

# Technical note on cyclical indicators

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December 2005



HM TREASURY





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# INTRODUCTION

*Evidence on the UK economic cycle*, published in July 2005, presented the Treasury's reassessment on the basis of revised national accounts data, supported by evidence from new data on market sector GVA, that the current economic cycle began in the first half of 1997. Following the publication of the paper, the Chancellor of the Exchequer asked the National Audit Office (NAO) to audit this revised judgement. The NAO is publishing its report alongside the 2005 Pre-Budget Report. In the interests of transparency, and to encourage public scrutiny, this supplementary technical note presents the evidence on the cyclical indicators used by HM Treasury to date 1997H1 as an on-trend point. The data series for the indicators, given in section 4, are also presented in the appendix of the NAO's audit report<sup>1</sup>.

**1.1** The Treasury's approach to measuring the economic cycle starts by identifying the points in the cycle when the economy is judged to be 'on-trend'. When the economy is on-trend, implying a zero output gap, its factors of production are employed at normal rates of utilisation and there is no change in the degree of inflationary pressure in the economy. The Treasury uses a wide range of cyclical indicators to identify on-trend points. These indicators contain useful information about the cyclical position of the economy; and they are used by policy analysts to assess the degree of slack or inflationary pressure in the economy.

**1.2** This paper lists the indicators used to date 1997H1 as an on-trend point. These indicators consist mainly of data from private sector business surveys and the Office for National Statistics. A total of 26 indicators<sup>2</sup> under 22 headings are presented individually in graphical form along with relevant information including definitions and sources. The paper also provides a brief interpretation of each indicator with respect to 1997H1 being an on-trend point that marked the end of the previous economic cycle<sup>3</sup>.

**1.3** As discussed in previous Treasury publications, and most recently in the July 2005 paper *Evidence on the UK economic cycle*, dating on-trend points is not an exact science; and a degree of informed economic judgement is exercised when dating the economic cycle. For example, sometimes the use of cyclical indicators to date on-trend points, and in particular the end or start of the cycle, does not give clear-cut signals. When the economy is close to trend any ambiguities can be resolved if national accounts output data suggest that the economy was decisively passing through trend. In such circumstances, cyclical indicators and output data are likely to corroborate each other. In contrast, if the economy is hovering relatively close to trend, the judgement on on-trend points is likely to be more uncertain. This is why GDP data and revisions are relevant to the Treasury's assessment of whether on-trend points signify the end or start of cycles.

<sup>1</sup> *Audit of Assumptions for the 2005 Pre-Budget Report*, NAO, December 2005. Web-link: [http://www.hm-treasury.gov.uk/pre\\_budget\\_report/prebud\\_pbr05/assoc\\_docs/prebud\\_pbr05\\_adnao.cfm](http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr05/assoc_docs/prebud_pbr05_adnao.cfm)

<sup>2</sup> Some of the indicators used in the assessment of the current cyclical position of the economy are not included as the data do not extend back to 1997.

<sup>3</sup> While mid-1999 is also judged to be an on-trend point, the Treasury's latest assessment as set out in *Evidence on the UK economic cycle*, July 2005, showed that this was not a period when the economy passed decisively through trend. As such, mid-1999 is not judged to have been at the end of a cycle or the beginning of a new one



# 2

## CYCLICAL INDICATORS AND THE OUTPUT GAP

**2.1** As a measure of the cyclical position of the economy, the output gap can be broken down into its components in a similar fashion to the decomposition of trend growth<sup>4</sup>. These components<sup>5</sup> are:

- productivity (output per hour);
- average hours worked; and
- employment rate.

**2.2** The cyclical indicators used to identify on-trend points relate either to the whole of the output gap or to a component of it. For example, business survey indicators of capacity utilisation measure companies' assessments of their utilisation of capital and workers. Variations in their assessments tend to reflect fluctuations in output per worker around trend; hence business survey capacity utilisation indicators probably relate to the output per worker component of the output gap (output per hour and average hours components together). A general classification of the indicators with respect to the output gap component they relate to is given in Table 1.

**Table 1: Classification of cyclical indicators with respect to the output gap components.**

Component of output gap	Corroborative indicators
Productivity and average hours (output per worker):	Business surveys of capacity utilisation
Employment:	Business surveys of labour constraints/recruitment difficulties Vacancies Deviation of unemployment from the estimates of the UK NAIRU
Output gap – overall:	Price inflation: CPI, RPIX Wage inflation: Average earnings, unit wage costs Labour share of GVA

**2.3** This classification is useful in the sense that it helps identify the sources of slack or inflationary pressures in the economy. For that reason, this note presents the cyclical indicators in the same order.

<sup>4</sup> More detailed explanations of the Treasury's trend growth and cycle-dating approaches are given in the following Treasury publications: *Fiscal Policy: Public Finances and the Cycle* (HMT, 1999, <http://archive.treasury.gov.uk/budget/1999/cycles/cycle.htm>), *Trend Growth: Prospects and Implications for Policy* (HMT, 1999, <http://archive.treasury.gov.uk/pdf/1999/trendgrowth.pdf>), *Trend Growth: Recent Developments and Prospects* (HMT, 2002, <http://www.hm-treasury.gov.uk/media/D6678/ACF521.pdf>), and *Evidence on the UK economic cycle* (HMT, 2005, [http://www.hm-treasury.gov.uk/media/2E6/A5/economic\\_cycles190705.pdf](http://www.hm-treasury.gov.uk/media/2E6/A5/economic_cycles190705.pdf)).

<sup>5</sup> The population component of the output gap is not included, as it would not make sense for the deviation of actual population from the level implied by an assumed trend rate projection to be regarded as signalling cyclical excess demand/supply in the economy



# 3

## OVERVIEW OF DATA AND SOURCES

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**3.1** This section provides an overview of the data used by the Treasury to identify on-trend points, and a broad description of how particular data series are used to assess whether the economy is on trend or not. The indicators are then set out in detail in section 4.

**3.2** No one indicator is uniquely informative about the overall cyclical position of the economy. This is because the relationship between each indicator and the overall economic cycle is likely to vary over time and as other economic variables and the structure of the economy change. For such reasons close mechanical relationships between fixed weighted averages of the cyclical indicators and the overall economic cycle also tend to prove elusive. The indicators are used collectively to provide a broad picture of the economy. Given the uncertainties in the interpretation of the data, and in some cases uncertainty about the data itself (e.g. the estimates of the Non-Accelerating Inflation Rate of Unemployment), a degree of informed judgement is applied when assessing the extent of slack in the economy.

**3.3** The Treasury uses data from three broad sources: private sector business surveys, the Office for National Statistics (inflation, unemployment and vacancy ratio data) and external organisations (estimates of the NAIRU).

### PRIVATE SECTOR BUSINESS SURVEYS

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**3.4** Most of the cyclical indicators used by the Treasury to date on-trend points are sourced from private sector business surveys. The data series from these surveys are compared with their respective long-run averages to gauge the degree of slack or inflationary pressure implied by each indicator. However, the long-run average over the whole span of a data series may not be a good indicator of its 'normal' level if the relationship between the indicator and the economic cycle changes, for example due to structural reasons. Therefore, consideration of the period over which the average is calculated to measure the 'normal' levels is important. Charts in section 4 compare the survey indicators to (a) their averages calculated over the whole span of the data series and, in most cases, to (b) the averages calculated over more recent periods. The selection of the more recent periods used in the calculation of averages is made to ensure that the periods are kept as long as possible to benefit from more survey information, and that the selected periods contain data with no discernible cyclical bias. The way in which the data periods are tested for cyclical bias is explained below.

**3.5** One of the necessary, but not sufficient, conditions for the suitability of a time period for the calculation of the ‘normal’ level is that the series should be normally distributed over that period<sup>6</sup>. However, a normal distribution of observations does not on its own justify the selection of a period. Ideally, the output gap over the selected period should average out at close to zero, thus ruling out cyclical bias. This is tested for all the periods over which the averages are calculated for the purposes of this paper. To avoid circularity with the Treasury approach, the output gap estimates used in this test are derived using a Hodrick-Prescott filter. The averages of the output gap estimates over the selected periods are all reasonably close to zero<sup>7</sup>. However, any conclusion regarding cyclical bias must be treated with caution given the uncertain nature of the output gap estimates.

**3.6** If a business survey indicator deviates from its long-run average during a particular time period, it may be interpreted as evidence of either inflationary pressure in that period or as evidence of slack. However, if the normal level is uncertain (i.e. there is uncertainty regarding the choice of the period over which the long-run average should be calculated), then the indicator can be compared with the values it took at recent on-trend points.

**3.7** It is possible that the degree of inflationary pressure in the economy depends on the rate of change, as well as the level, of the indicators. If the economy is growing rapidly at a rate that is significantly above the trend growth rate, short-term supply bottlenecks may lead to increased inflationary pressure despite the level of output being below the trend. Such effects are commonly known as the ‘speed limits’. Although a possibility, these effects are not considered a material factor in the use of cyclical indicators to date recent on-trend points.

**3.8** Private sector business survey indicators are not formally seasonally adjusted. However, to a degree, it is likely that seasonal factors are taken into account by respondents when answering the survey questions. Indeed some survey questions (e.g. CBI capacity utilisation) explicitly ask respondents to discount seasonal variation.

## CBI surveys

- **Industrial Trends Survey:** This survey covers the manufacturing sector, and provides quarterly data on capacity utilisation and output limiting factors starting from 1972Q1<sup>8</sup>. The number of firms responding to the survey questionnaire varies: for example, it was 676 in 2005Q1 and 748 in 2005Q2. Firms participating in the survey account for approximately one third of UK manufacturing employment, representing close to one million workers. Averages calculated over the whole period are unlikely to suffer from significant cyclical bias, because the data series are long enough to span a number of cycles.

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<sup>6</sup> All of the business survey data series presented in this paper are tested for normal distribution using a Jarque-Bera test; and the results are presented individually for each series.

<sup>7</sup> These range from –0.01 to 0.05 percent for all periods except the 1989Q4-2005Q2 period over which the average is –0.09 percent.

<sup>8</sup> Data are available on a tri-annual basis (June, October and February) between 1958 and 1972.

- CBI/Price Waterhouse Coopers Financial Services Survey: The coverage of this survey is smaller than the coverage of the CBI's Industrial Trends Survey. For example in March and June 2005, the total number of responses was only 99 and 81 respectively. Nevertheless, the survey can cast useful light on factors such as capacity utilisation in the financial services sector. The data series are only available from 1989Q4, and so the long-run average over the whole period is affected by end points, i.e. depressed by the deep down-phase in the economic cycle during the early 1990s.

## BCC Quarterly Economic Survey

**3.9** This quarterly survey covers both the manufacturing and services sectors. The data series are available on a quarterly basis since 1989Q1. The survey covers close to 6000 companies spread throughout the UK, employing more than a quarter million workers. These companies are typically much smaller than those covered by the CBI Industrial Trends Survey. Manufacturing firms make up approximately a quarter of the total; and the data are presented separately for each sector.

**3.10** For most of the early period of the BCC data series, the economy was in a deep and protracted down-phase of the cycle, which is likely to impart a downward bias to the long-run average. The majority of the indicators sourced from this survey have broadly remained above their respective long-run averages (calculated over the 1989 to 2005 period) since the mid-1990s. This would lend support to the view that the averages calculated over this period are likely to understate 'normal' levels. Furthermore, the distributions of the majority of the BCC data series since 1989 are negatively skewed, so not normal. They generally become normal after the mid-1990s. This would suggest that the appropriate 'normal' level is probably better reflected in the average since the mid-1990s, as opposed to the average over the whole span of the series. Therefore, averages since 1995 are used in addition to the averages over the whole period in gauging 'normal' levels for BCC series.

**3.11** There are other business surveys that provide useful data; and these are also of interest to the Treasury. However, this paper lists only the survey indicators which were used to date 1997H1 as an on-trend point; and it excludes indicators with insufficient back-run of data to evaluate the economy in that period<sup>9</sup>.

## DATA FROM THE OFFICE FOR NATIONAL STATISTICS

**3.12** In addition to the private sector business survey indicators, the Treasury's cyclical indicators include measures of price and wage inflation, the vacancy ratio and labour's share of the national income. The data series for these indicators are sourced from the Office for National Statistics; and the definitions are given in section 4 for individual indicators.

- The relationship between inflation and the output gap is not simple, as the inflation rate depends on a number of other temporary factors such as movements in the exchange rate and inflation expectations. The Treasury's approach is to compare the rate of inflation with its target rate, keeping these important caveats in mind.

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<sup>9</sup> For example, the CBI produces a quarterly survey of services firms which provides capacity utilisation data for sub-sectors such as business services and consumer services (CBI/Grant Thornton services sector survey). Although instructive, the data series are only available since 1998, and so they cannot be used for the purposes of assessing the cyclical position of the economy in 1997H1.

- Data on wage inflation are compared to the rate considered to be broadly consistent with the Bank of England's inflation target.
- The vacancy ratio data are compared to the average over the whole period for which the data are available.
- The labour share data are derived using ONS data. The relationship between on-trend points and the labour share data are explained in the July 2005 paper *Evidence on the UK economic cycle*.

### Other data sources

**3.13** The Treasury uses external estimates of the UK's Non-Accelerating Inflation Rate of Unemployment (NAIRU), broadly speaking the economy's sustainable rate of unemployment that is consistent with stable inflation, in its assessment of the unemployment rate. The difference between the economy's actual rate of unemployment and the estimated NAIRU provides an indication of slack in the labour market. However, the NAIRU is not observable and has to be estimated, introducing an element of uncertainty into this measure of slack in the economy. Nevertheless, a comparison of the unemployment rate with the NAIRU is an economic theory based approach; and it is instructive. The NAIRU estimates presented in this paper are sourced from the Organisation for Economic Co-operation and Development (OECD), the European Commission (EC) and Oxford Economic Forecasting (OEF).

# 4

## CYCLICAL INDICATORS

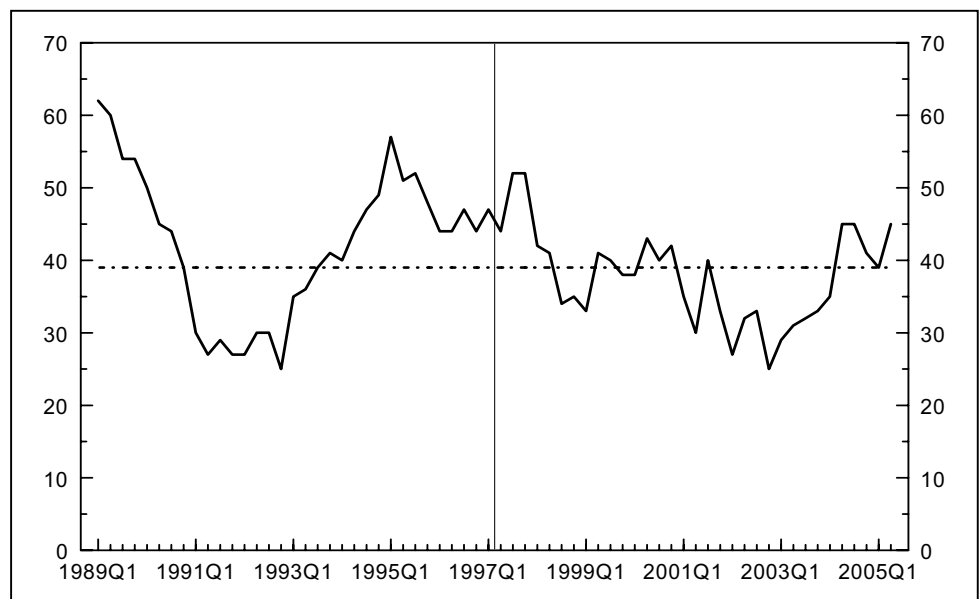
### Output per worker

1) Indicator: Capacity utilisation

2) Sector: Manufacturing

3) Source: CBI

4) Definition: Percentage of firms operating at full capacity. The survey question is “*Is your present level of output below capacity (i.e. are you working below a satisfactory full rate of operation)?*” The data series reflects the percentage of firms operating at full capacity.



Horizontal dashed line is the long-run average since 1972Q1. Vertical line marks 1997H1

5) Comments:

- The average calculated over the whole period is thought to be free from cyclical end point bias, given the length of the period. Indeed, the data series since 1972 is normally distributed at the 5% significance level with a Jarque-Bera (J-B) test probability of 0.29.
- The proportion of manufacturing firms operating at or above full capacity was above the long-run average in 1997H1, tending to suggest that the manufacturing sector was operating above trend at that time, though this needs to be viewed against the possibility that the ‘normal’ level of capacity utilisation in the 1990s exceeded the long-run average since the early 1970s as a result of efficiency improvements.

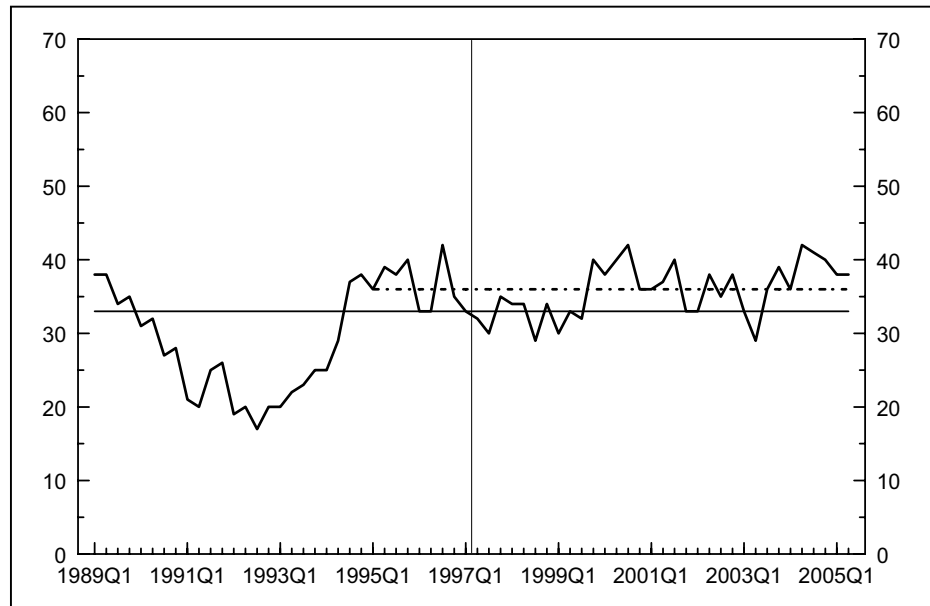
## Output per worker

1) Indicator: Capacity utilisation

2) Sector: Manufacturing

3) Source: BCC

4) Definition: Percentage of firms operating at or below full capacity. The survey question is “*Are you currently operating: at full capacity / below full capacity?*” The data series reflects the percentage of firms operating at full capacity.



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1. Vertical line marks 1997H1

5) Comments:

- As noted earlier, the average over the whole period (since 1989) is likely to suffer from bias reflecting the cyclical position of the economy at the start date of the series. To overcome this bias due to the end-point problem, the average since 1995 is also used in the analysis on the grounds that it is probably a better indicator of the ‘normal’ level of the series.
- The distribution of this data series between 1989 and 2005 is negatively skewed and not normal at the 5% significance level (J-B test probability is 0.04). The series is normally distributed between 1995 and 2005 with a J-B test probability of 0.49. The chart shows averages over both periods.
- The series was at its long-run average (since 1989Q1) in 1997H1, and below the average over the past 10 years, tending to suggest that the manufacturing output was at or below trend in 1997H1.

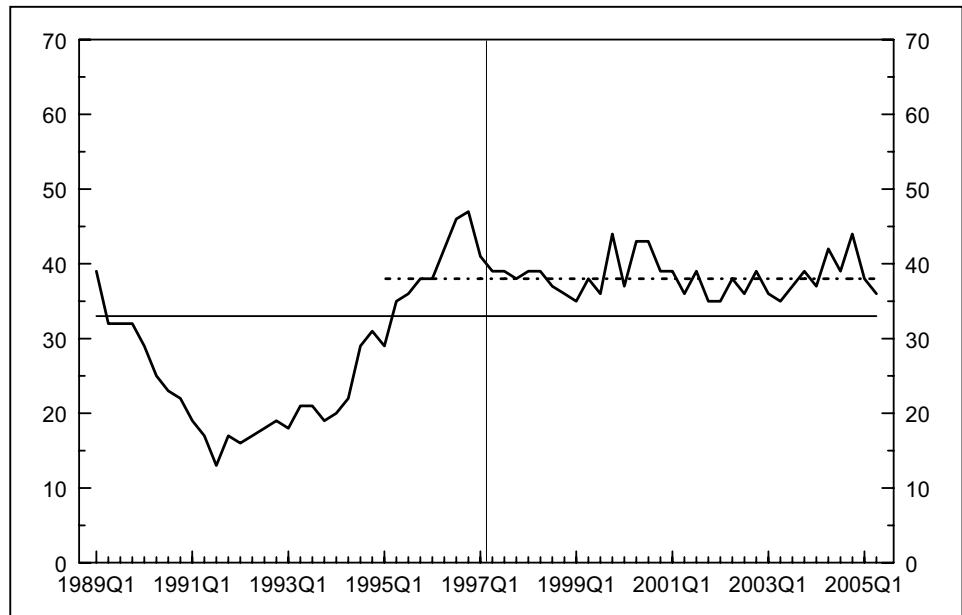
## Output per worker

1) Indicator: Capacity utilisation

2) Sector: Services

3) Source: BCC

4) Definition: Percentage of services firms operating at or below full capacity. The survey question is “*Are you currently operating: at full capacity / below full capacity?*” The data series reflects the percentage of firms operating at full capacity.



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1.

Vertical line marks 1997H1.

5) Comments:

- The distribution of the data series over the 1989-2005 period is negatively skewed and not normal at the 5% significance level (J-B test probability is 0.03). The series is normally distributed between 1995 and 2005 with a J-B test probability of 0.28. The chart shows averages over both periods.
- In 1997, this data series was very close to the average since 1995, but above the average over the whole period. Since the mid-1990s the series has been consistently above its average over the whole period, suggesting that the longer-run average understates the normal level of capacity utilisation.
- The evidence from this data series is therefore consistent with the service sector being close to trend in 1997H1.

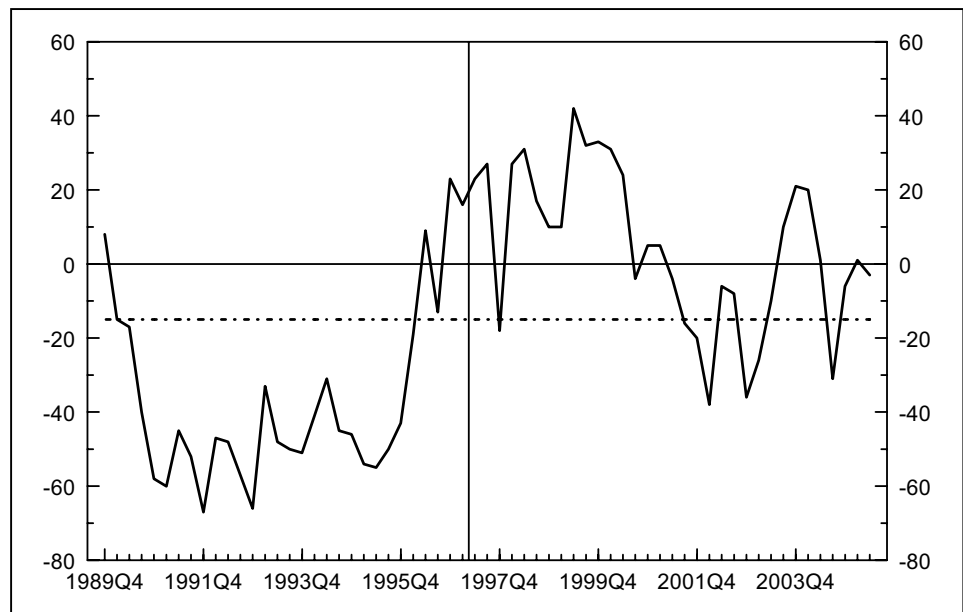
## Output per worker

1) Indicator: Capacity utilisation

2) Sector: Financial services

3) Source: CBI

4) Definition: Percentage balance of financial services firms with levels of business above/below normal. The survey question is “*Excluding seasonal variations, do you consider that in levels terms, your present level of business is above/below normal?*” The data series reflects the percentage point difference between firms operating at above and below normal levels.



Horizontal dashed line is the average since 1989Q4. Vertical line marks 1997H1

5) Comments:

- The data series is normally distributed at the 5% significance level over the 1989Q4 to 2005Q2 and 1995Q1 to 2005Q2 periods with J-B test probabilities of 0.12 and 0.33 respectively. The chart above shows the average over the whole period. The average since 1995 is -1; and it is excluded from the chart for clarity.
- The majority of firms reported operating below normal levels between 1990Q1 and 1996Q2. This situation was reversed between 1996Q4 and 2001Q1 (except for 1997Q4 and 2000Q3) with the majority of firms reporting above normal activity. This suggests that the financial services sector was broadly operating at an above trend level in 1997 having passed through trend in 1996.

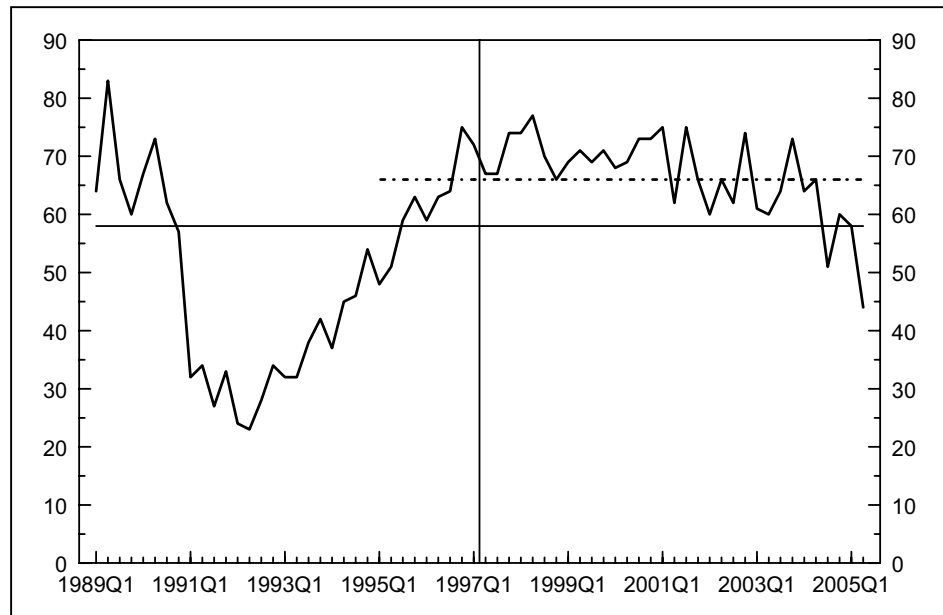
## Employment

1) Indicator: Overall recruitment difficulties

2) Sector: Manufacturing

3) Source: BCC

4) Definition: Percentage of manufacturing firms experiencing recruitment difficulties. The survey question is “*Did you experience any difficulties finding suitable staff?*” The data series reflects the percentage of firms answering “yes”.



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1. Vertical line marks 1997H1

5) Comments:

- The distribution of the series is negatively skewed and so not normal over the 1989-2005 period with J-B test probability of 0.02. It is normally distributed at the 5% significance level between 1995Q1 and 2005Q2, with a J-B test probability of 0.08. The chart shows averages over both periods.
- This indicator passed through its average over the past 10 years in 1996Q4 and remained above it until 2001Q2.
- In 1997Q2 and 1997Q3, the series was very close to its average calculated over the 1995-2005 period, consistent with the economy being on trend in 1997.

## Employment

- 1) Indicator: Overall recruitment difficulties
- 2) Sector: Services
- 3) Source: BCC
- 4) Definition: Percentage of services firms experiencing recruitment difficulties. The survey question is “*Did you experience any difficulties finding suitable staff?*” The data series reflects the percentage of firms answering “yes”.



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1996Q1.

Vertical line marks 1997H1

### 5) Comments:

- The distribution of the series is negatively skewed and so not normal at the 5% significance level over the 1989-2005 and 1995-2005 periods, with J-B test probabilities of 0.00 in both periods. However, the series is normally distributed between 1996Q1 and 2005Q2 with a J-B test probability of 0.62. The chart shows averages over the 1989-2005 and 1996-2005 periods.
- The indicator reached its average calculated over the 1996-2005 period (over which the series is normally distributed) from below in 1996Q4 and remained above it for most of the period between 1997Q3 and 2001Q4, corroborating an on-trend point in 1997.

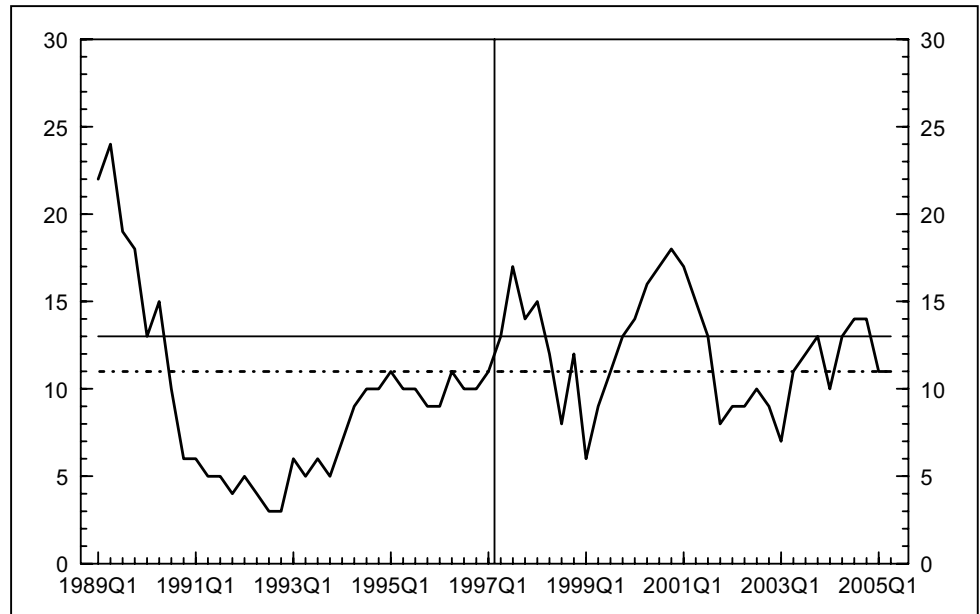
## Employment

1) Indicator: Skilled labour constraint on output

2) Sector: Manufacturing

3) Source: CBI

4) Definition: Percentage of firms experiencing skilled labour recruitment difficulties. Survey question is “What factors are likely to limit your OUTPUT over the next three months?” The data series reflects the percentage of firms answering “skilled labour”.



Horizontal solid line is the average since 1972Q1; dashed line is the average since 1989Q1.

Vertical line marks 1997H1

5) Comments:

- The distribution of the data series between 1972 and 2005 is positively skewed and so not normal at the 5% significance level (J-B test probability is 0.00). The series is normally distributed between 1989 and 2005, with a J-B test probability of 0.22. The chart shows the averages calculated over both periods.
- This indicator was below both of the averages in the early 1990s. In 1997Q1, it was at its average since 1989, edging up in 1997Q2 to its average over the whole period. This is consistent with an on-trend point in 1997.

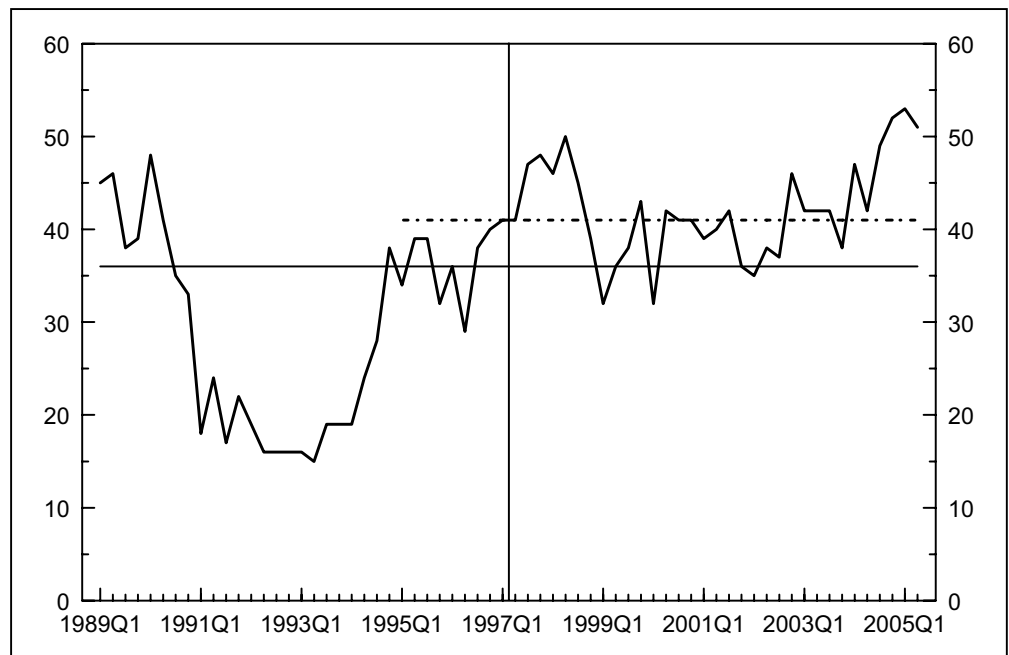
## Employment

1) Indicator: Skilled manual labour constraint

2) Sector: Manufacturing

3) Source: BCC

4) Definition: Percentage of firms experiencing skilled manual labour recruitment difficulties. This question follows on from the ‘*overall recruitment difficulties*’ question. The survey question is “*For which of the following categories did you experience difficulties in finding suitable staff?*” The data series reflects the percentage of firms answering “*skilled manual and technical*”.



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1.

Vertical line marks 1997H1

5) Comments:

- The series is normally distributed at the 5% significance level over the 1989-2005 period with a J-B test probability of 0.06, and over the 1995-2005 period with a J-B test probability of 0.76. The chart shows averages over both periods.
- In 1997H1 the series reached its average calculated over the 1995-2005 period from below, broadly corroborating the CBI indicator of skilled labour constraint in manufacturing, and consistent with an on-trend point in 1997H1.

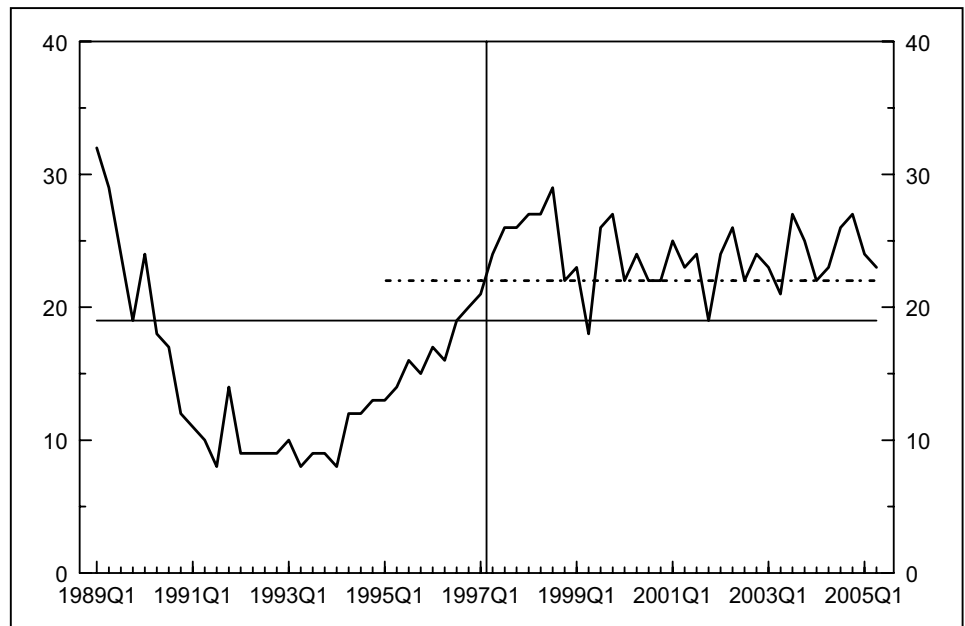
## Employment

1) Indicator: Skilled manual labour constraint

2) Sector: Services

3) Source: BCC

4) Definition: Percentage of firms experiencing skilled manual labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "skilled manual and technical".



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1.

Vertical line marks 1997H1

5) Comments:

- The series is normally distributed at the 5% significance level between 1989 and 2005 with a J-B test probability of 0.09, and between 1995 and 2005 with a J-B test probability of 0.15. The chart shows averages over both periods.
- This series was on an upward path through the mid-1990s, passing up through its average over the whole period in 1996Q3, and up through its average calculated over the 1995-2005 period in 1997Q2. This indicator, like the corresponding indicator for manufacturing, is consistent with an on-trend point in 1997.

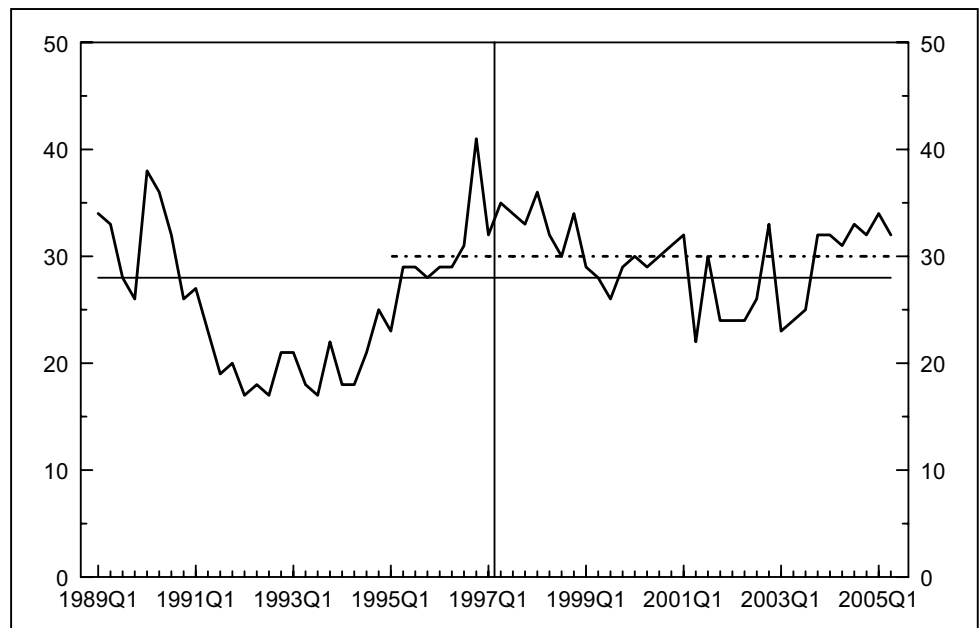
## Employment

1) Indicator: Professional/managerial labour constraint

2) Sector: Manufacturing

3) Source: BCC

4) Definition: Percentage of manufacturing firms experiencing professional / managerial labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "professional/managerial".



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1.

Vertical line marks 1997H1

5) Comments:

- The data series is normally distributed over the 1989-2005 and 1995-2005 periods, with J-B test probabilities of 0.39 and 0.97 respectively. The chart shows averages over both periods.
- In 1997H1 the series was above both averages. It passed up through its average since 1995 in 1996Q3.

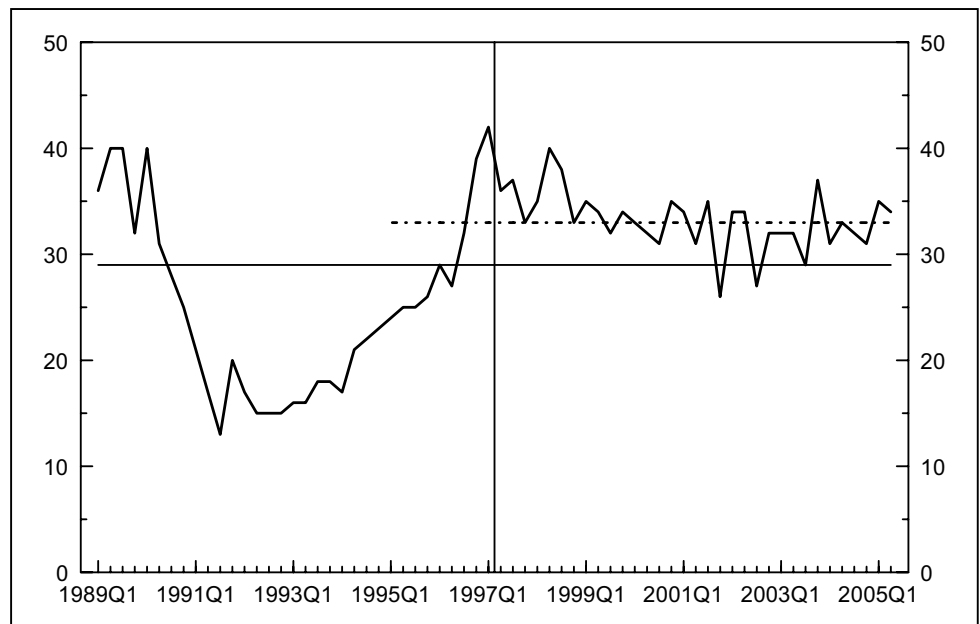
## Employment

1) Indicator: Professional/managerial labour constraint

2) Sector: Services

3) Source: BCC

4) Definition: Percentage of services firms experiencing professional / managerial labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "professional/managerial".



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1.

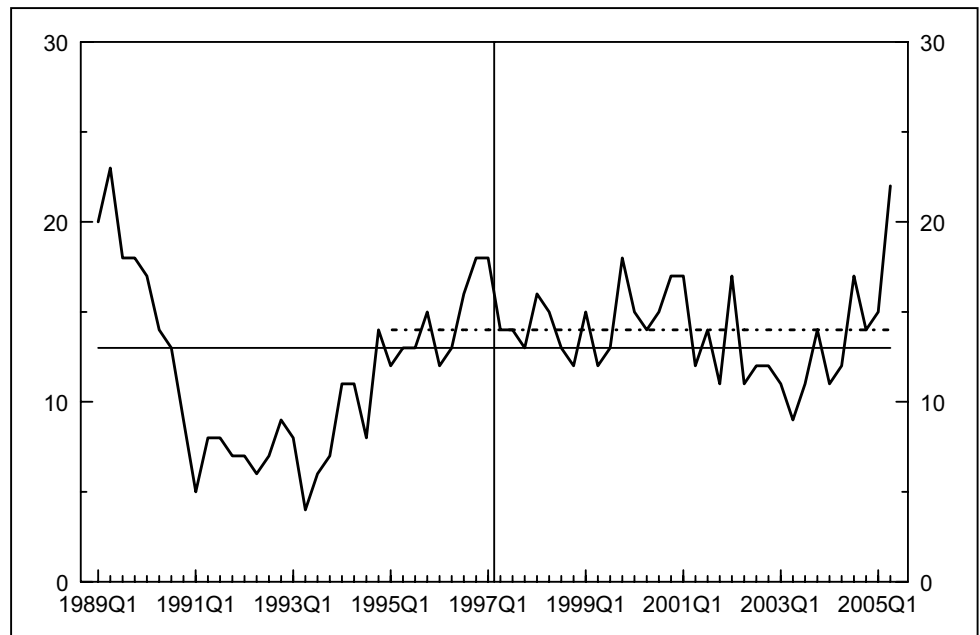
Vertical line marks 1997H1

5) Comments:

- The series is normally distributed at the 5% significance level over the 1989-2005 and 1995-2005 periods with J-B test probabilities of 0.09 and 0.90 respectively. The chart shows averages over both periods.
- This series was above both averages in 1997H1, passing up through its average over the past 10 years at the end of 1996, and showing a similar pattern to the corresponding manufacturing series.

## Employment

- 1) Indicator: Clerical labour constraint
- 2) Sector: Manufacturing
- 3) Source: BCC
- 4) Definition: Percentage of manufacturing firms experiencing clerical labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "clerical labour".



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1.

Vertical line marks 1997H1

### 5) Comments:

- The series is normally distributed at the 5% significance level between 1989 and 2005 and between 1995 and 2005 with J-B test probabilities of 0.95 and 0.10 respectively. The chart shows averages over both periods.
- This indicator was easing back, and was only slightly above both averages in 1997H1, having passed up through its average over the whole period in 1996Q2 and through its average since 1995 in 1996Q3. This suggests that the economy was operating at a level close to trend in 1997.

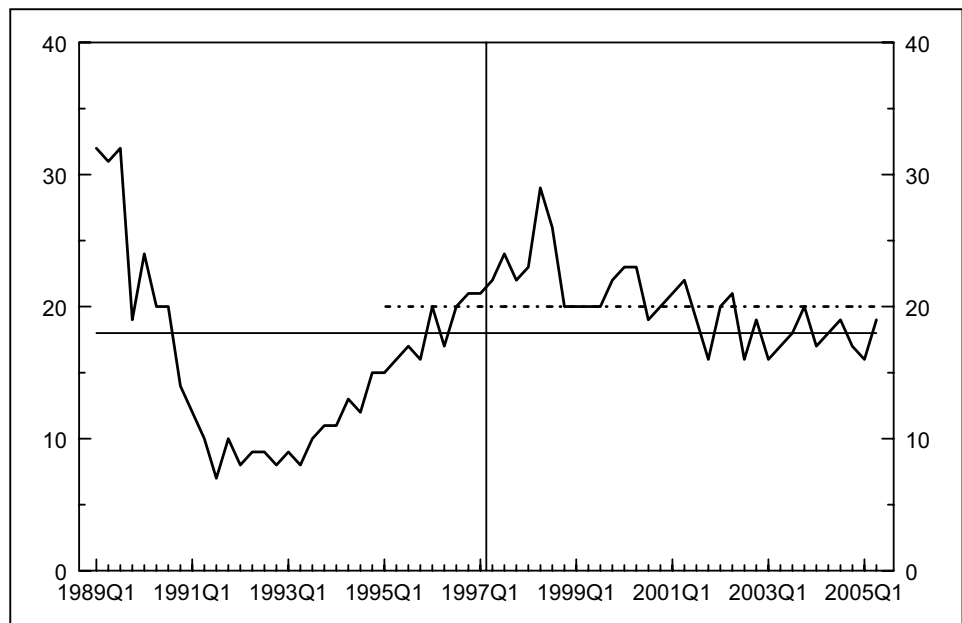
## Employment

1) Indicator: Clerical labour constraint

2) Sector: Services

3) Source: BCC

4) Definition: Percentage of services firms experiencing clerical labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "clerical labour".



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1. Vertical line marks 1997H1.

5) Comments:

- This series is normally distributed at the 5% significance level over the 1989-2005 and 1995-2005 periods with J-B test probabilities of 0.86 and 0.06 respectively. The chart shows averages over both periods.
- The series was close to its 1995-2005 average in 1997H1, though above its average since 1989, having moved up through these averages in 1996H2. This is broadly corroborative of the economy being close to trend in 1997.

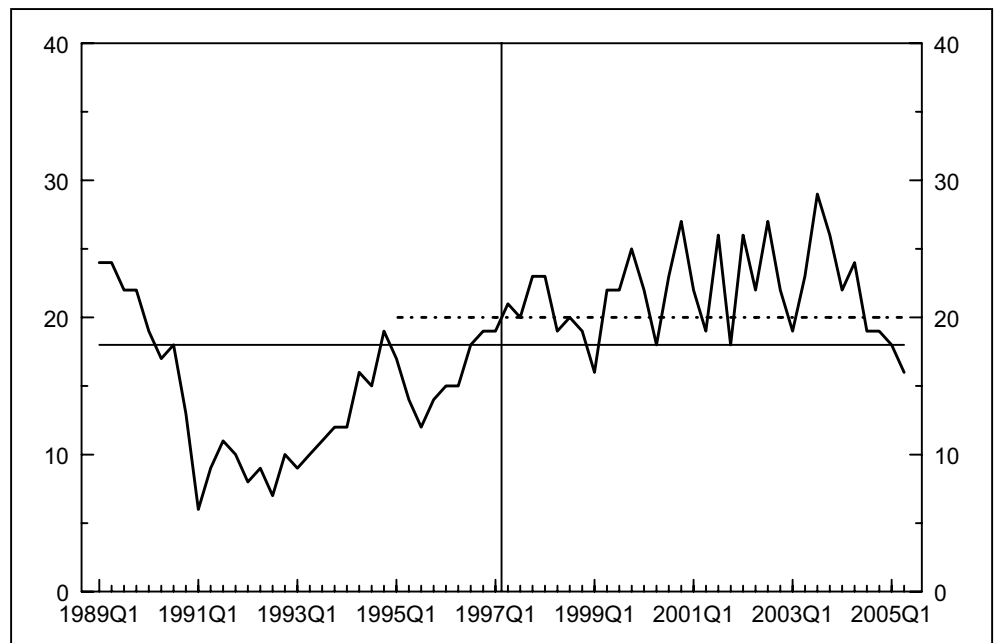
## Employment

1) Indicator: Semi/unskilled labour constraint

2) Sector: Manufacturing

3) Source: BCC

4) Definition: Percentage of manufacturing firms experiencing semi/unskilled labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "semi/unskilled".



Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1. Vertical line marks 1997H1.

5) Comments:

- This series is normally distributed at the 5% significance level over the 1989-2005 and 1995-2005 periods with J-B test probabilities of 0.29 and 0.81 respectively. The chart shows averages over both periods.
- The series was close to both averages in 1997H1, having passed up through its average over the whole period in 1996H2, and reaching its average since 1995 in 1997H1. This is broadly consistent with an on-trend point in 1997.

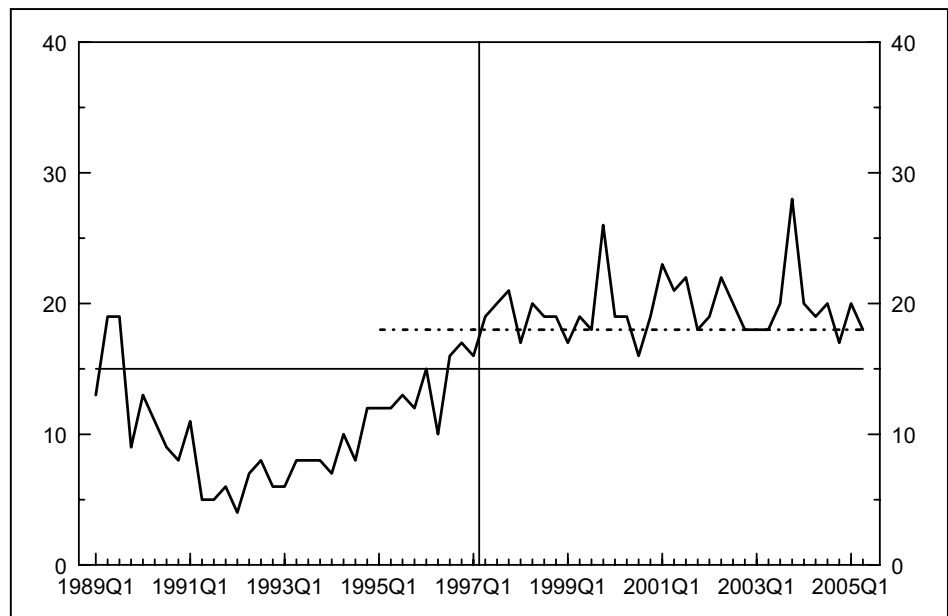
## Employment

1) Indicator: Semi/unskilled labour constraint

2) Sector: Services

3) Source: BCC

4) Definition: Percentage of services firms experiencing semi/unskilled labour recruitment difficulties. This question follows on from the 'overall recruitment difficulties' question. The survey question is "For which of the following categories did you experience difficulties in finding suitable staff?" The data series reflects the percentage of firms answering "semi/unskilled".



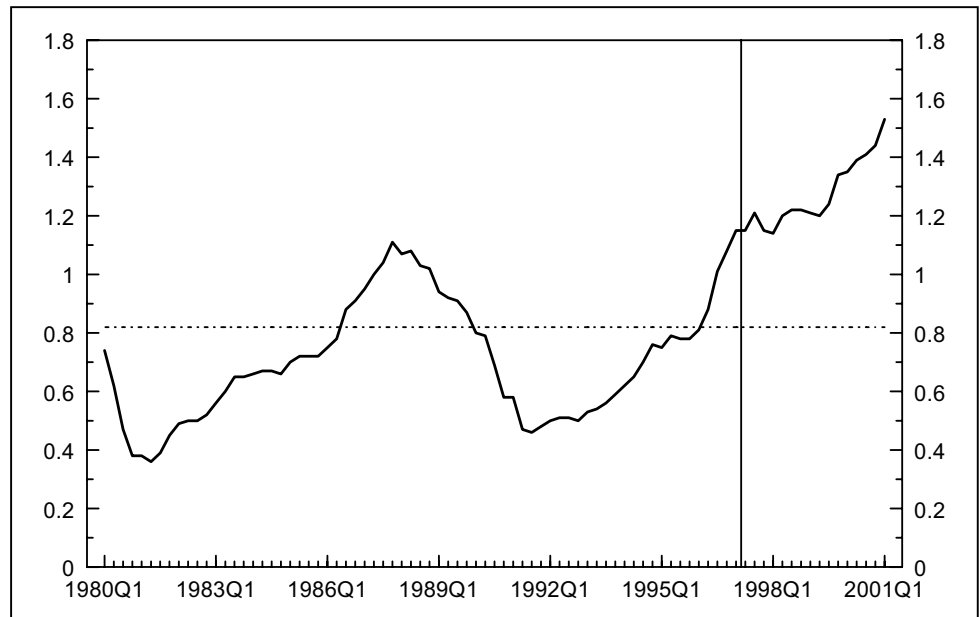
Horizontal solid line is the average since 1989Q1; dashed line is the average since 1995Q1. Vertical line marks 1997H1.

5) Comments:

- The data series is normally distributed at the 5% significance level over the 1989-2005 and 1995-2005 periods with J-B test probabilities of 0.24 and 0.32 respectively. The chart shows averages over both periods.
- The series reached its average since 1995 from below in 1997H1; and it is consistent with an on-trend point in 1997.

## Employment

- 1) Indicator: Vacancy ratio
- 2) Sector: Whole economy
- 3) Source: ONS, HMT
- 4) Definition: Number of vacancies per 100 employee jobs. The ONS data series used in the calculation are vacancies at Jobcentres and employee jobs (both UK, seasonally adjusted).



Horizontal dashed line shows the average between 1980 and 2001. Vertical line marks 1997.

### 5) Comments:

- The Jobcentre vacancy series used in the calculation of the vacancy ratio between 1980 and 2001 was discontinued in 2001 because of changes in the method of recording vacancies at Jobcentres. There are no exactly comparable data series post-2001.
- The chart shows that the vacancy ratio passed through its long-run average from below in 1986, from above in 1990, and again from below in 1996, to stand above its average in 1997H1.

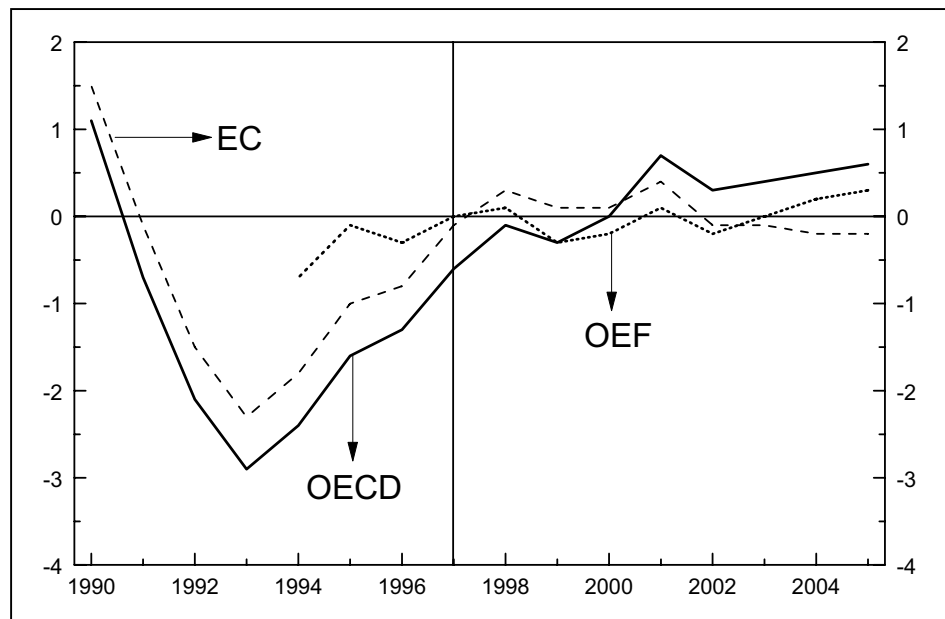
## Employment

1) Indicator: Deviation of unemployment from NAIRU

2) Sector: Whole economy

3) Source: Unemployment rate (ILO definition, 16+, seasonally adjusted) from the ONS, estimates of NAIRU from the OECD (Economic Outlook No.77, May 2005), European Commission (Spring 2005) and OEF (Economic Outlook, July 2005).

4) Definition: Percentage point difference between the estimated UK NAIRU and the unemployment rate (NAIRU minus the unemployment rate).



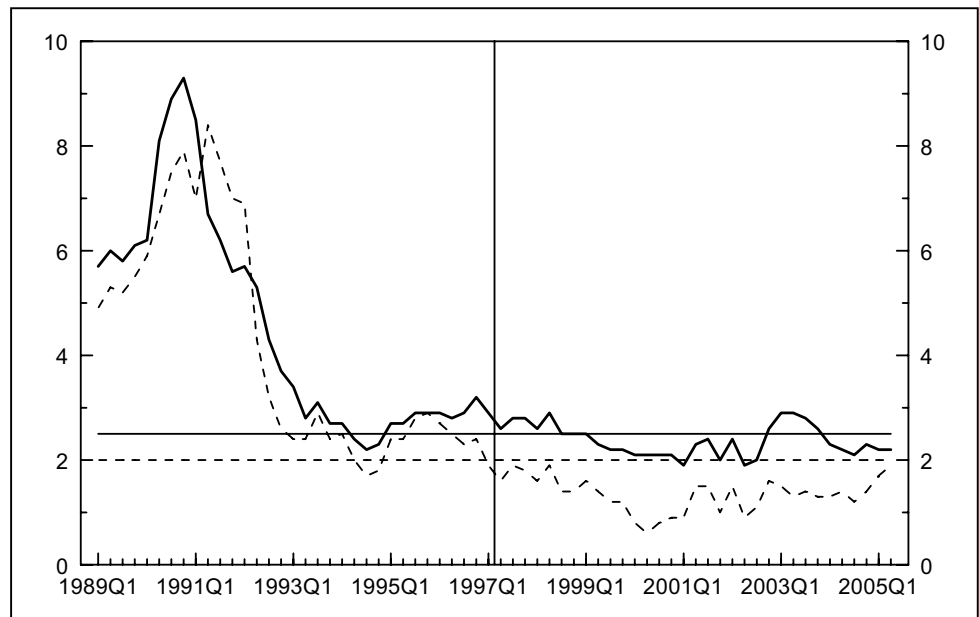
Vertical line marks 1997.

5) Comments:

- The Non-Accelerating Inflation Rate of Unemployment (NAIRU) is the equilibrium rate of unemployment that is consistent with stable inflation. However, the NAIRU is not directly observable, and has to be estimated.
- All three organisations assess that there was a negative unemployment gap (NAIRU minus unemployment rate) in 1996. OEF estimate that unemployment was at the NAIRU in 1997; and the EC estimate that the unemployment moved from just below the NAIRU (-0.1 ppts below) in 1997 to above by 1998. According to the OECD estimate, the unemployment rate remained above the NAIRU until 2000.

## General indicators of the output gap

- 1) Indicator: Price inflation
- 2) Sector: Whole economy
- 3) Source: ONS
- 4) Definition: Consumer Price Inflation (CPI) and Retail Price Inflation excluding mortgage interest payments (RPIX)



Solid lines show RPIX and its former target. Dashed lines show CPI and its current target.

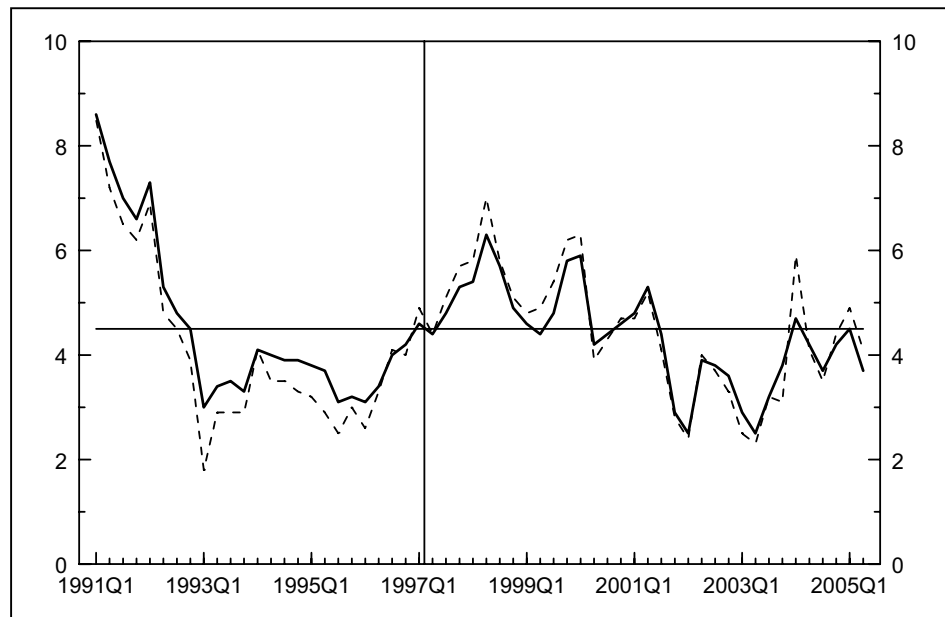
Vertical line marks 1997H1.

### 5) Comments:

- The relationship between the output gap and inflation is not simple. The inflation rate is also dependent on a number of other temporary factors, such as movements in the real exchange rate and inflation expectations. And there may be 'speed limits' on how fast a negative output gap can be closed without putting upward pressure on inflation, for instance, due to short-term supply bottlenecks.
- Nevertheless, it is generally to be expected that a zero output gap should coincide with stable inflation.
- The chart shows both CPI and RPIX inflation were stable around 1997.

## General indicators of the output gap

- 1) Indicator: Wage inflation (private sector)
- 2) Sector: (a) All industries and (b) services
- 3) Source: ONS, HMT
- 4) Definition: Year-on-year growth rates of ONS' quarterly Average Earnings Index series (seasonally adjusted, private sector, including bonuses).



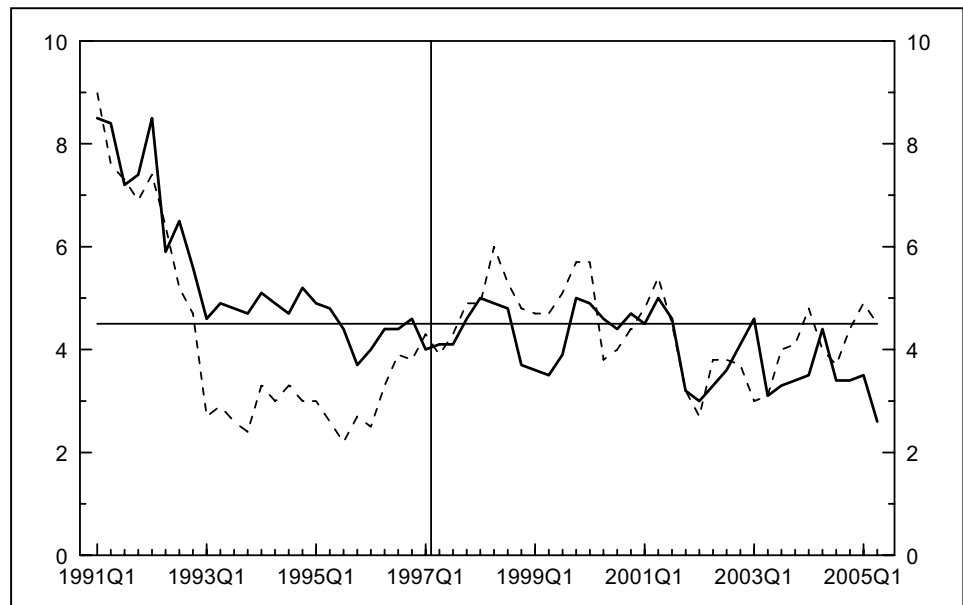
Solid line represents AEI for all private sector industries. Dashed line represents AEI for private sector service industries. Horizontal line marks 4½% rate which is around the whole economy rate considered by the Bank of England to be sustainable and broadly consistent with meeting the inflation target in the medium term. Vertical line marks 1997H1.

### 5) Comments:

- In addition to the data series shown in the chart, AEI excluding bonuses data are also useful in informing the judgement on the cyclical position of the economy. However, the 'excluding bonuses' data are only available from 1996Q2, which means that annual growth rates can only be calculated from 1997Q2, thus limiting the use of these data in assessing 1997H1 as an on-trend point
- Private sector earnings growth rates were very close to 4½% in 1997H1. Thereafter earnings growth rose above 4½% and remained above it for most of the time until 2001Q3. The evidence from this indicator is consistent with an on-trend point in 1997.

## General indicators of the output gap

- 1) Indicator: Wage inflation (whole economy)
- 2) Sector: (a) Manufacturing and (b) services
- 3) Source: ONS, HMT
- 4) Definition: Year-on-year growth rates of ONS' quarterly Average Earnings Index series (whole economy, seasonally adjusted, including bonuses).



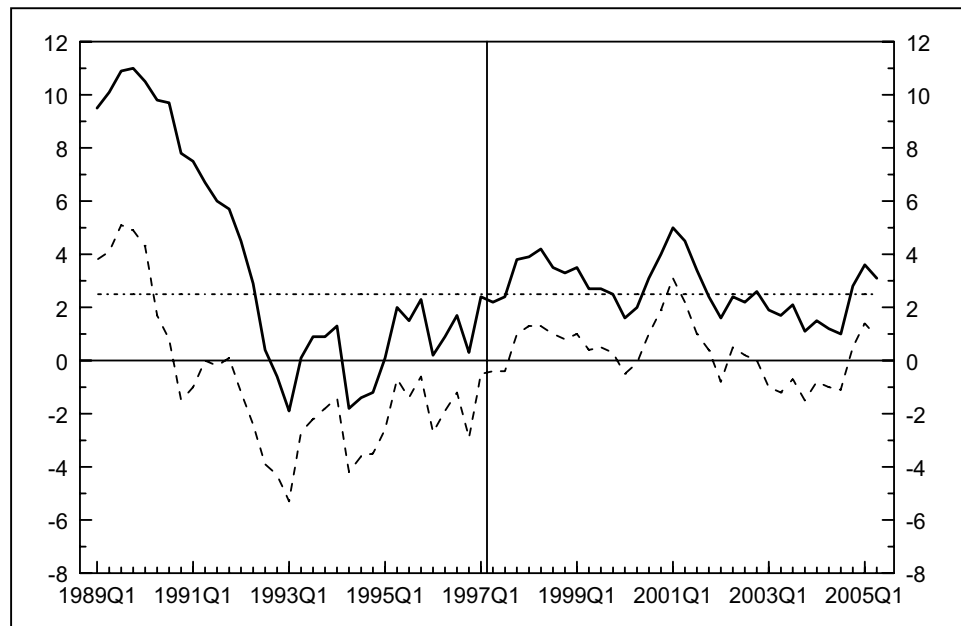
Solid line represents AEI for manufacturing sector. Dashed line represents AEI for service sector. Horizontal line marks 4½% rate which is around the whole economy rate considered by the Bank of England to be sustainable and broadly consistent with meeting the inflation target in the medium term. Vertical line marks 1997H1

### 5) Comments:

- Both series were slightly below 4½% in 1997H1 but edging up. Thereafter, while earnings growth in services remained above 4½% for most of the time until 2001Q3, earnings growth in manufacturing was generally somewhat lower. This indicator is consistent with the economy operating at a level close to trend in 1997.

## General indicators of the output gap

- 1) Indicator: Unit wage cost growth
- 2) Sector: Whole economy
- 3) Source: ONS
- 4) Definition: Unit wage costs, % change on year earlier, seasonally adjusted, whole economy.



Solid line is unit wage cost growth. Dashed line is real UWC growth (deflated with RPIX). Horizontal dashed line marks 2.5% which was the inflation target rate when it was defined in terms of RPIX. Vertical line marks 1997H1

### 5) Comments:

- Unit wage costs are defined as the ratio of wages and salaries to output, i.e. the wage cost of producing one unit of output. Sustained unit wage cost growth over and above price inflation is usually associated with excess demand.
- The chart shows the inflation target for RPIX, rather than for CPI, because the target in 1997 was defined in terms of RPIX, and components of RPIX, not CPI, are used for national accounts deflation.
- Unit wage cost growth was just below the inflation target in 1997H1, passed through the target from below in 1997H2; and it did not fall below 2.5% until 2001Q4 except for the dip over 2000H1. Both series are consistent with the economy being on trend in 1997.

## General indicators of the output gap

- 1) Indicator: Labour share of GVA
- 2) Sector: Whole economy
- 3) Source: ONS, HMT
- 4) Definition: Share of national income paid to workers: Total compensation of employees divided by GVA at basic prices, and expressed as a percentage. Both the numerator and the denominator are in current prices.



Vertical line marks 1997H1

### 5) Comments:

- The labour share is conceptually equivalent to real unit labour costs. It tends to rise during periods of excess demand when growth in nominal unit wage costs exceeds price inflation.
- New analysis presented in Evidence on the UK economic cycle (HM Treasury, July 2005) showed a close empirical correspondence between on-trend points of the economy, as previously assessed by the Treasury, and turning points (i.e. peaks and troughs) in the labour share of GVA. A detailed discussion of the labour share as a cyclical indicator can be found in the HM Treasury July 2005 publication; and Annex C of that paper looks at the theoretical relationship between the labour share and the output gap.
- The chart shows that the labour share started an upswing in 1997Q1 following a trough at the end of 1996, consistent with the economy being very close to trend in 1997H1. The labour share subsequently peaked in 2001.