

## FEATURE

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# Measuring low pay: the importance of timing

## SUMMARY

Recently the Labour Force Survey (LFS) has moved from reporting on a seasonal to calendar quarter basis. This article uses data on both bases to demonstrate how timing can affect low pay estimates, particularly when the survey period and changes in the National Minimum Wage (NMW) do not coincide. The number of low paid can vary considerably over a year. Looking at the changes in responses throughout the year shows some evidence of non-compliance and different patterns of implementing the NMW according to firm size.

The National Minimum Wage (NMW) is set in October of each year. The following April, the percentage of jobs paid below the NMW is estimated by the Office for National Statistics (ONS), to give the official estimate of the number of low paid.

Up to 2003, ONS estimates used both an employer survey, the New Earnings Survey (NES),<sup>1</sup> and a household survey, the Labour Force Survey (LFS).<sup>2</sup> Neither survey was felt to give a definitive picture of the number of low paid, and so the mean of the two survey estimates was used as the official value.

In 2004, the NES was redesigned specifically to address its coverage of the low paid, and was renamed the Annual Survey of Hours and Earnings (ASHE).<sup>3</sup> As this was believed to address most of the shortcomings of the NES, the ASHE low paid figure became the National Statistic on the number of low paid (Milton (2004)).

However, ASHE only holds a limited range of personal characteristics, and so the LFS is still used to give supporting estimates of the number of low paid when these are required, for example, by ethnicity and skill. Hence, the LFS methodology continues to be used. Since the inclusion of a new question on the hourly rate of second jobs in 2004, the LFS methodology has recently been improved (see Ormerod (2006)).

The most recent change to the LFS was a result of a European requirement to move the reporting period from seasonal to calendar quarters. This raises the possibility of investigating the impact of the time of measurement on the final estimate of low paid. The official estimate is carried

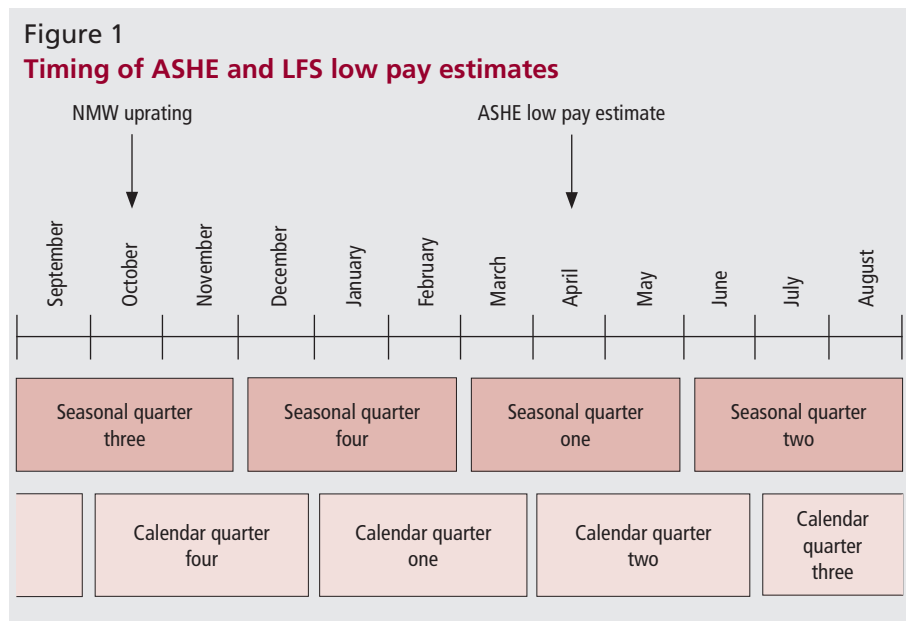
out in April because this is the reporting period for ASHE. However, the LFS runs throughout the year, and so it is possible to recreate the LFS low pay numbers in all quarters, not just the April one. This article generates these additional low pay estimates, and investigates what can be learned about the changing patterns of compliance and the way timing affects the estimates of low pay.

## Annual low pay estimates

The LFS collects information on a quarterly basis. This has recently moved from seasonal to calendar quarters to comply with European requirements. ONS has developed a partial back series for calendar quarters so that the effect of this change can be investigated. **Figure 1** shows the timing of ASHE and LFS low pay estimates and the relationship between the old seasonal quarters and the new calendar quarters.

The Government makes a change in the NMW (called an uprating) in October. The ASHE survey takes place in April, so there is a six-month gap between the uprating of the NMW and the official ONS measurement of the low paid.

Before the move to calendar quarters, LFS information from the spring seasonal quarter (March, April, May) was used to compare with the ASHE estimates. It is possible to apply the same methodology to produce estimates for other LFS quarters. Calendar quarters lag behind the seasonal quarters by one month. Following the move to calendar quarters in 2006, the quarter covering April, May, June will be used to



compare with the ASHE April estimate. Interest lies in the difference between the LFS estimate for the seasonal and calendar quarters containing April.

Figure 2 shows the annual estimates of the percentage of jobs paid below the NMW at April each year. The pattern for all estimates is similar, with an increase in the percentage of jobs paid below the NMW since 2003 (the change in the number of low paid is also related to the size of the change in the NMW; see Lam *et al* (2006)). Both LFS methodologies show a decrease in the estimate when moving from seasonal to calendar quarters. In general, the pattern of low pay is consistent across all methods.

**Quarterly LFS low pay estimates**

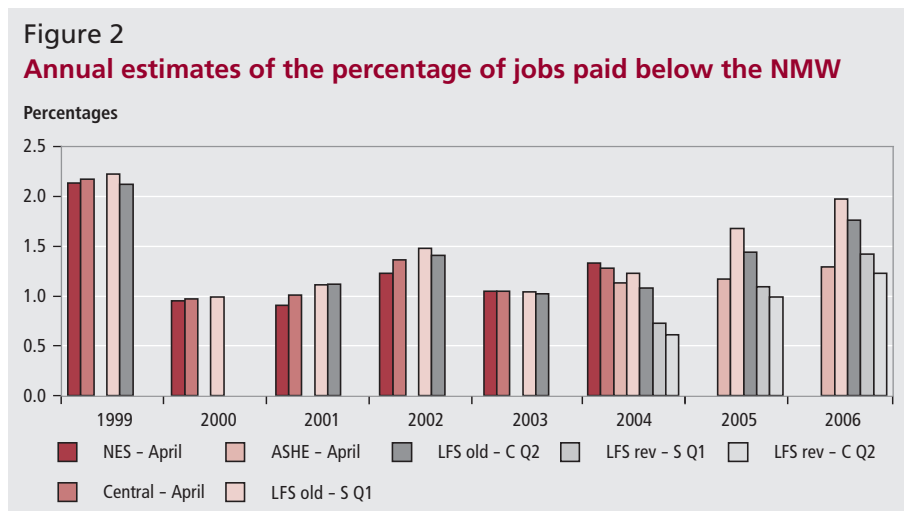
In the past, ONS has only looked at low pay in the April period when the official estimates are produced. However, the full set of quarterly estimates is available back to 2004; therefore, study can be made of whether the difference between the seasonal and calendar quarter estimates persists throughout the year. Figure 3 shows the LFS low pay estimates for all quarters from 2003 using the old and revised methodology, on calendar and seasonal quarter bases.

Generally, the April results are replicated throughout the year in that the calendar estimate is lower than the seasonal estimate. This is as expected, as wages are expected to increase as time progresses. There is some variation, probably due to sampling, as only two-thirds of the seasonal quarter sample appears in the calendar quarter.

The largest difference is for the quarter containing October (seasonal quarter three and calendar quarter four, see Figure 1). The seasonal quarter estimate covers responses to the LFS taken in September, October and November. All these are measured against the October rate. As such, the seasonal quarter three estimate is expected to be higher than the true value as there will be

a number of respondents from September who are being measured against an NMW rate which is not a legal requirement until October. The calendar quarter estimate is therefore a better measure over this period as it covers one NMW rate throughout the entire quarter.

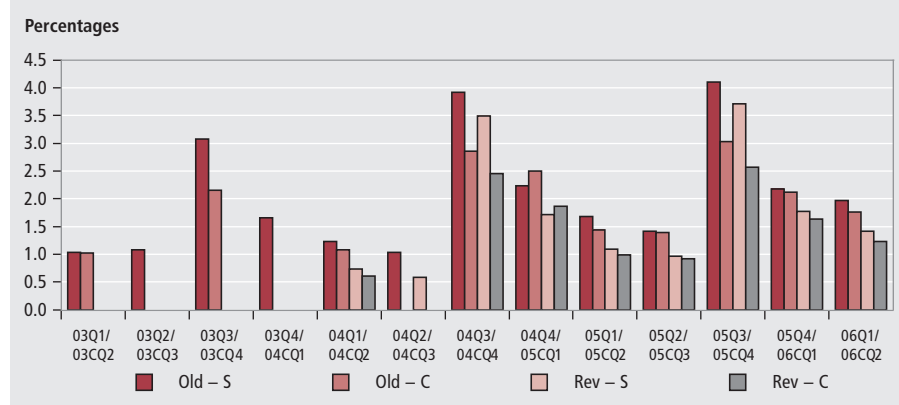
An additional issue to take into consideration, which could also affect the calendar estimate covering October, is the way respondents in the LFS report hours and earnings. When answering questions on earnings, respondents sometimes look at documentation such as pay slips or bank details to provide their response. Respondents in October could therefore be referring to a document for September in their response to the earnings questions. These earnings could have increased over the NMW change period. Similarly, respondents who do not refer to documentation or respondents who answer on behalf of other members of the household (proxy response) may be recalling earnings from the previous month. This will again lead to the estimate being higher than the true value. Therefore, seasonal quarter four or calendar quarter one may be a better estimate of the low paid as the first 'true' estimate following the uprating.



**Notes:**

- NES NES estimates, applicable until 2003
- Central Central estimate derived using ASHE and LFS methodologies
- ASHE ASHE estimate, applicable from 2004
- LFS old LFS old methodology
- LFS rev LFS revised methodology, applicable from 2004
- S Q1 Seasonal quarter one (March, April, May)
- C Q2 Calendar quarter two (April, May, June)
- 2000 Calendar data set not available for LFS

**Figure 3**  
**Quarterly estimates of the percentage of jobs paid below the NMW**



**Notes:**

Old LFS old methodology  
 Rev LFS revised methodology, applicable from 2004  
 S Seasonal quarter  
 C Calendar quarter; a full back series is not available, therefore some estimates cannot be calculated  
 For description of quarters see Figure 1  
 03Q1/03CQ2 'Q' refers to the seasonal quarter, 'CQ' to the calendar quarter, that is, March to May 2003 and April to June 2003

**Why do differences persist through the year?**

On all measures, the estimate of the percentage of jobs paid below the NMW is highest in the quarter containing October and then decreases throughout the year until the next uprating is made. While low pay estimates attempt to measure the number of jobs that are paid below the NMW, the estimates cannot be used directly as a measure of non-compliance with the legislation. This is because it is not possible to discern from data sources on earnings whether an individual is eligible for the minimum wage; for example, apprentices and those undergoing training, who are exempt from the minimum wage or are entitled to lower rates. If employees receive free accommodation, employers are entitled to offset hourly rates to reflect this.

However, if the issues in recording discussed above were the only ones in the measurement, we would expect the estimate to drop from the quarter containing October and then remain steady throughout the year. This is not the case, and the estimates continue to drop throughout the year. This suggests that companies are taking time to respond to the October rate and the trend in the LFS figures can provide some evidence about compliance or patterns of compliance.

There are two obvious possibilities why we might expect compliance to change over time. First, large companies often have complex pay negotiations with workforces which may run into several months. The LFS is not updated retrospectively, so if

an employee appears to be earning below the NMW in October but later receives back pay to cover this period, the October value will not be adjusted. Hence, for large companies, it might be expected that there is a delay in complying with pay legislation due to organisational inertia.

The second possibility is that large companies, even if involved in complex pay negotiations, would be more likely to implement NMW changes quickly than smaller companies. Larger companies:

- are more likely to be targeted by regulatory bodies checking on compliance
- will have a significant public presence and so be more promising targets for low pay campaigners
- have dedicated human resources departments, who should be aware of legislative changes and who can calculate complex wage changes accurately

Small companies may not have the information to set an acceptable wage level. They have a low probability of prosecution, and penalties imposed are relatively small. Small firms may therefore conclude that keeping up with the latest legislation is not a high priority.

These competing hypotheses can be examined. The LFS asks respondents how many employees are at the respondent's workplace. Estimates of the percentage of jobs paid below the NMW can therefore be broken down by company size. **Figure 4** shows estimates of the percentage of jobs paid below

the NMW for large, small and medium-sized companies. The pattern in the overall estimate with a high estimate in the quarter containing October and falling throughout the year can be seen clearly in the estimates for small companies. The pattern is still apparent, but not as pronounced in medium-sized companies. For large companies, the pattern has almost disappeared.

Examining the pattern across all bands and not only those selected in Figure 4 shows that the pattern appears to be less pronounced for companies with 25 or more employees.

**Figure 5** shows the estimate of the percentage of jobs paid less than the NMW, across all quarters from 2004, by company size. It can be seen that smaller companies have a higher percentage of jobs paid less than the NMW. The pattern in the high level estimate (shown under 'Total') is apparent across all groups. This pattern is more pronounced in the smaller companies and is almost non-existent for companies with 500 or more employees. This suggests that smaller companies are taking time to respond to the uprating in the NMW while large companies respond more quickly.

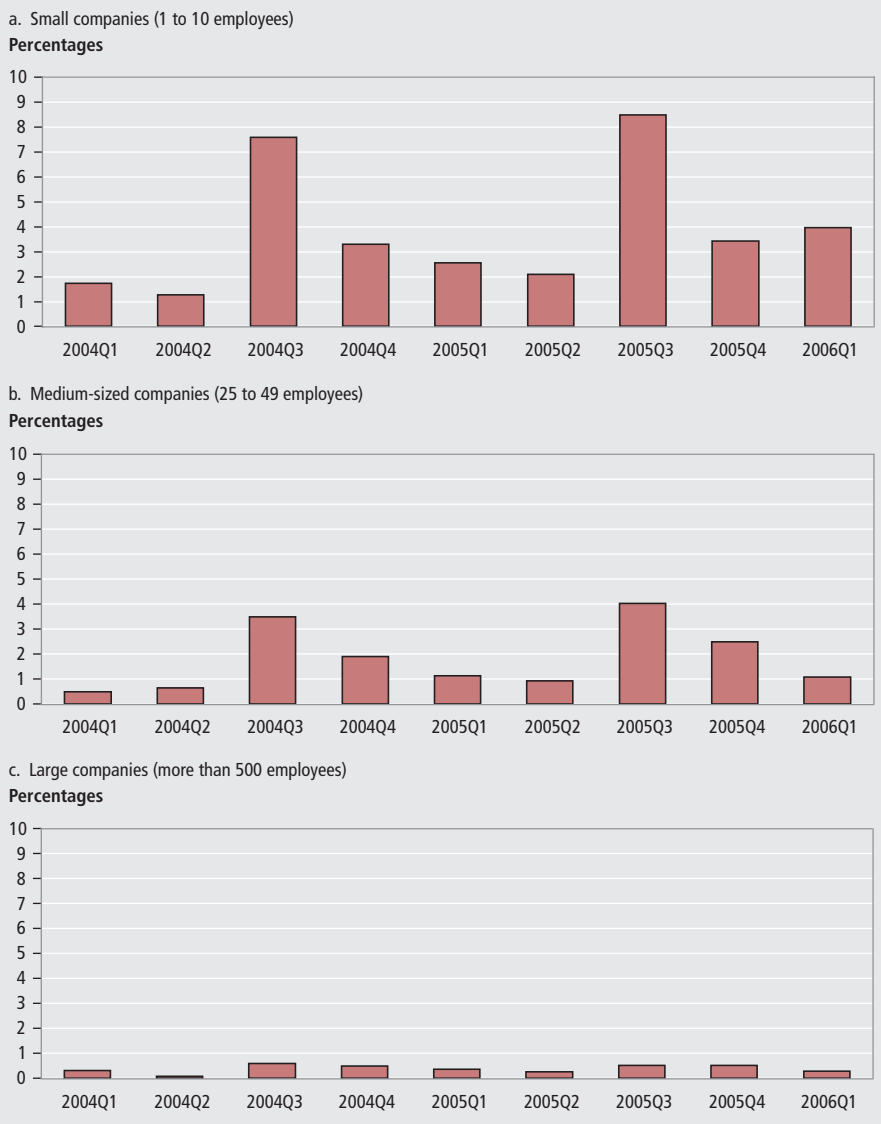
In summary, there is no evidence to support the view that back pay is a significant factor in the low pay estimates. Large companies, for whom back pay is expected to be important, appear to comply with legislation quickly.

On the other hand, small firms do take longer to adjust to rises in the NMW. There are few positive incentives to do so, and there may not be the awareness of legal requirements that large firms have. Hence, this may be the first indirect evidence of compliance problems. It should be noted that this could be a separate and additional effect of being a small company or it could be attributed to compositional effects relating to other characteristics of small organisations, for example, small companies may be clustered in different industrial sectors and have different mix of employees.

**Implications for official low pay estimates**

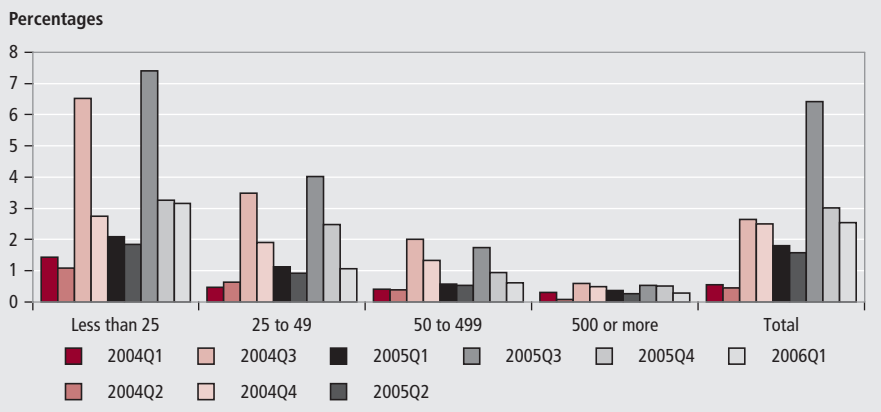
It is not possible to carry out the same analysis using ASHE as it is an annual survey. There is no reason to believe that the employers' surveys would produce a significantly different outcome from the household survey. Official low pay estimates are taken at a point in time, six months after the uprating, and should be interpreted as such and not as an annual average. The LFS figures do show that this is a relatively stable phenomenon, so ASHE figures can be compared from year to year.

**Figure 4**  
**Estimates of the percentage of jobs paid below the NMW:**  
**by selected company size**



**Note:**  
 LFS revised methodology used. Seasonal quarters shown, as full back series of calendar quarters not available.

**Figure 5**  
**Estimates of the percentage of jobs paid below the NMW: by**  
**company size**



**Note:**  
 LFS revised methodology used. Seasonal quarters shown, as full back series of calendar quarters not available.

**Conclusion**

The official ASHE estimates are measured in April which is some time after the NMW uprating takes place in the previous October. The Low Pay Commission (LPC) is eager to ensure compliance with the minimum wage legislation from the date it is implemented in October. The LFS is the only source that can provide information at this point in the year. The calendar quarter containing October is a better measure than the seasonal quarter as the period starts in October. The measure may still be higher than the true value due to respondents in October providing information relating to the previous month. Therefore the estimate in the first calendar quarter (January, February, March) should be the most useful for measuring the number of jobs below the NMW following the uprating. This supports the move from seasonal to calendar quarters in the LFS collection.

Overall, the move from seasonal to calendar quarters makes little difference to the LFS low pay estimates but this investigation has raised some interesting issues relating to timing. This investigation shows that the timing of low pay measurement is important; the number of low paid can vary considerably throughout the year.

More interestingly, using LFS quarterly estimates can provide some evidence of patterns of compliance when the trend throughout the year is examined. If measurement were the only issue, we would expect to see all quarterly estimates for quarters not containing October to be constant throughout the year. However, this is not the case. The estimate drops throughout the year until the next uprating is made. Moreover, this effect is much more pronounced in small companies where the incentive to comply is much lower. This suggests that companies are taking time to respond to the NMW uprating in October, which is not consistent with a view that observed payment below the NMW is entirely due to the legal exceptions.

**Notes**

1 The New Earnings Survey (NES) is an annual sample survey of the earnings of employees in Great Britain. The main purpose of the survey is to obtain information about the levels, distribution and make-up of earnings, and for the collective agreements which cover them. From October 2004, the NES was replaced by the Annual Survey of Hours and Earnings (ASHE). More

information on the NES is available at [www.statistics.gov.uk/statbase/Product.asp?vlnk=13293](http://www.statistics.gov.uk/statbase/Product.asp?vlnk=13293)

- 2 The Labour Force Survey (LFS) is a survey of households living at private addresses in Great Britain. It is the main source for information on the labour market in the UK. It is a random survey of approximately 57,000 households every three months. As well as private households, the survey includes people living in student residence halls and NHS accommodation. More information on the LFS is available at [www.statistics.gov.uk/statbase/Source.asp?vlnk=358](http://www.statistics.gov.uk/statbase/Source.asp?vlnk=358)
- 3 The Annual Survey of Hours and Earnings (ASHE) is a survey of employers requesting individual level information about their employees. ASHE is a new survey that has been developed to replace the New Earnings Survey (NES). ASHE includes improvements to the coverage of employees and to the weighting of earnings estimates. The data variables collected remain broadly the same, although an improved questionnaire was introduced for the 2005 survey. The change in methodology means that statistics on pay and hours published from ASHE, including the calculation of ONS's low pay statistics,

are discontinuous with previous NES surveys. More information on ASHE is available at [www.statistics.gov.uk/statbase/Source.asp?vlnk=1319](http://www.statistics.gov.uk/statbase/Source.asp?vlnk=1319)

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#### REFERENCES

- Lam K, Ormerod C, Ritchie F and Vaze P (2006) 'Do company pay policies persist in the face of minimum wages?', *Labour Market Trends* 114(3), pp 69–81 and at [www.statistics.gov.uk/downloads/theme\\_labour/LMT\\_Mar06.pdf](http://www.statistics.gov.uk/downloads/theme_labour/LMT_Mar06.pdf)
- Milton J (2004) 'New methodology for low pay estimates' at [www.statistics.gov.uk/ccl/article.asp?ID=992](http://www.statistics.gov.uk/ccl/article.asp?ID=992)
- Ormerod C (2006) 'Labour force survey low pay estimates: Method of dealing with second jobs', *Labour Market Trends* 114(7), pp 233–9 and at [www.statistics.gov.uk/downloads/theme\\_labour/LMT\\_July06.pdf](http://www.statistics.gov.uk/downloads/theme_labour/LMT_July06.pdf)