Migration and Labour Market Integration in Late Nineteenth-Century England and Wales[1]

George R. Boyer and Timothy J. Hatton

There is a long and well established tradition of studies analysing the pattern and causes of internal migration and assessing the degree of labour market integration in late nineteenth-century Britain. Some studies document the flows of migrants from one area to another and describe migrant characteristics and the directions of the predominant streams of migration. Others analyse the determinants of gross or net' migration flows at the region or county level. The questions implicit in these studies are: How mobile was the labour force? What were the major factors which determined individual decisions to migrate? How are these factors reflected in differences in migration flows between regions and in the pattern of long distance and short distance migration? Did. labour mobility increase during the nineteenth century?

There is also a strand of the literature which studies the effects of migration and labour mobility on the growth of industries, cities, and regions and above all on v/age rates and wage differentials. The, questions here are: How far did migration serve to integrate labour markets within and between regions and sectors? Do movements in regional and sectoral wage rates provide evidence of labour market integration? Did the degree of integration increase during the nineteenth century?

In this article we provide a framework within which these questions can be addressed and which links together these two separate strands of the literature. Some of the existing literature is reviewed within this framework, and new evidence offered on the questions raised above. The article is organized as follows. In section I a simple framework is set out which stresses the links between migration and labour market integration. In section II the evidence on the character of migration flows, their magnitude and direction is examined. Section III focuses on the determinants of migration flows at the county level, particularly from rural southern counties. This is followed, in section W, with an examination of the effect of rural-urban migration on agricultural wage rates. Section V considers the evidence on regional labour market integration, and is followed by a brief conclusion summarizing the results.

Section I

In analysing migration we are concerned not so much with the idiosyncratic forces which caused a particular individual to migrate but with explaining the broad tendency for individuals from a given population to migrate. In the simplest possible case we can depict the migration rate^ the number of migrants relative to the population 'at risk', as depending on the difference (or the ratio) between the wage or income available to the individual in the destination region and that in the region of origin. This simple economic model of migration is depicted in figure 1. In this illustration, a wage gap favouring the destination region will not cause everyone to move; but as the wage gap widens some who previously would not have moved find it worth while to do so. There

[1] We would like to thank Jeffery Williamson, an anonymous referee, the editors, and participants at seminars at Harvard University, Lehigh University, and at the 1996 Economic History Society conference at Lancaster for helpful comments.

are a variety of reasons why, because of differences between individuals in preferences, in the ability to exploit opportunities, and in the costs of making the move, different individuals require different levels of incentive in order to induce a move. The implication is that migrants cannot be treated like a homogeneous commodity where instantaneous arbitrage takes place.

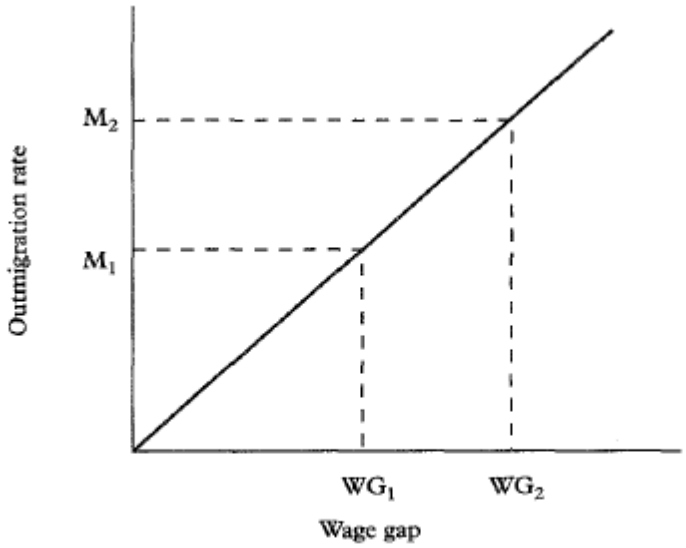

Figure 1. *The migration function*

The model offers a simple definition of labour mobility; it is the degree to which an increase in the incentive to move (in this case the wage gap) increases the migration rate, in other words it is the slope of the migration function. There has often been a tendency to associate high levels of migration with high labour mobility. This is not necessarily correct, as can be seen in figure 1. At WGj there is very little incentive to migrate and hence little migration, while at WG2 there is a greater incentive and more migration, although the behavioural relationship has not changed— labour mobility has remained the same even though the level of migration has increased. If a fitter curve were drawn this would imply lower mobility. It would, of course, be possible to imagine two different populations where the population with the lower level of mobility had a higher level of migration because it had a much larger incentive to migrate than the other. Hence examining the level of migration may be a poor guide to assessing labour mobility.

Clearly, the wage gap is not the only variable relevant to the migration decision. The probability of gaining employment in the individual's occupation or in some other occupation is another important factor. Theories of rural--urban migration have often included the probability of gaining employment in the destination relative to the region of origin[2]. In terms of figure 1, worsening prospects of employment in the destination would have the effect of shifting the migration function downwards, and worsening prospects at home would shift it upwards. Other characteristics of the origin and destination regions relating to the labour market, or more generally, to environmental considerations may

[2] Todaro, 'Mode! of labor migration'; Harris and Todaro, 'Migration, unemployment, and development

also be relevant. Poor working conditions, unsanitary housing conditions, or high mortality rates in the destination region would lower the incentive to migrate. These factors reflect the fact that the decision to migrate depends not just on income but on the whole basket of features which determine individual utility.

One factor often stressed in migration studies is the presence of previous migrants from the origin region in the destination region—the 'friends and relatives effect'. This can be considered as another environmental factor which could be individual specific (the individual's friends and relatives) or general (previous migrants from the same region of origin). The presence of previous migrants can have direct economic effects on the decision to migrate through lowering the costs of travel, of adjustment, of job search, and of uncertainty in general. Another factor stressed in migration studies is the distance between origin and destination. Distance is a proxy for the monetary and psychic costs of migration and for information on destination labour markets. Of course, the psychic costs associated with moving to an unfamiliar environment are likely to be mitigated by the friends and relatives effect.

Most theories of migration (and of job search) are set in a human capital-t3'pe framework and hence are implicitly forward looking. The investment in migrating in the present yields a prospective stream of 3-etums in the future which is higher than the prospective stream at home. Thus, migration decisions will be based on the estimate of the difference between two future earning streams which must be formed on the basis of past experience[3]." The appropriate measure of the incentive to migrate in figure 1, therefore, is not the current wage gap but the gap in (discounted) future income flows. However, if the migration decision is reversible at a relatively low cost, migrants could make decisions based on a shorter time horizon in which the immediate gains would dominate. We might then expect to see a large share of return migration, temporary migration, and repeated onward moves.

Modem theories of migration often stress the household or the family as the decision-making unit. To the extent that whole families migrate, the relevant incentive is the difference in current and future expected income for the family as a whole, although this would typically be dominated by the earnings gap for the male breadwinner. An alternative strategy might be for some members of the family (typically young adults) to migrate and to send back remittances to the non-migrant family members. This strategy can be interpreted as both increasing income and reducing risk by diversifying the sources of income[4]. It would also reduce the cost of return migration if adverse conditions were encountered at the destination. Nevertheless, migration of one or more family members would still be expected to respond to the same labour market incentives as would apply in an individual's migration decision.

In order to examine the link between migration and labour-market integration we can set up a simple model of two symmetric labour markets *(i* and *j)* with migrants moving between them. For ease of exposition, the markets are assumed to be the same

---

[3]Unless migration decisions are easily and costlessly reversible, we might expect migrants to be relatively young since they would have a long period over which to reap the retmms to migration; to be single since their costs of migrating would be lower; and to have fewer location-, firm-, or occupation-specific skills which would be less easily transferable to another location.

[4]Stark, *Migration of labour,* ch. 15.

size but to face different labour supply and demand conditions. The migration function can be specified as:

$$M_{ij,t} = \mu(W_{j,t-1} + \beta x_{j,t-1} - W_{i,t-1} - \beta x_{i,t-1}) \quad (1)$$

where $M_{ij,t}$ is the rate of net migration from *i* to *j* (which could be positive or negative). For each region, *w* is the natural log of the real wage and *X* is the log of an index of the non-wage factors which enter into the migration decision; μ is the slope of the migration function, which is our measure of labour mobility.

When the attractions of both regions are equal, there would be zero net migration. In this case (ignoring the time subscripts) the zero migration condition is: $Wi + \beta x_i = Wj + \beta z_j$[5]. If *x* is interpreted as the employment probability (or employment rate) and β set equal to one, then the expected income equilibrium familiar from Harris and Todaro results.

The (logarithmic) labour demand curves for the two regions can be written as:

$$l_{i,t}^{d} = \alpha_o - \alpha_1 W_{i,t} + \alpha_2 z_{i,t} \quad (2)$$

$$l_{j,t}^{d} = \alpha_o - \alpha_1 W_{j,t} + \alpha_2 z_{j,t}$$

where for the respective labour markets, / is the log of employment, *w* is the real wage as before, and *z* represents forces such as technical change, capital accumulation, and structural change which shift the labour demand curve out over time.

The change in labour supply in each region depends on the natural increase of -the labour force, *n,* and the rate of net migration. Hence labour supply in the two markets will be linked by net migration:

$$\Delta l_{i,t}^{s} = n_{i,t} - m_{ij,t} \quad (3)$$

$$\Delta l_{j,t}^{s} = n_{j,t} m_{ij,t}$$

By converting the labour demand equations into changes, setting labour supply equal to demand and solving out m.igration5 the following expression can be obtained:

$$(\Delta w_i - \Delta w_j)_t = \frac{\alpha_2}{\alpha_1}\left(\Delta z_i - \Delta z_j\right) - \frac{1}{\alpha_1}(n_i - n_j)_t \quad (4)$$

$$-2\frac{\mu}{\alpha_1}(w_i - w_j)_{t-1} - 2\frac{\beta\mu}{\alpha_1}(x_i - x_j)_{t-1}$$

Equation (4) illustrates that the change in the wage differential will depend on relative shifts in labour demand in the two regions (the first term on the right) and relative

[5] This condition may be more familiar in levels than in logs. Denoting levels with capitals ii would be $W_i X_i^{\beta} = W_j X_j^{\beta}$

shifts in labour supply (the second term). The third term reflects the rate at which the wage differential adjusts to an initial disequilibrium; that is, the degree to which the two labour markets are integrated depends on the so-called error correction parameter on the lagged wage gap term. This, of course, depends on lie labour mobility parameter, μ with higher μ giving a more rapid rate of adjustment and therefore a greater degree of labour market integration. Finally, the last term indicates that labour market or environmental characteristics will also determine the change in the wage ratio; once again, the rate of adjustment depends on the mobility parameter, μ.

This simple model demonstrates two important points about labour market integration. First, and most obviously, the degree of labour market integration depends directly on the mobility parameter, μ. Second, using a model such as (4) above, the degree of labour market integration can be assessed through the analysis of wage rates and without reference to direct observations on migration[6]. 'The model illustrates that labour market integration is a relative concept. If the labour market were instantaneously arbitraged then |μ would be infinite and the labour markets could be said to be perfectly integrated; if they were not integrated at ail then μwould be zero. It makes little sense to say that labour markets are either integrated or not integrated; rather, we should discuss the degree to which two or more labour markets are integrated.

Using expression (4) above, we can see the conditions under which the wage differential would be constant in the long run. By setting the left-hand side of (4) equal to zero (and dropping the time subscripts) we obtain:

$$\left(w_i - w_j\right) + \beta\left(x_i - x_j\right) = \frac{\alpha_2}{2\mu}\left(\Delta z_i - \Delta z_j\right) - \frac{1}{2\mu}\left(n_i - n_j\right) \tag{5}$$

If both sides of this expression were equal to zero we would be back to the zero migration condition above in which the wage rates, compensated for labour market and environmental characteristics, are equal in the two markets. However, if in the long run labour demand grew faster in market *i* than in market *j* (the first term on the right is positive) and/or the rate of natural increase was lower in market *i* (the second term is negative), then the compensated wage would be permanently higher in region *i* even though migration from *j* to *i* would be continuously tending to equilibrate the two markets. For given values of the variables on the right-hand side the permanent wage gap would be greater the smaller is the mobility parameter, μ.

Many of the existing studies of migration and labour mobility can be interpreted in this framework; and in what follows some further evidence is offered along these lines together with evidence using wage data. But first the main currents of migration in the late nineteenth century are examined.

[6] Although μ/α^1 can be estimated directly, the value of μ can only be calculated if an independent estimate of α^1 is available.

Section II

The first major study of migration in nineteenth-century Britain was undertaken by Ravenstein, who used birthplace data from the 1881 census to deduce seven 'laws of migration'. Ravenstein's first law states that most migration covered short distances. The resulting 'universal shifting of or displacement of population . . . produces shifting "currents of migration" setting in the direction of the great centres of commerce and industry which absorb the migrants'[7]. The second law describes the 'process of absorption' that results from this migration pattern: 'the inhabitants of the county immediately surrounding a town of rapid growth, flock into it; the gaps thus left in the rural population are filled up by migrants from more remote districts, until the attractive force of one of our rapidly growing cities makes its influence felt, step by step, to the most remote comer of the Kingdom'[8]. The other five laws state that: 'the process of dispersion is the inverse of that of absorption, and exhibits similar features'; 'each main current of migration produces a compensating counter-current'; the relatively few long distance migrants 'generally go by preference to one of the great centres of commerce or industry'; urban natives are 'less migratory' than rural natives; and 'females are more migratory than males'[9].

Ravenstein's 'laws' are essentially descriptive inferences from census data; they are concerned with the who, when, and where of migration, not the why. More recent observers have sought to illuminate some additional characteristics, such as the age structure of migrants. Friedlander and Roshier, Baines, and Williamson used demographic reconstructions to show that migrants were predominately young[10]. According to Bainesj 81 per cent of all intercounty migrants between 1851 and 1901 were aged 15-34 and the remainder were children[11]. Similarly Williamson estimates that two-thirds of rural-urban migrants in the 1860s were aged between 15 and 29 and the remainder were children[12]. These findings indicate that the migration of families was more important than Ravenstein suggested. Although age composition, alone cannot tell us why people migrated, the fact that two-thirds or more of migrants were young adults adds support to the view that migration was a forward-looking decision based on economic criteria. Younger migrants would have a longer future working life over which to obtain the benefits of migration, and their costs of migrating and of acquiring different skills and experience might be lower[13].

Ravenstein concluded from his analysis of birthplace data that the great majority of Britain's cities 'recruit their population in the main from the county in which they are situated, or in the case of border towns, from two contiguous counties[14]. The only

---

[7] Ravenstein, 'Laws of migration', p. 198.
[8] Ibid., p. 199.
[9] Ibid.
[10] Friediander and Roshier, 'Internal uiigratioKi'j pp. 271-2; Baines, *Migration in a. mature economy,* p. 104; Williamson, *Coping^ with city growth,* pp. 40-2.
[11] Barnes's estimate *{Migration in a mature economy,* p. 104) of the age distribution of current migrants is net of returns. For a discussion of the effect of return migration on estimates of the age distribution of migrants, see ibid.
[12] Williamson, *Coping with city growth, p.* 42.
[13] This insight is often attributed to Sjaasted, 'Costs and returns', which was one of the first analyses of migration in a human capital framework.
[14] Ravenstein, 'Laws of miration', p. 205.

exceptions to this rule were large or rapidly growing cities such as London, Liverpool, or Manchester, whose labour demands were so great that they could not be supplied by the surrounding counties[15]. Even in the exceptional case of London, however migration 'bears a most pronounced relation to distance, modified by facility of access and the vicinity of other centres of absorption[16]." Thus, while London contained a large number of long distance migrants in 1881, including 110,000 from the north and north midlands, it also contained 775,000 migrants from nearby southern and eastern counties[17].
The step-by-step process of absorption described in Ravenstein's second law suggests that a significant amount of rural-rural migration occurred as part of the larger rural-urban migration process. Agricultural areas located close to cities experienced high rates of outmigration the resulting reduction in labour supply drove up wage rates[18]. The high agricultural in turn raised wages in these areas and attracted migrants from even more distant rural areas. The series of short distance moves sometimes led to substantial shifts of population between regions. For example, the Royal Commission on Labour (1893) reported that agricultural 'labourers from Wiltshire, Somerset and Devon, from Hereford and the Cirencester district of Gloucestershire have almost everywhere superseded the indigenous Welsh labourer in the Vale of Glamorgan'[19]. These migrants had been attracted to south Wales by the high wages that resulted from the migration of Welsh farm workers to the mining districts.

Ravenstein devoted little attention to the issue of urban-urban migration, mainly because of the lack of birthplace data for cities in the 1881 census. Based on an analysis of data for natives of London and seven Scottish cities, he concluded that urban natives were less likely to migrate than were rural natives[20]. He did not discuss the direction of migration flows among English cities or whether a typical urban-urban move covered a longer distance than a typical rural-rural move.

More recent studies of internal migration in Victorian Britain have confirmed much of Ravenstein's analysis, and in particular his hypothesis that most migration covered short distances[21]. Table 1, constructed using the birthplace data recorded in the

---

[15] Weber, *Growth of cities,* p. 259, turned these exceptions into another law of migration: 'the distance travelled by migrants varies in the same ratio as the magnitude of the city, which is their destination. The larger the town, the wider its circle of influence in attracting immigrants.' More recently. Smith, 'Movement of population', found that, in the 1850s, among English cities 'London alone drew in large quantities upon areas that were up to .and even over a hundred miles distant.'

[16] Ravenstein, ".Laws of migration', p. 208.

[17] Ibid., pp. 206-7. Writing shortly after Ravenstein, Llewellyn Smith, 'Influx of population', 3p. 66-8, also used birthplace data from the 1881 census to demonstrate the effect of distance on migration to London.

[18] In what follows the term immigration refers to migration from all origins to a particular destination, and outmigration refers to migration to ail destinations from a given origin. Unless otherwise specified, these terms are used to describe net migration, that is, the balance of inward and outward flows. The term emigration is used to refer only to migration to destinations outside England and Wales.

[19] Quoted in Thomas, 'Migration of labour', p. 285.

[20] Ravenstein, 'Laws of m^ation', pp. 195-6. Ravenstein's finding that urban-urban migration rates were lower than rural-urban migration rates is probably a result of the fact that his data are net of returns. Baines, *Migration in a mature economy, p.* 120, concluded that 'rural-urban moves were more likely to be permanent' than urban-urban or urban-rural moves, so that the analysis of migration using the birthplace data in the census 'overstate[s] the rural-urban movement that occurred compared with movement between urban counties'. If urban migrants were more likely to return to their place of origin than were rural migrants, then urban-urban gross migration rates might well have been higher than rural-urban gross migration rates.

[21] The importance of distance in determining migration flows has been demonstrated for London by Shannon, 'Grovwh of London', and Fdedlander, 'London's urban transition'; for south Wales by Thomas, 'Migration of labour'; and for

census, demonstrates the effect of distance on migration. It reports the birthplaces of migrants to four major commercial/industrial areas enumerated in 1911. These figures indicate that commercial/industrial centres recruited a large share of their populations from nearby counties. The majority of migrants to Birmingham and Manchester came from their respective hinterlands, and slightly fewer than half of London's migrants came from the south and east. Two thirds of the migrants to Glamorgan came from Wales and the nearby south-west. The importance of local recruiting areas becomes even larger if we look only at migrants born in England and Wales. Manchester contained large numbers of Irish-born migrants, and London contained large numbers of Irish, Scottish, and foreign-born migrants. Not counting these, 65 per cent of London's and 66 per cent of Manchester's English and Welsh migrants were born in the south and east and in the north, respectively.

Table 1. *Birthplaces of male migrants to major urban areas, 1911*

	London Administrative County	*Birmingham County Borough*	*Manchester County Borough*	*Glamorgan Administrative County*
Male population	2,126,341	253,723	343,347	391,573
Born outside city/county	647,981	80,070	132,182	149,025
Birthplace of migrants				
South and east	298,979 (46.1%)	12,229 (15.3%)	10,586 (8.0%)	12,535 (8.4%)
North	45,530 (7.0%)	7,103 (8.9%)	70,064 (53.0%)	6,689 (4.5%)
Midlands	40,419 (6.2%)	43,568 (54.4%)	19,359 (14.6%)	11,814 (7.9%)
South west	62,377 (9.6%)	7,110 (8.9%)	3,074 (2.3%)	41,020 (27.5%)
Wales	13,393 (2.1%)	1,973 (2.5%)	3,606 (2.7%)	62,568 (42.0%)
Ireland, Scotland, other, unknown	187,283 (28.9%)	8,087 (10.1%)	25,493 (19.3%)	14,399 (9.7%)

Source: see text

The role played by migration in the redistribution of population between rural and urban areas is shown in table *2*. From 1841 to 1911 the 'rural residues' of England and Wales lost 4.5 million people as a result of migration. During this same period English and Welsh cities gained 2.65 million people through migration and the colliery districts gained 650,000; approximately 1.2 million people emigrated. The pattern of migration differed sharply across decades. From 1841 to 1881 rural-urban migration rates were high and emigration rates were low—^the 1840s was a decade of net immigration, largely from Ireland. In the 1880s, rural-urban migration, especially to northern cities, declined, and

England and Wales as a whole by Redford, *Labour migration*, Friedlander and Roshier, 'Internal migration'. Greenwood and Thomas, 'Geographic labor mobility', Vedder and Cooper, 'English and Welsh geographic labor mobility', Friedlander, 'Occupational structure', and Boyer, 'Labour migration in southern England'. For a discussion of the relationship between distance and migration, see Schwartz, 'Effect of distance'.

net emigration increased sharply. Internal migration picked up again in the 1890s and net emigration declined to a very low level. However, emigration returned to a high level in the first decade of the twentieth century, and English and Welsh cities experienced a net outmigration of 320,000 persons[22].

Table 2. *Migration in England and Wales, 1841-1911 (males and females)*

	Net gain or loss by migration, 1841-1911	*Migration rate (migrants per 1,000 population per decade)*	*Ratio of gain or loss to natural increase (%)*
1 Towns			
(a) Large towns			
London	+1,250,511	37.3	32.9
8 northern	+893,337	37.9	32.5
(b) Other towns			
66 southern	+414,627	16.5	16.4
52 northern	+93,113	3.1	2.6
2 Colliery districts			
9 northern	+650,548	27.9	19.3
3 Rural residues			
northern	−1,643,770	−88.6	−78.6
southern	−2,863,266	−104.5	−89.2
4 Total			
north	−6,748	−0.1	−0.1
south	−1,198,128	−13.9	−12.6

Source: Cairncross, 'Internal migration in Victorian England', p. 85

The importance of London as a destination for migrants is clearly shown in table 2. From 1841 to 1911 net migration to London equaled 1.25 million, 40 per cent larger than net migration into the eight largest northern and midlands cities combined. However, the immigration rates for London and the eight largest cities were virtually identical: 3.73 and 3.79 migrants per thousand population per year, respectively. London attracted three times as many migrants from 1841 to 1911 as the 66 other southern cities for which data are reported. Of the nine colliery districts, the two main destinations for migrants were Glamorgan, which attracted 372,000 migrants from 1841 to 1911, and Durham, which attracted 237,000 migrants.

The direction of migration flows for males and females was somewhat different. A large share of female migrants became domestic servants, and young women therefore were attracted to destinations with a large and growing demand for servants, in particular London and the Home Counties[23]. Women also were attracted to Lancashire and Cheshire, whose cotton factories required a large number of female workers[24]. Cairncross estimated that 'the net inflow [of migrants into the textile towns] seems to have been predominantly of women'[25]. On the other hand, employment opportunities for women were scarce in the coalfields and in cities such as Sheffield. As a result, 'several coalfields

[22] Caimcross, 'Internal migration', pp. 70-3, 83.

[23] Baines, 'Population, migration and regional development', p. 53; Saville, *Rural depopulation*, p. 96.

[24] Ibid., p. 74.

[25] Caimcross, 'Intemal migration', p. 74.

. . . attracted men in large numbers but were net losers of females'[26]. The effect of these differences in male and female migration flows can be seen by comparing the female/male sex ratios of various locations. In 1901 there were 106.8 females for every 100 males in England and Wales; in London the ratio was 111.8 while in Sheffield it was 100.6 and in Durham 97.2[27].

The major migration destinations varied over time. From 1841 to 1881, London was the most important destination with a net immigration of 1.1 million, followed by Manchester/Liverpool (475,000), and the Durham colliery district (229,000). London remained the most important destination from 1881 to 1901, attracting 395,000 migrants, but migration second most important destination was the group of 42 southern residential and military towns, with a net immigration of 214,000, followed by the Glamorgan colliery district with 128,000 immigrants. Migration patterns changed sharply in the first decade of the twentieth century. The only destinations to attract more than 100,000 migrants during the decade were the southern residential and military towns, with 138,000 immigrants, and the Glamorgan coalfields with 129,000 immigrants. London and most major cities experienced net outmigration[28].

Rural districts throughout England and Wales experienced high rates of outmigration; over the whole period 1841-1911 the rural north and rural south had outmigration rates of 8.9 and 10.5 per thousand per year, respectively. Net outmigration from the southern counties peaked in the 1870s; outmigration from the northern counties peaked in the 1880s. In both major regions the outmigration rate in 1901-11 was below that in any of the previous six decades. Rural outmigration was not driven simply by agricultural decline. Outmigration rates from rural southern counties were higher during the 1860s and 1870s, the so-called 'golden age' of English agriculture, than during the agricultural depression of the 1880s and 1890s[29]. Moreover, while the agricultural depression began earlier and was much more severe in grain producing areas than in pastoral areas, outmigration rates were no higher from southern counties that specialized in grain production than from southern counties specializing in pastoral farming. Lawton concluded from his study of rural depopulation that 'migration from rural areas was universal . . . distance from growth points was more important than the quality of soil or the type of farming in accounting for variations in the intensity or duration of loss of population'[30].

The estimates in table 2 suggest that, from 1841 to 1911, net emigration from England and Wales totaled 1.2 million. Baines has estimated gross emigration (net of returns) from each county of England and Wales from 1861 to 1901. He concluded that

---

[26] Hunt, *Britbh labour history,* p. 369.

[27] SaviUe, *Rural depopulation,* pp. 32-3.

[28] Caimcross, 'Internal migration', pp. 83, 86.

[29] Baines, *Migration in a mature economy,* pp. 285-98, presents outmigration rates for each county - England and Wales for each decade 1861-70 to 1891-1900. Over this period the highest outmigration rates occurred in the 1870s in 13 of 19 rural southern counties and in the 1860's in two counties.

[30] Lawton, 'Rural depopulation', p. 243. Evidence that the rate of outmigration from rural areas was similar for arable and. grazing counties was first presented by Longstaff, 'Rural depopulation', and Eversley, 'Numbers of agricultural labourers'. Eversley divided the English counties into six groups based on the share of cultivated arable land and showed that between 1861 and 1901 the farm labour force declined at a similar rate for each group of counties. Similarly, Bowley, 'Rural population', p. 616, divided England and Wales into 12 regions and found that from 1861 to 1901 'the general uniformity of the rate of decrease of shepherds and [farm] labourers throughout the country is very noticeable'. On the topic of rural depopulation, see also Saville, *Rural depopulation,* JP 46-69

during this period England and Wales lost 2.33 million emigrants[31]. While Thomas and others have interpreted Caimcross's results as evidence that most emigrants originated in rural areas, Baines concluded that the majority of English emigrants in the last forty years of the nineteenth century came from towns[32]. He estimated that at least 45 per cent of emigrants were born in towns and cities, 33 per cent emigrated directly from rural areas, and up to 21 per cent were stage migrants, persons who migrated from rural to urban areas before emigrating[33].

Caimcross's estimates suggest that there was an inverse relationship between rural-urban migration and emigration. From 1851 to 1881 migration to cities and the colliery districts was high and emigration was relatively low. In the 1880s emigration increased sharply and migration to cities fell, while in the 1890s emigration slowed to a trickle and internal migration returned to about its 1851-81 level. Finally, from 1901 to 1911 emigration increased again, and urban areas experienced net outmigration.

Baines tested the relationship between emigration and intimal migration from rural counties by comparing changes in each county's emigration and internal migration rates between decades. He found that between 1861 and 1901 male emigration and internal migration rates moved in opposite directions about half the time and together about half the time, and concluded that 'in general there was no significant relationship between long run rates of emigration and internal migration[34]. Does this finding mean that British cities and overseas destinations were not alternatives for the potential rural migrant? Clearly, it depends on how changes in internal and external migration responded to the changing attractions of home and overseas destinations. For example, if the attractiveness of both types of destination increased then we might expect migration to both to increase—even if they were viewed as substitutes. Conversely, if the incentive to move to internal destinations increased while the incentive to move to overseas destinations decreased, we might expect to observe a rise in migration to the former and a decline in migration to the latter—even if they were not viewed as substitutes by potential emigrants.

This observation is just another example of the general point that we can say little about the forces driving migration by simply looking at migration flows. To get a deeper insight into such behavioural relationships we must examine the migration response in relation to changing incentives to migrate.

Section III

In the past 30 years a large literature on the causes of internal migration in developing countries has appeared[35]. The majority of these studies have estimated 'macro' migration functions to explain intercounty or interregional migration rates. The typical estimating equation regresses the rate of migration from origin area i to destination area *j* , *MiJPj* where *M* refers to gross migration and *P* to population, on wage or income levels in *i* and

---

[31] Barnes, *Migration in a mature economy,* pp. 144-5.
[32] Thomas, *Migration and economic growth;* Baines, *Migration in a mature economy,* p. 147.
[33] Ibid., pp. 264-5.
[34] Ibid., pp. 237-8, 246.
[35] Two excellent, although somewhat dated, surveys of the literature on migration in developing countries are Todaro, *Internal migration,* and Yap, 'Attraction of cities'.

j , the distance between *i* and *j* , the level of urbanization in *i* and *j* , and the stock of individuals residing in *j* who had been born in *i,* a proxy for the presence of friends or relatives in the destination area[36]. Unemployment rates and average education levels in both origin and destination areas, and the population of destination areas^ are often included as explanatory variables. A much smaller number of studies attempt to explain the rate of migration into or out of areas using only origin (local) variables. That is, they regress an area's migration rate, *MJPi* on the area's wage rate or income level, unemplo5mient rate, occupational structure, and average level of education, omitting any variables measuring alternative opportunities from the regression model. While such studies yield useful information concerning what regional characteristics lead to net immigration or outmigration, they do not enable one to determine the direction of migration flows.

There have been surprisingly few empirical analyses of the determinants of migration in Britain in the second half of the nineteenth century, and only a handful of these examine the direction of migration flows. Taken together, the results of these studies indicate that migration in late nineteenth-century Britain, like migration in currently developing countries, was driven by economic incentives and the availability of information.

The first systematic analysis of internal migration in nineteenth-century Britain was by Hunt, who estimated the coefficient of correlation between the net gain or loss from migration and weekly earnings at the county and regional level of aggregation for 1871-91 and 1891-19113 and found a 'moderately significant [positive] relationship'—high (low) wage areas tended to gain (lose) population from migration[37]. He concluded that the over-all influence of migration was to transfer population from low to high-wage areas' and thus to erode regional wage differentials[38]. In certain areas the relationship between earnings and migration deviated from trend; the far north of England and southern Scotland experienced net outmigration despite high wage rates, while in rural southern England the rate of net outmigration was low despite the area's very low wage rates. Hunt attributed these exceptions largely to 'the influences of distance [from high-wage areas] and variations in natural increase and demand for labour[39]. The correlation between migration and earnings was stronger in 1871-91 than in 1891-1911 at both the county and regional levels, which suggests that the 'erosive effects of migration upon wage differentials' declined somewhat after 1891.

Regression models explaining the determinants of migration flows have been estimated by Greenwood and Thomas, Vedder and Cooper, Morgan, Friedlander, and Boyer[40]. Greenwood and Thomas, and Vedder and Cooper, examine the combined migration flows of males and females, Morgan and Friedlander estimate separate regressions to explain male and female migration flows, and Boyer examines male migration only. Because regional wage series for women do not exist, the authors who

---

[36] Yap, 'Attraction of cities', p. 242j Todaro, *Internal migration,* pp. 50, 68.
[37] HuDt, *Regional wage variations,* pp. 243-8.
[38] Ibid., pp. 248-50.
[39] Ibid., pp. 250-1.
[40] Greenwood and Thomas, 'Geographic labor mobility'; Vedder and Cooper, 'English and Welsh geographic labor mobility'; Morgan, 'Model of migration'; Friedlander, 'Occupational structure'; Boyer, 'Labour migration in southern England'.

estimate models to explain female migration flows are forced to use male wage rates as a proxy for female wage rates.

Greenwood and Thomas, and Vedder and Cooper, examine variations in intercounty migration rates, using as their dependent variable the stock of migrants born in origin county *i* and residing in destination county *j* at a point in time, a measure of cumulative migration[41]. Both studies specify cumulative migration as a function of origin and destination wage levels, distance between origin and destination, population of the destination county, and a measure of occupational structure in the destination county[42]. Not surprisingly, the results of the two studies are similar. Both found that migrants responded to economic incentives, moving from low-wage agricultural counties to high-wage urban counties, and that distance between origin and destination, a proxy for cost of migration and for information concerning job opportunities, had a strong negative effect on migration. Unfortunately, the regression coefficients in both papers are almost certainly biased, since both attempt to explain cumulative migration up to a certain year *t* with independent variables measured only in year *t*. If migration flows, say, from 1821 to 1861 influenced wage rates and occupational structure in 1861, then such a procedure will result in simultaneous equations bias[43]. In addition, it is not possible to distinguish the effects of the stock of previous migrants on the volume and direction of migration flows when the stock itself is used as a proxy for the flow.

In his important 1985 book, Baines presents estimates of male and female outmigration rates, net of returns, from each county of England and Wales in each decade 1861-70 to 1891-1900, to two destinations: other counties of England and Wales, and overseas[44]. Appendix 7 of the book (by Morgan) contains the first attempt to estimate econometrically the determinants of intercounty gross outmigration flows. She regresses male and female internal migration and emigration rates per decade on a series of variables measuring the county's economic and demographic environment. Because the dataset does not include information on the destinations of migrants, the model is estimated under the assumption that the set of destination conditions and the costs of migration were the same for migrants from all counties. The model is somewhat non-standard in that it uses as explanatory variables *changes* in the local (county) wage, agricultural employment, and literacy over the decade. Such a specification could result in simultaneous equations bias if the effects of migration on labour supply influenced the wage during the decade. Despite this, the regression results generally are consistent with the notion that outmigration rates were higher from rural agricultural counties than from more urbanized counties. However, the results also indicate that previous internal migration (measured by the dependent variable lagged one decade) had a negative effect on present internal migration, which goes against the theory of chain migration.

A recent study by Friedlander is noteworthy because it examines the determinants of net migration rates for the 600 registration districts of England and Wales during the late nineteenth century—all other studies have examined county level data[45]. For each

---

[41] Greenwood and Thomas, 'Geographic labor mobility', uses migrant stock data for 1861, while Vedder and Cooper, 'English and Welsh geographic labor mobility', uses 1851 data.

[42] Greenwood and Thomas, 'Geographic labor mobility', also includes a measure of the origin county's occupational structure.

[43] Yap, 'Attraction of cities', p. 243.

[44] Baines, *Migration in a mature economy*, pp. 283-98.

[45] Friedlander, 'Occupational structure'.

decade 1851-60 to 1871- 80, he regressed net migration on occupational structure in 1861, occupational change from. 1861 to 1870, the agricultural wage (measured at the county level) in 1867-70, and urban proximity, an index measuring 'the potential interaction of agricultural districts with their urban hinterland[46]. The results for 1861-70 show that low-wage agricultural districts experienced net outmigration while high-wage districts with a large share of the labour force employed in the tertiary sector experienced net immigration[47]. The share employed in mining or industry in 1861 did not have a significant effect on migration., although districts where the share employed in mining increased during the 1860s experienced net immigration. For the decade 1861-70 Friedlander also analysed migration •flows from agricultural counties to non-agricultural counties, using estimates of intercounty migration flows constructed by Friedlander and Roshier[48]. He found that the two major determinants of migration flows were the distance between origin and destination counties, which had a negative effect, and the wage level in the destination county, which had a positive effect.

None of these studies examines the effect of past migration on current migration flows, the so-called 'friends and relatives' effect. Studies of migration in developing countries have found that the presence, of friends or relatives in a city is an important source of information on wage rates and employment opportunities to individuals contemplating migration. Friends and relatives also reduce the psychic costs of migration, and might lower the costs of job search by supporting new migrants financially until they find employment[49]. Failure to include a measure of past migration in regression models has been shown to result in 'an overstatement of the current direct effects of other explanatory variables on migration[50].

Llewellyn Smith concluded from his study of the influx of population into London that 'a country nucleus once established in any particular district of London, grows in geometric ratio by the importation of friends and relations. We find one village sending the flower of its youth to Finsbury, another to Hornsey, a third to a big establishment in Cheapside[51]. Hunt concluded that the low rate of migration from rural southern England to the manufacturing and mining districts was due in part to the tendency of migration streams to perpetuate themselves. In his words, 'once set in a particular direction ties of family and friendship and especial knowledge of conditions in the receiving area make it likely that migration streams will continue[52].

In table 3 we estimate some simple regressions to determine the effect of real wage gaps, distance, and the stock of previous migrants on male migration flows from 19 southern and eastern counties to each of six major destinations for each decade 1861-70 to 1891-1900[53]. The six destinations are London and the Home Counties, Lancashire and

---

[46] Ibid., p. 298.

[47] The use of wage and occupational data for the 1860s to explain net migration in 1851-60 and 1871-80 creates possible simultaneous equations bias, which renders the regression results for these decades suspect.

[48] Friedlander and Roshier, 'Internal migration'.

[49] See Yap, 'A|-traction of cities', p. 249; Grtreenwood, 'India', p. 27.

[50] Levy and Wadycki, 'International comparison', p. 202; Greenwood, 'India', pp. 27-30.

[51] Smith, 'Influx of population', p. 134.

[52] Hunt, *Regional wage variations*, pp. 282-3.

[53] The remainder of this section is drawn largely from Boyer, 'Labour migration in southern England'. The 19 origin counties are: Beds., Herts., Berks., Bucks., Oxon., Sussex, Hants., Hunts, Cambs., Suffolk, Norfolk, Wilts., Dorset, Devon, Somerset, Cornwall, Northants., Rutland, and lines.

Cheshire, Yorkshire, the west midlands, the east midlands, and south Wales[54]. We focus OB male migration because the lack of female wage data makes it difficult to determine the causes of female migration[55].

Table 3. *Determinants of male migration rates from southern counties to six urban destinations*

	Dependent variable: log migration rate		
	(1)	(2)	(3)
Constant	2.19	2.25	0.71
	(4.68)	(4.82)	(0.40)
Distance	−1.02	−1.01	−1.04
	(7.37)	(7.38)	(7.41)
Wage gap	0.51		0.46
	(3.88)		(3.29)
Expected income gap		0.48	
		(4.38)	
Migrant stock	0.49	0.49	0.47
	(7.63)	(7.72)	(7.32)
Service employment			0.51
			(0.85)
D1870s	0.13	0.08	0.13
	(1.75)	(0.95)	(1.64)
D1880s	−0.40	−0.44	−0.51
	(4.87)	(5.19)	(3.40)
D1890s	−0.62	−0.64	−0.74
	(6.56)	(6.84)	(4.42)
Origin county dummies	yes	yes	yes
Destination county dummies	yes	yes	yes
R^2	0.880	0.881	0.880
N	452	452	452

Source: see text
Note: '*t*' statistics are in parentheses. The dependent variable and all explanatory variables except the dummy variables are defined in logs.

The migration rate is defined as *Mj/Pi*, the number of migrants from origin county *i* to destination *j* during *a* decade, divided by the population of the origin county at the beginning of the decade. Our estimates of migration flows between origin counties and destination counties are constructed by Boyer[56], using the birthplace data from the 1861-1901 censuses, along with assumptions concerning the age distribution of migrants and

[54] The region London and the Home Counties includes the counties of Middlesex, Surrey, Kent, and Essex. The west midlands includes the counties of Warwick, Stafford, and Worcester the east midlands includes the counties of Nottingham, Derby, and Leicester. Because birthplace data are only available at the county level, it was necessary to include the entire counties of Surrey, Kent, and Essex in the destination Greater London. This is unfortunate, because these counties include lower-wage rural areas which were a major source of migrants to metropolitan London (Smith, Influx of population*, pp. 66-8). While we would have preferred to include extra-metropolitan Surrey, Kent, and Essex as origin counties, their exclusion from the regression probably does not laterally alter our results.

[55] Morgan, 'Model of migration', and Friedlander, 'Occupational structure', used male agricultural wage rates as a proxy for female wage rates in their regressions to explain female outmigration rates. However, domestic service was by far the most important occupation for women even; in the rural southern counties: Lee, *Regional employment statistics*. Neither Morgan nor Friedlander offers any evidence that male agricultural wages are a good proxy for the wages of female domestic servants.

[56] Boyer, 'Labom- migration in southern England'

the age-specific mortality of migrants[57]. The number of migrants from county *i* to county *j* during, say, the decade 1861-70 is calculated as:

$$MIG(61-70)_{ij} = MS(71)_{ij} - MS(61)_{ij} + D(61-70)_{ij} \quad (6)$$

where $MS(71)_{ij}$ is the stock of individuals born in country *i* and residing in destination *j* in 1871, and $D(61-70)_{ij}$ refers to the number of individuals born in country *i* and residing in country *j* in 1861 who died between 1861 and 1870[58].

The wage gap is measured as *(Wj-Wi)/Wi*, the difference between destination and origin real wages divided by the origin wage. Origin county wages are measured as weekly wage rates in agriculture at the beginning of the decade. The destination wage is measured as a weighted average of the weekly wage rates of building labourers in each of the destination's major cities at the beginning of the decade[59]. Distance is measured as the air-mile distance between the centre of the origin county and the nearest major city of the destination. Migrant stock is the number of individuals born in county *i* who were residing in destination *j* at the beginning of the decade, divided by the population of the origin county at the beginning of the decade. It is a measure of the magnitude of previous migration flows from an origin to a destination, and a proxy for the presence of friends and relatives in the destination.

Rural-urban migration might have been driven by differences in expected income rather than by simple wage differentials[60]. New migrants to cities might not immediately find jobs if urban areas have significant levels of unemployment. A new migrant's expected urban income typically is assumed to be equal to the urban wage times the

---

[57] Our estimate of the age distribution of individuals born in each origin county and living in each destination was obtained from Baines, *Migration in a mature economy*, p. 106. Our estimate of the age distribution of current migrants from each origin county to each destination was obtained from ibid., p. 104. Estimates of age-specific mortality for each destination for each decade were calculated using the age-specific mortality tables in the annual reports of the registrar general. For more details, see Boyer, 'Labour migration in southern England'.

[58] There is a degree of error associated with this method of estimating intercounty migration flows, resulting from the fact that some migrants from southern counties to urban destinations later emigrated or moved to another, urban area. For example, a person from Wiltshire who moved to Birmingham in 1868 and then migrated to London in 1874 would be counted as a migrant to Birmingham in the 1860s but would mask the migration of a Wiltshire born individual to London during the 1870s (because he or she would be listed as a Birmingham resident in the 1871 census but not in the 1881 census). Moreover, the individual would be counted as a migrant from Wiltshire to London in the 1870s, despite the fact that he or she had moved from Birmingham to London.

Because of the potentially serious nature of 'these errors, Baines chose not to calculate, intercounty migration flows. He estimated the net migration from each county to two destinations only: other counties within England and Wales, and overseas: *Migration in a mature economy*, app, 1. On the used here to calculate intercounty migration rates. In his analysis of migration flows from agricultural
to non-agricultural counties for the decade 1861-70, Friedlander, 'Occupational structure', used the migration rates constructed by Friedlander and Roshier.

Our reading of Baines suggests that the errors are relatively small for the southern counties used in this analysis and that the method used here yields reasonably reliable estimates of the direction and magnitude of migration flows from southern counties. Baines, *Migration in a mature economy*, p. 120, concluded that 'the rural-urban moves were more likely to be permanent' than urban-urban or urban-rural moves. Because our analysis focuses on rural-urban migration, we believe that the moves we observe are a good sample of the moves that actually occurred. Baines also found that the extent of rural-urban stage migration was relatively small for migrants born in the southern counties included here, and that 'the share of stage emigrants was probably about the same in all industrial areas except in south Wales where it was probably high'. The high rate of stage emigration from south Wales involved mainly migrants from rural Wales rather than from the south west of England; ibid., pp. 253-7, 263.

[59] For a discussion of the wage data used in the analysis, see Boyer, 'Labour migration in southern England'.

[60] Todaro, 'Model of labor migration'; Harris and Todaro, 'Migration, unemployment, and development'.

urban employment rate. The expected income gap is therefore equal to [$W_j(1 - U_j) - W_j/Wi$, where *Wj* is the destination wage rate and *Uj* is the destination unemployment rate. To test the hypothesis that migration decisions were based on differences in expected income, in column 2 of table 3 the expected real income gap is substituted for the real wage gap[61].

The regression model also included origin county dummies, destination dummies, and time dummies. The origin county dummies pick up influences that affected a county's outmigration rate but should not have affected migrants' choices of destination, such as the extent of urbanization or the percentage of a county's male population who were of 'prime migration age'. Destination dummies pick up influences, not measured by wage rates, that made a destination especially attractive or unattractive, such as occupational structure or disamenities.

The regression results indicate that the origin-destination real wage/expected income gap, distance between origin and destination, and the size of the migrant stock had significant effects on migration rates. The elasticities of migration with respect to distance and wage gaps are quite large; a 10 per cent increase in distance between origin and destination led to a decline in migration of 10.1-10.2 per cent, while a 10 per cent increase in the wage/expected income gap led to an increase in migration of 4.9-5.1 per cent. The existence of previous migrants had a strong positive effect on migration rates, with an elasticity of 0.49. The regression model was also estimated with the dependent variable and migrant stock entered in levels rather than in logs. The results indicate that an increase of 1,000 in a county's migrant stock living in a destination at the beginning of a decade would cause the number of migrants from the county to the destination to increase by 243 during the decade.

Migrants from agriculture might have preferred employment in transport, distribution, or other service occupations to factory employment[62]. Service employment varied significantly across destination regions, being high in London and the Home Counties and relatively low in the industrial north and midlands[63]. To determine the effect of a destination's occupational structure on migration, in column 3 a variable measuring the share of each destination's employed males with jobs in transport, distribution, and miscellaneous services in each decade is included[64]. The coefficient on the service employment variable is not significantly different from zero, which suggests that, when wage gaps, distance, and migrant stock are taken into account, differences across destinations in the extent of service sector employment were not *a* major determinant of migration flows in southern England.

For each specification of the model, the coefficients on the time dummies for the 1880s and 1890s are negative and significantly different from zero, and the coefficient for the 1890s is larger in absolute value than the coefficient for the 1880s. This suggests that,

---

[61] Destination unemployment rates were constructed from unemployment data for members of the Amalgamated Society of Engineers in the major cities in each region. For a discussion of the data, see Southall, 'Regional unemployment patterns'; for evidence that the engineers' unemployment rates are a reasonable proxy for the experience of other groups, see Southall and Gilbert, 'Good time to wed?'.

[62] Hunt, *Regional wage variations*, pp. 283-4. It will be recalled that Friedlander, 'Occupational structure', found that the share of a destination county's male labour force employed in the tertiary sector had a significant positive effect on immigration from agricultural counties in 1861-70.

[63] Lee, 'Service sector', pp. 148-51.

[64] * The share of males employed in transport, distribution, and miscellaneous services was calculated using county-level employment estimates constructed by Lee. *Regional employment statistics*.

other things being equal, migration rates from the rural south to the six major destinations declined in the last two decades of the nineteenth century. The decline was not simply a result of increased emigration. Although there was a significant increase in the emigration rate from rural counties in the 1880s, these rates declined sharply in the 1890s[65]. Rather, the decline was caused in large part by the sharp increase in migration to southern towns outside London. From 1861 to 1881, southern residential and military towns attracted fewer than 10,000 migrants; from 1881 to 1901 they attracted 214,000 migrants[66].

The studies surveyed in this section all show that migration in late nineteenth-century England and Wales responded to economic incentives, and that this stimulated large migration flows from low-wage agricultural areas to high-wage urban areas. While the results in table 3 support this inclusion, they also show that late nineteenth-century migration patterns cannot be explained simply by distance and destination wage rates. Potential migrants from low-wage southern and eastern counties had to choose their destinations from among several high-wage areas. The strong influence of the migrant stock on migration rates suggests that individuals contemplating migration received assistance from friends and relatives who had previously migrated[67]. This assistance, which reduced the monetary and psychic cost of migration, led to a perpetuation of migration patterns and helps to explain the continued dominance of London as a destination for migrants in the late nineteenth century. We turn now to an analysis of the effect of these migration flows on rural-urban wage gaps.

Section IV

The analysis of migration discussed above suggests that, at most times and in most places, migration worked to erode wage differentials. Yet substantial wage gaps persisted, not only between rural and urban locations but also within occupations across cities or regions. One of the first attempts to estimate trends in rural-urban wage ratios was made by Bellerby, who found that weekly agricultural wage rates were slightly less than one-half of weekly industrial wage rates throughout the period 1850-1914[68]. This large and persistent rural-urban wage gap suggests that there was significant inertia in the labour market. However, Bellerby's estimates clearly overstate the size of the wage gap, because he compares wages of low-skilled agricultural workers with those of skilled industrial workers. More recently, Williamson calculated the nominal wage gap between agricultural workers and 'unskilled nonfarm' workers for several benchmark years, and found that the rural-urban wage ratio increased from 0.68 in 1851 to 0.76 in 1871, then declined slightly to 0.71 in 1911[69].

---

[65] Baines, *Migration in a mature economy*, pp. 238-40.

[66] Caimcross, 'Internal migration', p. 83. Migration to southern residential and military cities was particularly heavy in the 1890s, when these cities attracted 156,000 migrants, which was two-thirds as many as London did (ibid.).

[67] Anderson, *Family structure, p.* 155, contends that 'kin and co-villagers were [the] main recourse' for the newly arrived migrant, who needed a 'roof over his head, a job, and someone to help him adjust to the new environment. . . . The literature is full of references to immigrants coming into the town, seeking out relatives or friends, and being sheltered and assisted by them.'

[68] Bellerby, *Agriculture and industry, p.* 233.

[69] Williamson, 'Structure of pay', p. 17.

Table 4 presents estimates of the ratio of weekly earnings of agricultural labourers to those of bricklayers' labourers for several dates between 1870 and 1912. The agricultural earnings estimates were constructed from annual farm-level data on weekly cash wages collected by the Board of Trade, adjusted to reflect total weekly earnings[70]. The estimates for bricklayers' labourers are a weighted average of wages in 11 large cities[71]. Nominal wage ratios are reported in the upper panel of the table, and real wage ratios in the lower panel. The estimates suggest that, in nominal terms, the rural wage was about two-thirds of the urban wage throughout the period. When adjustments arc made for differences in the cost of living between rural and urban areas, title rural-urban wage ratio rises to about 0.75[72]. Thus our estimate of the rural-urban wage gap is about half as large as that suggested by Bellerby.

Table 4. *Unskilled labourers' rural-urban wage ratios, 1870-1872 to 1910-1912*

	1870–1872	*1880–1882*	*1890–1892*	*1900–1902*	*1910–1912*
(a) Nominal wages					
England and Wales	0.669	0.657	0.648	0.627	0.650
North	0.771	0.720	0.722	0.697	—
South	0.597	0.607	0.591	0.575	—
(b) Real wages					
England and Wales	0.730	0.728	0.730	0.724	0.756
North	0.788	0.748	0.762	0.754	—
South	0.681	0.705	0.697	0.695	—

Sources: see text

[70] Continuous annual observations of weekly cash wages in summer for agricultural labourers on 100 farms located throughout England and Wales were obtained for the years 1862-1904 from Appendix V of the Board of Trade's *Second Report on Agricultural Labourers.* The distribution of farms across regions is as follows: north: 13%; midlands: 21%; south and east: 38%; south-west: 21%; Wales: 7%. We believe that our wage series yields a more reliable estimate of the trend in rural-urban wage ratios than would be obtained using the cross-sectional surveys of agricultural wages reported by Bowley, 'Statistics of wages', because the cross-sectional series are: drawn from different sources and might not be comparable with each other. Feinstein, 'New estimates', used the Wilson Fox/Board of Trade wage series in calculating average earnings for 1880-1913; in his words, the Board of Trade data were preferable to Bowley's data 'on the grounds that information collected on a consistent basis from a sample of farms was more likely to provide an accurate record of changes over time (even though the sample was small)'. The same Board of Trade report also contains estimates of average weekly cash wages and average weekly earnings in 1902 for agricultural labourers in every English county and in Wales (pp. 27-30). We used these data to calculate the ratio of average weekly earnings to weekly cash wages in 1902. Evidence presented by Wilson Fox, 'Agricultural wages', p. 138, and Bowley, 'Statistics of wages', p. 556, suggests that the ratio of earnings to wages remained roughly constant from 1860 to 1902. We constructed a time series of average weekly earnings by multiplying the weekly cash wage series by the earnings/wage ratio in 1902.

[71] Wage data for 1870 to 1906 were obtained from an unpublished 1908 Board of Trade report. *Rates of Wages.* Wage data for 1907-13 were obtained from Board of Trade, *Abstract of Labour Statistics,* nos. 11-6, and Board of Trade, *Report on Standard Time Rates.*

[72] In an earlier paper, we constructed rural and urban cost-of-living series for 1860 to 1913, assuming that prices were the same in rural and urban areas for every commodity except housing. See G. R. Boyer, T. J. Hatton, and H., R. Southall, 'Regional labour markets in England and Wales, 1850-1914' (unpub. MS., 1994, available from authors), pp. 11-2. Price data and budget weights were obtained from Feinstein, 'National statistics', p. 409; *idem,* 'New look', pp. 170-1; ^Wood, 'Real wages', p. 102. Using rent data from Board of Trade, *Working Class Rents,* and *Second Report on Agricultural Labourers,* we estimate that the ratio of urban to rural living costs in 1900-2 was 1.167. For comparison, Belierby, *Agriculture and industry,* p. 251, calculated that in 1904 the ratio of urban 10 rural living costs was 1.14 using rural budget weights and 1.09 using urban budget weights.

Table 4 also presents rural-urban wage ratios for the north and south, where the two regions are delineated roughly by a line between the Severn and the Wash. The wage gaps are larger in the south than in the north throughout the period, but the difference between the two regions is smaller in real than in nominal terms—largely because of the relatively high living costs in the main southern city, London. One can get some idea of the long-term movement in rural-urban wage ratios by comparing the results in table 4 with Williamson's estimates of real wage ratios in the 1830s: 0.598 for the south, 0.820 for the north, and 0.684 for England as a whole[73]. The comparison suggests that the rural-urban wage ratio for the south increased significantly from the 1830s to the 1870s, but that the northern wage ratio remained roughly constant, albeit at a higher level, during this period. Thus, the evidence from wage ratios offers some support for Jones's contention that 'a crucial change from conditions of glut to a partial but structural shortage of [agricultural] labour took place in the 1850s[74], although the change occurred only in the south and somewhat more gradually than Jones suggested.

To what extent do these real wage differentials reflect non-wage advantages or disadvantages of rural and urban locations? Even if rural and urban labour markets were perfectly arbitraged by migration it is unlikely that wage rates would be equalized. Differences in the probability of experiencing unemployment would influence the equilibrium wage ratio. While unemplo5Tnent in agriculture was mainly seasonal and weather related, unemployment in urban occupations was driven by the trade cycle. As we shall see, cyclical variations in urban unemployment had an important influence on migration and on variations in the wage ratio. But the average unemployment differential is difficult to establish because of the paucity of data for rural unemployment (or underemployment). The effect of urban unemployment on the expected wage for rural migrants would be magnified if, as is sometimes argued, they experienced lengthy periods of unemployment or underemployment before gaining access to regular jobs. Williamson's analysis of urban workers drawn from the 1851 census indicates that unemployment among male migrants was only slightly higher than among non-migrants, and that the age-earnings profiles of migrants from rural England were not significantly different from those of urban non-migrants[75]. Thus rural-urban migrants do not seem to have suffered special disadvantages in the urban labour market[76].

A second potential influence on migration decisions (and therefore on the equilibrium wage ratio) is the availability of employment for family members other than

---

[73] Williamson, 'Did factor markets fail?', pp.421-3.

[74] Jones, 'Agriculture and the industrial revolution', p. 211.

[75] Williamson, *Coping with city growth*, pp. 115-22. The data from the 1851 census are subject to certain limitations (ibid., p. 111). First, the census does not contain data on wage rates so that earnings for those in employment had to be assigned according to the individual's occupational group. Thus inter-occupational wage differences between migrants and non-migrants will be captured but intra-occupational wage differences will not. Second, migrants can be identified by place of birth but not by length of time since migration. Thus recent migrants, who might have been expected to have more difficulty gaining access to regular and higher paid employment, can be identified only by their age. Nevertheless, the fact that migrants do not appear to have been at a serious disadvantage in the urban job market probably owes much to the assistance of friends and relatives discussed earlier.

[76] Occupational data for 1891 reported by Booth suggest that London's casual labour market was dominated by native Londoners. Two-thirds of costermongers and dock labourers, and 61% of coal porters had been born in London, compared with 50% of workers overall (see table in Jonas, *Outcast London, p.* 137). Llewellyn Smith, 'Influx of population', p. 120, concluded that 'so far from finding their position in London hopeless, . . . [rural migrants] usually get the pick of its posts'. Jones, *Outcast London,* pp. 135-44, rejects much of the Booth-Llewellyn Smith argument, although he concludes that it is 'probable that the London-born did bear the main brunt of distress and unemployment in the 1880s'.

the male breadwinner in urban areas. If wage rates and job opportunities for women and children were significantly higher (lower) in urban areas than in rural areas, then the family income gap would be larger (smaller) than the male wage gap. While earning opportunities varied across agricultural regions and across cities, Hunt concluded that there was a 'generally positive correlation' between male wage rates and the wage rates of women and children[77]. Moreover, employment opportunities for women and young people were typically higher in cities than in rural areas. In 1891, the labour force participation rate for females aged 10 and over was 34.4 per cent for England and Wales; in London the participation rate was 38.4 per cent, in. Birmingham it was 40.4 per cent, and in Manchester 42.4 per cent[78]. Although it has recently been argued that the census underestimates women's employment in agriculture[79], declining employment opportunities in rural crafts and the evidence of higher outmigration rates for women than for men suggest that the advantages of urban locations favoured women even more than men[80]. In sum, the available evidence suggests that the family income gap was at least as large as, and probably somewhat larger than, the male wage gap, and that the opportunities for women and young people in urban areas enhanced the attractiveness of cities to potential migrants.

Differences in the quality of life between rural and urban areas might also have influenced the evaluation of alternative locations. Living conditions in Victorian cities were often considerably worse than in rural areas, which reduced the attractiveness of cities to potential migrants. Part of the wage gap between rural and urban areas might have represented a bribe, or 'urban disamenities premium', paid to workers to compensate them for the low quality of life in large cities[81]. Williamson, Buer, and others have used mortality rates, and in particular infant mortality rates, as a proxy for the quality of life[82]. In 1910-2, the standardized death rate for male agricultural labourers aged 25-65 was less than two-thirds that for all British prime-age males, and the infant mortality rate in families headed by agricultural labourers was substantially below that in families headed by urban low-skilled workers, and even below the national average[83]. Using the occupation-specific infant mortality rates from the 1911 census and Williamson's estimate of the urban disamenities premium in 1905, we estimate that as much as 9 percent of the wage of unskilled building trades workers represented compensation for the low urban quality of life[84].

It is not possible to say whether the balance of factors affecting the relative attractiveness of rural and urban locations narrowed or widened the effective rural-urban

---

[77] Hunt, *Regional mage variations*, p. 117.
[78] Ibid., p. 125.
[79] Higgs, 'Occupational censuses'.
[80] Saville, *Rural depopulation*, pp. 31, 109-16.
[81] Williamsn, 'Urban disamenities'; *idem*, 'Disamenities and death'. For a sceptical view of the existence of urban disamenities premia for workers in Victorian cities, see Pollard, 'Amenities and living standards'.
[82] Williamson, 'Urban disamenities'j *idem*, 'Disamenities and death'; Buer, *Health, wealth and population.*
[83] Armstrong, *Farmworkers*, p. 141.
[84] In 1911, the infant mortality rate was 139 per thousand live births in families headed by bricklayers' labourers and 97 per thousand live births in agricultural labourers' families: Armstrong, *Farmworkers*, p. 141. Applying Williamson's estimated coefficient ('Urban disamenities', p. 79) for the effect of infant mortality on wages (0.241) to the difference in infant mortality (in logs) between bricklayers' labourers' and agricultural labourers' families yields a disamenities premium of 8.7%. It should be noted that Williamson's estimate of the urban disamenities premium in 1905 (ibid., p. 80) is for the difference between large and small towns, not between towns as a whole and the countryside.

wage gap, but it is unlikely that they completely eliminated it[85]. Hence there were definite gains to migration which were reflected in the continuing rural-urban flows.

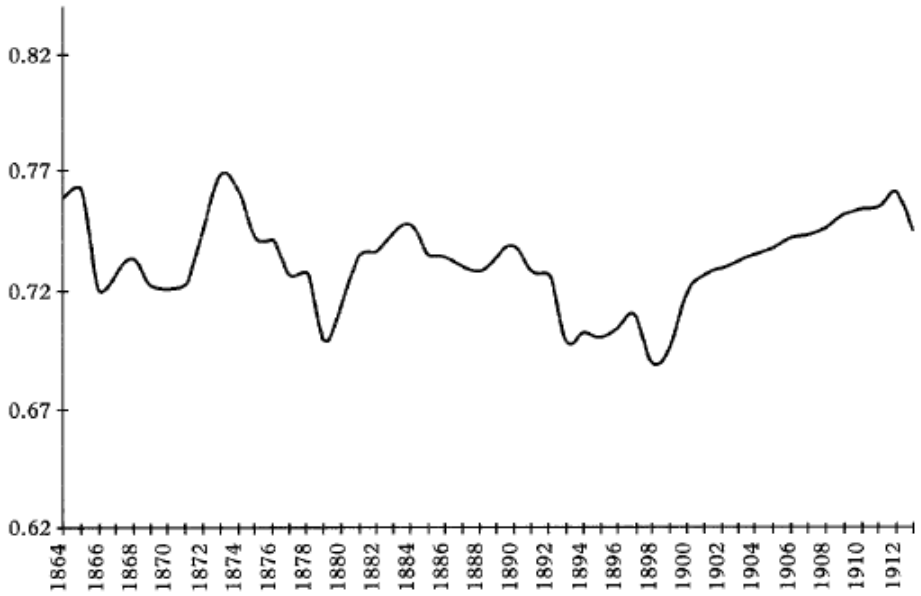

Figure 2. *Rural-urban wage ratio, 1864-1913*

The potential short-run gains from migration varied from year to year with fluctuations in urban wage rates and employment levels. Figure 2 shows that the rural-urban real wage ratio fluctuated within a relatively narrow band between 1864 and 1913. The ratio reached its highest point at 0.765 in 1873-4, the years of peak trade union activity in agriculture, and its lowest point at 0.699 in 1893-9, at the end of the great depression in agriculture, before increasing to 0.756 in 1910-2. Collins contends that 'the rate of rural migration . . . ebbed and flowed with the expansion and contraction of emplo3mient in the non-agricultural sector. The rate of outflow increased during the upturns and in a major recession slowed down but may even have become negative due to large numbers of migrants returning to their home parishes[86].

Collins argues that agriculture was a residual employer in that 'the size of the population it had to support . . . was governed not by the size of the labour requirement but by the numbers seeking work[87]. As a result, at times when labour was abundant farmers substituted labour for capital and sometimes delayed the purchase of new machinery. The demand for labour in agriculture also depended on factors such as

[85] It seems unlikely that the balance of the factors discussed here operated clearly in one direction. Rough calculations based on seasonal variations in employment in agriculture suggest that underemployment in rural areas may have been higher than average unemployment in urban areas (see P. Dewey, 'Farm labour in England and Wales, 1850-1914' (unpub. MS., Royal HoHoway College, Univ. of London, undated), p. 15). The employment opportunities for females and children would also tend to favour the urban sector. On the other hand urban disamenities would favour the rural sector.

[86] Collins, ' "Surplus" agricultural labour', pp. 42-3. He goes on to note that 'the effect of cyclical fluctuations was especially pronounced in industries such as building, brickmaking, dockwork and general labouring, a large proportion of whose workforce consisted of casual labourers, and which opted directly with agriculture at the work peaks': ibid., pp. 42-3.

[87] Ibid, p. 36.

agricultural prices, costs, and farm technology. The interaction of the forces of supply and demand for rural labour determined movements in the agricultural wage. To the extent that high urban wages and employment rates drew migrants out of agricultural districts a decline in the supply of agricultural labour would result, and subject to variations in demand conditions, the agricultural wage would increase. Thus it is possible, in the absence of annual data on rural-urban migration, to observe the effect of urban conditions on migration through movements in agricultural wage rates.

We develop a simple time-series model to determine the extent to which annual changes in agricultural wages were driven by conditions in urban labour markets. The model is a variant on the framework laid out in section I, the only difference being that wages and employment conditions m the urban sector are taken as predetermined. The rate of urban outmigration is assumed to depend on the urban/rural wage ratio and the urban employment rate, as follows:

$$m_t = \mu[log(\frac{w_t}{w_a})_{t-1} + log(1-U)_{t-1}] \tag{7}$$

where *m* is the outmgration rate, W_u is the urban wage rate, W_a is the rural wage rate, and *U* is the urban unemployment rate. The labour demand curve in agriculture is specified as:

$$\log L_{a,t}^d = A - \alpha \log(\frac{w_o}{P_a})_t + rt \tag{8}$$

where $L_{a,t}^d$ is labour demand, P_a is the price of farm output, α is the labour demand elasticity, and the term *rt* represents trend capital accumulation and technical progress. The rate of change of rural labour supply is equal to the difference between the rate of natural increase and the rate of rural outmigration:

$$\Delta log L_{a,t}^s = n_t - m_t \tag{9}$$

Converting (8) into changes, setting labour demand equal to labour supply and eliminating m_t yields an expression for the change in the agricultural wage:

$$\Delta log W_{a,t} = \frac{r-n}{\alpha} + \Delta log P_{a,t} + \frac{\mu}{\alpha}[\log(\frac{W_u}{W_a})_{t-1} + \log(1-U)_{t-1}] \tag{10}$$

Changes in the agricultural wage are determined on the demand side by technical progress and changes in farm output prices, and on the supply side by the rate of natural increase (assumed constant) and by the forces driving rural-urban migration represented in the square bracket.

We estimate equation (10) using the wage data for agricultural labourers and building labourers discussed above[88]. The model is modified in two ways, by adding a further lag of the change in agricultural prices and by the addition of a dummy variable

[88] In estimating the model we also use the index of agricultural prices constructed by Turner, 'Output and prices', p 47, and the trade union unemployment rate from Feinstein, *National income* tab. 57, pp. T125-6.

for 1872-6, the years of high trade union activity in agriculture[89]. The results obtained from estimating the model are presented in table 5. Column (1) shows the basic model. Changes in agricultural prices have a significant positive effect on agricultural wages, although the sum of the coefficients is less than one.

Table 5. *The determinants of changes in the agricultural wage, 1866-1912*

	(1)	(2)	(3)
Constant	–0.075	–0.084	–0.058
	(3.07)	(2.99)	(3.71)
Change in price (t)	0.166	0.159	0.167
	(4.59)	(4.22)	(4.61)
Change in price (t – 1)	0.097	0.091	0.092
	(2.47)	(2.26)	(2.42)
Urban/rural wage (t – 1)	0.291	0.308	
	(3.53)	(3.62)	
Urban employment rate (t – 1)	0.214	0.215	
	(2.79)	(2.80)	
Urban/rural wage × employment rate (t – 1)			0.242
			(3.95)
Union dummy 1872-6	0.017	0.019	0.015
	(2.89)	(2.85)	(2.83)
time		0.0001	
		(0.54)	
Rho	0.509	0.542	0.456
	(3.26)	(3.55)	(2.87)
R^2	0.745	0.747	0.742
RSS	0.0028	0.0028	0.0028
D.W.	1.859	1.904	1.871

Note: '*t*' statistics are in parentheses
Source: see text

The coefficients on both the lagged urban/rural wage ratio and the urban employment rate are positive and significantly different from zero, indicating that economic conditions in urban areas had a strong influence on short-run wage changes in agriculture. The positive coefficient on the union dummy indicates that agricultural trade unions were successful in raising wages in 1872-6.

Columns (2) and (3) of table 5 present two variants of the basic model. It might not be appropriate to assume that the first term in equation (10) can be treated as a constant. If the rates of technical progress and capital accumulation in agriculture were accelerating or the rare of natural increase in rural areas was decreasing there would be a positive trend component in the model. However, the results in column (2) show that when a time trend is included in the model its coefficient IS small and insignificant and it has little effect on the other coefficient estimates Second, in column (3) we test the restriction that the coefficients on the lagged wage-ratio and the lagged urban employment rate are the same, as suggested in equation (1.0). The results indicate that the restriction cannot be rejected[90]. Together, the results in table 5 provide strong evidence

[89] On die impact of unionism on agricultural wages, see Boyer and Hatton, 'Joseph Arch'. The estimates presented here differ from those in the earlier article in two important respects: we use unskilled building labourers' wage rates rather than carpenters' wage rates, and we extend the period of estimation to 1912.

[90] The computed chi-squared (1) statistic for this restriction is 0.67 compared with the critical 5% value of 3.84.

that a simple Todaro-type migration mechanism influencing rural urban migration can be identified from agricultural wage movements in the absence of direct observations on annual migration flows.

While a direct measure of the mobility parameter, μ, cannot be obtained from estimating equation (l0), an indirect estimate can be obtained by making an assumption about the labour demand elasticity m agriculture, α. Gowers and Hatton estimated that, for the interwar period, the labour demand elasticity was equal to -0.55[91]. Based on this estimate and the estimated coefficient for μ/α in column (3), the implied value of the mobility parameter is 0 12 (-0.55 x 0.24) This is close to the value of 0.l obtained for off-farm migration, for the United States in the interwar period by Hatton and Williamson[92].

If labour markets were segmented regionally, it might be more appropriate to estimate the above model for individual regions rather than for England and Wales as a whole. In another article we estimate a modified version of equation (10) for each of six regions the south, east, southwest, midlands, north and Wales[93]. In the modified model changes in a region's agricultural wage are determined not only by the lagged local urban/rural wage ratio and the local urban employment rate, but also by wage and employment rates in large cities outside the region concerned. Thus the model enables us to test for the influence on rural outmigration of conditions m both nearby and more distant urban centres.

The (augmented) model performs reasonably well for each region, although the results differ significantly across regions. In the south and east agricultural wages were affected by economic conditions in London but not by conditions in cities outside the region. In all other regions the agricultural wage was influenced by the London wage and employment rate as well as by economic conditions in local urban centres in the midlands conditions both in London and in the urban north influenced local agricultural wages. These results strongly underline the importance of London as a magnet for migrants from all parts of England and Wales, and they point to the importance of interregional migration flows (especially to London) in influencing rural wages in distant parts of the country. This suggests that a more explicit consideration of labour market integration among regions is called for. We turn to this next.

Section V

Did Britain's local and regional labour markets become more integrated over the second half of the nineteenth century? Did the intra- and interregional dispersion of wage rates decline? It is important to recognize that growing labour market integration and wage convergence are not the same thing. As we pointed out in section I, wage rates might diverge despite well-functioning labour markets if divergent (and persistent) trends in labour demand dominated the supply response. On the other hand, wage convergence might take place in the absence of any improvement in the functioning of labour markets. It is also necessary to distinguish (at a minimum) between rural and urban labour markets. Although rural and urban markets were closely linked, as we have seen, they were still sufficiently segmented to merit separate consideration.

---

[91] Gowers and Hatton, 'Minimum wage', pp. 93-4.
[92] Hatton and Williamson, 'What explains wage gaps?', p. 277
[93] Boyer Hatton, and Southall, 'Regional labour markets' (above, n. 72).

Nineteenth-century observers often commented on the large differences in wage rates for similarly skilled workers within and between regions. In mid-century Caird and Purdy pointed to sharp differences in agricultural wage rates, especially between the high wage north and the low wage south[94]. Examining statistics for 1860, Purdy wrote that 'no commodity in this country presents so great a variation in price, at one time, as agricultural labour . . . A labourer's wages in Dorset, or Devon, are barely half the sum given for similar services in the northern parts of England[95]. Similarly, Clapham, discussing the extent of variations in agricultural wages in 1902, commented that:

> Variations in earnings from county to county remained astonishingly great. The broad divisions corresponded roughly with differences in labour efficiency. . . Yet differences in efficiency can hardly explain such gaps as those between the 14s. 6d. of Oxfordshire, . . . the 16s.4d. of Buckingham, the 16s. 11d. Of Essex and the 20s.of Surrey. Surrey no doubt runs into London; but so does Essex, and the Buckingham and Oxford boundaries are not very far away. Some explanation connected with mobility is more probable[96].

There were also considerable regional variations in wage rates within urban occupations. Lawrence concluded from his analysis of artisans' wages in the building, printing, and iron industries that 'marked changes . . . [in wage rates] are noticeable as we pass from one part of the country to another'[97].Similarly, Rowe found 'appreciable' differences across cities in the wages of building operatives, and concluded that regional 'variations in wage rates [in 1914] presented a picture hardly more uniform or symmetrical than that of 1893'[98].

The most prominent contributions to the literature on regional wage differentials and regional wage convergence are those by Hunt[99]. In his 1973 book Hunt divided Britain into 13 regions and examined trends in the regional wage structure, using wage data for agricultural labourers and workers in the building trades. He concluded that the regional wage structure was relatively stable over the period 1850-1914; 'in broad terms there were two high-wage areas in 1850: the London area; and the counties of the north of England together with parts of the Midlands as far south as Birmingham. In 1914 the position was similar except that these two areas had been joined by south Wales and much of southern and central Scotland'[100]. The 'remarkable' stability in wage differentials was not due to the immobility of labour. Rather, 'between 1850 and 1914 there were strong forces wording to reinforce the existing wage differentials, forces so strong that it would be rash to assume that the slow erosion of regional differentials necessarily implies a high degree of [labour] immobility'[101].

Hunt argued that, at least from 1870, the integrating forces of labour supply overcame the dis-integrating forces of labour demand, leading to an overall convergence of wage rates. To determine the trend in wage dispersion he calculated the coefficient of variation of

---

[94] Caird, *English agriculture;* Purdy, 'Earnings of agricultural labourers'.
[95]Purdy, 'Earnings of agricultural labourers', p. 344.
[96] Clapham, *Economic history.* III, pp. 97-8.
[97] Lawrence^ *Local variations,* pp. *IB,* 52.
[98] Rowe, *Wages in practice and theory,* pp. 67-70.
[99] Hunt, *Regional wage variations', idem,* 'Regional inequality'.
[100] *Idem, Regional wage variations,* p. 4.
[101] Ibi d . , p. 242.

agricultural labourers' weekly earnings across 86 British counties in 1867-70, 1898, and 1907, and of bricklayers' weekly wages across 21 towns in England and Wales for 1886, 1900, and 1913. For agricultural labourers the coefficient of variation declined from 0.14 in 1867-70 to 0.10 in 1898 and then to 0.09 in 1907. For bricklayers, it declined from 0.145 in 1886 to 0.107 in 1900 and then remained roughly constant at 0.108 in 1913[102]. Two doubts might be raised about these results. First, they are based on an examination of each occupationai wage rate at only three points in time. In order to determine whether there was a discernible downward trend in wage dispersion it would clearly be preferable to examine annual time series of wages rather than rely on a few benchmark years[103]. Second, Hunt's earnings data for agricultural labourers were drawn from a separate source for each benchmark year, which raises issues of comparability[104].

We extend Hunt's analysis by constructing annual time series of wages for agricultural labourers, bricklayers' labourers, and carpenters, and testing for trends in the level of wage dispersion in these series. The agricultural series consists of annual wage data for 'ordinary labourers' on 100 farms in England and Wales from 1862 to 1904[105]. The series for bricklayers' labourers consists of wage data for 32 English and Welsh cities from 1880 to 1913, and the series for carpenters consists of wage data for 29 cities from 1866 to l913[106]. Available evidence suggests that rural living costs were similar throughout England and Wales, so that the use of nominal wages is valid for the analysis of the agricultural labour market[107]. On the other hand, there were significant differences in the cost of living across English and Welsh cities. To take account of these differences, we deflated the nominal wages of workers in each city using the 1905 town-level cost-of-living estimates reported in the Board of Trade's *Enquiry into Working Class Rents, Housing, and Retail Prices* (1908)[108].

To determine whether there was a systematic trend in the level of wage dispersion, for each occupation we calculated the annual coefficient of variation, and regressed the time series of coefficients of variation on a constant and a time trend. If there was wage convergence over time the coefficient on the time trend will be negative

---

102 Ibid., p. 59. More recently, Hunt, 'Regional inequality', p. 951, calculated the co3efficient of variation of agricultural labourers' weekly earnings across 42 English counties, and found that it declined from 0.136 in 1867-70 to 0.100 in 1898.

103 The problems associated with relying on a few benchmark years can be seen by comparing Hunt's results obtained using data for 1867-70, 1898, and 1907 with results obtained using wage data for 1860-1, 1898, and 1907. Dewey, 'Farm labour' (above, n. 85), p. 30, concluded that 'there [is not] much evidence that regional wage differentials were becoming less' from 1860-1 to 1907; '22 counties in 1860-1 (out of 45) had wages which were more than 10% greater or less than the national average, and there were 25 such comities (out of 50) in 1907'. G. R. Boyer, 'Wage convergence among low skilled workers in late Victorian England and Wales' (unpub. MS., 1995; available from author) calculated the coefficient of variation of agricultural labourers' weekly cash wages across English counties for several years and found that wage dispersion declined from 1867-70 to 1898, but that it remained roughly constant from 1860 or 1861 to 1898 or 1907.

104 The earnings data used by Hunt include estimates of the average weekly value of extra wages at harvest time, occasional piecework, and perquisites ranging from a rent-free cottage to beer or cider at harvest time. Although, in principle, the value of these items should be included in the total wage, it is not clear that they were valued appropriately across districts or especially between the different surveys. For a further discussion of issues of comparability see Boyer, 'Wage convergence' (above, n. 103).

105 The wage data were obtained from Appendix V of the Board of Trade's *Second Report on Agricultural Labourers;* the same data were used earlier in the construction of the aggregate time series for agricultural labourers.

106 These data were also obtained from the sources used earlier in the construction of aggregate time series for urban wage rates: the unpublished 1908 Board of Trade report. *Rates of Wages,* supplemented for 1907-13 by various Board of Trade reports.

107 Hunt, *Regional wage variations,* pp. 80-7, examined rural living costs from 1860-1 to 1912-3 and found that 'the cost of living of rural workers did not vary significantly in different parts of the country'. Crafts, 'Regional price variations', reached a similar conclusion from an analysis of regional price data in 1843.

108 Board of Trade, *Enquiry,* pp. xlvi-xlvii.

and significantly different from zero. The regression results are presented in table 6. Consider first the regressions for agricultural labourers' wages in panel (a). The regression in row 1 shows that the coefficient of variation for the full set of 100 farms exhibits a significant upward trend indicating that, contrary to Hunt's conclusion, wage dispersion in agriculture increased from 1862 to 1904. The increase in wage dispersion could have been a result of increasing interregional wage dispersion, increasing intraregional wage dispersion, or both. To examine the trend in interregional wage dispersion, we grouped the farms into seven regions (north, midlands, south, east. Home Counties, south-west, and Wales), calculated the coefficient of variation of wages across the regions for each year, and regressed the series on a time trend. The results, presented in row 2, show that there was an upward trend in interregional wage dispersion from 1862 to 1904. To examine the trend in intraregional wage dispersion, we calculated the coefficient of variation for each region for each year, and then calculated the weighted average (by number of farms) of the coefficients of variation of the regions. The resulting series, which measures the average intraregional wage dispersion for the seven regions, is regressed on a time trend in row 3. The coefficient on the time trend is negative and significantly different 5rojm zero, indicating that intraregional wage dispersion declined from 1862 to 1904. Thus, the increase in the dispersion of agricultural wages shown in row 1 was caused entirely by an increase in the dispersion of wage rates across regions[109].

Table 6. *Regressions of coefficients of variation of wages on a time trend*

	Constant	*Time/100*	R^2	*Mean*
(a) Agricultural labourers (1862-1904)				
1 All 100 farms	0.158	0.033	0.198	0.165
	(0.008)	(0.010)		
2 Interregional	0.103	0.075	0.479	0.120
	(0.010)	(0.012)		
3 Intraregional	0.109	–0.014	0.135	0.106
	(0.005)	(0.006)		
(b) Bricklayers' labourers (1880-1913)				
4 All 32 cities: nominal wages	0.106	–0.114	0.786	0.086
	(0.006)	(0.011)		
5 All 32 cities: real wages	0.117	–0.113	0.844	0.098
	(0.005)	(0.009)		
6 Interregional: nominal wages	0.097	–0.138	0.716	0.073
	(0.009)	(0.015)		
7 Interregional: real wages	0.086	–0.085	0.508	0.071
	(0.008)	(0.015)		
(c) Carpenters (1866-1913)				
8 All 29 cities: nominal wages	0.095	–0.088	0.797	0.073
	(0.006)	(0.007)		
9 All 29 cities: real wages	0.107	–0.080	0.701	0.087
	(0.007)	(0.008)		
10 Interregional: nominal wages	0.102	–0.139	0.740	0.068
	(0.012)	(0.012)		
11 Interregional: real wages	0.079	–0.102	0.673	0.054
	(0.010)	(0.010)		

Note: standard errors are in parentheses
Source: see text

109 The results reported here are slightly different from those presented in an earlier paper: Boyer and Hatton, 'Regional labour market integration', p. 93. There we found that intraregional wage dispersion remained roughly constant from 1855 to 1903. The difference results from the fact that we grouped ferms into six regions in the earlier paper and into seven regions here. The new region

The regression results for bricklayers' labourers and carpenters are presented in panels (b) and (c) of table 6. For both occupations regressions were run using both nominal and real wage rates. Because age data are available for only a small number of cities within certain regions we were able to estimate only the trends in overall and interregional wage variations. The regression results indicate that, for both occupations, the dispersion in nominal and real wage rates declined sharply over time at both the town and the regional level.

In sum, the results in table 6 suggest that urban occupations experienced interregional wage convergence in late nineteenth-century England and Wales, but that regional wage dispersion increased in agriculture, despite the evidence that migration was working to reduce the labour 'surplus' in the rural south. Ironically, the convergence of urban wage rates might have been a cause of increasing regional wage dispersion in agriculture. During the late nineteenth century urban wages in the midlands, the south-west, and Wales gradually converged on the London wage. Rural wages in these regions also grew rapidly as a result of the 'pull' of local urban wage growth and that of destinations further afield. In the south and east rural wage rates, already low, stagnated because of the relatively slow wage growth of their major migration destination, London, and because of the agricultural depression from the mid-1870s to the mid-1890s, which was especially severe in grain-producing regions. The slow growth of agricultural wages in the already low-wage south and east was a major cause of the increase in regional wage dispersion in agriculture[110].

Thus we agree with Hunt that 'there were strong forces working to reinforce the existing [regional] wage differentials'. It is also possible, however, that the interregional migration currents were a weaker integrating force than has sometimes been suggested. In a recent article we examined the degree of labour market integration between pairs of regions, by determining the extent to which regional wage ratios converged to a long run equilibrium after an initial shock[111]. For each pair of regions *i* and *j* we estimated the following 'error correction' model:

$$\Delta logW_{i,t} = \gamma_0 + \gamma_1 \Delta logW_{j,t} + \gamma_2 log(\frac{W_i}{W_j})_{t-1} + v_t \quad (11)$$

where *W* denotes the regional wage. This equation is a simplified version of equation (4) in section I, in which shocks to labour demand (denoted by Δz) and labour supply (denoted by *n)* are subsumed in the error term v. The coefficient on the lagged wage ratio, γ_2 (the error correction term), is a measure of the degree of integration between the 'two markets. The size of γ_2 is determined in part by the migration semi-elasticity (μ in equation (4)). A negative and statistically significant coefficient for the lagged wage ratio is evidence of convergence to a long run, equilibrium wage ratio. The larger the (absolute) value of γ_2, the shorter the lag between an initial shock and the return to the equilibrium wage ratio.

---

is the Home Counties, where, because of the close proximity to London, wages were significantly higher than elsewhere in the south and east.

110 For example, from 1868-70 to 1894-6, nominal wage rates in agriculture increased by 17.4% in the high-wage north; in the low-wage east, nominal wages fell by 3.5% during the same period: Boyer, 'Wage convergence' (above, n. 103), tab. 4.

111 Boyer and Hatton, 'Regional labour market integration'.

We constructed regional wage series for agricultural labourers from 1855 to 1903 and carpenters from 1864 to 1913, and med these to estimate the error correction model[112]. We estimated a version of equation (11) for each of 15 regional pairs for agricultural wages and 10 regional pairs for carpenters' wages. The coefficient on the error correction term ($\gamma_{2,}$ in equation (11)) was negative in each of the 15 regional pair regressions for agricultural wages, but was significantly different from zero in only eight of the regressions. The results suggest that some regions were better integrated than others. The north, midlands, south, and Wales were well integrated with other regions, while 'the east and south-west were poorly integrated. The south-west was found to be integrated only with Wales. These findings are consistent with the migration literature. Baines found that the south-western counties of Devon, Cornwall, and Somerset, and the eastern counties of Norfolk and Suffolk, had relatively low rates of internal migration[113]. South Wales was a major destination of migrants from the south-west, especially in the 1870s and 1880s, and the vast majority of those easterners who migrated moved in the direction of London, which for most of them could be reached without passing through another region[114].

The example of the south-west demonstrates how wage convergence can occur without increasing labour market integration. The south-west was the lowest-wage region in England and Wales in the 1860s; however, in the last three decades of the nineteenth century agricultural wages increased faster there than in any other region, so that by 1902-4 wages in the south-west were above wages in the south and cast[115]. Our results indicate that this wage convergence occurred despite the fact that the south-west was not well integrated with other regions[116]. The increase in wage rates was caused in large part by labour shortages resulting from the region's 'exceptionally high' emigration rates. According to Baines, between 1861 and 1900 'nearly a quarter of all males at risk' emigrated from Cornwall, Devon, Dorset, and Somerset[117]. In contrast, the east, which also was poorly integrated with other regions, had relatively low emigration rates. This, along with the demand shocks caused by the agricultural depression, explains why agricultural wages stagnated in the east.

Turning to the carpenters, the coefficient on the error correction term was negative in each of the 10 regional-pair regressions, and significantly different from zero in seven regressions. Each of the regions London, the midlands, Wales, and the south-west was integrated with three of the other four regions. However, the small size of the coefficient on the error correction term in some of the regressions suggests that regional integration was not always very strong. The average lag between an initial shock to the equilibrium wage ratio and the adjustment back to equilibrium was as long as five to seven years for some regional pairs[118]. While it is tempting to conclude that urban labour markets were better integrated that rural markets, the evidence from estimating the error correction model is not compelling.

---

[112] Ibid., pp. 94-100.

[113] Baines, *Migration in a mature economy*, pp. 234-5.

[114] Friedlander and Roshier, 'Internal migration', pp. 252-8, 263.

[115] See Boyer, 'Wage convergence' (above, n. 103), tab. 4i and Hunt, *Regional wage variations*, pp. 15,64.^

[116] The increase in wages also was not a result of a sharp increase in the demand for labour; & from 1851 to 1911 the south west had a dearth of expanding occupations' and suffered a decline IB employment in mining: Hunts *Regional wage variations*, pp. 138-40.

[117] Baines, M*igration in a mature economy*^ p. 157.

[118] The average lag in adjustment to an initial shock can be calculated from the regression coefficient as $(1 - \gamma_2)/ \gamma_2$.

It is possible that further research using more sophisticated models will pinpoint the contours of regional integration in more detail, but the existing evidence suggests that regional labour markets were fairly loosely integrated in the short run. In the long run, of course, the cumulative movement of labour to areas where demand was growing rapidly attenuated the divergence in wage rates which otherwise would have occurred. For example, one estimate suggests that in the absence of outmigration between 1861 and 1901 the average agricultural wage in rural southern counties in 1901 might have been as much as 32 per cent lower. Similarly, the London wage might have been 24 to 28 per cent higher in 1901 in the absence of immigration over the same period[119].

Finally, what can be said about movements over time in the degree of labour market integration? The answer, on present evidence, is very little. We have shown that regional wage convergence alone is not sufficient proof that labour market integration increased, and, in any case, the results in table 6 show that not all occupations experienced wage convergence in the late nineteenth century. There is some evidence that in the second half of the century regional wage dispersion was smaller in Britain than in other west European countries or the United States[120]. While this evidence also must be interpreted cautiously, it suggests that we must look to earlier periods to find evidence of growing labour mobility and labour market integration which surely must have occurred with falling transport costs and improvements in information networks.

Section VI

The literature on labour mobility in Victorian Britain largely can be divided into *two* strands: studies that focus on the determinants of migration flows across counties or regions; and studies that focus on changes over time in the degree of labour market integration, as measured by movements in rural-urban or regional wage differentials. This article surveys both of these strands, and offers a framework for linking the two. Within this framework, we present new evidence on several of the questions that have been raised in the literature.

The migration studies surveyed in sections II and III show that migration, in late nineteenth-century England and Wales was driven by economic incentives. The major determinants of migration flows were the magnitude of the benefits from moving, the cost of moving, proxied by the distance between origin and destination areas; and the availability of information concerning urban job opportunities, proxied by distance and by the stock of individuals residing in a destination area who were born in the origin area. The strong migration flows from low-wage agricultural areas to high-wage urban areas suggest that migration worked to erode wage differentials.

To examine 'the relationship between rural and urban labour markets, we developed a simple time-series model to determine the causes of annual changes in agricultural wages. The results indicate that economic conditions in urban areas had a strong influence on short-run wage changes in agriculture. Moreover, they show that a simple Todaro-type migration mechanism can be identified from agricultural wage movements in the absence of direct observations on annual migration flows. However,

---

[119] Boyer, 'Labour migration in southern England'. These estimates assume (very) long-run labour demand elasticities of -2.0 in agriculture and -1.6 in the urban sector. They take no account of shifts in labour demand which might arise if migration caused 'backwash' effects which reinforced the original shifts in labour demand.

[120] Soderberg, 'Regional economic disparity', p. 276; Boyer and Hatton, 'Regional labour market integration', p. 100.

substantial wage gaps remained at least until the First World War both between rural and urban locations and within occupations across regions and cities. Their persistence despite strong migration flows appears to support Hunt's conclusion that the erosive effects of migration were countered by 'strong [demand and supply] forces working to reinforce the existing wage differentials[121]. Then we examined the degree of labour market integration between pairs of regions using a simple error connection model, we found that the labour markets of some regional pairs were weakly integrated at best.

We have argued that it makes little sense to describe the late nineteenth century labour market as either integrated or not integrated Rather, the degree of integration, as reflected m the mobility of labour, generally was sufficient to prevent either a dramatic widening of or a dramatic convergence in wage differentials m the face of the unbalanced growth of labour demand across sectors and regions. Our analysis of trends m the level of wage dispersion indicates that urban occupation & experienced interregional wage convergence m late nineteenth-century England and Wales, but that regional wage dispersion increased in agriculture However, such evidence cannot be interpreted as reflecting changes over time in the degree of labour market integration. On present evidence there is little reason to believe that the labour market, at least after 1850, was becoming either more or less integrated. Tests of trends in the degree of integration would require more subtle analysis than has been performed to date and this must await future research.

Cornell University
University of Essex

[121] Hunt, *Regional wage variations*, p. 242

Footnote references

Anderson, M., *Family structure in nineteenth century Lancashire* (Cambridge, 1971).

Armstrong, A., *Farmworkers: a social and economic history, 1770-1980* (1988).

Baines, D. E., *Migration in a mature economy* (Cambridge, 1985).

Baines, D. E., 'Population, migration and regional development, 1870-1939', in R. Floud and D.
N. McCloskey, eds.. *The economic history of Britain since 1700, 2* (Cambridge, 1994), pp. 29-61.

Bellerby, J. R., *Agriculture and industry: relative income* (1956).

Bowley, A. L., 'The statistics of wages in the United Kingdom during the last hundred years, IV: agricultural wages—concluded', *J. R. S. S.,* 62 (1899), pp. 555-70.

Bowley, A. L., 'Rural population in England and Wales', J. *R. S. S.,* 77 (1914), pp. 597-645.

Boyer, G. R., 'Labour migration in southern and eastern England, 1861-1901', *Eur. Rev. Econ. Hist.,* 1 (1997), pp. 191-216.

Boyer, G. R. and Hatton, T. J., 'Did Joseph Arch raise agricultural wages? Rural trade unions and the labour market in late nineteenth-century England', *Econ. Hist. Rev.,* XLVII (1994), pp. 310-34.

Boyer, G. R. and Hatton, T. J., 'Regional labour market integration in England and Wales, 1850-1913', in G. Grantham and M. MacKinnon, eds.. *Labour market evolution* (1994), pp. 84-106.

Buer, M. C , *Health, wealth, and population in the early days of the industrial revolution* (1926).

Caird, J., *English agriculture in 1850-51* (1852).

Caimcross, A. K., 'Internal migration in Victorian England', *Man. School,* 17 (1949), pp. 67-87.

Clapham, J. H., *An economic history of modem Britain,* III: *machines and national rivalries* (Cambridge, 1938).

Collins, E. J. T., 'The rationality of "surplus" agricultural labour: mechanisation in English agriculture in the nineteenth century", *Agric. Hist. Rev.,* 35 (1987), pp. 36-46.
Crafts, N. F. R., 'Regional price variations in England in 1843: an aspect of the standard of living debate', *Exp. Econ. Hist.,* 19 (1982), pp. 51-70.

Eversley, Lord, 'The decline of the numbers of agricultural labourers in Great Britain', *J. R. S. S.,* 70 (1907), pp. 267-319.

Feinstein, C. H., *National income, expenditure and output of the United Kingdom, 1855-1965* (Cambridge, 1972).

Feinstein, C. H., 'National statistics, 1760-1920', in C. H. Feinstein and S. Pollard, eds.. *Studies in capital formation in the United Kingdom, 1750-1920* (Oxford, 1988), pp. 259-401.

Feinstein, C. H., 'New estimates of average earnings in the United Kingdom, 1880-1913', *Econ. Hist. Rev.,* XLIII (1990), pp. 595-632.

Feinstein, C. H., 'A new look at the cost of living, 1870-1914', in J. Foreman-Peck, ed.. *New perspectives on the late Victorian economy* (Cambridge, 1991), pp. 151-79.

Friedlander, D., 'London's urban transition, 1851-1951', *Urban Stud.,* 11 (1974), pp. 127-41.

Friedlander, D., 'Occupational structure, wages, and migration in late nineteenth-century England and Wales', *Econ. Dev. & Cult. Change,* 40 (1992), pp. 295-318.

Friedlander, D. and Roshier, R. J., 'A study of' internal migration in England and Wales: part I', *Pop Stud.,* XDC (1966), pp. 239-79.

Gowers, R. and Hatton, T. J., 'The origins and early impact of the minimum wage in agriculture', *Econ. Hist. Rev.,* L (1997), pp. 82-103.

Greenwood, M. J., 'The influence of family and friends on geographic labor mobility in a less developed country: the case of India', *Rev. Reg. Stud.,* 3 (1972-3), pp. 27-36.

Greenwood, M. J. and Thomas, L., 'Geographic labor mobility in nineteenth-century England and Wales', *Ann. Reg. Sci., 7* (1973), pp. 90-105.

Harris, J. and Todaro, M. P., 'Migration, unemployment, and development: a two-sector analysis', *Amer. Econ. Rev.,* 60 (1970), pp. 125-42.

Hanon, T. J. and Williamson, J. G., 'What explains wage gaps between farm and city? Exploring the Todaro model with American evidence, 1890-1941', *Econ. Dev. & Cult. Change,* 40 (1992), pp. 267-94.

Hiais, E., 'Occupational censuses and the agricultural workforce in Victorian England and Wales', *Econ. Hist. Rev.,* XLVIII (1995), pp. 700-16.
Hunt E. H.. *Regional wage variations in Britain, 1850-191'i* (Oxford, 1973).

Hunt, E. H., *British labour history, 1815-1914* (1981).

Hunt, E. H.. 'Industrialization and regional inequality: wages in Britain, 1760-1914', *J. Econ. Hist.,* XLVI (1986), pp. 935-66.

Jones, E. L., *Agriculture and the industrial revolution* (Oxford, 1974).

Jones, G.S., *Outcast London* (Oxford, 1971).

Lawton, R., 'Rural depopulation in nineteenth-century England", in R. W. Steel and R.

Lawton, eds., *Liverpool essays in geography* (1967), pp. 227-55.

Lawrence, F. W., *Local variations in wages* (1899).

Lee, C. H., *British regional employment statistics, 1841-1971* (Cambridge, 1979).

Lee, C. H., 'The service sector, regional specialization, and economic growth in the Victorian economy', *J. Hist Geog.,* 10 (1984), pp. 139-55.

Levy, M. and Wadycki, W., 'The influence of family and friends on geographic labor mobility: an international comparison'. *Rev. Econ. & Stat,* 55 (1973), pp. 198-203.

Longstaff, G B., 'Rural depopulation', *J. R. S.* S., 56 (1893) pp 380-442.

Morgan M., 'A model of internal and overseas migration by natives of English and Welsh counties, 1861-1900', app. 7 of D. Baines, *Migration in a mature economy* (Cambridge, 1985).

Pollard, S., "Sheffield and Sweet Auburn—amenities and living standards in the British industrial revolution', *J. Econ. Hist,* XU (1981), pp. 902-4.

Purdy, F., 'On the earnings of agricultural labourers in England and Wales, I860', *J. R. S. S.,* 24 (1861), pp. 328-73.

Ravenstein, E. G., 'The laws of migration', *J. R. S. S.,* 48 (1885'>, pp. 167-227.

Redford, A., *Labour migration in England, 1800-1850* (Manchester, 1926).

Rowe, J. W. F., *Wages in practice and theory* (1928).

Saville, J., *Rural depopulation in England and Wales, 1851-1951* (1957).

Schwartz, A., 'Interpreting the effect of distance on migration', J. *Pol Econ.*, 81 (1973), pp. 1153-69.

Shannon *H. A.,* '.Migration and the growth of London, 1841-91', *Econ. Hist. Rev.,* V (1934-5), pp. 79-86.

Sjaastad, L. A., 'The costs and returns of human migration', J. *Pol Econ.,* 70 (1962), pp. 80-93.

Smith, C.T., 'The movement of population in England and Wales in 1851 and 1861', *Geog. J.*, 117 (1951), pp. 200-10.

Smith, H. L., 'influx of population—East London', in C. Booth, ed.. *Life and labour of the people in London,* III (1892), pp. 58-119.

Soderberg, J., 'Regional economic disparity and dynamics, 1840-1914: a comparison between France, Great Britain, Prussia, and Sweden', *J. Eur. Econ. Hist,* 14 (1985), pp. 273-96.

Southall, H. R., 'Regional unemployment patterns among skilled engineers in Britain, 1851-1914', *J. Hist Geog.*, 12 (1986), pp. 268-86.

Southall, H. R. and Gilbert, D. M., 'A good time to wed?: marriage and economic distress in England and Wales 1839 to 1914', *Econ. Hist Rev., XUX*. (1996), pp. 35-57.

Stark, O., *The migration of labor* (Cambridge, Mass., 199!).

Thomas, B., 'The migration of labour into the Glamorganshire coalfield, 1861-1911', *Economica,* 10 (1930), pp. 275-94.

Thomas, B,, *Migration and economic growth* (Cambridge, 1954).

Todaro, M. 'A model of labor migration and urban unemployment in less developed countries', *Amer. Econ. Rev.,* 59 (1969), pp. 138-48.

Todaro, M., *Internal migration in developing countries* (Geneva, 1976).

Turner, M., 'Output and prices in UK agriculture, 1867-1914, and the great agricultural depression revisited', *Agric. Hut. Rev.,* XL (1992), pp. 38-51.

Vedder, R. K. and Cooper, D., 'Nineteenth-century English and Welsh geographic labor mobility: some further evidence', *Ann. Reg. Sd., 8* (1974), pp. 131-9.

Weber, A., *The growth of cities in the nineteenth century* (New York, 1899).

Williamson, f. G., 'Urban disamenities dark satanic mills, and the British standard of living debate', *J. Bacon. Hist,* XLI (1981), pp. 75-83.

Williamson, J. G., 'Was the industrial revolution worth it?: disamenities and death in nineteenth century British towns , *Exp. Econ. Hist,* 19 (1982), pp. 221-45.

Williamson, J. G. 'Tlae structure of pay in Britain, 1710-1911', *Res. Econ. Hist,* 7 (1982), pp. 1-54.

Williamson, J. GL, 'Did English factor markets fail during the industrial revolution?', *Oxf. Econ. Pap.,* 39 (1987), pp. 641-78.

Williamson,]. G., *Coping with city growth during the British industrial revolution* (Cambridge, 1990).

Wilson Fox A. 'Agricultural wages in England and Wales during the last fifty years', *J. R. S. S.,* 66 (1903), pp. 273-348.

Wood, G. H., 'Real wages and the standard of comfort since 1850', J. *R. S. S.,* 72 (1909), pp. 91-103.

Yap, L., 'The attraction of cities', *J. Dev. Econ.,* 4 (1977), pp. 239-64.

Official publications

Board of Trade, *Second Report by Mr. Wilson Fox on the Wages, Earnings, and Conditions of Employment of Agricultural Labourers in the United Kingdom* (1905).

Board of Trade, *Enquiry into Working Class Rents, Housing and Retail Prices* (1908).

Board of Trade, *Rates of Wages and Hours of Labour in Various Industries in the United Kingdom* (unpub. report, 1908).

Board of Trade, *Abstract of Labour Statistics,* nos. 11-6 (1907-14).

Board of Trade, *Report on Standard Time Rates erf Wages [and Hours] in the United Kingdom* (1909-14).