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*The origins and early impact of the minimum wage in agriculture*¹

By ROBIN GOWERS and TIMOTHY J. HATTON

In this article we examine the effects of minimum wage regulation on wage rates and employment in England and Wales during the interwar period. Economic historians have often pointed to wage regulation as one of the sources of wage rigidity and high unemployment in the interwar period. Yet few estimates have been offered of its effects on the sectors involved. Such concerns are also relevant to the contemporary debate among economists about minimum wage effects following the abolition of the Wages Councils in 1993. The only minimum wage now remaining is that in agriculture and its effects are the subject of debate.² In our examination of interwar agriculture we focus on the effect of the introduction of minimum wages in 1924. In contrast to many other minimum wage studies, we find that not only did regulation substantially raise wage rates, it also significantly reduced farm employment. The minimum wage reduced poverty among those farm workers who remained employed and reduced the incomes of farmers, particularly on larger farms.

The article is organized as follows. We first examine the circumstances surrounding the introduction of the minimum wage in English and Welsh agriculture beginning in 1917, its abolition in 1921, and its reintroduction in 1924. We then investigate the immediate impact of the minimum on the wage level and review the provisions for setting and enforcing it. We proceed to estimate the extent to which the agricultural wage was raised above the free market level during the interwar period as a whole. In order to measure employment effects we estimate the impact of the minimum across counties. Using this estimate we then calculate by how much the higher wage reduced farm employment and the extent to which it shifted the distribution of farm income in favour of labour. We summarize our findings in a short conclusion.

¹ We are grateful to Dr Richard Anthony for his advice and for allowing us access to his unpublished worksheets. We have also benefited from useful comments from Joanna Bourke, Peter Dewey, Raja Junankar, Peter Muriel, Andrew Oswald, participants in seminars at Essex, Birkbeck, Oxford, Australian National University, Melbourne, and Warwick, and anonymous referees. All remaining errors are our responsibility.

² On the effects of Wages Councils see for example Kaufman, 'Effects of statutory minimum rates'; Bazen, 'On the employment effects of introducing a minimum wage'; Dickens *et al.*, 'Effect of minimum wages on employment'; and Machin and Manning, 'Effects of minimum wages'; on the agricultural minimum wage, see Lund *et al.*, 'Wages and employment in agriculture'; and Dickens *et al.*, 'Effect of minimum wages'.

I

Before the First World War minimum wages were imposed only in a few very low wage occupations under the Trade Boards Act of 1909. The minimum wage in agriculture was first introduced during the food supply crisis of the First World War. In the face of declining food imports and the loss of agricultural labour through recruitment to the forces, the government appointed a committee under Lord Selborne to consider agricultural policy during and after the war. The Selborne committee recommended a strengthening of the controls on land use which had been introduced in 1916, policies to improve the efficiency of agriculture, and guaranteed prices and wages for farmers and workers. These recommendations were put into effect almost in their entirety under the Corn Production Act (1917) including guaranteed prices for wheat and oats (but not barley) and an immediately imposed minimum wage of 25s. per week. The minimum wage was strongly endorsed by Prime Minister Lloyd George: 'if the government guarantees prices, then labour must also be guaranteed'.³

The Corn Production Act set up a central Agricultural Wages Board which in turn appointed, in an advisory role, District Wage Committees each covering a county or two neighbouring counties. Although the 25s. minimum initially raised the wage in some of the lowest wage counties, inflation quickly made it ineffective and, from May 1918, the minimum was raised to 30s. The minimum wage (for an adult male) was raised progressively until, in August 1920, it reached 46s. In some of the traditionally high wage counties in the north, higher rates were fixed but the overall effect was to narrow sharply the dispersion of wage rates both within and between counties.

Working hours were also determined under the act and by August 1920 standard hours (to which minimum rates applied) were generally 50 per week in summer and 48 in winter with slightly higher levels in some counties. This compares with a typical working week of about 60 hours before the war. Separate wage rates were determined for women and young workers, and a variety of piece rates, overtime rates, harvest rates, and skill premia (for workers such as horsemen and shepherds) was established, often differing across counties.

Following the Royal Commission on Agriculture of 1919, the Agriculture Act (1920) provided that guaranteed prices and minimum wages would continue indefinitely, to be terminated only by Order of Council with four years' notice. But the collapse of farm prices which began late in 1920 and the prospect of the Treasury having to underwrite massive deficiency payments led to a sharp reversal in policy. After little more than a year, the provisions of the act dealing with minimum prices and wages were abolished. The 'great betrayal' aroused bitter recriminations

³ House of Commons, 23 Feb. 1917 (Hansard).

from both farmers and farm workers.⁴ The last ruling of the Agricultural Wages Board was to reduce the minimum wage from 46s. to 42s.

The Repeal Act of 1921 replaced the Agricultural Wages Board and the District Wage Committees with 63 voluntary Joint Conciliation Committees operating at the district level. Like the preceding committees, they were constituted from local representatives of employers and employees. They could agree a district wage but this could be legally enforced only after confirmation by the Ministry of Agriculture. Few submitted their agreed rates to the ministry and, as prices and wages continued their downward spiral, fewer and fewer were able to agree any rate at all. Employers pressed for reductions until the average fell to 28s. at the end of 1922. By this time agreements existed in only about one-third of the districts and a year later this number had fallen by half. Up to the end of 1924 only three committees managed to maintain agreements continuously.⁵ In the absence of agreements, wages were set by individual bargaining between employer and employee with the result that the inter- and intra-regional variation increased.

The savage cuts in wage rates for what were already relatively low-paid workers brought protests from agricultural workers and support from the wider labour movement.⁶ Though weakened by the fall in membership, the National Union of Agricultural Workers resisted further cuts in the wage and increases in hours with a strike in Norfolk in March 1923.⁷ Frustration with the failure of collective bargaining strengthened calls by the union for the reintroduction of wage regulation. The cause was also supported by the findings of a tribunal of investigation and by the Labour Party which pledged to restore the wage fixing mechanism which had been abolished in 1921.⁸ Shortly after Labour gained office minimum wages were reintroduced with the Agricultural Wages (Regulation) Act, 1924.

Under the 1924 act an Agricultural Wages Board and Agricultural Wages Committees at the district level were re-established but with the difference that the committees' recommendations were legally enforceable and the central board had only supervisory powers.⁹ The committees were composed of equal numbers of representatives of employers and employees with two independent members appointed by the Minister of Agriculture. They were given power to fix minimum wages, standard hours, and a variety of other special rates which would take into account

⁴ Whetham, 'Agriculture Act'. More recently it has been argued that the National Farmers' Union was not opposed to abolition in 1921 but that hostility towards the government crystallized in 1922 when the temporary subsidy on wheat and oats which had been provided in 1921 was withdrawn (Cooper, *British agricultural policy*, pp. 57-9).

⁵ Ministry of Agriculture, *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1930*, p. 19.

⁶ Groves, *Sharpen the sickle*, p. 189.

⁷ Howkins, *Poor labouring men*, ch. 8.

⁸ Pedley, *Labour on the land*, p. 32; Whetham, *Agrarian history*, pp. 155, 157.

⁹ This was a compromise forced by strong opposition from the Conservatives and Liberals in the House of Commons (Armstrong, *Farmworkers*, pp. 180-1).

the diversity of local conditions and customs. As under the previous acts, the minimum wage was calculated to include the value of benefits in kind such as board or a cottage and a variety of other perquisites.

The act prescribed that 'in fixing minimum rates a Committee shall, so far as is practicable, secure for able-bodied men such wages as in the opinion of the Committee are adequate to promote efficiency and to enable a man in an ordinary case to maintain himself and his family in accordance with such standard of comfort as may be reasonable in relation to the nature of his occupation.'¹⁰ The seemingly pro-labour stance of the act is reinforced by the fact that, unlike the previous legislation, the provision of minimum wages for workers was not linked to minimum price guarantees, at least not until the re-introduction of price supports for wheat under the Wheat Act (1930).¹¹ Furthermore, the minimum wages and hours determined by the committees were strictly enforced by Ministry of Agriculture inspectors, if necessary through the magistrates' courts. Although the results of regulation were often bitterly criticized by farmers, some of whom faced low prices and poor returns on their capital and effort throughout the interwar period, successive Conservative and National governments failed to repeal the act.

One important difference between the 1924 act and the Corn Production and Agriculture Acts is that the 1924 act applied only in England and Wales and excluded Scotland. It has been argued persuasively that because of the higher wages, higher proportion of skilled workers, and lower unemployment among Scottish agricultural workers, the Corn Production Act had little impact in Scotland and was regarded by the organizations of employers and employees as at best an irrelevance and at worst a hindrance. Both the National Farmers' Union of Scotland and the Scottish Farm Servants' Union opposed the reintroduction of minimum wage provisions. It was not until the 1930s, with the decline in employment opportunities outside agriculture and the further fall in farm prices and incomes, that the Scottish Farm Servants' Union pressed for government intervention.¹² Following a parliamentary inquiry into wage and employment conditions in Scotland, the Agricultural Wages (Regulation) (Scotland) Act, 1937, introduced minimum wage legislation on a pattern similar to that which had been operating in England and Wales since 1924. As a result, according to Anthony, 'real wages rose and employment fell, creating the classic minimum wage effect, a situation in direct contrast to the failure of the Corn Production Act.'¹³

¹⁰ Ministry of Agriculture, *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1930*, p. 20.

¹¹ However, sugar beet subsidies were introduced in 1925, and in 1934 a subsidy was introduced for cattle.

¹² Anthony, 'Scottish agricultural labour market'.

¹³ *Ibid.*, p. 572.

II

Did wage regulation raise the agricultural wage in England and Wales and, if so, by how much? Contemporary observers could not offer any precise estimate as to the impact of regulation on farm wage rates, though a figure of 20 per cent was sometimes suggested.¹⁴ In its *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1930*, the Ministry of Agriculture commented that, 'It would be rash to attempt to say what is the precise difference between the present weekly earnings and the sum which would be paid in the absence of statutory regulation.' But the report went on to speculate that the figure might be 5s. or more (of a current average minimum wage of 33s. 8d.).¹⁵ Some observers such as Astor and Rowntree, writing in the late 1930s, argued that the act of 1924 had had little effect on agricultural wage rates.¹⁶ Others such as Pedley, who compared the course of wage rates in England and Wales with those in Scotland, suggested a substantial effect.¹⁷

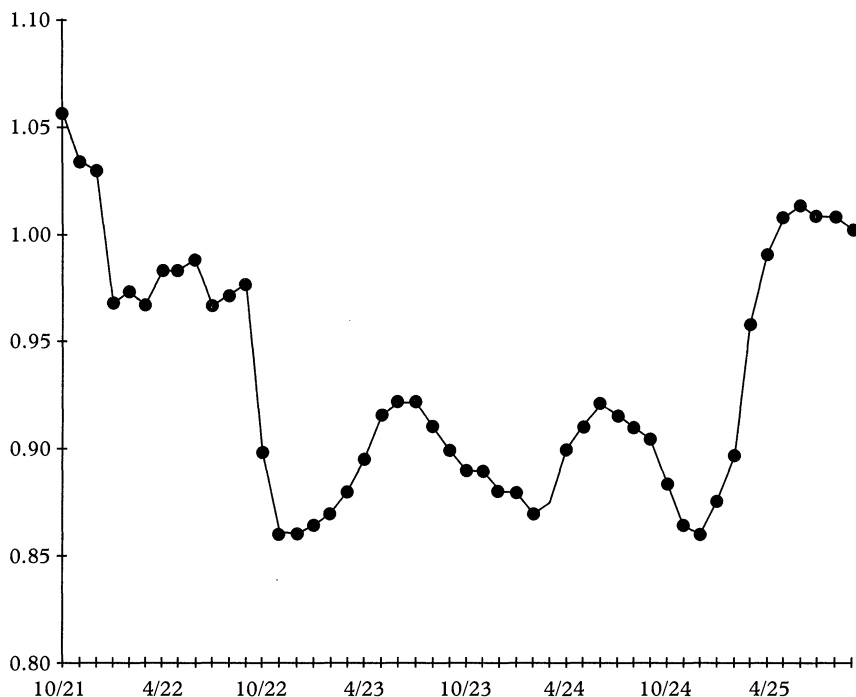


Figure 1. *Monthly real agricultural wage, England and Wales, October 1921-September 1925 (1914=1)*

Source: see text

¹⁴ Venn, *Foundations of agricultural economics*, p. 248.

¹⁵ Ministry of Agriculture, *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1930*, p. 31.

¹⁶ Astor and Rowntree, *British agriculture*, p. 314.

¹⁷ Pedley, *Labour on the land*, p. 63.

Some impression of the impact of regulation can be gained by examining agricultural wages over the period when it was abolished in 1921 and then reinstated in 1924. Figure 1 plots the agricultural wage index divided by the cost of living from October 1921 to September 1925. It shows a sharp decline in the autumn of 1921 and a further even sharper decline a year later. This reflects partly the fact that prices were declining rapidly in the first year and that wages followed with a lag, a point noted by contemporary observers.¹⁸ It also reflects the gradual breakdown of collective bargaining under the voluntary conciliation committees. By the end of 1922 these had virtually ceased to function and from then until the end of 1924 real agricultural wages were almost constant, albeit with some variation arising from seasonal movements in the cost of living. Not all of the decline in the nominal wage can be ascribed to the abolition of the minimum wage; wages elsewhere fell sharply in 1921-2 and agricultural prices fell more than most other prices. But the fall in the real wage was noticeably more severe in agriculture than in other sectors.¹⁹

Perhaps more striking is the sharp rise in real agricultural wage rates following the introduction of the Agricultural Wages (Regulation) Act in October 1924. However, it took time for the agricultural wage committees to begin operation and to determine minimum rates. As figure 1 shows, the sharpest increase took place in the first half of 1925. Comparing June 1924 with June 1925, the real wage rose by 13 per cent. It seems unlikely that much of this increase would have occurred in the absence of regulation. Prices and the cost of living were almost constant across these years and wage rates in other occupations rose by only 1.5 per cent between the third quarter of 1924 and the third quarter of 1925.

Did these minimum wage rates effectively raise wages throughout the country? Comparing the minimum wage rates in the summer of 1925 with the rates prevailing in 1924 before the introduction of the Agricultural Wages (Regulation) Act suggests that they did. The largest increases of 20 per cent or more took place in Cambridgeshire, Hampshire, Kent, and Rutland, all of which had wages below the average in 1924. In only six counties (five Welsh counties and Durham) out of 52 was there no increase in the minimum wage over that prevailing in 1924 and hence the vast majority of counties experienced some wage increase. The effect in the first year was to change the wage structure but not the dispersion of wage rates which narrowed only in the longer run. The correlation coefficient across counties between wage rates in 1924 and 1925 is 0.6 while the coefficient of variation of wage rates is 0.82 in both years.

Most observers maintained that the minimum rates established became

¹⁸ Enfield, *Agricultural crisis*, p. 77.

¹⁹ Mejer, *Agricultural labour*, pp. 27-9.

the actual rates that were paid to the majority of workers.²⁰ The Ministry of Agriculture occasionally reported the results of samples of actual earnings of ordinary labourers and these can be compared with the minimum rates. In 1930 when the minimum was 31s. 8d., average earnings were 33s. 8d., only 6 per cent higher. An independent survey of farms in East Anglia during the early 1930s indicated that earnings were about 8 per cent above the minimum rates.²¹ On the other hand, some farmers paid below the minimum rates and, in response to complaints, Ministry of Agriculture inspectors were investigating about 2,000 farms a year in the late 1920s. But only a minority were found to be paying wages below the minimum and the arrears recovered amounted to about four days' wages per case.²² During 1929-31 random inspections were made of farms employing 7,822 workers. Infringements were mainly in connection with payment for over-time but 7.3 per cent of workers were paid below the basic minimum rate.²³ Thus it appears that payments above or below the minimum were not of sufficient magnitude to render the minimum a misleading guide to wages actually paid.

III

In this section we attempt to estimate the degree to which the operation of the Agricultural Wages (Regulation) Act raised agricultural wage rates over the whole of the interwar period. In order to do this we need to estimate what the wage would have been in the absence of regulation. We do this in two ways, first by estimating a model of the agricultural wage in the period before 1914, and second by comparing movements of the agricultural wage in England and Wales with those in Scotland.

Our model of agricultural wage setting determines the agricultural wage as the equilibrium of supply and demand in the rural labour market. Labour supply is influenced by opportunities in the urban sector which determine migration in a manner first suggested by Todaro.²⁴ This model has been applied to a number of countries and periods including late nineteenth-century Britain.²⁵

The demand for farm labour (L^D) is specified as a function of the product wage (W^A/P^A) and a time trend representing technical progress and capital accumulation:

²⁰ According to the Ministry of Agriculture's *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1926*, wage rates above the minimum were paid in some districts bordering on industrial centres but 'over large areas of the country the wages normally paid are simply the general weekly minimum wages fixed under the Act which tend in practice to become the "standard" for ordinary work' (p. 27).

²¹ Carslaw and Graves, 'Labour bill', p. 603.

²² Ministry of Agriculture, *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1930*, p. 64.

²³ Pedley, *Labour on the land*, p. 52, app. III.

²⁴ Todaro, 'A model of labor migration'.

²⁵ Hatton and Williamson, 'Integrated and segmented labor markets'; Hatton and Williamson, 'What explains wage gaps?'; Boyer and Hatton, 'Did Joseph Arch raise agricultural wages?'.

$$L_t^D = A \left(\frac{W^A}{P^A} \right)_t^{-\alpha} e^{rt} \quad (1)$$

Taking the first difference of natural logs gives:

$$\Delta \log L_t^D = -\alpha \Delta \log \left(\frac{W^A}{P^A} \right)_t + r \quad (2)$$

The rate of change of labour supply is the difference between the rate of natural increase (n) and the rate of net migration (m):

$$\Delta \log L_t^S = n_t - m_t \quad (3)$$

Net migration is determined by the ratio of urban to rural wage rates (W^B/W^A) and the urban employment rate (one minus the unemployment rate, $1-U$):

$$m_t = \mu \left[\log \left(\frac{W^B}{W^A} \right)_{t-1} + \log (1-U)_{t-1} \right] \quad (4)$$

where μ is the migration (semi) elasticity. Migration would be zero when $W^A = W^B (1-U)$, the familiar Todaro equilibrium condition.

Substituting (4) into (3) and equating the resulting expression for the logarithmic change in labour supply with the logarithmic change in labour demand from (2) on the assumption of market clearing yields:

$$\Delta \log W_t^A = \frac{r-n}{\alpha} + \Delta \log P_t^A + \frac{\mu}{\alpha} \log \left(\frac{W^B}{W^A} \right)_{t-1} + \frac{\mu}{\alpha} \log (1-U)_{t-1} \quad (5)$$

We estimate this model on annual time series data for the prewar years 1872-1913. For the urban wage we use an index of wage rates for builders' labourers, a ubiquitous occupation and a common destination for rural-urban migrants. The unemployment series is for trade union unemployment. The sources and methods of construction of the series used are discussed in the appendix. In estimating the model we make some modifications to equation (5). We allow the coefficients on each of the terms to be freely estimated rather than imposing the restrictions implied by equation (5) and we treat the term $(r-n)/\alpha$ as a constant. We also add an extra lag in the price change term and a dummy (D) for 1872-6 to allow for the outbreak of unionism and rural unrest in the 1870s.²⁶

The result of estimating the modified equation (5) over the years 1872-1913 is as follows (' t ' statistics in parentheses):

$$\begin{aligned} \Delta \log W_t^A = & -0.06 + 0.10 \Delta \log P_t^A + 0.12 \Delta \log P_{t-1}^A \\ & (1.99) \quad (2.51) \quad (2.57) \\ & + 0.13 \log(W^B/W^A)_{t-1} + 0.21 \log(1-U)_{t-1} + 0.02 D \\ & (2.52) \quad (2.87) \quad (4.12) \\ R^2 = & 0.73, \text{RSS} = 0.003, \text{DW} = 1.35, \text{LM}(1) = 2.09 \end{aligned}$$

²⁶ See Boyer and Hatton, 'Did Joseph Arch raise agricultural wages?'.

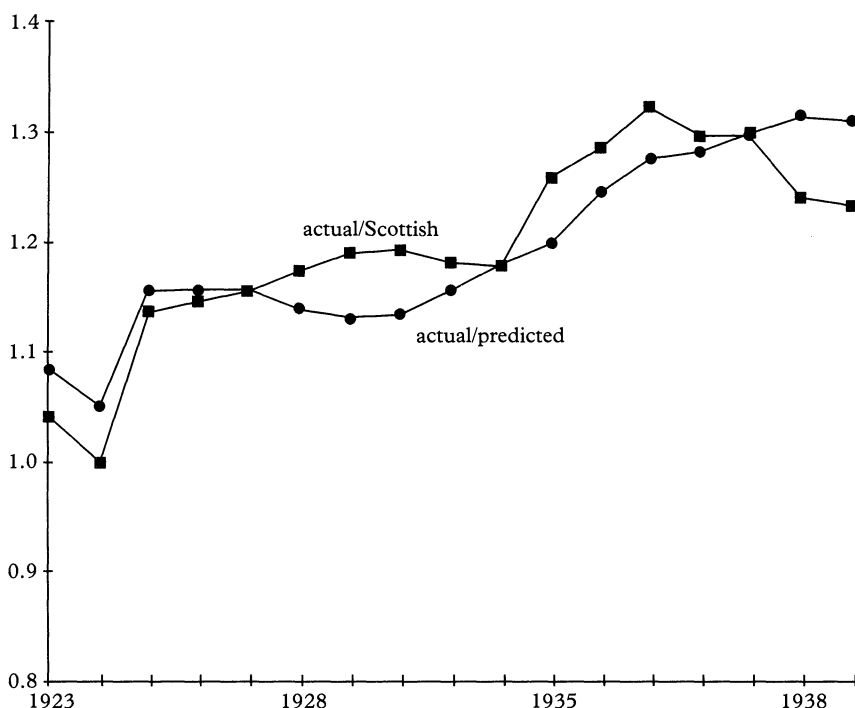


Figure 2. *Agricultural wage ratios, 1923-1939, actual/predicted and actual/Scottish (1924=1)*

Source: see text

This model explains the variation in the agricultural wage reasonably well and all coefficients are significant with the expected signs. The coefficients on the relative wage and employment rate terms give strong evidence of the impact of migration in determining rural labour supply.²⁷

We can use the model to predict what the equilibrium wage would have been during the interwar period if the structure of wage determination had been the same as in the prewar years. This is done by means of a dynamic simulation of the model beginning in 1923. We then take the ratio of the actual (average minimum) wage to the simulated wage to measure the impact of interwar wage regulation. This ratio is graphed in figure 2. It shows that the actual wage rates were a little above the predicted rates in 1923 and 1924 but then rose sharply to 14 per cent above predicted in 1925. For the period 1925 to 1930 the actual averaged 14.6 per cent higher than the predicted and this rose to 22.3 per cent over the following six years. Hence it appears that in the depression of

²⁷ From this equation we cannot identify the migration semi-elasticity, μ , directly. But if we use our estimated value for α of 0.55 from section IV below, we obtain estimates for μ of 0.07 from the relative wage term and 0.12 from the employment rate term. This can be compared with the direct estimate for μ of 0.09 obtained for the United States, 1922-41 (Hatton and Williamson, 'What explains wage gaps?', p. 277).

the 1930s the impact of regulation was to raise the wage by half as much again as in the late 1920s.

It might be argued that even in the absence of wage regulation, agricultural wages would have been higher in the interwar period than the prewar model would predict. There are a variety of factors, not captured in the model, which could have been important. One is the fall in agricultural labour supply in the course of the First World War when labour was pulled out of agriculture for the armed forces or the munitions industries. There was also a fall in the birthrate which would have affected labour supply in the 1930s. Another factor was unemployment insurance which, although it was not introduced into agriculture until 1937, could have reduced the deterrent effect of urban unemployment and induced greater migration to covered industries in the urban sector. Finally, the growth of unionism and collective bargaining in agriculture might have resulted in higher wages than the prewar model predicts.²⁸

An alternative (and much simpler) test is to compare wage trends in England and Wales with those in Scotland where wage regulation was not reintroduced until 1937. If the factors mentioned above were raising the agricultural wage even in the absence of regulation then they should apply equally to the Scottish wage until 1937. Thus trends in the Scottish wage can be used as an alternative control to gauge the impact of minimum wage regulation in England and Wales. Figure 2 also shows the ratio of the wage in England and Wales to that in Scotland, based at 1 in 1924. The striking result is that this line falls very close to that for the actual/predicted wage for England and Wales. It exhibits the same sharp rise between 1924 and 1925 and the same further rise in the 1930s. It also shows a sharp downturn after 1937 when the Scottish minimum wage was introduced, but this only partially reversed the increase in the ratio from 1924. The comparison with Scotland suggests that the wage in England and Wales was raised on average by 16.6 per cent in 1925-30 and by 25.4 per cent in 1931-6.

IV

In order to calculate the effects of minimum wage legislation on employment we must first estimate the relationship between wages and employment. Given that agricultural prices were largely determined on world markets, these can be treated as exogenous so that any change in the nominal wage can be regarded as a change in the real wage facing farmers. One approach would be to estimate the marginal product of labour function to obtain the labour demand curve. However, if there were elements of monopsony present before the introduction of the minimum wage, then the introduction of the minimum could cause

²⁸ These possible effects are all connected with changes on the supply side rather than with labour demand. In the context of the model specified and estimated above, changes on the demand side will have only relatively short run effects. Even if longer-term effects were admitted, the fall in the relative price of agricultural goods would have led to lower rather than higher wages in agriculture relative to other sectors.

employment to rise or fall and the marginal productivity schedule would be a misleading guide to the impact of regulation. Such arguments have been used recently to explain the apparently small employment effects of minimum wages in Wage Council industries and for women under the Equal Pay Act.²⁹ In this case it would be more appropriate to examine the actual changes in employment associated with the introduction of the minimum wage.

Was the farm labour market characterized by monopsony? There is considerable evidence that in the long run, farm labourers were reasonably mobile and responded to opportunities in other sectors. This effect can be seen in the model of agricultural wages presented above. Within the rural labour market there was also considerable labour mobility and it seems, on the face of it, that no individual farmer would be large enough to determine the wage rate in anything but the very short run. However, one factor which could have given rise to monopsony power was the tied cottage. It was estimated that in the 1920s as many as half of regular adult male labourers lived in tied cottages. Some members of an Interdepartmental Committee on Tied Cottages concluded in 1932 that tied cottages placed undue power in the hands of farmers.³⁰ However, there is little hard evidence that monopsony was exercised in the agricultural labour market.

In the light of these considerations it is important to estimate the employment impact of the minimum wage over the period when it was introduced rather than to infer it from other periods or other data. In order to do this we look at changes in the wage and in employment across counties between 1924 and 1929. Looking at a cross-section of changes also allows us to eliminate common (fixed) effects which may have influenced the overall trend. Fortunately, there is enough variation in wage changes across counties to make this a viable approach, even though the correlation coefficient between wage levels in 1924 and 1929 is quite high at 0.76.

There are several factors, apart from the wage, which could have caused employment changes to diverge across counties and which might be correlated with wage change. One factor is the composition of farm output, whether arable or pastoral. Since the prices of arable output fell somewhat faster than those of animal products, employment might be expected to fall more in a county where the greater share of agricultural land was devoted to arable. Secondly, employment trends might be expected to differ depending on whether farms were large or small. On small farms it would be possible to substitute family labour for paid

²⁹ Dickens *et al.*, 'Effect of minimum wages on employment'; Manning, 'The Equal Pay Act as an experiment to test theories of the labour market', London School of Economics, unpub. MS., 1993.

³⁰ Based on evidence from trade union representatives they concluded that tied cottages 'prevented the [labourer] from obtaining what was due to him whether in the matter of wages, compensation for injury, repairs to his dwelling and so on' (*Report of the Interdepartmental Committee on Agricultural Tied Cottages*, 1932, p. 9). However, the Committee was divided on the issue of whether tied cottages should be abolished (see Pedley, *Labour on the land*, pp. 74-6).

Table 1. *Cross-section county employment change regressions*
(dependent variable: change in log employment, 1924-9)

	<i>Total employment</i>	<i>Permanent employment</i>	<i>Casual employment</i>	<i>Male employment</i>	<i>Female employment</i>
Constant	0.04 (1.52)	0.13 (4.39)	-0.32 (5.30)	0.01 (0.30)	0.19 (2.40)
Δ log wage 1924-29	-0.55 (3.39)	-0.59 (3.47)	-0.45 (1.26)	-0.58 (4.14)	-0.73 (1.54)
Proportion of land arable	0.09 (1.69)	0.10 (1.80)	0.25 (2.14)	0.14 (2.97)	-0.09 (0.57)
Average farm size (acres/100)	-0.10 (2.59)	-0.15 (3.79)	0.01 (0.14)	0.07 (2.17)	-0.22 (1.95)
R ²	0.29	0.38	0.09	0.32	0.19
RSS	0.14	0.16	0.70	0.11	0.14
RESET	5.01	2.08	0.07	3.56	0.74
HETERO	0.10	1.79	3.32	0.07	0.01

Note: 't' statistics are in parentheses. RESET is the test statistic for functional form based on the regression of the residuals on the squared fitted values. HETERO is the test statistic for heteroskedasticity based on the regression of the squared residuals on the squared fitted values. The critical ($\chi^2(1)$) 5% value for these tests is 3.84. *Source:* see text and appendix

labour to a greater degree than on large farms. Conversely, it might have been possible to substitute labour for capital more easily on large farms than on small farms.

Contemporary commentators suggested that minimum wage regulation may have had different employment effects across different groups of workers. It was sometimes argued that the impact of regulation was felt disproportionately in the decline of employment of casual workers who were employed less often and for shorter periods in the summer. It was also suggested that regular workers were more often laid off in the winter months. Since employment is observed in June, the observed effects of the rise in wage rates might be biased downward. However, the employment data do allow us to distinguish between permanent and casual workers and between men and women.

The regressions in table 1 are run on a cross-section of 52 districts or counties and the dependent variable is the change in employment (in logs) between 1924 and 1929. To reflect the discussion above, two variables are included in addition to the change in the log of the wage. These are the proportion of farmland under arable crops and the average farm size, both for 1924.³¹ Unfortunately, we have no direct measure of the number of tied cottages for that date but we did experiment with a measure of the ratio of the number of employee cottages to male perma-

³¹ These two variables are entered as levels to capture differential *shifts* in labour demand across different types of agriculture and across different farm sizes.

nent agricultural workers for 1941.³² This coefficient was always insignificant and generally took a negative sign, and so was excluded from the regressions in table 1.

The result for total employment gives a strong negative coefficient on the change in the wage, with an elasticity of -0.55 . The effect of arable agriculture is weakly to increase employment while average farm size gives a significant negative sign. The latter finding suggests tentatively that the scope for capital/labour substitution was greater on larger farms. The RESET test suggests some functional misspecification but the inclusion of the change in the log of the wage squared resulted only in both wage terms becoming highly insignificant. An alternative explanation might be that total employment brings together some rather heterogeneous groups.

The regression for permanent employees (who were the bulk of all employees) produces a result fairly similar to that for the total. However, the wage coefficient for casual workers is insignificant although it is not much smaller than for the total. Similarly, the result for male workers gives a strongly significant wage coefficient while that for females, though larger, is not significant at the conventional level. The lower significance on the wage for casuals and females may arise because the wage variable used is the standard rate for males. Although the wages for these groups were undoubtedly strongly correlated with the permanent male wage, the correlation may not have been perfect.³³ Overall, however, these results suggest an employment elasticity of -0.5 to -0.6 over the period following the introduction of minimum wage regulation.

As an alternative way of examining the relationship between wage rates and employment we can, as before, use Scotland as a control. Figure 3 shows trends in wage ratios and employment ratios between England and Wales, and Scotland. The employment measure is total employment and the wage ratio is the same as that used in figure 2. Both ratios are normalized to 1924=1. As the graph clearly shows, employment in England and Wales fell faster than employment in Scotland while the English and Welsh wage rose relative to the Scottish wage. There is some evidence of sharp declines in employment following by about a year the sharp increases in the relative wage in 1924-5 and 1932-3. There was also some increase in relative employment at the very end of the period when the relative wage declined with the introduction of minimum wage regulation in Scotland.

A simple regression of the log of relative employment (E^W/E^S) on the log of the relative wage (W^W/W^S) (lagged one year) for the period 1923-39 gives the following result (' t ' statistics in parentheses):

³² These data were obtained from what appears to be the earliest survey of employee cottages, reported in the Ministry of Agriculture, *National farm survey of England and Wales, 1941-3*. We also interacted this variable with the wage change to allow for different employment effects across counties which might have been predicted if monopsony power was associated with tied cottages. This also yielded insignificant results.

³³ Another difference is that casuals and females were generally paid an hourly wage rather than a weekly wage.

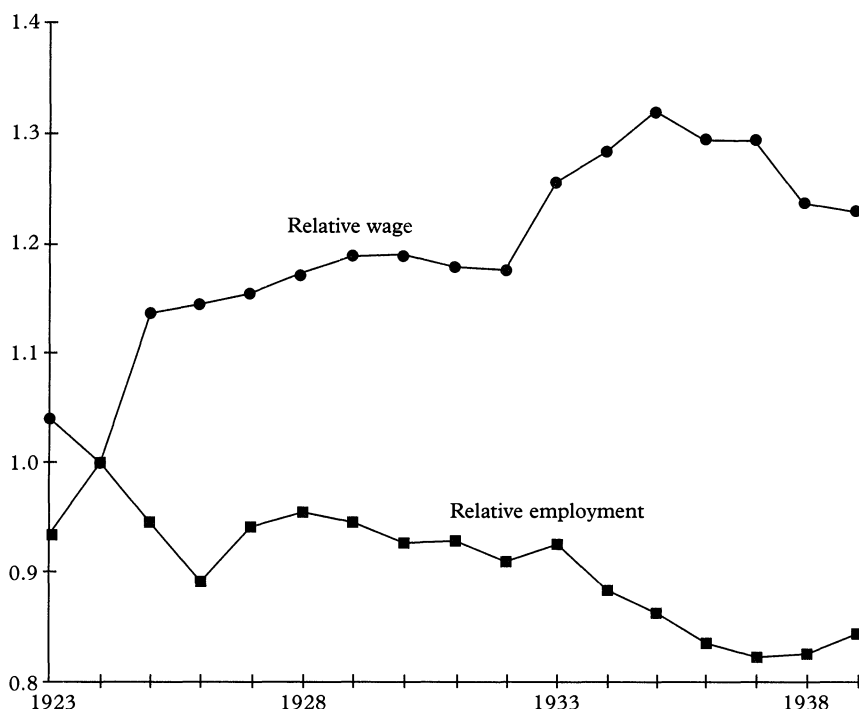


Figure 3. *Relative wages and employment, England and Wales/Scotland, 1923-1939 (1924=1)*

Source: see text

$$\log(E^{EW}/E^S)_t = -0.02 - 0.47 \log(W^{EW}/W^S)_{t-1}$$

$$(1.27)(4.49)$$

$$R^2 = 0.57, \text{RSS} = 0.022, \text{DW} = 1.06, \text{LM}(1) = 2.19$$

Though the Durbin-Watson statistic is a little low, the LM(1) statistic³⁴ does not reject the null hypothesis of no serial correlation. The coefficient on the log of the relative wage suggests a wage elasticity of about -0.5 , highly consistent with the results from the cross-section estimates.

V

We can calculate the overall impact of wage regulation on employment for each year from 1925 to 1939 by combining our estimate of the impact on the wage rate (from calculations underlying figure 2) with our estimates of the employment effects of wage changes from table 1. Using the elasticities estimated for each group and for the aggregate we can calculate the absolute and proportionate employment loss measured as

³⁴ This is the Lagrange multiplier test for first order serial correlation. The critical chi-squared 5 per cent value is 3.84.

the difference between predicted employment without regulation and actual employment. These estimates for certain years appear in table 2.

Table 2. *Estimated job loss from minimum wage regulation*

	<i>Total employment</i>	<i>Permanent employment</i>	<i>Casual employment</i>	<i>Male employment</i>	<i>Female employment</i>
	employment loss ('000)				
1925	70.0	51.1	11.1	60.9	12.1
1929	53.7	43.8	7.2	49.8	9.6
1933	74.3	60.3	10.2	69.5	12.7
1937	96.9	80.2	12.0	91.3	16.1
	% of predicted employment without regulation				
1925	7.6	7.4	6.3	8.1	10.1
1929	6.5	6.4	5.4	6.9	8.6
1933	9.4	9.2	7.9	10.0	12.3
1937	13.3	13.0	11.2	14.1	17.3

Source: see text

For total employment the estimated loss of jobs ranged from 54,000 in 1929 to 97,000 in 1937. Most of the employment loss was concentrated among permanent workers, reflecting their greater numbers. The maximum job loss for these was about 80,000 in the late 1930s. Similarly, as might have been expected, absolute job losses were greater for men than for women. Because the estimated employment elasticities are fairly similar across these groups, so are the proportionate job losses. As a proportion of the employment level that would have prevailed in the absence of wage regulation, total employment loss reached 13.3 per cent in 1937, having averaged about 7 per cent in the 1920s.

Clearly, since the employment elasticity of wages was less than one, total labour earnings were raised—by a maximum of about 8 per cent in the late 1930s. But we can say little about the welfare of the workers who were displaced. However, reports during the 1920s suggest that agricultural unemployment was considerably lower than unemployment in insured industries.³⁵ When unemployment insurance was introduced in agriculture in 1937, the unemployment rate was 5.6 per cent in January but fell sharply in the summer. Displaced workers evidently did not remain as unemployed in rural areas but moved to the towns. One reason is that those who were in tied cottages would have been forced to move. Even if they failed to gain regular employment in urban areas, they may have been able eventually to qualify for unemployment benefit.

What impact did wage regulation have on the living standards of those who kept their jobs? Many observers sympathetic to wage regulation pointed to the long-standing problem of rural poverty and saw the minimum wage as a means of reducing it. In 1936 Seeböhm Rowntree

³⁵ See, for instance, Ministries of Agriculture and Health, *Report of the Interdepartmental Committee on Agricultural Unemployment Insurance*.

calculated a revised poverty line, somewhat more generous than his 1899 standard, and with a variant for rural areas.³⁶ Rowntree's calculation was for a family of five (man, wife, and three children) but it can be adapted to other family types.³⁷ His allowance of 5s. 6d. for rent seems rather generous in the light of the typical allowances of 3s. which the Agricultural Wage Committees made in the calculation of the minimum wage when a cottage was provided by the farmer. We therefore allow 4s. for rent (on the assumption that about half of agricultural labourers lived in tied cottages). With this modification, the Rowntree rural poverty line is given in table 3 for four different family types.

Table 3. *Rural poverty-line budget for different family types, 1936 (s.)*

	<i>Man and wife</i>	<i>Man, wife, and one child</i>	<i>Man, wife, and two children</i>	<i>Man, wife, and three children</i>
Food	8.95	12.14	15.29	18.50
Clothing	4.14	5.10	6.05	6.99
Fuel	2.92	3.08	3.24	3.40
Sundries	<u>5.00</u>	<u>5.61</u>	<u>6.22</u>	<u>6.83</u>
Total non-rent	21.01	25.93	30.80	35.72
Rent	4.00	4.00	4.00	4.00
Total	25.01	29.93	34.80	39.72

Source: adapted from Rowntree, *Human needs of labour*, p. 123

These poverty lines can be compared with the average minimum wage for an adult male in 1936 of 32s. 4d. On this basis, families with two or more children would be in poverty. However, in low wage counties where the minimum wage was about 30s., families with only one child would have been on the poverty line. In the high wage counties with a wage of 35s. or more, families of four would have been just above it. If we allow an extra 2s. for the average payment above the minimum wage then, on average, the family of four would have been just about on the poverty line. Some families obtained extra income from the earnings of women and children, particularly at harvest time, but the rates of pay were low, typically 4d. to 6d. per hour.³⁸ Against this must be set any loss of earnings during the winter months and periods of sickness. Overall, it appears that families of moderate size would have been close to the

³⁶ Rowntree, *Human needs of labour*, p. 123.

³⁷ Rowntree gave allowances for food and clothing separately for men, women, and children and hence these can be used to calculate allowances for different family types. The other items were given only for a family of five and these have been scaled down (non-proportionately) for smaller families.

³⁸ If we allow for extra earnings at 6d. per hour for a 50-hour week over a period of 8 weeks, this would add 3s. 10d. to average weekly income over the year.

poverty line in the mid-1930s.³⁹ Single men would almost never have been in poverty.⁴⁰

How much difference did minimum wage regulation make? Our prediction based on the estimate discussed above indicates that, in the absence of regulation, the wage for the adult male agricultural labourer in 1936 would have been 22 per cent lower at about 25s. 3d. At this rate, all the families with children would have been in poverty in the absence of other sources of income. The results suggest that the effect of wage regulation must have been to lift a considerable number of families out of poverty or at least to prevent them from falling far below the poverty line. In the absence of detailed information on the distribution of family incomes, precise numbers cannot be calculated.

What effect did it have on the farmers? Many observers lamented the low returns to farming in the interwar period after the collapse in farm prices in the early 1920s. Farm costs had risen relative to output prices and rents had hardly changed in nominal terms since before the First World War. We can obtain a glimpse of the incomes of tenant farmers in East Anglia from a series of surveys which were conducted by the Department of Agriculture at the University of Cambridge in the early 1930s. These examined the costs and revenues for farms of different sizes. Table 4 is adapted from the report of the findings of the survey for 1933.

Average annual family income for these farms comprises farm income, wheat deficiency payments, the imputed value of the labour of family members, other than that of the farmer, and the family's consumption of produce from the farm. The latter two amounts were counted as costs when calculating farm income in the second row. Taking all these sources of income, on a weekly basis, family farm incomes ranged from about 44s. per week for the smallest farms to about 322s. per week for farms over 500 acres. Thus even the smallest farmers would not have been in poverty on this basis unless they had very large families. But it is worth noting the importance of deficiency payments, in the absence of which, family incomes on the smallest farms would have been about 35s. per week. These would have been more important in East Anglia than in agriculture as a whole.⁴¹

These figures suggest low returns to the effort of some farmers who often had considerable capital invested in their farms. The survey gave estimates of the value of a tenant farmer's capital tied up in livestock, crops, and deadstock but excluding land and buildings (for which the farmer paid rent). The imputed rental on the farmer's capital is calculated

³⁹ Mejer, *Agricultural labour*, reached similar conclusions based on Rowntree and on several contemporary surveys of working-class expenditure.

⁴⁰ The equivalent poverty line for a single adult male would be 16.87s. allowing the same 4s. for rent. However, a large proportion of single men received board and lodging on the farm, typically valued at 15s.-17s. leaving about the same amount to cover only clothing and personal sundries.

⁴¹ At this time East Anglia accounted for nearly half of all wheat grown in England and Wales and 80% of sugar beet. As Whetham observes: 'It is not surprising therefore that farmers elsewhere looked askance at the subsidies paid on these two crops' (Whetham, *Agrarian history*, p. 245).

Table 4. *Farm family incomes, 1933 (£ p.a.)*

	<i>Farm size (acres)</i>					
	20-50	50-100	100-150	150-300	300-500	over 500
No. of farms in sample	190	283	199	253	118	42
Farm income (excl. deficiency payments)	19	34	49	43	86	214
Wheat deficiency payments	23	51	93	160	277	466
Labour credited to wife and family	30	38	46	36	28	56
Private drawings in kind	42	49	57	72	76	101
Total family income	114	172	245	311	467	837
Imputed return on capital at 4%	19	32	50	80	131	229
Return to farmers' labour	65	102	149	195	308	552
Increase in income with 17.5% lower wage bill	13	29	47	86	144	256

Source: adapted from Carslaw *et al.*, *Economic survey of agriculture*, pp. 11, 15, 18

assuming a rate of return of 4 per cent. If we deduct this and the value of labour credited to family members from total family income we have the return to the farmer's labour. This rises from 25s. per week on the smallest farms to 212s. per week on the largest. In fact, on farms smaller than 50 acres the return to the farmer's labour was lower than the minimum wage for agricultural labourers of 30s. 6½d. per week in 1933. In 1931 and 1932 even some of the larger farmers failed to earn a return as high as the labourer's wage.

How much difference did the minimum wage make? We can get an impression by reducing the wage bill for each group of farms by the effect of the minimum wage—for 1933 a reduction of 17.5 per cent. This would have added significantly to the return to farmers' labour, raising it by between 20 per cent on the smallest farms and 46 per cent on the largest. But it would barely have raised the return to the small farmer's labour to the level of the agricultural labourer's minimum wage. Clearly, it was the large farmers who would have benefited most, both in absolute and in relative terms, had the minimum wage been absent. In addition, since the lower wage would have increased the profit maximizing level of output and employment, the return to farmers would have risen by more than these figures indicate.

We should note, however, that farm incomes recovered somewhat in the later 1930s. From 1932 the deficiency payments under the Wheat

Act compensated to some extent for the fall in prices.⁴² As table 4 illustrates, by 1933, deficiency payments were making a substantial contribution to farm incomes, amounting to more than 80 per cent of the return on farmers' labour for farms larger than 150 acres. At each farm size deficiency payments added more to farm revenues than minimum wage regulation did to farm costs. Overall, they continued to outweigh the effect of minimum wage regulation until 1936. Thus in the early 1930s farmers could hardly complain about the overall impact of government intervention—at least not those in East Anglia.

VI

In this article we have studied the origins of the minimum wage in agriculture beginning in 1917 and especially from its reintroduction in 1924. Based on prewar experience, we estimate that the impact of regulation was to raise the wage for agricultural labourers by about 15 per cent in the late 1920s and by more than 20 per cent in the 1930s. Comparison with wage trends in Scotland strongly supports these orders of magnitude. We estimate the employment elasticity of changes in the wage over the period spanning the introduction of the Agricultural Wages (Regulation) Act at about -0.55 . This finding, too, is supported by the comparison with wage and employment trends in Scotland.

The overall impact of minimum wage regulation was to reduce farm employment by about 54,000 (6.5 per cent) in 1929 up to a peak of about 97,000 (13.3 per cent) in 1937. The effect of the minimum wage on those who remained in employment was to lift many families of farm labourers out of poverty and to prevent many more falling substantially below the poverty line. The minimum wage raised farm costs significantly and lowered the returns to the labour of farmers.

These conclusions can be compared with those from studies of the effects of the agricultural minimum wage in the postwar period. Lund *et al.* estimated a labour demand elasticity in the neighbourhood of -1 but they found that changes in the minimum wage were almost totally offset by compensating movements in the average wage premium over the minimum.⁴³ By implication, minimum wage regulation had little effect on either the average wage or the numbers employed. More recently, in a study commissioned by the Ministry of Agriculture, Fisheries and Food, Dickens *et al.* found that variations in the minimum wage had significant effects on earnings, especially at the bottom of the distribution, but that such variations did not affect the level of employment.⁴⁴ The results of our study, though they apply to a different period, stand in sharp contrast to the studies of the postwar period. It is possible that the minimum wage was less binding in the postwar period and the effects were corre-

⁴² It is perhaps worth noting that in 1933–4 deficiency payments effectively raised the price of total farm output by 3.4 per cent. Based on our earlier estimate of the elasticity of labour demand, this would have saved about 13,000 jobs.

⁴³ Lund *et al.*, 'Wages and employment in agriculture', p. 35.

⁴⁴ Dickens *et al.*, 'Effect of minimum wages'.

spondingly smaller. But the fact that we are able to observe the effects of the *introduction* of minimum wages and the fact that these effects were so significant lends additional importance to the interwar findings.

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APPENDIX: data sources and methods of construction

Time series data

Agricultural wage, England and Wales: The basis of the agricultural wage series is the weekly wage rate including the value of allowances but excluding extra payments for overtime, harvest work, etc. The series for 1919-39 is the minimum wage or negotiated wage for an ordinary adult male labourer from Ministry of Labour, *18th abstract of labour statistics*, for 1926 (Cd 2740) and the *83rd annual abstract of statistics of the United Kingdom*, 1940 (Cd 6232). For the pre-1914 period we have a series for wage rates on 156 farms from the *16th abstract of labour statistics*, 1915 (Cd 7131) which we extend back to 1870 based on the series for 69 farms from Board of Trade, *Report by Mr Wilson Fox on the wages and conditions of employment of agricultural labourers in the United Kingdom*. To obtain a benchmark for the pre-1914 series we take the average cash wage plus allowances for ordinary labourers from the 1907 agricultural wage census reported by Bowley, *Prices and wages*.

Urban wage rates: For 1920-39 building labourers' wage rates in 39 large towns in Great Britain were taken from the *18th abstract of labour statistics*, 1926, p. 116 and the *Annual abstract of statistics*, 1940, pp. 158-9. For 1880-1913 a series was constructed for 12 towns weighted by their 1891 populations based on data in the unpublished Board of Trade report on *Rates of wages and hours of labour*, 1908. The series was extended back to 1870 based on six towns from the same source.

Agricultural price index: For 1913-39 we use the Ministry of Agriculture's index of agricultural prices from *A century of agricultural statistics, 1866-1966*, p. 85. For 1870-1913 we use the index (with 1910 weights) provided by Turner, 'Output and prices'.

Urban unemployment: for 1920-39 the series is for insured unemployment and for 1870-1913 for unemployment in certain trade unions, both reported in Feinstein, *National income*.

Scottish agricultural wages: For 1922-39 a series was constructed from data kindly supplied to us by Dr Richard Anthony. For 1928-39 we used his series for orramen and for the earlier years we spliced his series for married ploughmen on to this.

Agricultural employment: Employment figures of agricultural workers for England and Wales and for Scotland, 1923-39, were taken from Ministry of Agriculture, *A century of agricultural statistics, 1866-1966*, p. 62.

Cross-section data

County wage rates: These are for 52 counties (or county divisions) and are for the prevailing (1924) or minimum (1929) wage for ordinary male labourers of 21 years and over. For 1924 these were taken from Ministry of Agriculture, *Report of proceedings under the Agricultural Wages (Regulation) Act, 1924, for the year 1925*, pp. 56-7. For 1929 the data were taken from Ministry of Agriculture, *Agricultural statistics, vol. LXV, 1930, pt 1*.

County employment: Numbers of employed wage earners are subdivided into males, females, and permanent and casual workers. For 1924 these were taken from Ministry of Agriculture, *Agricultural statistics, vol. LIX, 1924, pt. 1*. For 1929 they were taken from Ministry of Agriculture, *Agricultural statistics, vol. LXV, 1930, pt. 1*.

Proportion of land under arable crops and average acreage per farm: For 1924 these were taken from *Report on certain statistical enquiries in connection with the Census of Production Act, 1906 (1927)*.

Tied cottages: The ratio of the number of cottages attached to farm properties to the number of permanent adult male labourers for 1941 was taken from Ministry of Agriculture, *National farm survey of England and Wales, 1941-3*.

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