
UK Monetary Policy, Earnings Growth and Labour Market Structure 1989-1998

Anne Gasteen, John Houston and Darinka Asenova ¹

Abstract

The Bank of England's Monetary Policy Committee (MPC) sets UK interest rates to control inflation paying particular attention to earnings growth as measured by the Average Earnings Index (AEI). In October 1998, a revised AEI indicated that wage inflation had been overestimated bringing the conduct of monetary policy into question. This index was given credence by the popular belief that structural change in the labour market has reduced the earnings growth rate. However, a further revised AEI in March 1999 suggested wage inflation had been underestimated. This paper investigates why labour market changes have not suppressed earnings growth, assessing the influence of structural factors on the AEI. A new series of occupation-weighted, earnings indices from Labour Force and New Earnings Surveys' data is computed. The failure to adequately adjust for changes in UK labour market structure (in particular, increased service sector employment and greater female participation) is observed to have slightly underestimated earnings growth.

1. Introduction

IN June 1997 the Bank of England became responsible for the operation of monetary policy, in particular, the setting of interest rates, to achieve the Government's selected inflation target. The Bank's Monetary Policy Committee (MPC) takes monthly operational decisions on the level of interest rates. The Office for National Statistics (ONS) provides monthly estimates of aggregate earnings growth to assist the MPC in these decisions. From a scrutiny of its minutes, it is clear that

the MPC has always placed great emphasis on these earnings growth estimates, from which it gained the impression that there were significant wage-inflation pressures building in the economy during the course of 1998 that would cause the Government's inflation target to be breached (MPC Minutes, June 1998). However, considerable doubt was cast subsequently on the quality of the earnings growth data provided by the ONS.

In October 1998 the ONS was accused of having provided the MPC with estimates that exaggerated UK earnings growth which resulted in the Bank of England 'unnecessarily' raising interest rates, particularly in June 1998. Their belief that the UK economy was in danger of overheating was contradicted by a series of other surveys of earnings growth, consumer spending and business confidence, all of which pointed towards a possible economic slowdown in 1999 (*Guardian*, 22 February, 1999). In particular, private surveys of earnings indicated that earnings were not growing anything like the four to five per cent per annum estimated by the ONS, except perhaps in sectors where there were skill shortages. Nevertheless, the MPC continued to increase interest rates.

The disparity between a 'revised' Average Earnings Index (AEI) series and the 'original' series presented to the MPC forced the ONS to suspend the Index subject to its own investigation and the outcome of an independent inquiry set up by the Treasury and the Bank of England. At first, the revised October 1998 series lent credence to the argument that monetary policy had been too tight as it appeared to confirm the view that earnings growth was, in

fact, substantially lower than that implied by the original AEI.

Initial criticism of the original AEI series then focused on the use by the ONS of industrial weights based on the 1987 Census of Employment (CoE). It was argued that their use was likely to overstate the rate of earnings growth given the nature of structural change in the labour market (in particular the subsequent growth of service sector, part-time and female employment which would serve to suppress earnings growth). Subsequently, it appeared that the major source of error in the index lay in the sampling and grossing procedures employed and that the use of an outdated structure of employment exerted a negligible impact on the AEI. Publication of an 'improved' AEI in March 1999 suggested that the original series, in fact, had understated earnings growth.

This paper investigates why it should be the case that failing to adjust for a changing labour market structure appeared to have little impact on the estimates of earnings growth. It examines the individual contribution of the major structural changes in the labour market to the rate of earnings growth to ascertain why, contrary to popular belief, earnings growth has not fallen as a result of these changes. Section 2 of the paper documents the conduct of monetary policy under the MPC and the use of the AEI as a wage inflation indicator. The methodology used by ONS for the calculation of earnings growth and the sources of error in the original and revised, October 1998 indices are outlined in section 3. Labour Force and New Earnings Survey data are used to investigate the likely individual impact of the major structural changes in the labour market on earnings growth in section 4.

2. Conduct of monetary policy under the MPC

When making policy decisions about interest rates, the MPC takes into account the strength of the global economy and world price data;

domestic monetary conditions; domestic demand in terms of households' debt-to-net worth ratios and consumption patterns; and labour and product market conditions including employment, output and productivity trends. It is labour market conditions, however, that have given it greatest cause for concern. There was uncertainty about the 'natural' level of unemployment, the MPC believing that it might be lower than it had been in the 1980s because of structural change in the labour market (MPC Minutes, October 1997). Official unemployment had fallen to levels not seen since 1980 which, historically, would have resulted in a sharp increase in wage inflation.

Earnings growth is regarded as a key labour market indicator as to the short-term course of domestic inflation. As the labour market 'tightens', wages will tend to rise. In line with various contemporary Phillips Curve analyses, increased labour costs are then held to feed into rising prices. Movements in average earnings growth, as measured by the AEI, have therefore been consistently monitored by the MPC.

2.1 MPC decisions - June 1997-March 1999

The MPC's interest rate decisions taken between June 1997 and May 1999 are summarised in the Appendix. The reported AEI considered at the MPC's monthly meetings is an indicator of trends in earnings growth three to four months earlier. Between June 1997 and January 1998, the AEI suggested that earnings growth had been relatively stable at approximately 4.5 per cent, the level thought to be consistent with achieving the 2.5 per cent inflation target (see the 'original' AEI series plotted in figure 1). The labour market, however, was clearly tightening as indicated by a falling claimant count and towards the end of 1997 the Bank's inflation projections started to rise. It was on this basis that the MPC instigated three successive quarter per cent interest rate rises between June and August 1997 to seven per

cent with a further quarter per cent rise in November 1997. These decisions appeared to be over-cautious given the behaviour of the AEI at the time and the warnings of impending economic recession (MPC Minutes, October/November 1997).

fall in the AEI between April and May led the MPC to regard the data as too volatile to be a reliable indicator of the real trend. Interest rates were left unchanged between July and September despite the combination of a relatively high AEI, a level of unemployment

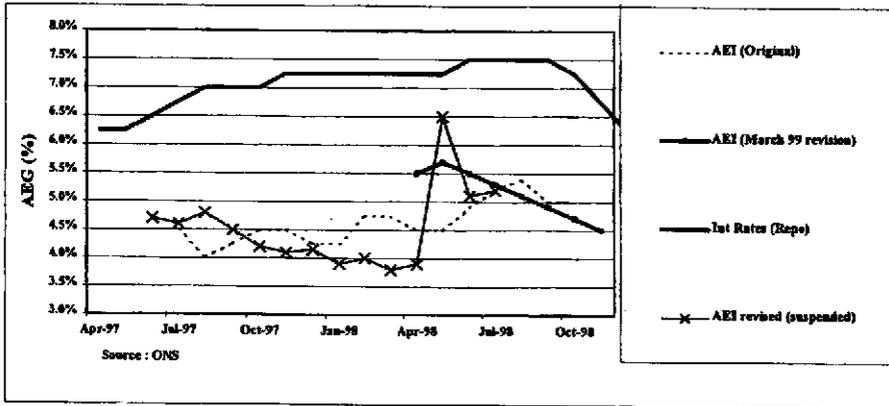


Figure 1: AEI original, revised (suspended) and reinstated series (at time of reporting)

Between February and May 1998, the reported AEI became somewhat less stable, exhibiting a rise in earnings growth to 4.75 per cent for the last two months of 1997 followed by a return to 4.5 per cent at the beginning of 1998. Unemployment continued to fall but given signs of an economic slowdown, an improved inflation forecast and what appeared to be weakening earnings growth, the MPC left interest rates unchanged. At the June 1998 meeting, however, the AEI for February registered an increase to 4.9 per cent, up from 4.5 per cent in January (original series AEI, figure 1). The MPC regarded this as significant and alarming given the continued falls in unemployment and implemented the much decried quarter per cent interest rate rise in June 1998 to 7.5 per cent.

The AEI reported to the MPC between July and October 1998 peaked at 5.4 per cent (April) before falling back to five per cent (May/June) while unemployment stabilised and then fell again in May and June. The sharp

below its 'natural' rate and increased public expenditure as the inflation forecast appeared to be on target. Subsequently revised AEI figures implied, however, that the fall in earnings growth in May was not as sharp as originally reported, the revised index standing at 5.2 per cent rather than five per cent. At its October meeting, the Committee decided to cut interest rates by a quarter per cent given the May/June slowdown in average earnings growth and the deterioration in the world economy.

On October 14, publication of a revised AEI series (the 'revised, suspended' AEI series of fig. 1) suggested that there had been a marked fall in earnings growth in February and March, as opposed to the alarming increase to 4.9 per cent and 5.2 per cent respectively in the original series. The implication was that the June interest rate rise had been not just unnecessary but potentially recession inducing. The revised index was totally at odds with the initial series and labour market conditions characterised by falling unemployment. Calculation of the AEI

and, therefore, its reliability as a wage inflation indicator, was called into question, resulting in its suspension by the ONS on November 2.

It remained suspended between November 1998 and February 1999 pending the results of the independent ONS and Treasury/Bank reviews. During this period, the MPC implemented a number of successive interest rate cuts. The rationale for these cuts rested on a combination a downturn in economic growth forecasts, rising unemployment and perceived lower earnings growth. New inflation projections implied that the Bank would undershoot the 2.5 per cent target.²

After a quarter per cent reduction at the April meeting of the MPC, interest rates were left unchanged in May as they were considered to be impact neutral, exerting neither an inflationary nor deflationary effect. A new AEI series (the 'March 1999 revision' of figure 1) was introduced, estimating a rate of earnings growth of 4.5 per cent for November 1998. This mirrored the original series much more closely, vindicating Bank conduct of monetary policy and suggesting that, in fact, the old series had underestimated wage inflation pressures.

2.2 The AEI Problem

Publication of the revised October 14 AEI series resulted in a general outcry from commentators that monetary policy decisions had been taken largely on the basis of movements in what was clearly an unreliable and outdated indicator of earnings growth (*Guardian*, 15 October 1998). Greatest criticism concerned the use of fixed industrial weights based on the 1987 Census of Employment. The argument was that the structure of the labour market had changed considerably over the course of the intervening ten years with a continued growth of the service sector, the decline of the manufacturing sector, increased part-time working and higher workforce participation by women (*The Economist*, March 1999). Accordingly,

such changes were likely to result in a situation where higher levels of employment were consistent with a lower rate of earnings growth (albeit that unemployment also rose, as the aggregate labour force expanded). That is, the unemployment rate consistent with stable inflation, the non-accelerating inflation rate of unemployment (NAIRU), had fallen. Section 3 outlines the construction of the various AEI series to enable a fuller understanding of the role that labour market restructuring might play in its miscalculation.

3. The Average Earnings Index (AEI)

The ONS and the Treasury/Bank reviews concluded that the pre-October 1998 series were seriously deficient. The Treasury/Bank review (Sedgwick and Weale, 1999) looked at the circumstances of the revisions and set out 37 recommendations related to both technical and managerial issues. The 'Chambers Report' (Chambers and Holmes, 1998) for the ONS focused on the technicalities and dealt with the actual calculation methodology.

The description of the AEI herein is drawn largely from the Treasury/Bank review. The AEI was designed to provide policy makers with a up-to-date indicator of trends in earnings. It gives the percentage change in the 'national average wage'. It is calculated by estimating an 'economy wide average wage', dividing this by the economy wide average wage in a base period and multiplying by one hundred to produce an index, i.e.³

$$AEI = \frac{\text{Average wage in economy}}{\text{Base period average wage}} \times 100 \quad [1]$$

Essentially, weighted estimates of industry average earnings are combined to produce this national average. Clearly, such a measure can disguise occupational, work mode and gender variations.

3.1 AEI data sources and calculation of the economy-wide average wage

Data for the AEI come from the statutory Monthly Wages and Salaries Survey (MWSS). The survey covers approximately 40 per cent of employees in employment by sampling a 'representative' panel of around 8,000 employees.⁴ The sampling frame from which the panel is drawn was constructed in 1989 (at the AEI's inception in its present form) using the 1984 Census of Production. The survey excludes firms with less than 25 employees and sub-divides the sample into four categories or 'ranges' according to their size in terms of employment:

- Range 1 covers 1 in 20 organisations with between 25 and 99 employees
- Range 2 covers 1 in 4 organisations with between 100 and 499 employees
- Range 3 covers 1 in 2 organisations with between 500 and 999 employees
- Range 4 covers all organisations with more than 1000 employees.

A Department of Employment classification (not the 1980 Standard Industrial Classification (SIC)) was used to define industrial groups and an average wage was calculated for each industry by firstly, summing the grossed-up total wage bills for the ranges as follows:

$$\begin{array}{l}
 \text{Range 1 Total Wage Bill} \times 20 \\
 + \text{Range 2 Total Wage Bill} \times 4 \\
 + \text{Range 3 Total Wage Bill} \times 2 \\
 + \text{Range 4 Total Wage Bill} \\
 \hline
 \text{Industry Total Wage Bill}
 \end{array}$$

The Average Wage in the Economy was calculated as follows:

$$AWE = \sum_{i=1}^n \frac{L_i}{E_i} \cdot \alpha_i \quad [2]$$

- where L_i is the total wage bill for industry i
- E_i is the total employment in industry i
- α_i is the Census of Employment (CoE) derived weight for industry i (weights must sum to 1).

Equation [2] is then inserted into equation [1] to derive the AEI.⁵ The main earnings series was called the 'underlying rate' prior to April 1998, after which it was replaced by the 'headline rate'. Calculation of the underlying rate was far from transparent, involving 'a fair degree of judgement' (Sedgwick and Weale, 1999) which meant that replication of the estimation process by users was impossible. The more transparent headline rate 'is calculated by comparing a centred three month average of the "actual" seasonally adjusted index, excluding arrears, with the same figure from a year earlier' (Sedgwick and Weale, 1999). The underlying rate was also based on a centred three month moving average but the figure for the last month was estimated. In contrast, the headline rate was based entirely on actual returns and unrounded and was considered, therefore, to represent an improvement in the accuracy of the index (Bird, 1998, Perry, 1998).⁶ The cost of greater index accuracy was an increased lag in the reporting time, since the headline rate could only be made available after a four month period rather than a three month period as for the underlying rate.⁷

3.2 Problems with the original AEI

Both independent reviews revealed that the representativeness of the MWSS sample and methodological approach had long been in question. Sedgwick and Weale (1999) describe the sample as poorly designed and drawn from a sampling frame that was out of date. They further comment that '... there is no evidence that the 1989 structure was ever built up to the efficient sample design needed to provide accurate estimates of wage growth.'

(Sedgwick and Weale, 1999, p38). When the sample size fell to under 6,400 in 1994, it was simply 'topped up' in an *ad hoc* manner to nearly 8,000 thereby compounding this problem. Indeed, there were no formal mechanisms for either replacing lost organisations, or re-categorising firms which changed size range or rotating the smaller Range 1 firms, all of which would have been desirable to safeguard sample representativeness. Similarly, the Chambers Report concluded that: a return to the methodology used before October 1998 could not be an option since it was statistically indefensible. The report states '...there is strong evidence that the panel sample has now become quite unrepresentative of the UK economy, and therefore data obtained from it are suspect. The consequences for bias in an AEI based on these data are obvious.' (Chambers and Holmes, 1998, p.3).

Given that the structure of the UK economy has changed significantly since the 1987 Census of Employment, the weights applied to the industry average wages were becoming increasingly outdated. The use of fixed weights meant that the changing industrial composition of the workforce was not reflected in the index and the service sector was under-represented. Moreover, the trend for more flexible modes of employment and contractual relations in the UK labour market has the potential to change the AEI even if the wages of individuals remained the same. For instance, the contracting out of cleaning services previously carried out in-house is likely to push an industry average wage up; the fall in employment is likely to be greater than the fall in the wage bill given that such workers receive low rates of pay. If two part-time workers replace a full-time employee, on the other hand, this is likely to reduce the AEI, as part-time workers tend to be lower paid *pro-rata* (Nichol, 1998, Webb et al, 1996).

Consultations with different users have indicated that there is no consensus on what the

index should actually measure. The report states that the AEI (as presently defined) is intended to track changes in wages and therefore represents a measure of the change in the economy average wage, controlling for the compositional effect on this average caused by variation over time of employment between different industries, sectors and sizebands.

3.3 *The discredited revised October series*

The revised AEI, published on October 14 and suspended on November 2, was the product of a programme of work undertaken by the ONS to improve the index, the primary aim of which was to ensure an appropriate size and mix of organisations in the MWSS for the AEI's calculation. New organisations were introduced into the sample from April 1998 with the result that the estimated national average wage fell, as the new additions paid significantly lower wages than those in the original sample. Accordingly, the derived growth rate of the average wage was considered to be unrepresentative. Wage rates in organisations new to the sample were believed to have grown at the same rate as other organisations but just started from a lower level. The index was recalculated from April 1998 using the original sample. The new sample was then used to calculate forward the monthly rate of growth and roll the index forward. New firms were 'chain-linked' into the existing sample - a procedure which was exonerated by the Treasury/Bank report (Sedgwick and Weale, 1999). This revision formed the basis of an amended index published on 6 October 1998.

In addition, the discredited October 14 revised series incorporated the following changes: (1) The 1992 SIC classification from the Inter-Departmental Business Register (IDBR) was introduced to improve the accuracy of industry groups; (2) new industrial weights based on the Censuses of Employment in 1991 and 1993 and the 1995 and 1996 Annual Employment Surveys were applied

(these were to be annually updated); and (3) the new grossing procedure was used to produce the finalised October 14 series (which was not corrected for sample replenishment). Sedgwick and Weale (1999) decomposed the effects of these changes on the series, taking the October 6 index, introducing each change one at a time and calculating the resultant change in the growth rate of the index. The subsequent introduction of all three changes produced the October 14 index. The results for the period of MPC interest rate hegemony are shown in fig. 2. This demonstrates that the most consistently deflationary influence on the October 14 revised index was produced by the grossing procedure. The impact of the new industrial weights was negligible.

Summing up, early criticism of the MPC's reliance on the original AEI as an indicator of wage inflation focused on the use of an outdated structure of employment (1987 Census of

desirable, the major source of error lay in the sampling and grossing procedures employed in the MWSS for the revised, suspended index. Nevertheless, it might be reasonably expected that the 1987 weighting of average industry wages would distort the calculation of the AEI. Received labour market wisdom (that the UK is creating an increasing number of low paid jobs) would suggest that the distortion was likely to be in an upward direction, overestimating wage inflation. Increased service sector and/or part-time employment and greater female participation rates would be expected to exercise a deflationary influence on the AEI, confirming the belief that the NAIRU has fallen. In the event, the March 1999 revised AEI series suggested the opposite, that wage inflation pressures had been rising and were, in fact, underestimated by the original AEI. The next section investigates the possible effects of the use of weights based on a twelve year old

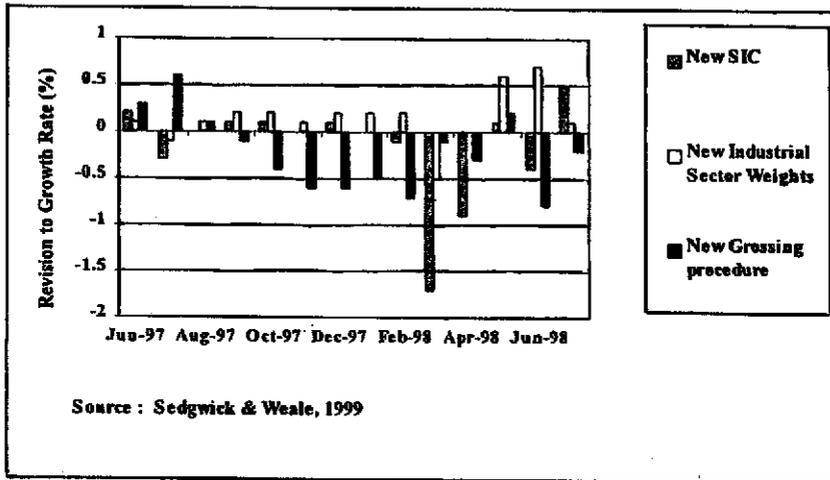


Figure 2: Analysis of the effects of the October 14 Series changes on the AEI

Employment) to provide fixed industrial weights for the final summation of the industry averages. Subsequently, the ONS and the Treasury/Bank reviews have suggested that, although updated weights were obviously

structure of employment and speculates as to the influence of the above factors on average earnings growth as measured by the AEI.

4. Estimating Earnings Growth using the NES and LFS

One alternative to estimating aggregate earnings growth using the MWSS-based AEI is to compute a series of earning indices weighted by the numbers employed in each of the nine Standard Occupational Classifications (SOCs),⁸ in conjunction with data from the UK Labour Force Survey (LFS) and the New Earnings Survey (NES).⁹ Although the LFS contains earnings data, this is only available from 1992 onwards. Hence, the analysis combines data from the NES with the LFS derived employment structure to cover the period 1987-1998.

There are several widely accepted methods of computing aggregate indices from such data. To ascertain whether the method employed made a significant difference to the indices themselves (and therefore, the rates of earnings growth), four standard indices were computed separately for each year: viz Laspeyres, Paasche, Fisher's Ideal and Ordinary Weighted Average Indices.¹⁰ In this instance, all four methods produced an almost identical set of indices between 1989 and 1998. For the purposes of this paper the Laspeyres index was adopted. In essence, this method uses the base period 'quantity' element throughout, allowing the 'price' element to vary. In this case, the breakdown of the entire workforce into its various gender/mode/occupational class categories represents the 'quantity' element (and fixed at the 1990 weights), whilst the 'price' element was computed as the 'mean' annual wage, itself being computed from the mean wage rate reported for each class, multiplied by the mean hours worked per annum (as reported in the LFS and NES). The specific formula used to calculate the index for a given year is as follows:

$$\bar{W}_b = \frac{\sum_{i=1}^{60} \alpha_{ia} (H_{ib} \cdot w_{ib})}{\sum_{i=1}^{60} \alpha_{ia} (H_{ia} \cdot w_{ia})}$$

where:

- \bar{W}_b is the fixed-weight index for year b (not the base year);
- α_{ia} is the percentage of the workforce of gender/mode/occupation type i (the 'weights') in the base year;
- a, H_{ia}, H_{ib} are the mean hours worked per annum by gender/mode/occupation type i in the base and 'other' years respectively;
- w_{ia}, w_{ib} are the mean hourly wage rates by gender/mode/occupation type i in the base and 'other' years, respectively.

4.1 The significance of using the 1987 employment structure to weight earnings growth indices

Given the initial criticism of the original AEI series produced by the ONS (that it was based on an out-of-date employment structure), the issue to be addressed is whether the rate of structural change in the UK labour market was great enough to necessitate the use of the most recent employment structure, or not. To test this, the indices were calculated twice - firstly, with the 1987 LFS occupational structure used throughout¹¹; secondly with each year's LFS occupational structure used to weight the indices. The differences between the resulting earnings growth rates derived from the two methods were compared and are shown in fig. 3.

It would appear that the underlying change in the UK Labour Market over the decade was not sufficiently pronounced to make any significant difference to the calculation of earnings growth. This result accords with the finding of Sedgwick and Weale (1999) that the sampling and grossing procedures lay at the centre of the problem rather than the 1987-based industry weights.

Given the assumed persistence of the underlying structural changes, it might be thought inevitable that continuing to weight the index according to the 1987 structure of employment must ultimately lead to significantly inaccurate estimates of earnings growth (*cet.par.*). To test

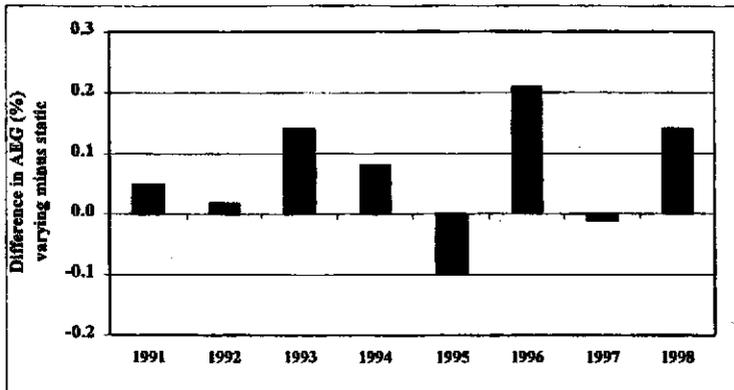


Figure 3: Differences in earnings growth (varying minus fixed)

this, the mean observed annual changes in the UK labour force, with respect to hourly pay rates; hours worked by each SOC (differentiated by sex and mode); and the changes to the structure themselves, were projected forward to 1999-2005. As with the historic data, the indices were computed twice with both fixed and varying occupational weights. It was found that (*cet.par.*), the differences between the estimated earnings growth rates continue to be negligible.

4.3. The UK Labour Market since the 1987 Census of Employment

In order to understand why the updated structure did not appear to exert any significant

influence on the rate of earnings growth, the underlying structural changes in the UK labour force were examined in more detail. The following trends were considered: the shift away from (1) primary/manufacturing to service occupations; (2) full- to part-time working; (3) a rise in the participation of women in the workplace (albeit, mainly into part-time jobs); (4) the increasing proportion of those employed in high-paid occupations.¹²

LFS data suggest a slow but steadily rising dependence on service sector jobs between 1989 and 1998 with an average annual increase in employment of less than 1 per cent (0.85 per cent). Assuming the AEI to be free from any artificial distortion caused by compositional

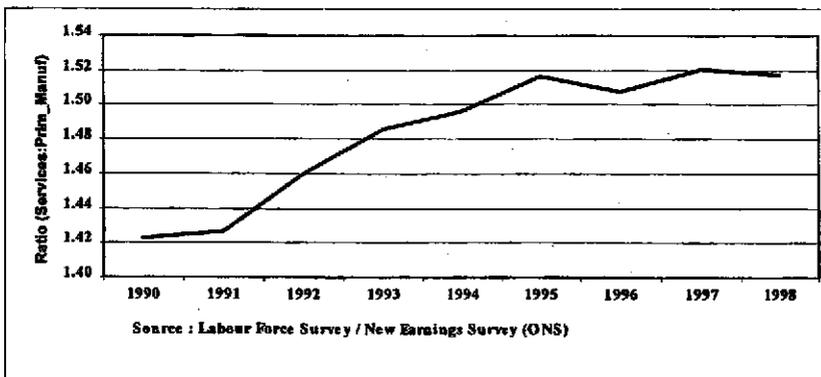


Figure 4: Ratio of hourly wage rate services to primary/manufacturing occupations UK(1990-1998)

changes (e.g. the replacement of high wage firms by low wage firms in the sample), this trend would only impact on its calculation if the earnings growth experienced by both broad categories were *significantly* different. That is, should it be the case that the earnings of those employed in services were growing significantly faster than those in the primary and manufacturing sectors, then failure to incorporate the observed drift towards services into the calculation process, would tend to *understate* the rate of earnings growth.

The ratio of the (SOC weighted) mean hourly wage rate for service to primary/manufacturing occupations between 1989/90 and 1997/98 is shown in fig. 4.¹³ Clearly, wage rates in service sector occupations have outpaced those in primary/manufacturing jobs, though, in terms of individuals' total pay, this is partially offset by the tendency of the latter group to work paid overtime. As suspected,

Turning to the mode of employment, the year-on-year percentage change in the number of part-time workers, whilst usually positive, is generally less than 1 per cent also. The ratio of the hourly pay rate of full- to part-time workers during the 1990s is shown in fig. 5. Whilst the ratio was not constant, it cannot be said that the modes diverged significantly over the decade. This is borne out by ONS analysis of the NES. The rate of increase of the gross hourly earnings of full- and part-time workers is almost identical (at 4.6 per cent and 4.4 per cent respectively) and the hourly part-time rate is just under two thirds of the full-time rate (Nichol, 1998).¹⁴ Combined with the fact that the drift towards part-time working is slow and gradual, it would appear that *not* reflecting this shift in the calculation of the index should not, in itself, have significantly distorted the earnings growth calculations. Again, this does not accord with the general perception of the effect

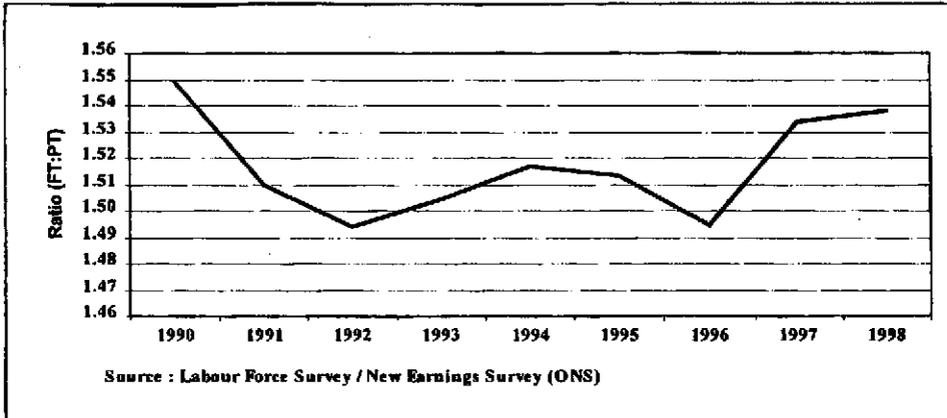


Figure 5: Ratio of wage rate of full- to part-time modes of occupation, UK(1990-1998)

this on its own, would tend to *understate* the rate of earnings growth if the occupational structure were assumed unchanged throughout. Such a finding runs counter to the general perception that increasing service sector domination of the UK economy is synonymous with low paid work. If this were so, average earnings growth would be depressed.

of part-time work on average earnings growth. Given that part-time work is generally lower paid *pro rata*, such a trend would be expected to suppress the AEI (as indicated above in Section 3.2).

The participation of women in the UK labour force over the decade exhibits a generally increasing but unspectacular rise with a posi-

tive year-on-year change of less than 0.5 per cent on average. The relationship between female and male average hourly pay rates for the 1990s is illustrated in fig. 6. Women have steadily closed the pay rate gap and it might be

31.2 per cent in 1989 to 36.7 per cent in 1998, wholly at the expense of those employed in 'middle-paid' occupations, who fell proportionately from 42.4 per cent of the workforce in 1989 to 36.6 per cent in 1998 (LFS) - the

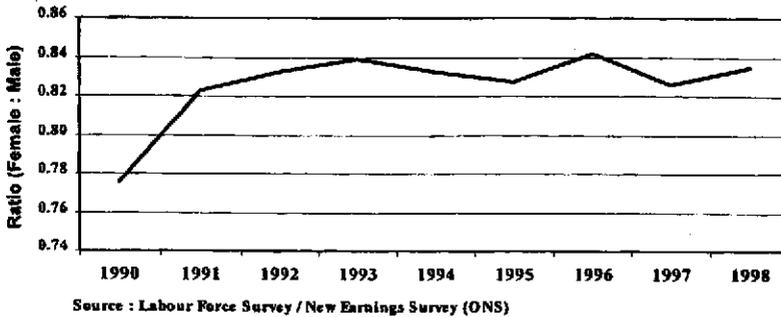


Figure 6: Ratio of mean hourly wage rate: females to males, UK (1990-1998)

concluded therefore, that a failure to incorporate the increased participation of women in the workforce would tend to *understate* the underlying rate of earnings growth. This finding is also counter-intuitive to the perceived effect of greater female participation which suggests that, because women tend to be lower paid, average earnings growth is likely to fall as their employment increases.

The proportion of the UK workforce working in 'high-paid' occupations increased from

proportion of lower paid individuals remained static at 26 per cent. At the same time, the high and middle wage earners' rates of pay have forged ahead of those in the 'low-paid' occupations (fig. 7) and the higher paid have pulled away *slightly* from the middle-paid.¹⁵ Failure to reflect the drift towards the high-paid and away from the medium-paid occupational categories would tend to *slightly* understate the underlying rate of earnings growth. Such changes, once again, do not conform to the

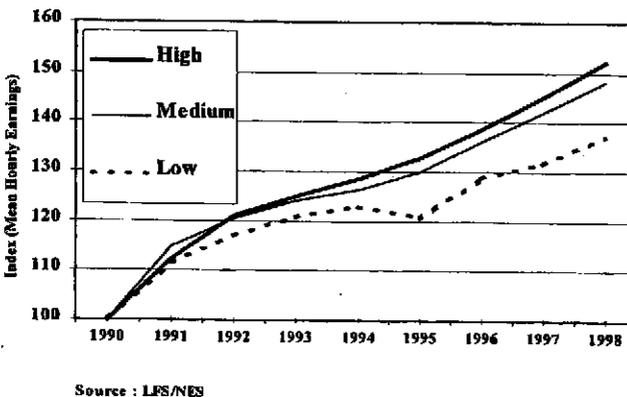


Figure 7: Indices of mean hourly wage-rates: high-, medium-, and low-paid occupations

belief that the economy is creating low-paid jobs which would tend to suppress the rate of earnings growth.

Finally, though not of direct relevance to SOC-based LFS/NES estimates, there has been a contemporaneous shift away from public-sector to private-sector employment over the period. Private sector pay rates have moved well ahead of their public sector counterparts over the period (Nichol, 1998). Were SIC-based LFS estimates to be used instead to weight the indices, then failure to reflect the movement in favour of private-sector employment would have significantly understated the true rate of earnings growth. In this respect, it should be noted that the private sector was

age earnings growth would have been significant enough to have led the MPC, or previously the government, to change their decisions as to the level of interest rates at any time over the past ten years.

4.3. What if the LFS/NES had been used instead of the CoE?

A LFS/NES-based earnings growth series for April 1997 to February 1999 was superimposed on fig. 1 to give fig. 8. The resultant level of the index, at just under 4.5 per cent over the period, was consistent with that reported by Chambers et al (2000) in their comparison of a NES-only index with the three AEI series. It is noticeable that it did not suf-

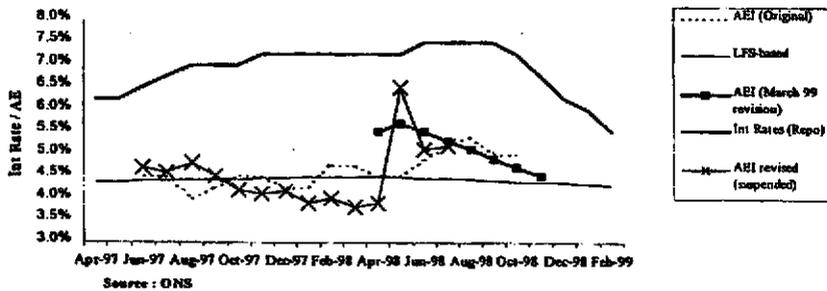


Figure 8: Interest rates, AEI and LFS/NES Indices (April 1997-February 1999)

under-represented in the MWSS sample (Sedgwick and Weale, 1999).

In summary, the generally acknowledged structural changes in the labour market, the shift toward services and the increases in part-time working, the participation of women and higher paid jobs, were observed to be slow and gradual in nature. If these changes were not incorporated in the index calculation process, they would inevitably lead to some degree of underestimation of the true rate of earnings growth. This is borne out to some extent by fig. 3, though it is doubtful whether the impact of these differences on the calculation of aver-

fer from the erratic fluctuations of, in particular, the AEI revised-suspended series. This perceived stability may be partially illusory, however, as this series was based on annual Labour Force- and New Earnings Surveys, suitably interpolated and extrapolated. The Quarterly LFS Surveys (earnings and employment data) would have to be used in order to reduce the age of the reported data but this would be at the expense of increased volatility in the resulting series. It is a matter of speculation whether using such a series would have avoided any of the interest rate increases over the period. It would also have to be investigat-

ed whether using quarterly surveys would have produced a series as erratic as any of the AEI series.

5. Conclusions

The Bank of England's Monetary Policy Committee relied heavily on the original Average Earnings Index as an indicator of wage inflation throughout the period June 1997 to October 1998. The revised October 14 series suggested that the original index had over-estimated wage inflation pressures and compounded the controversy over the June 1998 (quarter per cent) interest rate rise. Subsequently, it would appear that the original index understated the true extent of earnings growth, thereby vindicating the MPC's conduct of monetary policy.

The use of an out-dated (1987-based) employment structure to weight the industry average gave credence to the discredited October series as it seemed to confirm the growing consensus as to the likely effect of labour market restructuring on earnings growth, namely that increases in service sector employment, part-time working and the participation of women have served to depress average earnings growth producing a fall in the NAIRU.

This hypothesis was examined using a combination of LFS and NES data. Two sets of earnings indices for the 1990s were calculated from NES data for the major SOC groups. These were weighted using the fixed (1987) and varying (year-on-year) LFS structure of employment. The impact on earnings growth calculation was found to be negligible. Further investigation of commonly acknowledged structural changes in the labour market revealed that their impact was likely to be slow and gradual and, in fact, ran counter to widely held beliefs as to their effects on earnings growth. The omission of increased service sector employment and greater female participation were shown to be likely to result in the

underestimation of earnings growth, while the rise in part-time employment appeared to exert a neutral influence. Additionally, the slow growth of higher paid occupations would also tend to *slightly understate* the rate of earnings growth if omitted.

Failure to update the industrial weights was then likely to produce, as happened, an AEI which *understated* the rate of earnings growth but not so significantly as to have altered the conduct of monetary policy. However, this is purely fortuitous and it remains incredible that key monetary policy decisions, that can have profound effects on the economy in general, and the manufacturing sector in particular, were taken on the basis of statistically and methodologically flawed data. The impact of structural change in the labour market on wage inflation, however, is, as demonstrated, far from clear and the suggestion that the observed trends may have lowered the NAIRU is open to question.

Summary of the Bank of England Monetary Policy Committee Minutes

Date of the meeting	AEG reported (revised)	Manufacturing (Service) sector AEG	Private (Public) sector AEG	Claimant count	Interest Rate (IR) Change Level	Rationale for policy
June 97	4.5% Mar				+0.25% 6.5%	Rise in Aggregate Earnings Growth (AEG) since 1995, strong domestic demand.
July 97	4.5% Apr (4.25%)			5.8%	+0.25% 6.75%	Domestic demand growing significantly faster than output.
Aug 97	4% May	4.25% (4.5%)		5.7%	+0.25% 7%	Inflation forecast suggested policy needed tightening.
Sept 97	4.25% Jun	4.25% (4.5%)		5.5%	unchanged	No conclusive evidence for an IR change.
Oct 97	4.5% Jul	4.25% (4.5%)		5.3%	unchanged	Earnings growth had not accelerated. Need for further rise in IR unclear.
Nov 97	4.5% Aug	4.25%		5.2%	+0.25% 7.25%	Projection for inflation above target of 2.5% and gently rising.
Dec 97	4.25% Sept.	4%		5.1%	unchanged	Earnings growth expected to slow given the tightening of monetary and fiscal policy.
Jan 98	4.25% Oct.	4.25% (4.5%)			unchanged	Underlying rate of inflation above target (3-4%) but MPC voted against an increase.
Feb 98	4.75% Nov (4.5%)		5%	5%	unchanged	Clear signs that economy was slowing, expectations of weaker world activity.
Mar 98	4.75% Dec (5.6%)	4.75% (4.75%)	5%+	5%	unchanged	Unemployment below 'natural' rate but earnings growth just consistent with target.
April 98	4.5% Jan. (5.1%)	4.6%		4.9%	unchanged	Weaker-than-expected earnings growth although still only just consistent with target.
May 98	4.5% Jan. (4.6%)	4.7% (4.8%)	5.2%(2.5%)	slowing	unchanged	Inflation outlook improved no pressure for immediate rise in IR.
June 98	4.9% Feb.	5.3% (5%)	5.6%(2.6%)	4.8%	+0.25% 7.5%	Significant rise in earnings growth, domestic inflation stronger than expected.
July 98	5.2% Mar (5.3%)	5.6% (5.3%)	5.9%(2.5%)	4.8%	unchanged	Both inflation and earnings growth had rose but MPC decided to wait.
Aug 98	5.4% Apr (5%)	5.7% (5.4%)	6.2%(2.8%)	4.8%	unchanged	Earnings data worse than expected but inflation forecasted close to target in 2 years.
Sept 98	5% May (5.2%)	5.1% (5.5%)	5.8%(3.2%)	4.7%	unchanged	Surprising and significant slowing in earnings growth but increased downside risks.
Oct 98	5% June	5% (5.4%)	5.6%(3.3%)	4.6%	-0.25% 7.25%	Corrections to AEG for May, June and July related to revised sampling method.
Nov 98	suspended				-0.5% 6.75%	Revised figures implied a lower fall in earnings growth but danger of recession.
Dec 98	suspended				-0.5% 6.25%	Indications of sharp slowdown in growth but difficulty in judging labour market conditions given problems with AEI.
Jan 99	suspended			rising	-0.5% 6%	Indicators of domestic activity showed negative growth in all sectors. Alternative labour market data suggested slowdown in earnings growth.
Feb 99	suspended			4.6%	-0.5% 5.5%	Unemployment expected to rise in 1999 and service sector growth no longer able to balance job losses in manufacturing, wage inflation pressures easing.
Mar 99	4.5% Nov.			4.6%	unchanged	If IR unchanged, projections for inflation would be less than 2.5% target.
Apr 99	4.3% Dec (4.5%)			4.6%	-0.25% 5.25%	IR considered impact 'neutral' at very low level. Improved AEI published.
May 99	4.6% Feb.			4.6%	unchanged	Earnings growth lower than expected, confidence fragile, risk of being under target.

NB The reported AEG or headline numbers are centred moving averages of twelve month growth rate.

Endnotes

1. Glasgow Caledonian University. Material from the Labour Force Survey and Quarterly Labour Force Survey is Crown Copyright; has been made available by the Office for National Statistics through the Data Archive and has been used by permission. Neither the ONS nor the Data Archive bear any responsibility for the analysis or interpretation of the data reported here. We would like to thank the former Faculty of Business, Glasgow Caledonian University for providing financial support for the Public Finances and Structural and Institutional Change in the Labour Market project from which this work is drawn and the Editor and two anonymous referees for their comments and suggestions.

2. Alternative private surveys were used to provide information on earnings growth.

3. The base periods for the October 6 and October 14 indices were 1990 and 1995 respectively.

4. The panel is deemed to be representative in terms of different industries and variations in organisation size.

5. Total employment was calculated from sample organisations' MWSS employment data returns.

6. Rounding of the underlying rate to the nearest quarter per cent meant that small revisions in the index could produce a quarter point change in the this rate after rounding.

7. Thus, in May 1998, the MPC appear to switch from considering a reported AEI for three months earlier to one indicating earnings growth four months earlier (see the Appendix).

8. The major SOC occupational groups are:
1. Managers and administrators
 2. Professional occupations
 3. Associate professional and technical occupations
 4. Clerical and secretarial occupations
 5. Craft and related
 6. Personal and protective services
 7. Sales occupations
 8. Plant and machine operatives
 9. Other occupations.

9. For demonstration purposes, the *annual* LFS and NES surveys were used throughout this paper. Given that the MPC works on a monthly cycle, the frequency of these surveys would have to be greater than annual (even with careful interpolation). (The LFS is currently available on a quarterly basis.)

10. Details of the differences between the bases on which these indexes are computed are readily available in any standard statistics text.

11. This was the year used throughout by the ONS in calculating the AEI series.

12. In addition, some consideration is given to the drift away from public to private sector jobs, though this is not of direct relevance to the SOC-based LFS data used in this work.

13. A *higher* ratio implies that service wage rates have moved ahead of primary/manufacturing.

14. It should be noted, however, that use of NES data may disguise a possible negative impact of increased part-time employment on earnings growth since survey coverage of part-time workers is limited to those with earnings above the income tax threshold.

15. For the purposes of this paper, 'high-paid' workers are assumed to be employed in Professional, Managerial/Admin and Associate Professional/Technical Occupations. 'Low-paid' are those employed in Personal & Protective, Selling, Unskilled and Other Occupations. 'Medium-paid' are those employed in the remaining categories.

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