

Deconstructing the Phillips Curve for pre-1914 Britain

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Summary:

A.W. Phillips estimated his famous relationship between unemployment and wage inflation entirely from pre-1913 British data about which he said little. His wage series was in fact partly interpolated and the remainder were 'Standard Rates', set unilaterally by trade unions: members offered work at sub-'Standard' wages could claim unemployment benefit. Phillips' unemployment data came from the same unions, and the statistical relationship is unsurprising. The paper analyses the wage-setting process within the Amalgamated Engineers, the largest national union pre-1914. The largest single determinant of wage reductions was local unemployment, but increases were determined more by the union's finances and its success in recruitment.

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A.W. Phillips' 1958 study of the apparent trade-off between unemployment and wage inflation has been one of the most influential empirical studies in the history of economics.¹ Given the innumerable studies which have since appeared, it may seem foolhardy to claim that anything new can be said about Phillips' work except from the most abstruse of econometric perspectives. However, Phillips' original paper differs from almost all the studies which followed in being concerned with really long-run historical patterns. The impact of the paper resulted not from any compelling theoretical analysis but from the robustness of the empirical relationship demonstrated. Phillips showed not merely that the same broad pattern held over a substantial period, but that a particular functional form and set of parameters gave a good fit to data for many separate periods within an overall run of 96 years; although the years since he wrote have seen large departures from that relationship, it is unsurprising that at the time the existence of the relationship was almost unquestioned and debate concerned the reasons for it.

What follows is an exercise in statistical archaeology. In order to obtain such a long run of records for Britain, or anywhere else, Phillips had to go back to periods before modern labour statistics became available. More than half of his entire run of data covers a sequence of seven trade cycles between 1861 and 1913, and this was over this period that he estimated the parameters of his model. Before the First World War, the British government had only the most limited involvement in the labour market, there being no state unemployment insurance system before 1911 and no regular surveys of either unemployment or wages. So who was compiling information on unemployment and wages in the 1860s, and what exactly was measured by the resulting data? These are the questions this paper attempts to answer. It explores the operation of skilled labour markets and reinterprets Phillips's own findings, but its relationship to the wider Phillips' curve literature is for others to judge; in particular, it questions whether the trade-off that Phillips identified for pre-1914 Britain should be seen as a macro-economic relationship at all.

The paper is organised into three sections. The first traces the data used in Phillips' paper back through a number of stages to the original sources. The second explores qualitatively the micro-economic relationship between wages and unemployment within specific local labour markets; for example, skilled engineers in Sunderland. The third section presents a simple statistical analysis of this relationship, using data drawn from largely unexplored primary sources to study the fine structure of British labour markets.

I

Almost all research into pre-1914 British labour markets relies, knowingly or unknowingly, on the work of the Board of Trade Labour Department. Until the late 1880s, three arms of government gathered labour information: the Home Office was interested in industrial matters only as a source of social unrest; the Local Government Board tabulated numbers of paupers, but most were orphans, the aged and the infirm, outside the labour market; and Royal Commissions and Select Committees conducted *ad hoc* surveys, generally with vague questions and miniscule response rates.² Middle class concern with the 'condition of England' and the growing political importance of the labour movement led to the appointment in 1886 of a Labour Correspondent. The details of this appointment reflected the location of existing expertise. The first Correspondent was John Burnett, previously the General Secretary of the Amalgamated Society of Engineers (ASE). He had first come to public attention as the leader of the Newcastle Nine Hours movement of 1871, further discussed below. He was based within the Board of Trade, the department with greatest experience of gathering statistics because of its traditional concern with overseas trade; conversely, Local Government Board statistics were notoriously unreliable.³

Assisted only by a few clerks, Burnett produced a series of major reports: on Trade Unions, on Strikes and Lock-Outs, on hours of work, on working class expenditure and so on. In 1892 his office was expanded into the Labour Department of the Board of Trade, headed by a new official, the Commissioner for Labour. The first Commissioner was Hubert Llewellyn Smith, an Oxford mathematician who had previously worked at Toynbee Hall in London's East End and on William Booth's survey London poverty. The Labour Department began with six officials and about thirty clerks, expanding rapidly, plus a network of local correspondents around the country sending in reports. In 1916 it became the main component of a separate Ministry of Labour.⁴

However, until the creation of a network of labour exchanges in 1909 and the National Insurance system in 1911, the Labour Department lacked any mechanism for collecting statistics in the field. Its role was largely to collate information recorded by others, and the network of local correspondents was a formalisation of this: their task was to 'report at once to the Central Office cases in their districts of strikes and lock-outs ..., changes of wages, hours or other conditions of hours in the chief trades, and other events likely to lead to disputes; the opening and closing of large industrial works, and the formation and important proceedings of trade unions, trades councils, and co-operative societies.' The twenty-six part-time correspondents could be expected to know of such events because they were all trade unionists, ten were General Secretaries or equivalent, and each

represented the key trade of their area. For example, the correspondent for Tyne and Wear was the ASE district organiser for the area; for Oldham and Bolton, the General Secretary of the Operative Cotton Spinners; for Liverpool, the District Secretary of the National Union of Dock Labourers.⁵

This system of Whitehall officials and unionists in the field provided Phillips with his data, but this is not immediately apparent in his article. Figure 1 presents essentially the time series of wage rate changes and unemployment underlying Phillips' analysis, as identified in the footnotes to the paper.⁶ Taking the rate of change of money wage rates first, he calculated this from the index of hourly wage rates constructed by Phelps Brown and Sheila Hopkins.⁷ This study in turn drew its wage rates for Britain primarily from a 1909 paper by George Wood of the Labour Department, which combined hourly rates for workers in agriculture, building, printing, shipbuilding, engineering, coal, puddling, cotton, wool and worsted, gas, and furniture, using weights based on the relative numbers employed in 1850.⁸ Wood commented that:

the inclusion of railway servants, domestic servants, the clothing trades, and one or two other large industries which we cannot, for want of material, trace in sufficient detail, would probably affect the final result; but it is improbable that the effect would be very great, as the numbers already included are so large. (p.94)

However, there is another problem in using Wood's data for the study of the behaviour of aggregate wages over the trade cycle. Some sectors were well-documented: 'we have what may be regarded as final estimates of the course of average wage rates in building, engineering, shipbuilding, and printing (compositors)' (p.91). However, Wood's concern was with long-run trends in overall working class living standards, and he therefore also used much more problematic data for other sectors. He does not fully document all his sectoral series, but that for cotton is based on data for 1859-61, 1871, 1880-82, 1886, 1891-3, and 1905-8:

Intermediate years have been interpolated on the assumption that all increments due to increased speed of machinery, more machinery per operative, reduced proportions of children, &c., have been uniform and regular during these years. (p.92)

Clearly, time series constructed by linear interpolation could not contain the large cyclical swings with which Phillips was concerned, hence volatility must come principally from the data for building, engineering, shipbuilding, and printing, the other series mainly damping down the aggregate swings.⁹

Wood's 1909 article gives few details of the series for individual sectors, but he and his collaborator Bowley were responsible for a series of nineteen articles in the *Journal of*

the Statistical Society between 1898 and 1910, totalling some 450 pages and covering agriculture, printing, building, engineering and shipbuilding, and cotton; and also for an unpublished Board of Trade report of some 350 pages.¹⁰ These listed wage rates for particular towns and occupations, and were the raw material for almost all subsequent research on wages in the period. Although some information came from employers, the main sources of continuous series in the sectors Wood saw as unproblematic were trade union reports of ‘standard time rates’. Elsewhere, Bowley commented ‘the history of wages must be sought to a great extent in the records of trade unions’;¹¹ what precisely a trade union meant by a ‘standard rate’ is discussed in the next section.

Turning to unemployment, Phillips drew his pre-1911 series principally from a government report of 1905,¹² supplemented from a 1933 statistical abstract;¹³ these sources have of course been used by many writers and are easily available in the standard abstracts of historical statistics, but their origins in the work of the Labour Department have not been extensively explored.¹⁴ From its creation, the Department systematically abstracted information from the current reports of trade unions, and from 1892 onwards its *Labour Gazette* included a national unemployment time series, based on twenty-three trade unions. The 1905 report used by Phillips extended this series back to 1851 from earlier union reports.

These data took two forms: actual numbers of union members unemployed at the end of each month, and where this was not available an estimate based on a union’s annual expenditure on unemployment benefit. Table 1 assembles membership information on the main unions contributing to the early series. It includes all twelve unions providing unemployment counts in the 1905 report and adds all unions listed in an earlier report as providing a continuous unemployment series based on a monthly claimant count beginning in 1875 or before.¹⁵ Some of the unions providing expenditure data would seem to have paid benefits only to strikers, those affected by mining disasters, those travelling in search of work and so on; this makes the rates for mining and textiles highly problematic, as most unions paying benefits specifically excluded ‘slackness of trade’.¹⁶ The bottom row of the table gives the total membership of all unions contributing to the Board of Trade’s series, unfortunately only available from 1881 onwards.¹⁷

Comparing the column totals with the final row, in 1880 those unions listed in table 1 contributed most of the membership covered by the national series but the proportion subsequently declined. In 1860 and 1870, the metal trades provide respectively almost 90 per cent and 70 per cent of the total, and the overall series was inevitably dominated by the experience of this sector. Most other unions included were in building, wood-working and printing, all artisan sectors into which entry was controlled by apprenticeship and within which unemployment rather than short-time working was the

main response to recession, unlike textiles or mining.¹⁸ Overall, in 1880 66 per cent of those covered by the unemployment statistics were in just four trade unions, and 32 per cent were in the Amalgamated Engineers alone; in the 1860s, the engineers were probably in a majority. Wood's comment that reliable wage data were largely limited to 'building, engineering, shipbuilding, and printing' seems to apply also to the Labour Department's unemployment data.¹⁹ This conclusion reflected the Labour Department's reliance on the well-organised trade unions in these sectors for data, and it is to these unions that we now turn.

II

Having tracked Phillips' unemployment and wage series down to their origins in the operations of artisan trade unions, what do they measure? This requires an investigation of how unions operated and there were significant variations. The analysis that follows concentrates on the Amalgamated Society of Engineers, the largest national union of the period, the model for most other artisan unions and the subject of the concluding statistical analysis.

The most direct statement of any union's procedures were its rulebooks, which generally described the operation of welfare benefits in great detail. However, they were much less specific about industrial matters, and the interaction between benefits and bargaining. What follows therefore draws on additional sources. Firstly, the Executive Council minutes of the ASE are available from 1852 onwards but pose major problems of interpretation: the Council met four times a week,²⁰ and the minutes occupy several volumes for each year, but each minute records only the resolution adopted, not the background or discussion.²¹ Secondly, the ASE's General Secretary, William Allan, was cross-questioned on the union's industrial policy by the Royal Commission on Trade Unions of 1867-9. These sources present only the perspectives of London-based officials, not those responsible for bargaining within local labour markets, but a third source covers these, in a later period: in the early 1890s the Webbs interviewed with local union organisers from several unions around the country.²²

Turning first to unemployment statistics, the figure tabulated for each branch in the ASE's monthly reports was the number of members signing each branch's vacant book and in receipt of 'donation' benefit on the last working day of the previous month.²³ The requirement that men regularly 'signed-on' was a test that they were genuinely seeking work, and remained a feature of British unemployment insurance until relatively recently; it also provided a straightforward means of counting the unemployed. The ASE's rules further defined eligibility for 'donation' as follows:

Should any free member be thrown out of employment under circumstances satisfactory to the branch to which he belongs, and not [in arrears], or non-free member be withdrawn from his situation by a branch district committee, or Executive Council, and continue out for three consecutive days, he shall be entitled to the sum of ten shillings per week for fourteen weeks, seven shillings per week for thirty weeks, and a further sum of six shillings per week [indefinitely].²⁴

This benefit certainly covered men losing their jobs because their employer had no work for them, as often happened when orders for machinery dwindled at the onset of a recession. However, the phrase ‘circumstances satisfactory to the branch’ also covered men offered work at an unsatisfactory rate of pay, while the rules make it clear that a man otherwise ineligible for donation could be granted it if ‘withdrawn from his situation’, i.e. called out on strike.

Several features of the period need to be understood. Firstly, employers’ attempts to impose wage reductions were common and the distinction between a strike, a lock-out and men simply becoming unemployed was often unclear. Secondly, even in engineering there were numerous small employers, hence the union was seldom involved in collective bargaining in a modern sense; it had rather to give its individual members clear guidelines as to how to respond to wage offers. This last point was true both nationally, where the Executive Council set guidelines for the districts rather than bargaining with a national employers’ organisation, which only became effective in the late 1890s;²⁵ and locally, where the district committees might bargain with major employers but could not deal with each individual employer of one or two maintenance men.

Another crucial characteristic of the period was the strength of the trade cycle, ensuring that wages in engineering and similar sectors were in constant flux, and making unemployment insurance so attractive to those workers who could afford it. This account emphasises the interaction between that insurance and industrial bargaining, but changes in numbers on ‘donation’ benefit were, unquestionably, primarily a function of the stage of the cycle, not the level of unrest. For the ASE, direct evidence comes from the very different behaviour of numbers on ‘contingent’ benefit, reserved solely for disputes. However, recessions first manifested themselves in engineering through a drop in orders for new machinery, leading to employers attempting to cut wages so as to aggressively compete for the remaining orders. In general, recessions meant a genuine reduction in employers’ ability to pay; and their relatively limited fixed capital reduced incentives to maintain production for stock. At the same time, unions were consciously involved in a long-term struggle to maintain wages during recessions and advance them in booms; as William Allen told the 1867 Royal Commission, ‘we keep what we can get as a general rule’.²⁶

So what guidance did unions give their members in dealing with wage offers from employers? This was precisely the role of the 'Standard Rate' as tabulated in the union reports. That rate was certainly not a measure of earnings, which were affected by elaborate systems of overtime pay, bonuses for working at a distance and so on; in most districts these were fixed relative to basic rates through long-established practice. Neither was the 'Standard Rate' an average over the experience of different workers within a locality; crucially, it was laid down by the union, sometimes as a result of bargaining with employers but often unilaterally, not the result of a survey of workers. The Webbs stated that 'the Standard Rate is a minimum, not a maximum';²⁷ this was much closer to the truth, but it was in no way binding on non-unionists, and even union members might accept work at lower pay.

The 'Standard Rate' provided union members with a benchmark, and it had a more specific function: it defined the reservation wage level below which they were entitled to claim 'donation' benefit rather than accept offered employment. Given that benefit rates, at an initial ten shillings per week, were far below Standard Rates even in the lowest paid localities, they might still choose to accept the work. Under these circumstances the union might decide to require them to leave their jobs in the interest of maintaining overall wage levels; should they refuse, the union had the sanction of expulsion, which meant loss of all accumulated benefit entitlements including pension rights. However, it is unsurprising that the union offered the positive inducement of contingent benefit, paid to strikers as a supplement to donation benefit.²⁸

How were these mechanisms used in practice? Firstly, although unions had no contractual obligation to pay benefits to their members at any particular rate, or indeed to pay any benefits at all, successful unions changed their rates very rarely: the ASE maintained its 10s. per week top rate for donation benefit from 1851 to 1911, although after 1885 members of under ten years standing had benefit terminated after two years. They behaved as if they had a contractual obligation to their members, and the basic rules and scales of benefits were effectively fixed. Secondly, as shown below, the standard rate was varied in response to economic conditions but in a highly constrained manner: in much of the country it changed only once or twice in fifty years, and then only upwards, while in a few localities it varied more frequently and sometimes dropped sharply. Thirdly, the fact that in many centres the rate was never dropped, and the sustained high levels of benefit expenditure which the unions carried through recessions shows that while they were making some concessions to economic pressures they were still actively resisting them. Here the engineers contrasted both with those sectors, notably mining, which operated a sliding scale tying wages to product prices,²⁹ and with those unions,

notably in iron and steel, which refused to accept any pay reductions in recessions and then collapsed through catastrophic loss of membership.³⁰

Study of a specific period can provide a clearer understanding of the roles of different actors within the union. The late 1860s and early 1870s featured a major recession with its trough in 1868-9, the suspension and re-introduction of Contingent benefit, and the 'Nine-Hours' movement of 1871-2, which began as a dispute in the north-east of England over working hours but became a nation-wide campaign. The actions of the ASE's General Secretary and Executive Council can be documented in detail, but the latter consisted entirely of London members and consequently acted more as trustees to the union's funds than as the active initiator of industrial strategy. The union's policy was set by a delegate meeting every two years and between such meetings the highest authority of the union was arguably the rulebook, not the Executive.

In any given locality, the conduct of bargaining and disputes was the responsibility of the local branch or, in any town with multiple branches, the district committee.³¹ Information about these committees is limited; the original 1851 rules of the ASE state:

They shall have power to place on the funds of the society any member who may be discharged for refusing, in accordance with their advice, to infringe any of the rules or recognised customs of the trade; or who may be discharged for carrying into operation any measure for the benefit of the trade, which has been agreed to by the society, and authorised by the Executive Council, such as abolition of 'piecework' [or] 'systematic overtime ... No committee shall expend ... a greater amount weekly than is contributed by the members they represent ... , unless by consent of the Executive Council.³²

However, this rule was deleted after the union's defeat in the 1852 lockout and although district committees re-appeared in the 1854 rules there was no reference to dispute pay and the committees' job was stated simply as to 'watch over the interests of the trade'.³³

The union pooled the income and expenditure of all branches at the end of each year by a process known as 'equalisation', and therefore funds spent on unemployment or contingent benefits were a cost to the whole union; this seems to have been the principal justification for the extremely detailed financial reporting operated by the union. It is clear from the EC minutes that the General Secretary carefully examined all branch returns, often wrote requesting clarification, and on occasion arranged for visitations by officials from other branches. The minute books record a flow of instructions to branches, and the EC clearly sought to oversee the operations of District Committees but was not always successful. Consider these minutes from 1866:

- 2nd Jan. That the Bradford D. Committee cannot be permitted to use the society's funds [to pay] expenses connected with the short-time movement in that district.
- 9th Feb. The Council considers that the members of the Jarrow branch did wrong in mixing up with the nine hours movement in that place without first consulting the Newcastle-on-Tyne district committee, such committee having been established for the express purpose of looking after the interest of the trades.
- 9th Feb. That the Hull D. Committee be informed that in as much as the Committee issued a memorial to the employers of Hull without the sanction of the Council, the Council deemed it advisable not to give any definite instructions on the subject seeing the demand on the employers had already been made ... and that the attention of the committee be drawn to the fact that the proceedings of District Committees are subject to the approval of the Executive.
- 7th Mar. That a conference of delegates be held in Liverpool as soon as possible for the purpose of considering the wage question &c., and that the delegates be appointed from the following places, namely — the Liverpool and Birkenhead branches, one each, two from the Liverpool D. Committee, one from Bolton D. Committee, one from the Oldham Local D. Committee, one from the Bury and one from the Blackburn D. Committees, one from Manchester Local D. Committee, also Mr. Austin, together with two from the Council.³⁴

District committees were clearly acting without the authority of the EC. These examples come from a prosperous period when the union was seeking better wages and shorter hours. By early 1867, the onset of recession meant wage reductions in many towns, and the EC then routinely authorised strike pay.³⁵ By the spring of 1868, the recession had deepened and wage reductions were more widespread. A deputation of east London members calling on the EC in January 1868 reported:

Notice of the reduction had been given to George Clark and two or three others on Friday. [The employer told Clark] there was to be a general reduction throughout the London factories [and] did all in his power to get Clark to accept the reduction, but he and the others had left their situations ... Two smiths who had received an advance of wages, but who afterwards had to leave through slackness of work had now gone to work at the reduced rate. The deputation believed the firm had got some work in and were now setting on a few men. [Another firm was] discharging all the high waged men and were setting on fresh hands at [reduced wages].

[The delegation] believed those at 38/- would have accepted the reduction but the members did not like the idea of those at 36/- being reduced to 34/- and those at 34/- down to 32/- per week. [They thought] there would be no difficulty whatever in [the firm] getting as many men as they required at the reduced rate of wages, and could be done in a day or even less time. At the same time they felt assured if a reduction took place at [this firm], the same would take place at Blythes and other shops. Four of our members belonging to the Millwall branch had started that morning at the reduced rate, and the pattern makers were now commencing work for 36/- per week.³⁶

The variation in wages within one firm is notable; at this time, the 'standard rate' for London was 36/- per week. So too is the variety of responses: some men quit while others accepted the reduction.

By now, the EC was increasingly cautious in authorising payments of strike pay, and there are repeated mention of 'the present state of trade'.³⁷ By 1869, the EC was actively discouraging strike action, even where the alternative was to accept a wage reduction; for example:

29th May That the members of the Halifax branch be recommended to prevent as far as possible the introduction of piece work, at the same time they must be careful not to bring about a strike seeing the present state of trade.

16th June That in the event of the factory operatives at Hyde accepting a reduction of 5 per cent, and that the same has to apply to our members, the Council would recommend the members affected not to strike work seeing the present state of trade.

29th June That the London East branch be instructed not to withdraw members from Messrs. Ravenhill & Co. who are in receipt of 33/- per week seeing the present state of trade and the practice of that factory for years past.³⁸

It was at this time that the Contingent benefit was suspended, although those involved in strikes remained entitled to Donation benefit.

By the summer of 1871, economic conditions had improved although there were significant regional variations. The shipbuilding industry of the north-east was expanding rapidly, so that region escaped relatively lightly and quickly from the recession. There had been earlier attempts to reduce the working week to 54 hours, or a nine-hour day, and in early 1871 this was again sought on Wearside, and then nearby on Tyneside. This was unquestionably an aggressive move by the workers, the employers' refusal to reduce hours being followed by a mass resignation by the men. The action was organised by a specially-formed 'Nine Hours League' but the leaders were mostly ASE members, the

most prominent was the same John Burnett who became the first Labour Correspondent, and the Executive in London treated the League and the Newcastle district committee as one and the same.³⁹

A protracted struggle developed on Tyneside, in which the League sought to financially support the strikers, many being non-unionists; to prevent work in progress being moved elsewhere; and to prevent strike breakers being imported from as far away as Belgium. Initially the EC helped little, resisting even payment of Donation benefit for a month and censuring other districts for organising meetings supporting the strike. However, after rejecting many requests from various districts to give assistance, in mid-July they agreed to circulate the branches requesting financial support for the strike.⁴⁰ By August they were co-ordinating the blacking of work transferred from Tyneside and sending an agent to Belgium to discourage recruitment of strike breakers.⁴¹ Then, following victory on Tyneside in early October, the EC worked actively to extend the movement across the country and by December they were repeatedly suggesting that districts 'use their best endeavours to get the nine hours', authorising payments of the re-introduced Contingent benefit where employers resisted; at the same time they were discouraging district committees in the north-east who wanted to go further.⁴² In most districts the employers seem to have put up little resistance.

Summarising this history, district committees would seem to have responded mainly to events within their own local labour markets, but were constantly being reminded by the London office and EC of both the financial position of the union and events in other localities. The policy of the EC would seem to have been to equalise wages and conditions between workers within a workplace, between employers, and between districts. This same broad policy can be found in the comments of the newly-created ASE district organisers in the 1890s. All were concerned at the variation in wages within their districts, and emphasised this more than the absolute level of wages. This, for example, was the view of the organiser for the Midland counties:

His [aim] is to get one union alone in the industry, and that one so strong and perfect as to be able to govern the trade. To do this it is necessary to first so organise the trade that no skilled man shall be left outside the Society quite regardless of whether he gets the full standard rate, or a shilling or two less Then when all or nearly all are in he hopes to begin by levelling up the wages of the low paid men to an equality with the others in the same town ... When that is achieved the next object is to level *all* the towns up to one rate and that the highest one. Thus the Lincoln rate is now only 28/-, the Derby rate 31/- while Birmingham is 34/- and for these differences he can see no justification. His object therefore is to

raise them all even the lowest places, like Gainsborough and Grantham ... to at least the Birmingham level ...

He fails to see any argument whatsoever against a uniform rate for the whole country. The Lincoln man at 28/- per week is quite as good a workman, and works quite as hard as the B'ham man at 34/-. He does not believe in allowing different rates on account of difference in the cost of living in various towns — that he says is an old-fashioned and played-out argument. Competition has quite overcome the strength of that plea.⁴³

III

The previous section analysed the relationship between unemployment and wages from qualitative evidence, but the ASE gathered abundant statistics on local unemployment and wage rates. It is therefore possible to analyse the union's behaviour and the influence of unemployment on Standard Rates more formally. The main source of wage data is the table listing 'standard time rates of wages for a full week's work (exclusive of overtime) recognised for fitters ... at January 1st of each year', in an unpublished Board of Trade report.⁴⁴ These data are described as 'compiled from the reports of the Amal. Society of Engineers and the Steam Engine Makers' Society, and from returns furnished by the unions.' The last year listed is 1906, and for 1902-11 additional rates for the same towns were taken from the union's own annual compilation of rates; where there was any disagreement, the latter source was used.⁴⁵ For earlier dates, some additional information was taken from a tabulation of 'trade union standard rates' by Bowley and Wood.⁴⁶

The previous section suggests that changes in the 'standard rate' for a given town should be interpreted as a conscious decision taken collectively by the relevant union branch or district committee, influenced but not controlled by the urgings of the General Secretary and the Executive Council. One factor which would clearly encourage changes, and particularly reductions, was the unemployment rate among the membership, but the union's finances and its ability to recruit and retain its membership were also relevant. Further, officials in a particular town might have been influenced both by the situation in the town itself and in the remainder of the union. The following explanatory variables were therefore included, all of them information available to local union officials at the time through the ASE's annual and monthly reports; figure 2 summarises the behaviour of these variables at a national aggregate level.

Firstly, unemployment was measured by the numbers on 'donation benefit', computing annual averages from rates in the ASE's *Monthly Reports* for January and July. The analysis carefully distinguishes between local unemployment, in the branches making up the districts to which the wage rates refer, and unemployment in the remainder of the

country; for each town, a separate 'national' rate was calculated excluding the local branches. The impact of strikes was minimised by deducting those on strike benefits from the total on donation. Local and national unemployment rates for the previous year were included as separate variables.

Secondly, union officials measured the union's strength mainly through the size of its membership and therefore looked to their ability to recruit and retain members. This was measured here in two ways, by changes in the membership over the year, computed from the *Monthly Reports*, and by the number of new admissions, as tabulated for each branch in the *Annual Reports*. Ideally, the analysis would also include data on the number of 'exclusions', generally for non-payment of dues, and on inter-branch transfers, but as all available information is for individual branches, not districts, this would require a large volume of additional data. For now we can say that admissions statistics more directly measure the union's capacity to recruit locally, while change in the membership also reflected migration and exclusions. Four distinct variables were included in the analysis: the percentage increase in the local membership during the year and the percentage increase in all other branches; the number of new members admitted to local branches as a percentage of initial membership, and the equivalent percentage of new members admitted to all other branches.

Thirdly, the national Executive Council's constant concern was 'the state of the funds', the equalisation system meaning that all branch expenditure was effectively shared and it was the overall national financial balance which mattered. This was represented by the annual financial balance per member for the year, expressed in constant 1900 pounds.⁴⁷

Lastly, changes in the cost of living were included as a possible influence on wage demands. No attempt has been made to calculate town-specific indices, but the main sources of inter-urban price variations were coal and housing, together comprising 13.3 per cent of the index. This was a period of modest inflation: over the 1870-1910 period the maximum and minimum values of the index were 122.1 for 1873 and 93.5 for 1896.⁴⁸

Wage data were available for 48 towns, although continuous series are available for all of them only from 1894.⁴⁹ Only three towns provide continuous series before 1870, and this was therefore taken as the first year for the analysis, with twenty towns available. Three-quarters of all observations show no change on the previous year, and when rates changed it was normally by a round number: 81 per cent of all increases and 78 per cent of all reductions were of one or two shillings per week. Rates for individual towns cannot therefore be treated as continuous variables and the following analysis therefore focuses on the decision whether or not to raise or lower the standard rate: the money wage rates for each town are used to create two categorical response variables, a measure of

increases with a value of 1 if the rate was higher than the previous year and 0 otherwise, and a similar measure of reductions. These two categorical responses were related to the conventionally-measured explanatory variables using logistic regression, essentially measuring how, for example, a given reduction in unemployment resulted not in any particular percentage increase in wages but rather in a changed likelihood of *some* increase in wages.

Figure 3 maps the 48 towns according to the frequency with which wages changed, regardless of direction, showing that volatile wages were strongly associated with high long-run average regional unemployment rates. Tables 2 and 3 present the final ‘best fit’ relationships for each response variable, the use of over 1,400 observations ensuring the robustness of the results: these relationships explain 94 per cent of the overall variance for wage decreases and 84 per cent for wage increases.⁵⁰ The single most important determinant of the decision to cut the Standard Rate, measured by R, was the unemployment rate for the particular district. The unemployment rate in the rest of the country was not a factor: as figure 3 shows, districts little affected by unemployment seldom cut wages, whatever the national pattern. However, the state of the union nationally did matter: falling membership and funds encouraged wage cuts. The final significant factor, local admissions, has a perverse positive association with wages, but while significant this has much the highest standard error.

Different factors determined wage increases. The most important explanatory factor was the local admission rate, the best available measure of an expanding local demand for labour given that unemployment rates were minimal for long periods during booms, especially in southern areas. The national unemployment rate was the next most important factor, a high rate in other districts reducing the likelihood of an increase even if the district itself was prospering, followed by the union’s overall financial situation and admissions rate.

IV

Macro-economists have shown little interest in the empirical basis for Phillips’ original study, but to anyone familiar with the limitations of pre-1914 British labour statistics the Phillips’ curve works remarkably, indeed suspiciously well.⁵¹ In particular, the unemployment data derive from a notoriously narrow group of trade unions, mainly in construction and the metal trades, while the wage series include a broader range of sectors. ‘Standard rates’ were clearly far stickier than true average wage rates, let alone earnings. More detailed investigation shows that many of the sectors that supposedly contributed to the wage series in fact supplied only interpolated values which served merely to suppress the cyclical variation in the true annual series.

Once we understand the true nature of Phillips' data, the relationship between wages and unemployment emerges as more micro-economic than macro-economic, but no less real. Within the Amalgamated Engineers, local unemployment rates were the single most important determinant of wage reductions; very much as we would expect, given the very direct relationship between 'standard rates' and eligibility for unemployment benefit. Unemployment rates were less important to wage increases mainly because artisan unionists experienced essentially full employment outside recessions and admissions rates are consequently a better basis for distinguishing between periods of rapid expansion and mere prosperity. These results of course relate to just one trade union, but it was both the largest national union and the dominant source of Phillips' data for the earliest years of his series.⁵²

Lastly, this paper forms part of an investigation into the fine structure of British labour markets pre-1914, drawing on the wealth of data available to those willing to venture beyond the published aggregates used by Phillips and his macro-economic successors. The findings demonstrate the geographical differentiation of local labour markets, the wage-unemployment trade-off being almost absent from the more stable local economies of southern England. However, they also demonstrate the integration of labour markets over space: wage determination was local, but events elsewhere had a large influence.⁵³ In both respects, late nineteenth century British labour markets emerge as surprisingly modern.

Notes:

- ¹ Phillips, 'Unemployment and money wages'.
- ² For example, that of Chambers of Commerce and Commercial Associations conducted by the R.C. on Depression of Trade of 1884-6 (*First Report*, appendices A and B, with an analysis of responses in the *Final Report*, pp.123-29).
- ³ Davidson, *Whitehall and the Labour Problem*, pp.79-98.
- ⁴ Board of Trade, *Progress of the Labour Department*, p.367; Llewellyn Smith, *Board of Trade*, pp.183, 233.
- ⁵ The correspondents are listed, and their duties described, in *Progress of the Labour Department*, pp.263-73. On the selection of correspondents, see Davidson, thesis, pp.96-7.
- ⁶ The wages series is presented here as deviations from a ten-year centred moving average to demonstrate more clearly its relationship with the cycle. Phillips does not say which unemployment series he uses, but for the years where the two alternatives overlap figure 1 uses the series based entirely on numbers unemployed, rather than that incorporating expenditure data.
- ⁷ Phelps Brown and Hopkins, 'Course of wage rates'.
- ⁸ Wood, 'Real wages'. The series was continued for 1903-10 using Wood's figures as presented in Bowley, *Wages and Income*, table 1 col. 4, and for 1911-14 using figures from the *Eighteenth Abstract of Labour Statistics*, p.120. Bowley and Wood were close collaborators at the Labour Department, hence all three sources were closely related. For early wage statistics in general, see Hopkinson and Bowley, 'Bibliography of wage statistics'.
- ⁹ There is one definite exception to this. Wood's agricultural data came from Wilson Fox's work, published in Board of Trade, *Wages of Agricultural Labourers*. This provides a continuous annual index from 1850 to 1903 using returns from 69 farms. Measuring variability over the trade cycle by the mean absolute deviation from a ten-year centred moving average, this series is only slightly less variable than Bowley and Wood's final index for engineering and shipbuilding (Bowley and Wood, 'Statistics of wages: Engineering and Shipbuilding, part E'): a mean absolute deviation of 1.5 versus 1.7.

- ¹⁰ Board of Trade, *Rates of Wages*.
- ¹¹ Bowley, *Wages in the United Kingdom*, p.16.
- ¹² Board of Trade, *British and Foreign Trade*.
- ¹³ Ministry of Labour, *Twenty-first Abstract of Labour Statistics*.
- ¹⁴ Mitchell and Deane, *British Historical Statistics*, pp.64-5; Feinstein, *National Income*, Table 57, T.125-7.
- ¹⁵ Board of Trade, *Fourth Report on Trade Unions*-.
- ¹⁶ This explains some of the differences between table 1 and Wood's similar calculations using the the same source: Wood, 'Working Class Progress'. Most importantly, Wood's Table III includes the Amalgamated Tailors who, at least until 1891, provided only travelling benefit: Board of Trade, *Agencies & Methods*, Appendix I, pp.75-6.
- ¹⁷ Ministry of Labour, *Eighteenth Abstract of Labour Statistics*, p.94. The figures concern the end of June in a given year whereas the membership figures refer to the year's end. The 'total membership' figure for 1880 refers to June, 1881 while the other such figures are interpolations. Union memberships for 1900 and 1910 are taken from the *Thirteenth* and *Seventeenth Reports on Trade Unions* respectively. Where listed separately, female members are included and overseas members excluded. Many union members were ineligible for unemployment benefit but no adjustment was possible.
- ¹⁸ Differences between the labour markets described here and those studied by Carter and Sutch ('The labor market a hundred years ago') were therefore more sectoral than national.
- ¹⁹ For more extensive accounts of trade union unemployment statistics, see: Southall, thesis; Southall, 'Regional unemployment patterns'; and Garside, *Measurement of unemployment*, ch.1.
- ²⁰ R.C. on Trade Unions, *First Report*, p.29, Q.621.
- ²¹ The minute books are held by the Modern Records Centre, University of Warwick, holding MSS.259/1/1/1-. An example of a minute which will probably always defy

interpretation is, in its entirety, 'That the General Secretary communicate with the Station Master at Inverness respecting the lost packing case.' (19/2/1866).

²² Notes on these interviews, which were based around a standard questionnaire, are preserved in the Webb Trade Union Collection in the British Library of Political and Economic Science (hereafter Webb T.U.).

²³ ASE *Monthly Report* 9/1868, p.41.

²⁴ ASE, *Rules*, 1864; rule 17, cl.1; the phrasing changes little in subsequent books. 'Unfree' members were those in arrears or the first twelve months of membership.

²⁵ Clegg *et al*, *British Trade Unions*, pp.161-8.

²⁶ R.C. on Trade Unions, *First Report*, Q. 861.

²⁷ Webb and Webb, *Industrial Democracy*, p. 280; see also pp. 279-323 as a whole.

²⁸ In 1892, this meant 5s. per week for up to a year in addition to an initial 10s. per week donation benefit; ASE *Rules* 1892, BLPES Coll.E.C.29.x.

²⁹ Webb and Webb, *Industrial Democracy*, p. 209-12.

³⁰ Clegg *et al*, *British Trade Unions*, pp. 21-3, 202-12; Webb and Webb, *History of Trade Unionism*, pp.222-3, 335-6.

³¹ William Allen said these were 'composed of seven members from the different branches, or more in proportion to the number of branches in the district; ... in London we have a district committee composed of 24 members because we have 24 branches in the district' (R.C. on Trade Unions, *First Report*, p.29, Q.708).

³² ASE, *Rules*, 1851, rule 22.

³³ Southall, 'Lock-outs and national bargaining'; ASE, *Rules*, 1854, rule 8.

³⁴ Modern Records Centre MSS. 259/1/1/16.

³⁵ There are fifteen such reports in the minutes for January to March 1867 (MSS. 259/1/1/18).

³⁶ MSS. 259/1/1/20.

³⁷ *Idem.*; see 30th Jan., 31st Jan., 7th Feb., 21st Mar. 1868.

- ³⁸ MSS.259/1/1/22.
- ³⁹ Southall, 'Nine-hours movement'; Allen *et al*, *North East Engineers' Strikes*; Burnett, *Nine Hours Movement*.
- ⁴⁰ Contrast the minutes of the 15th July and later with those of May 27th, June 6th, 15th, 22nd, 24th, 27th, and 29th, July 4th and 8th, all rejecting requests for a special levy (MSS. 259/1/1/25).
- ⁴¹ This is recorded in many minutes during August and September 1871 (MSS. 259/1/1/26).
- ⁴² For example, on January 17th 1872 the Sunderland DC was told 'That in consequence of the [Nine Hours] movement ... not being settled, this Council is of opinion that it is premature for our members at Sunderland to enter into any ... action [to obtain] an advance of wages' (MSS. 259/1/1/27).
- ⁴³ BLPES Coll..A.XVI, ff.214-5.
- ⁴⁴ Board of Trade, *Rates of Wages*, pp.96-9.
- ⁴⁵ Amalgamated Society of Engineers, 'Statistics of Rates of Wages and List of Corresponding Officers' (copies in the BLPES). These volumes are based on reports from branch secretaries concerning the final day of the previous year.
- ⁴⁶ Bowley and Wood, 'Statistics of wages: Engineering and Shipbuilding, part A'.
- ⁴⁷ The data come from a retrospective tabulation: ASE *Annual Report*, 1919, pp.lxvi-lxix.
- ⁴⁸ Feinstein, 'A new look', pp. 170-1.
- ⁴⁹ Aberdeen, Ashton-Under-Lyne, Barnsley, Barrow, Belfast, Birmingham, Blackburn, Bolton, Bradford, Brighton, Bristol, Bury, Cardiff, Chatham, Cork, Darlington, Derby, Dublin, Dundee, Edinburgh, Glasgow, Greenock, Halifax, Huddersfield, Hull, Ipswich, Leeds, Leicester, Liverpool, London, Manchester, Middlesbrough, Newcastle, Newport, Northampton, Nottingham, Oldham, Paisley, Plymouth, Preston, Reading, Sheffield, Shields N&S, Southampton, Stockton, Sunderland, Wigan and Wolverhampton. As the wage data refer to the first day of the year listed, and in what follows they are treated as outcomes, they are considered here as referring to the year previous to that listed in the original source.

- ⁵⁰ Given the number of explanatory variables and the degree of multi-collinearity among them, stepwise logistic regression was used to eliminate the least significant, notably lagged unemployment and the cost of living. Manual selection based on the Wald statistic then determined the final model selection.
- ⁵¹ In a rarely cited critique, which notes many of the compositional problems discussed here in section I, Routh observed ‘The demonstration is impressive, yet I cannot help feeling that [Phillips] has not quite got the wage series into orbit, or, if it is in orbit, that it is revolving around the wrong planet.’ (Routh, ‘Comment’, p. 299).
- ⁵² The ASE reports are not unique and this analysis could potentially be replicated for several other artisan unions, notably the Carpenters and Joiners, and the Boilermakers; see Southall *et al*, *Trade Union Records*.
- ⁵³ This is perhaps clearer evidence of labour market integration than wage convergence or migration flows (see Boyer and Hatton, ‘Labour market integration’), given the many structural factors maintaining differentials.

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Table 1: Trade Unions providing Unemployment Series, 1860-1910

Society (& starting date of series)	Membership at end of year:					
	1860	1870	1880	1890	1900	1910
a) Metal Trades						
Amalgamated Society of Engineers (1851)	20,935	34,711	44,692	67,928	83,574	100,111
Friendly Society of Iron Founders (1854)	7,973	8,994	11,380	14,821	18,357	17,490
Associated Blacksmith's Society (1859)	8,56	1,590	2,002	2,300	2,933	2,953
Steam Engine Makers' Society (1865)	---	2,819	4,134	5,822	8,495	13,328
United Society of Boilermakers (1873)	---	---	17,688	32,926	47,670	49,245
United Pattern Makers' Society (1881)	---	---	---	2,205	4,604	7,214
Total, metal trades	29,764	48,114	79,896	126,002	165,633	190,341
b) Other Trades						
London Society of Compositors (1848)	2,650	3,350	5,100	8,910	11,287	12,231
Warehousemen's Philharmonic Society (1850)	97	173	196	110	84	---
London Operative Zinc Workers' Society (1855)	26	33	57	69	107	64
London Consol.Soc.of J'men B'kbinders (1856)	634	690	823	1,266	4,064	1,166
Amal.Soc. of Carpenters & Joiners (1863)	---	10,178	17,764	31,495	65,012	55,785
Glass Bottle Makers of Yorkshire (1867)	---	792	1,061	1,899	2,840	2,450
United Kingdom Society of Coachmakers (1867)	---	5,801	4,989	5,367	6,463	6,743
Alliance Cabinet Makers (1868)	---	242	1,346	4,298	5,270	6,685
Amalgamated Society of Millsawyers (1873)	---	---	502	692	4,179	4,079
Typographical Association (1873)	---	---	5,350	9,016	16,179	21,436
Kilkenny Operative Bakers (1874)	---	---	50	45	---	28
United Society of Brushmakers (1878)	---	---	1,583	---	1,470	1,109
Total, other trades	3,407	11,259	38,821	63,167	114,015	111,648
Total, all unions	33,171	69,373	118,717	189,169	282,588	302,117
Total, Trade Unions Reporting Unempl. %			140,000	221,000	528,000	731,000

Source: 4th, 13th & 17th Reports on Trade Unions; 18th Abstract of Labour Statistics.

Table 2:
Determinants of reductions in ASE Standard Rates, 1870-1910

Variable	Parameter Estimate	Standard Error	R
Local Unemployment Rate	0.1382	0.0224	0.2399
National Membership Change	-0.1400	0.0349	-0.1498
National Financial Balance	-0.0256	0.0067	-0.1425
Local Admissions Rate	0.0448	5.8787	0.0786
Constant	-3.9441	0.2763	

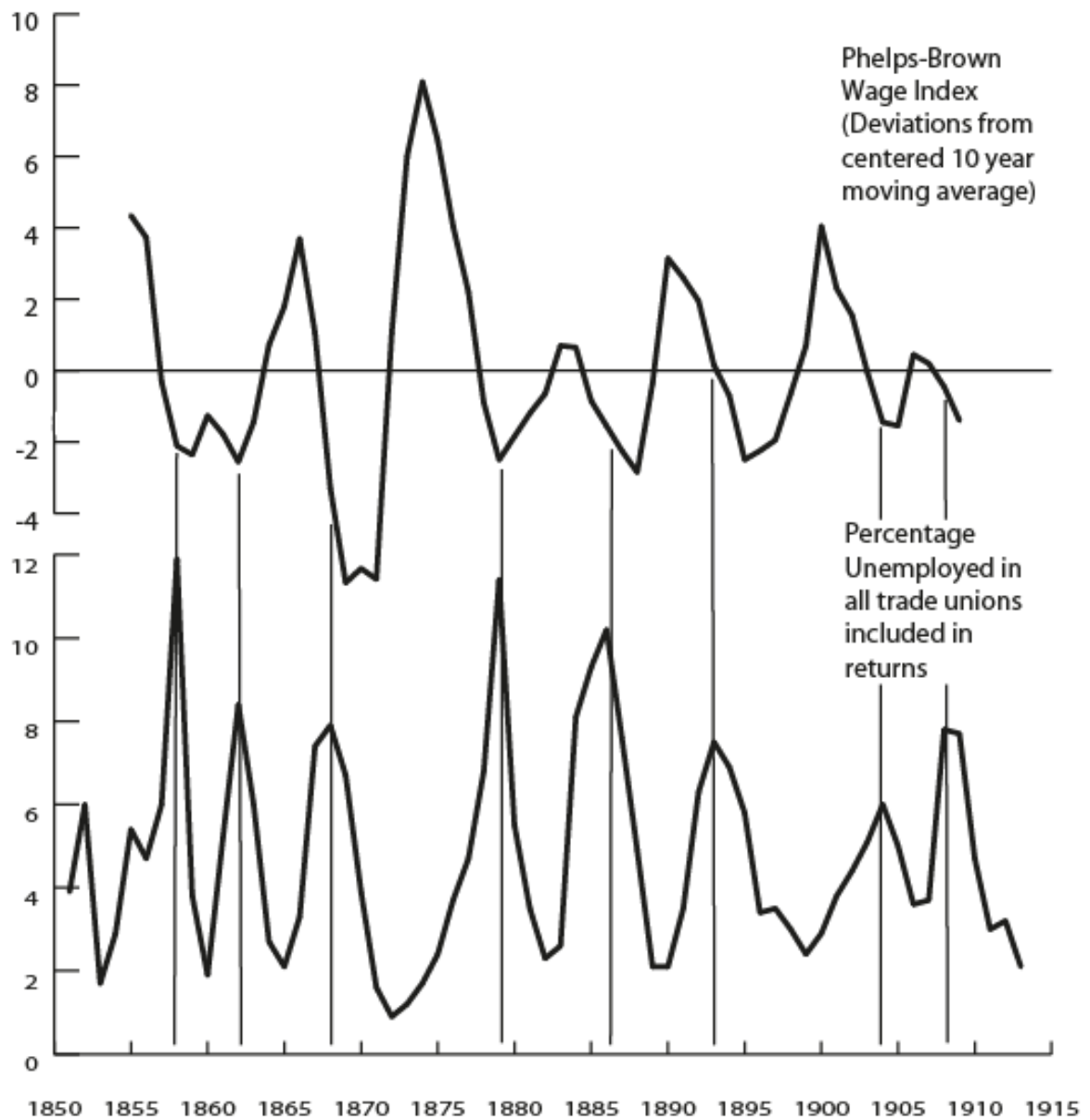
Source: See text

Table 3:
Determinants of increases in ASE Standard Rates, 1870-1910

Variable	Parameter Estimate	Standard Error	R
Local Admissions Rate	0.0624	0.0123	0.1321
National Unemployment Rate	-0.1997	0.0491	-0.1036
National Financial Balance	0.0159	0.0044	0.0907
National Admissions Rate	0.0646	0.0275	0.0510
Constant	-2.2593	0.3988	

Source: See text

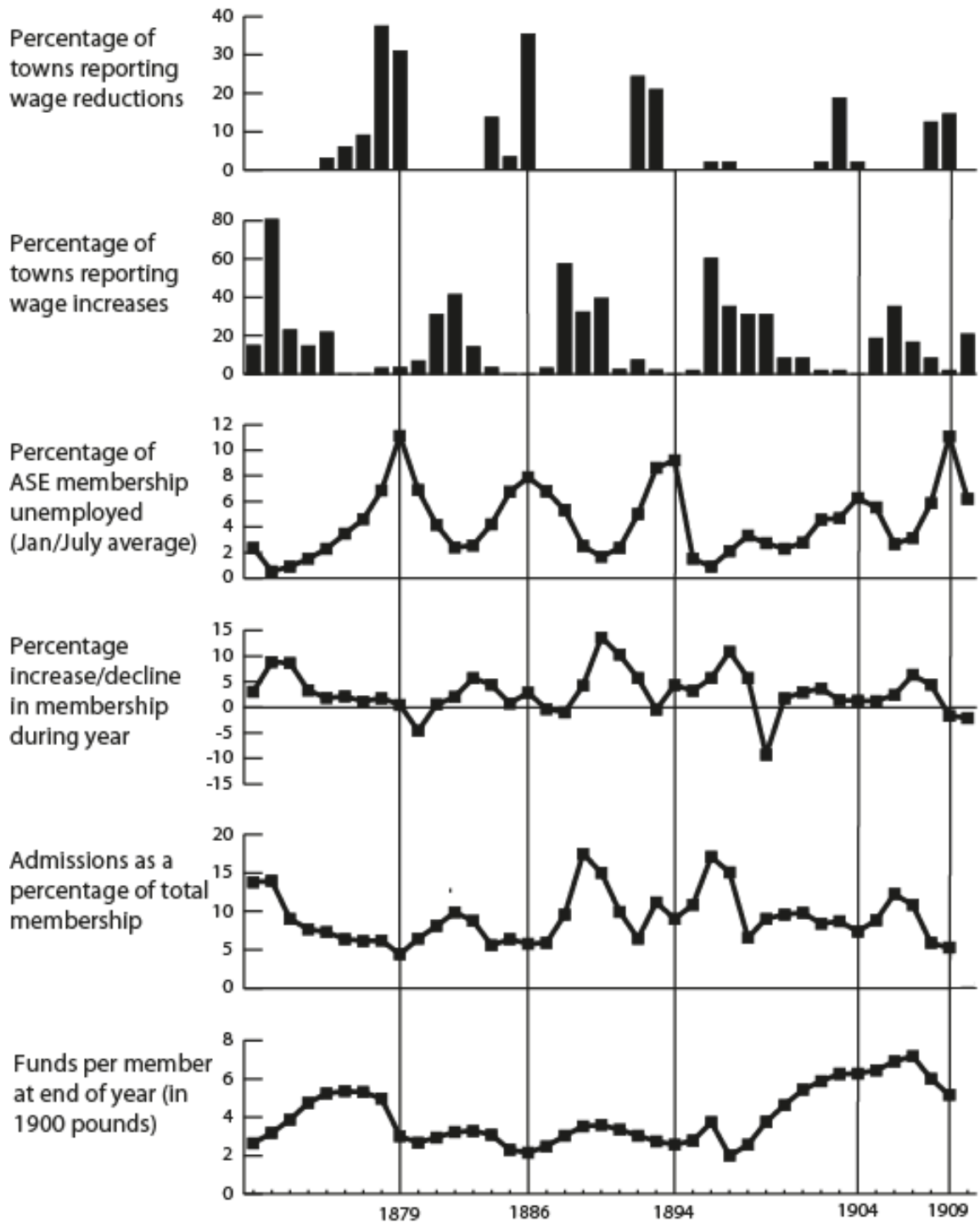
**Figure 1:
Wages and Unemployment, 1851 to 1914**



Sources: Wage Index from Phelps Brown and Hopkins, 'Wage rates in five countries', p.276; rates for 1850-59 from Wood, 'Real wages', pp.102-3 (with adjustment for working hours specified by Phelps-Brown and Hopkins, p.264, and re-indexed to 1890=100).

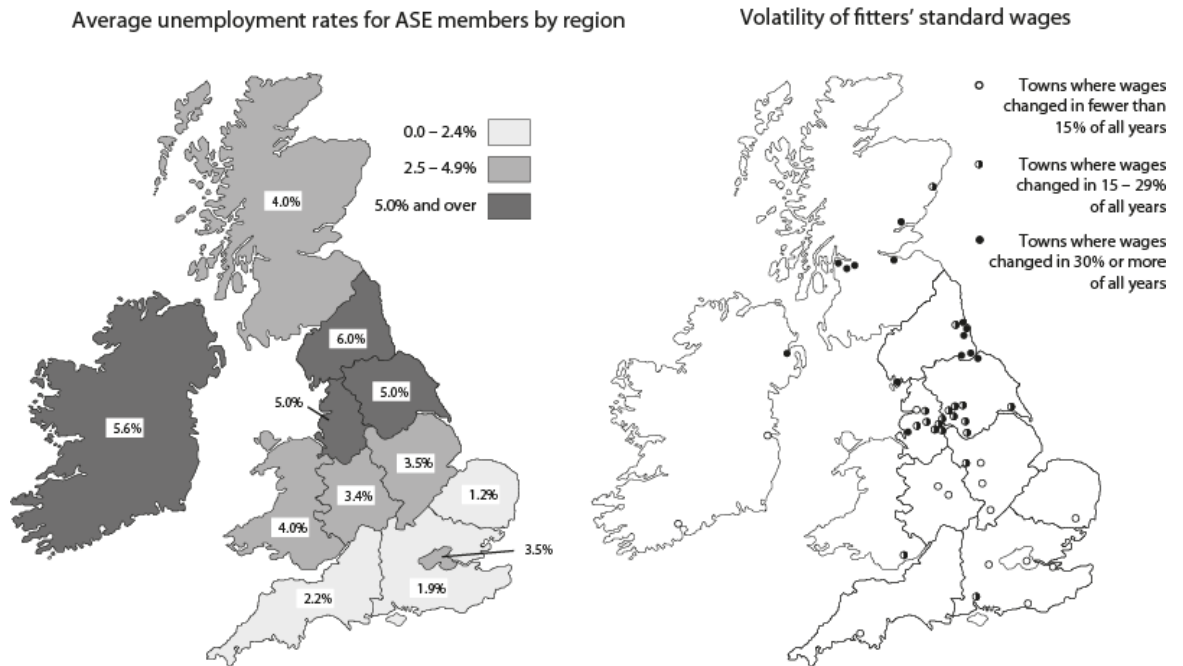
Unemployment series from Board of Trade, *British and Foreign Trade*, pp.90-91; data for 1904-14 from Ministry of Labour, *Twenty-first Abstract of Labour Statistics*.

Figure 2:
Amalgamated Society of Engineers: Aggregate Trends, 1871 to 1910



Sources: *A.S.E. Monthly and Annual Reports*

Figure 3:
Unemployment and the volatility of money
wages for engineers, 1871 to 1910



Sources: Unemployment rates computed from A.S.E. *Monthly Reports* for January and July; for wage rates, see text.