthorn, R. (2000) 'The Political Economy of Full Employment in Modern Britain', *Oxford Bulletin of Economics and Statistics*, 62, pp. 139-174.
- Simpson, D. (1992) 'Why Are Welsh Wages So Low II', *Welsh Economic Review*, pp. 54-63.
- Snicker, J. (1999) 'Autonomous economic units make poor political subordinates: Public administration and economic change in Wales' (Oxford University: mimeo).
- Thomas, B. (1962) *The Welsh Economy: Studies in Expansion* (Cardiff: University of Wales Press).
- Wilkinson, D. (1992) 'Has the North-South divide come to an end? Prospects for regional unemployment', *National Institute Economic Review*, pp. 88-98.

Data Appendix

Sources of Variables

Log real average weekly earnings of full-time male employees. Source: New Earnings Survey.

Regional unemployment rate. Source: Employment Gazette, various issues.

Share of production workers in total employment. Source: ONS, Earnings and Employment Division.

Share of banking, finance and real estate workers in total employment. Source: ONS, Earnings and Employment Division.

Share of female part-timers in female total workers. Source: ONS, Earnings and Employment Division.

Log mix-adjusted second-hand house prices. Source: Department of Environment, Transport and the Regions.

Log percentage of owner-occupiers. Source: Department of Environment, Transport and the Regions.

Average mortgage debt to income ratio in region (relative to GB) weighted by the mortgage interest rate. Source: Cameron and Muellbauer (1998).

The real exchange rate. Source: Economic Trends.

Financial liberalisation dummy, normalised to between 0 and 1, where 1 represents full liberalisation. Source: Muellbauer (1997).

Table A1 Summary Statistics for Wales

Variable Name	Mean	Std Deviation	Minimum	Maximum
Relative log earnings of full-time men	-0.077	0.041	-.137	0.028
Relative log unemployment	1.461	0.916	-0.221	2.820
Δ Relative unemployment	-0.048	0.319	-0.681	0.607
Proportion of production workers	0.0236	0.009	0.010	0.043
Proportion of banking workers	-0.0373	0.015	-0.066	-0.021
Proportion of part-time women in total women	-0.0011	0.019	-0.033	0.020
Relative log house prices	-0.263	0.082	-0.477	-0.154
Weighted relative mortgage debt/income ratio	-1.726	1.513	-4.387	-0.360
Weighted Δ relative mortgage debt/income ratio	0.0672	0.466	-0.902	1.402
UK proportion owner-occupation	0.600	0.052	0.526	0.677
UK log real exchange rate	-0.104	0.106	-0.316	0.016
UK financial liberalization	0.537	0.429	0.000	1.000

Notes: See text for description of variables. Housing market variables in this table are not weighted by the proportion of owner-occupiers in the UK. Sample period is 1972 to 1995.

Figure 1
Log Ratios of various measures Welsh earnings to GB

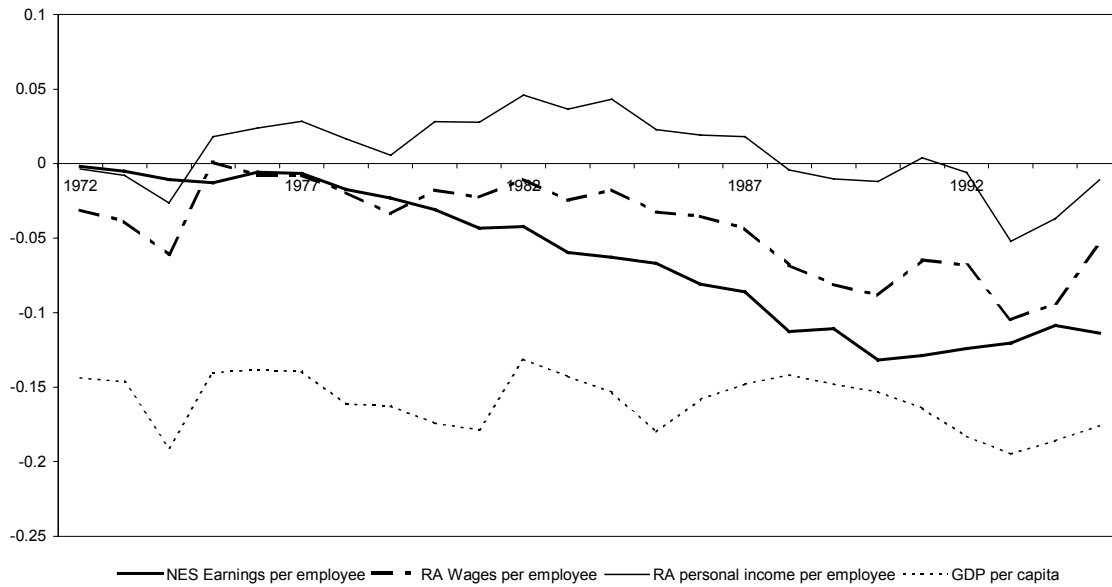


Figure 2
**Log Ratios of Welsh NES Earnings relative to GB,
 by type of employee**

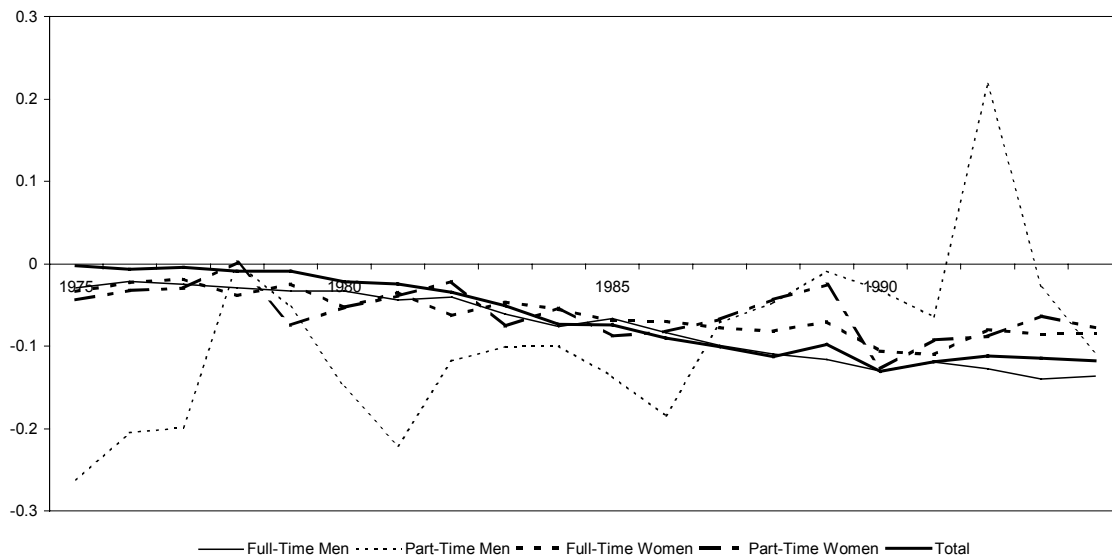


Figure 3
Log Ratio of Welsh to GB Earnings for All Workers:
Actual Earnings, Regional Industry Structure with GB Earnings,
and GB Industry Structure with Regional Earnings

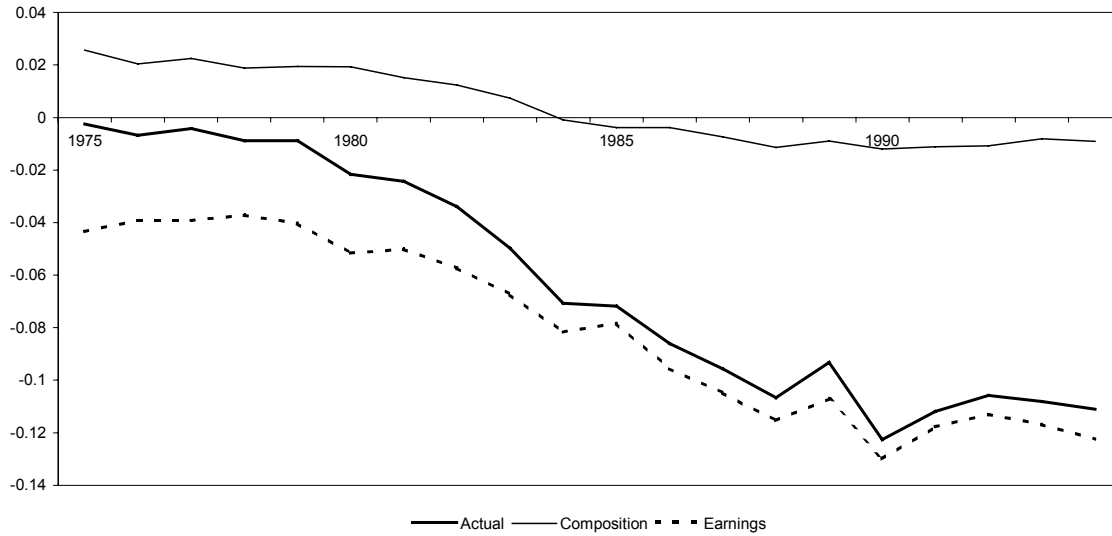
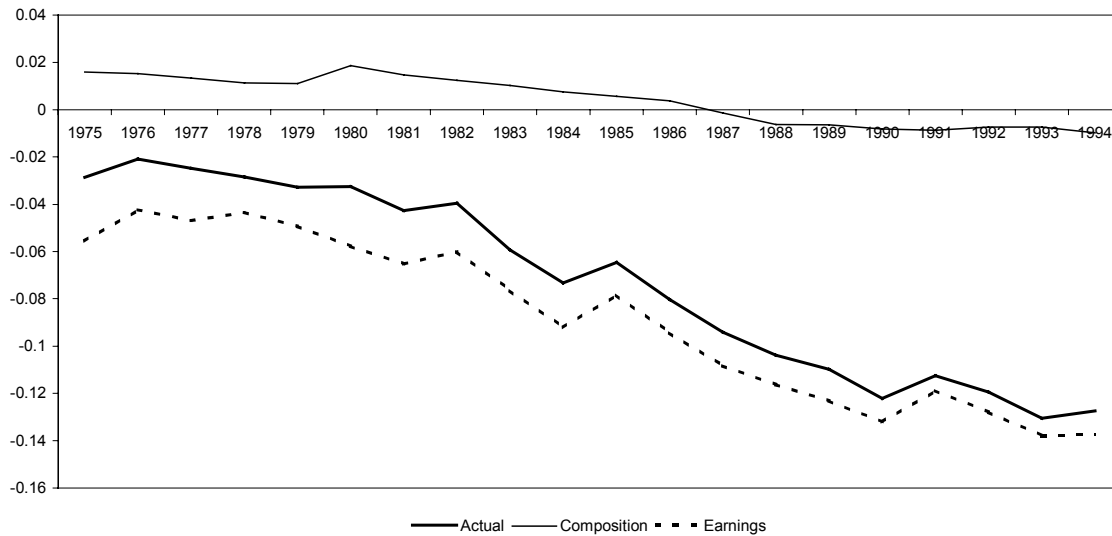


Figure 4
Log Ratio of Welsh to GB Earnings for Full-Time Men:
Actual Earnings, Regional Industry Structure with GB Earnings,
and GB Industry Structure with Regional Earnings



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¹ See Armstrong (1991) for an introduction to regional economic problems in the UK, and Thomas (1962) for a Welsh historical perspective. Snicker (1999) examines the interactions between the autonomist movement in Wales and economic performance.

² See Wilkinson (1992) and Blackaby and Murphy (1995) for discussions of the disappearance of the North-South divide in unemployment during the early 1990s.

³ Morris (1995) provides a readable overview of these developments. In 1994-5, 19 per cent of households in Wales were in receipt of sickness, invalidity or disablement benefits, compared with an average across Great Britain of 13 per cent. In spring 1995, the economic activity rate in Wales was 57.3 per cent compared with 62.5 per cent across the United Kingdom. See *Regional Trends*, tables 8.6 and 15.3.

⁴ Lovering (1999) provides an excellent critique of the New Regionalism.

⁵ Since the New Earnings Survey is based on a one per cent sample of employees who have National Insurance records, it does not collect any data on those who fall below the National Insurance floor. Therefore, the very low-paid and part-time workers are generally under-represented. For example, the NES reports that 27.6 per cent of women were part-time in 1975, compared with 37.2 per cent in the employment census.

⁶ The data in this paragraph are taken from various issues of the *Employment Gazette*, except for the data on foreign-ownership, which are from Morris (1995) and Cameron (1998), and on unionization which are from Simpson (1992) and the *Labour Force Survey*.

⁷ In 1994-1995, 22.5 percent of Welsh household income was derived from Social Security Benefits, the highest proportion of any UK region (including Northern Ireland), and compared with a UK average of 13.5 percent. See *Regional Trends* (1996), table 8.1.

⁸ Note that since part-time men are a fairly recent and minor labour market phenomenon, we should treat their NES earnings data with caution. None of the results later in the paper are at all sensitive to the inclusion of part-time men in the sample.

⁹ The present paper compares Wales with the whole of Great Britain. It would also be interesting to look at Wales compared with Scotland, as well as Wales compared with Great Britain *excluding* the South East, but such a series of comparisons is beyond the scope of the present work.

¹⁰ Note that all earnings in this table are expressed relative to GB average earnings for all workers, regardless of type - this reflects the fact that the E^{GB} term in the above equations does not have a j subscript. Since the data in the tables are the sums over the period 1975 to 1994 of all the annual changes, there is also a small covariance term that is suppressed in the results that follow.

¹¹ Note that since relative earnings declined overall, a positive contribution to the 'within' or 'between' change indicates that the change in composition reinforced the overall fall in relative earnings, while a negative contribution indicates that the change in composition helped to ameliorate the fall.

¹² Blackaby et al. (1997) discuss how the gender pay gap narrowed in Britain over this period.

¹³ Relative earnings of Welsh full-time men in banking fell throughout the 1980s as financial liberalisation occurred and stabilised at about 71 per cent of the GB average in 1989-1990.

¹⁴ Note that these 'within-between' calculations are robust to measurement errors that might occur in the smaller industries since the smaller industries are given a very small weight in the decompositions.

¹⁵ Each regression comprised a panel of ten Standard Statistical Regions over twenty four years, for a total of two hundred and forty observations. All coefficients were constrained to be equal across regions, except for the inclusion of regional fixed effects. See Cameron and Muellbauer (2001) for further discussion, as well as Pooled Mean Groups estimates and Instrumental Variables estimates, both of which produce broadly comparable results.

¹⁶ The time profile is consistent with evidence from regional and national loan-to-value ratios on mortgages for first-time buyers, which are a good reflection of credit constraints, see Muellbauer (1997).

¹⁷ See Baker and Fortin (1999) for US evidence that wages of men decrease with the presence of females in their occupation.

¹⁸ Although some variables in table 4 are potentially jointly determined with earnings (for example, house prices), note that the parameter estimates are consistent since only lagged variables enter into the regressions and this rules out any contemporaneous correlation. However, the potential endogeneity does affect table 5. Consequently, while we claim that one-third of the fall in steady-state earnings is associated with falling relative house prices, we do not claim any causal connection, since we have only weak exogeneity, not strong exogeneity. See Muellbauer and Murphy (1997) for discussion of the effect of earnings on house prices at the national level.

¹⁹ Relative unemployment in Wales actually falls between 1972 and 1995, but this small fall has almost no overall effect on relative earnings, mainly because of the small estimated effect of the 'wage-curve'.

²⁰ Rowthorn (2000) suggests a good reason for such worries. He argues that the extent of the decline outside of the South East of Britain has been masked by government spending, but that this can only be a short-term palliative since it does nothing to improve the situation in 'tradeables'. By this he means employment in goods and services that can be traded with other regions or countries. To put this more formally, a fall in a region's terms of trade with other regions is likely to be reflected by lower net exports, and hence, lower consumption in the long-run.

²¹ For a discussion of Conservative administrations, see Richardson (1994).