Economic & Labour Market Review

Contents

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About the Office for National Statistics

The Office for National Statistics (ONS) is the government agency responsible for compiling, analysing and disseminating economic, social and demographic statistics about the UK. It also administers the statutory registration of births, marriages and deaths in England and Wales.

The Director of ONS is also the National Statistician and the Registrar General for England and Wales.

In brief

Measuring performance in our public services

How can we best measure the output and the productivity of the public services? This is a pivotal question, given the importance of hospitals, schools, policing and so on in people's lives and one which was the topic of discussion at several high-profile events hosted by the UK Centre for the Measurement of Government Activity (UKCeMGA) at the end of last year.

UKCeMGA is seen as a world leader in advancing methodologies for measuring the output and productivity of public services. It hosted a major conference in London on 4 October 2006 in collaboration with the Paris-based Organisation for Economic Cooperation and Development (OECD), and the Norwegian Government, welcoming over 160 statisticians from as far away as Japan, China and New Zealand, to discuss methods for measuring output and productivity in public services around the world.

Feedback from the event was extremely positive and UKCeMGA will continue its work internationally, with the next stage being to produce a Handbook on Measuring Education and Health Volume, in collaboration with the OECD.

Last year also saw the first two in a series of three seminars designed to accompany three public consultations on the measurement of the performance of the public services. The first, held in London on 30–31 October, focused on the methodological issues common to the measurement of all the public services. This was followed on 4 December by a seminar on the measurement of output and productivity in the Education Service. The third seminar on health will take place in London and Edinburgh on 6 and 21 February, respectively.

Karen Dunnell highlighted the importance of the work of UKCeMGA in her opening speech on 30 October:

'[The work of UKCeMGA] is important partly because government is responsible for 20 per cent of economic output, and so we need to understand what is going on in the public sector in order to understand fully what is going on in the economy as a whole. It is also important because voters have a legitimate interest in whether the Government is delivering value for money with the money that it is spent on public services on their behalf.'

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Responses to BRES consultation

ONS has published on the National Statistics website the outcome of its consultation on the proposed Business Register and Employment Survey (BRES) to replace two existing surveys, the Business Register Survey (BRS) and the employment part of the Annual Business Inquiry (ABI). There were 30 responses from users, mainly in government, but also from academics and 'people' quangos.

Questions asked related to current and future uses of the data. Users' main concerns related to continued requirement for a male/female split of employment estimates and that BRES would provide less detailed information than is currently available on ABI via NOMIS.

ONS will try to estimate gender data by other routes using administrative and business survey sources, for example, in the longer term, improving the Labour Force Survey, but would not collect gender data in BRES because many respondent businesses have difficulty in supplying the figures.

Employment at detailed levels of geography would continue to be available via NOMIS, down to 2-digit SIC at local authority level, but 4-digit SIC only by region. Greater detail, subject to disclosure controls, will continue to be supplied on request for a fee.

Development work will proceed and be reported via the BRES Steering Group. It is planned to run a pilot survey in 2008, followed by full implementation in 2009.

More information

www.statistics.gov.uk/about/consultations/BRES_users.asp

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Transfer of Civil Service statistics collection to ONS

As part of an ONS-led programme of work across government departments to improve the consistency, timeliness and coverage of public sector employment statistics, ONS took over responsibility from the Cabinet Office for collecting and publishing statistics on total employment in the Civil Service from the fourth quarter of 2004, launching a new quarterly survey.

At that time, the Cabinet Office retained responsibility for the publication of breakdowns by government department, the collection of more detailed statistics on the profile of the Civil Service, for example, region, diversity, skills and pay via the Mandate survey, and the collection of Senior Civil Service statistics.

Following a strategic review of the role of the Cabinet Office in the data collection and analysis of Civil Service personnel statistics announced by the Cabinet Secretary in 2005, these responsibilities have now also transferred to ONS.

In June 2006 ONS extended the regular quarterly Public Sector Employment First Release to include a breakdown of Civil Service employment by government department. The latest figures are available from the web address shown at the end of this note.

In September 2006 ONS issued the Senior Civil Service and Mandate surveys for the first time. The first Senior Civil Service statistics were delivered to the Cabinet Office in January this year and the Mandate statistics will be published in early summer on the National Statistics website, reconciled with the quarterly headline Civil Service employment numbers.

Working closely with the Cabinet Office, a development programme is now also underway to streamline future data requirements and bring systems and processes fully in line with ONS best practice.

More information

www.statistics.gov.uk/pdfdir/pse1206.pdf

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RECENT RELEASES

Government statistical publications

Measuring average retirement age

One of the options being discussed in the debate about pensions provision is to raise the age of retirement. ONS is responding to the proposal from the Pensions Commission for more analysis of trends in average retirement ages and in employment rates among older people. Results published in December last year show that average retirement ages are rising. In 2006, the average age at which workers over 50 retired reached its highest level for men (64.2 years) since 1984, when data were first available, and its second-highest level for women (61.8 years). Employment rates for men and women aged over state pension age rose in spring 2006, to 9.6 per cent and 11.1 per cent respectively, the highest since data first became available in 1984.

Defining and measuring the average age of retirement poses a number of challenges. For example, it can only be with a period of hindsight that permanent withdrawal from the labour market can be confirmed. Building on ILO and OECD approaches used by the Pensions Commission, ONS has examined age-specific economic activity rates and inferred the likelihood of an economically active person at each age withdrawing from the labour force. These probabilities are then used to estimate the average age of withdrawal from the labour market for people aged 50 to 75. The methodology and results are described in a paper on the National Statistics website as part of the updating of *Pension Trends*. The paper presents estimates of the average ages of withdrawal from the UK labour force for men and women, from 1984 to 2006, based on changes in economic activity rate data by year of age. The paper also discusses estimation issues.

More information

www.statistics.gov.uk/cci/nugget.asp?id=1273
www.statistics.gov.uk/cci/article.asp?id=1669

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UPDATES

Updates to statistics on www.statistics.gov.uk

4 January

Corporate profitability

15.2% in third quarter of 2006
www.statistics.gov.uk/cci/nugget.asp?id=420

10 January

UK trade

Deficit widened to £4.7 billion in November
www.statistics.gov.uk/cci/nugget.asp?id=199

11 January

Index of production

Manufacturing: 0.1% three-monthly rise in November
www.statistics.gov.uk/cci/nugget.asp?id=198

15 January

Producer prices

Factory gate inflation rises to 2.2% in December
www.statistics.gov.uk/cci/nugget.asp?id=248

16 January

Inflation

December: CPI at record 3.0%; RPI at 4.4%
www.statistics.gov.uk/cci/nugget.asp?id=19

17 January

Average earnings

Pay growth steady in year to November 2006
www.statistics.gov.uk/cci/nugget.asp?id=10

Employment

Rate at 74.6% in three months to November 2006
www.statistics.gov.uk/cci/nugget.asp?id=12

19 January

Public sector

December: £4.7 billion budget deficit
www.statistics.gov.uk/cci/nugget.asp?id=206

Retail sales

Strong December sales growth
www.statistics.gov.uk/cci/nugget.asp?id=256

24 January

GDP growth

Economy grows by 0.8% in Q4 2006
www.statistics.gov.uk/cci/nugget.asp?id=192

Index of services

Experimental: 1.0% three-monthly rise into November
www.statistics.gov.uk/cci/nugget.asp?id=558

25 January

Motor vehicle production

Total production rises in three months to December
www.statistics.gov.uk/cci/nugget.asp?id=376

31 January

Local employment

Highest rate of 91.1% in South Northants
www.statistics.gov.uk/cci/nugget.asp?id=252

Local inactivity

Lowest rate of 8.4% in South Northants
www.statistics.gov.uk/cci/nugget.asp?id=1013

Local unemployment

Lowest rate of 1.8% in Eden, Cumbria
www.statistics.gov.uk/cci/nugget.asp?id=1606

FORTHCOMING RELEASES

Future statistical release on www.statistics.gov.uk

5 February

MA4: Business monitor, foreign direct investment – 2005

6 February

Mergers and acquisitions involving UK companies – Q4 2006

7 February

Index of production – December 2006

9 February

UK trade – December 2006

12 February

Producer prices – January 2007

13 February

Consumer price indices – January 2007

14 February

Labour market statistics – February 2007

MM24: monthly review of external trade statistics – December 2006

15 February

Retail sales – January 2007

19 February

Focus on consumer price indices – January 2007

20 February

Public sector finances – January 2007

MM22: Producer prices – January 2007

21 February

Average weekly earnings – December 2006

Engineering turnover and orders – December 2006

Index of labour costs per hour – Q4 2006

22 February

Business investment provisional results – Q4 2006

23 February

Digest of engineering turnover and orders – December 2006

Experimental market sector gross value added (GVA) – Q4 2006

Index of services – December 2006

Motor vehicle production – January 2007

Public sector finances: supplementary (quarterly) data

UK output, income and expenditure – Q4 2006

26 February

Monthly digest of statistics – February 2007

28 February

Distributive and services trades – December 2006

Economic review

February 2007

Anis Chowdhury
Office for National Statistics

SUMMARY

GDP continued to grow robustly in 2006 quarter four, driven mainly by the services sector, with little contribution from manufacturing output. In quarter three however, it had been business and government investment which had underpinned growth, whilst consumer expenditure had slowed from its strong performance in quarter two. As a reflection of the UK's dynamic domestic demand profile and unfavourable exchange rate position the trade deficit widened in November. The Labour Market exhibited signs of an improvement in November, while the Public sector net debt continued to rise in December. Consumer and producer output price inflation rose in December 2006.

GROSS DOMESTIC PRODUCT

Fourth quarter growth of 0.8 per cent

Preliminary figures for the fourth quarter of 2006 are now available and showed a slight acceleration from quarter three. GDP grew by a relatively robust 0.8 per cent, from 0.7 per cent in the previous quarter. The initial rate for the annual rate of growth rose to 3.0 per cent, from 2.9 per cent in the previous quarter. It should be noted that these estimates are based on the output side. The headline figure will be firmed up later as more data becomes available (**Figure 1**).

The growth rate in the UK economy in 2006 quarter four continues to be led by strong growth in services sector output. Total industrial production growth in contrast remains subdued, recording virtually flat growth and continuing the trend from the previous quarter. Muted industrial production was led by flat manufacturing and mining output and quarrying output, together with weakening energy supply output. Construction output accelerated in quarter four, continuing to grow strongly.

OTHER MAJOR ECONOMIES

Global growth slows in 2006 quarter three

Data for 2006 quarter four for the other major OECD countries were not available at the time of writing this article. Data for 2006 quarter three from the other major OECD countries show a mixed but an overall weakening picture of the global economy. US GDP data for the third quarter showed a further slowdown. Growth was 0.5 per cent compared to 0.6 per cent in the previous quarter. The slower rate of growth was led by a marked fall in residential investment and to a lesser extent a high trade deficit. On the other hand, private consumption, business investment and government spending were resilient. Japan's growth continues to show weakness. Growth was 0.2 per cent, slightly down from 0.3 per cent in the previous quarter. Lower growth was mainly driven by lower household consumption expenditure and to a lesser extent, lower growth in manufacturing investment. This was offset by relatively strong exports.

Growth in the three biggest mainland EU economies – Germany, France and Italy – also showed a weakening picture. Euro-area growth overall was 0.5 per cent, down from 0.9 per cent in the previous quarter. German GDP growth was 0.6 per cent in 2006 quarter three, still a modest rate of growth but a marked deceleration from growth of 1.1 per cent in the previous quarter. The lower growth was mainly due to a lower rate of investment. This was offset by a rebound in private consumption and higher exports. French GDP growth showed an even more marked deceleration to the point of achieving flat growth in the third quarter. This compares with growth of 1.2 per cent in the second quarter. The slowdown reflected primarily, a sharp fall in business investment. The slowdown was also to a lesser extent driven by a contraction in exports and lower private consumption growth, although the latter continues to grow at a healthy rate. Italy GDP grew by a muted 0.3 per cent, down from 0.6 per cent in the previous quarter. There was an acceleration in household consumption expenditure; offset by a sharp fall in total investment and net exports.

Figure 1
Gross Domestic Product

FINANCIAL MARKETS

Share prices fall and pound appreciates in 2006 quarter four

Equity performance has been fairly volatile in 2006. The FTSE All-Share index fell by 2 per cent in 2006 quarter four after increasing by around 9 per cent in 2006 quarter three. As share prices follow economic sentiment, this perhaps could be due to a more pessimistic outlook of the global economy, particularly in regards to the euro-zone and the US economies, on the part of investors. Also, this has coincided with increases in actual interest rates in some world economies in order to dampen inflationary pressures, therefore making interest bearing assets more attractive than shares.

As for currency markets, 2006 quarter four saw sterling's average value appreciating broadly grow in line with quarter three. The pound appreciated against the dollar by around 2.0 per cent, following appreciation of around 2.4 per cent in the previous quarter. Against the euro, sterling's value appreciated by around 1.0 per cent in 2006 quarter four following appreciation of 1.2 per cent in the previous quarter. Overall, the quarterly effective exchange rate appreciated by 1.4 per cent following growth of 2.7 per cent in the previous quarter (**Figure 2**).

The recent movements in the exchange rate might be linked to a number of factors. Firstly, exchange rate movements can be related to the perceptions of the relative strengths of the US, the Euro and UK economy. The appreciation of the pound against the both the dollar and euro in 2006 quarter four may be partly linked to perceptions of stronger UK economic growth, leading to greater inflationary pressures and therefore the prospects of higher interest rates in the UK. In recent months, there have been particular concerns regarding the impact of the US housing slowdown and weaker US GDP growth. This may have lessened the likelihood of further interest rate rises in the US. US interest rates currently stand at 5.25 per cent. The euro area shows signs of lower inflationary pressures and this may have lessened the likelihood of future interest rate rises, although interest rates were raised in the euro-area by a further

0.25 percentage points in December, following the 0.25 percentage points rise in October 2006 to leave rates currently standing at 3.50 per cent. In the UK, interest rates were raised by a further 0.25 percentage points in January 2007 following on from the 0.25 percentage point increase in November 2006 to leave interest rates currently standing at 5.25 per cent.

Secondly, another factor for the US depreciation relative to the pound may be due to the current account deficit which is generally seen as a weakness for the US economy. The dollar may have fallen recently in response to a readjustment process, with the intended consequence of making exports cheaper and imports dearer – thus in theory leading to switch in expenditure to home produced goods and ultimately leading to a narrowing in the deficit.

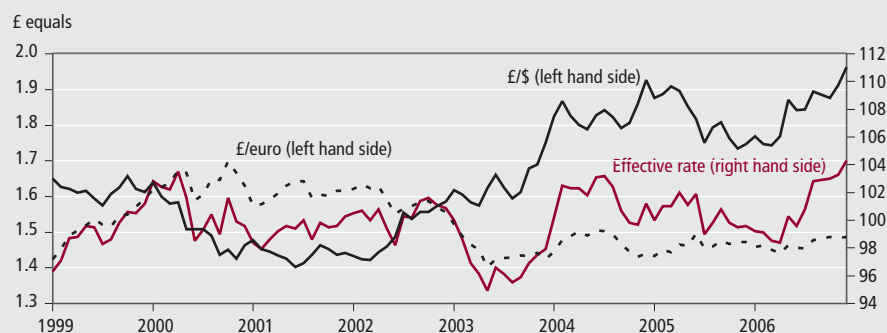Thirdly, another factor may be due to a lack of international appetite for dollar denominated assets, particularly from central banks, whom are choosing to mix up their currency assets on their balance sheets (for portfolio and risk management purposes) thereby further undermining the value of the dollar.

Figure 2
Exchange rates

£ equals

£/$ (left hand side)
£/euro (left hand side)
Effective rate (right hand side)

OUTPUT

Services sector drives economic growth

GDP growth in 2006 quarter four was estimated at 0.8 per cent, up from 0.7 per cent growth in the previous quarter. On an annual basis it was 3.0 per cent, up from 2.9 per cent in 2006 quarter three.

Construction activity is estimated to have accelerated in the fourth quarter of 2006. Construction output grew by 0.9 per cent in quarter four, up from 0.7 per cent in the previous quarter. Comparing the quarter on the quarter a year ago, construction output rose by 2.9 per cent following growth of 1.8 per cent in the previous quarter (**Figure 3**). It should be noted that there are no actual survey responses at this stage for construction. This initial figure is a forecast calculated by the DTI.

As for external surveys of construction, the CIPS survey signalled strengthening activity in 2006 quarter four, with the headline index at 56.8 up from 53.8 in the previous quarter. Stronger activity was driven

Figure 3
Construction output

Growth

Quarter on same quarter a year earlier
Quarter on quarter
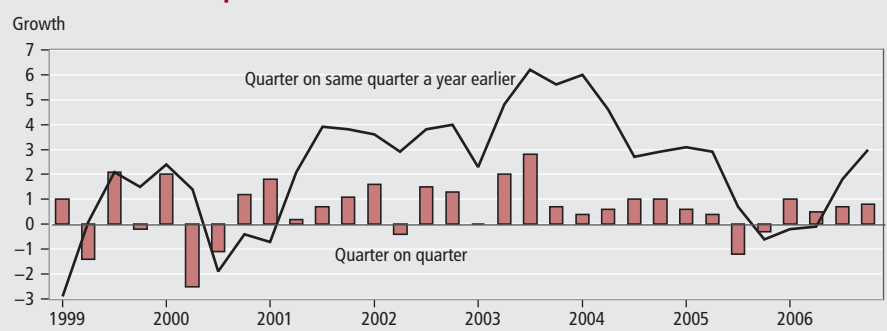
Figure 4
Manufacturing output

Growth

3 months on same 3 months a year earlier

3 months on 3 months
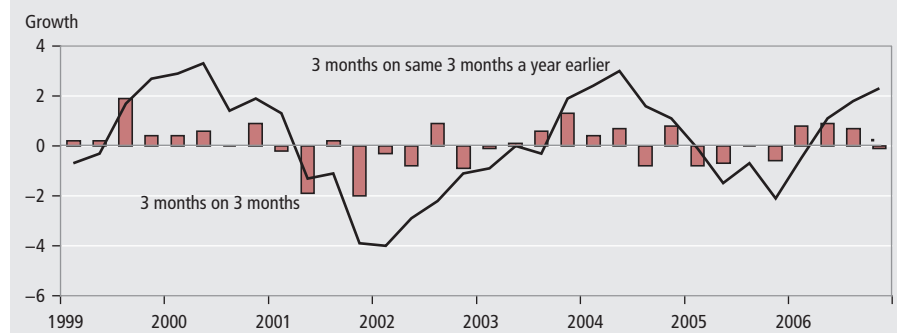
by sharp growth across all sectors, with commercial activity recording the fastest growth. The RICS in its 2006 quarter four construction survey report that construction workloads showed the largest rise in over two years, led by rapid expansion in commercial and private housing activity. The workload balance was 26 per cent, up from 21 per cent in quarter three.

Total output from the production industries fell by 0.2 per cent in 2006 quarter four following growth of just 0.2 per cent in the previous quarter. On an annual basis it grew by 0.7 per cent compared to 0.4 per cent in the previous quarter. The main contribution to the decline came from flat manufacturing output after fairly robust growth of 0.6 per cent in the previous quarter. On an annual basis, manufacturing output continues to grow strongly at 2.3 per cent (**Figure 4**). Another contribution to the fall came from a weakening in the output of the electricity, gas and water supply industries which decelerated further, by 2.3 per cent in 2006 quarter four following a decrease of 0.2 per cent in quarter three. The decrease in output can be mainly attributed to milder weather in quarter four. Mining and quarrying output (including oil & gas production), was virtually flat in quarter four, after decreasing by 3.8 per cent in quarter three. Higher oil production was offset by a decline in gas extraction. This suggests that the temporary maintenance shutdowns of oil rigs in the third quarter may no longer be a factor. Production growth has generally been weak in the last three quarters of 2006. The output of the agriculture, forestry and fishing industries fell by 0.5 per cent following virtually flat growth in the previous quarter.

External surveys of manufacturing for 2006 quarter four show a mixed picture (**Figure 5**). It is not unusual for the path of business indicators and official data to diverge over the short term. These

differences happen partly because the series are not measuring exactly the same thing. External surveys measure the direction rather than the magnitude of a change in output and often inquire into expectations rather than actual activity.

The CIPS average headline index for manufacturing output indicated a slowdown in 2006 quarter four. The headline index was 52.7, down from 53.8 in quarter three, but still indicative of fairly robust growth. The output index fell sharply to 53.8 from 56.2 in the previous quarter. The CBI in its quarter four Industrial Trends survey reports an improvement in its total order books balance, although the balance was negative at minus 9. The BCC survey in contrast

reports an overall positive picture. The net balance for home sales rose sharply to plus 31 from plus 18 in the previous quarter. The net balance for home orders rose by 9 points to plus 27, both recording the highest growth since 2004 quarter two.

Overall, the service sector, by far the largest part of the UK economy and the main driver of UK growth recently, continued to grow strongly in 2006 quarter four. Growth was 1.0 per cent, up from 0.8 per cent growth in the previous quarter (**Figure 6**). The main contribution to the growth rate came from distribution, hotels and catering, where output accelerated sharply in 2006 to 1.8 per cent from 0.2 per cent in the previous quarter. Transport, storage and communication output also grew strongly, by 1.4 per cent in quarter four, a jump from 0.3 per cent in the previous quarter. This was offset by slower growth in output of business services & finance at 1.0 per cent, down from 1.4 per cent in the previous quarter. Government and other services output continues to grow moderately, with growth of 0.5 per cent in 2006 quarter four.

The external surveys on services showed a strengthening picture in 2006 quarter four in line with the official picture. The CIPS survey signalled strong growth in 2006 quarter four. The headline index was 59.9 in quarter four, up from 57.2 in the

Figure 5
External manufacturing indicators

Balances

CIPS (left hand side)

BCC (left hand side)

CBI (left hand side)
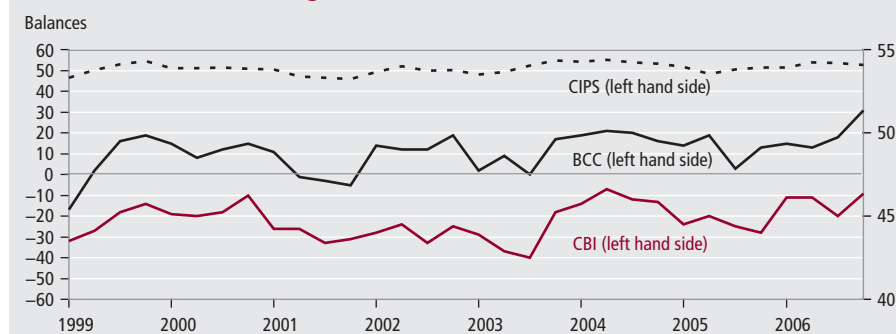
Figure 6
Services output

Growth

Quarter on same quarter a year earlier
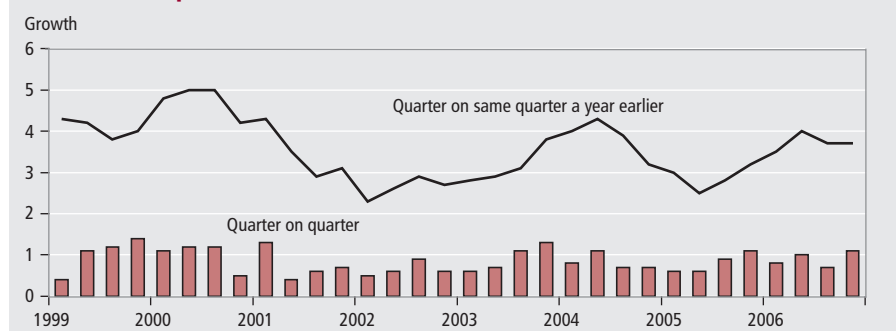
Quarter on quarter

Figure 7
External services indicators

Balances
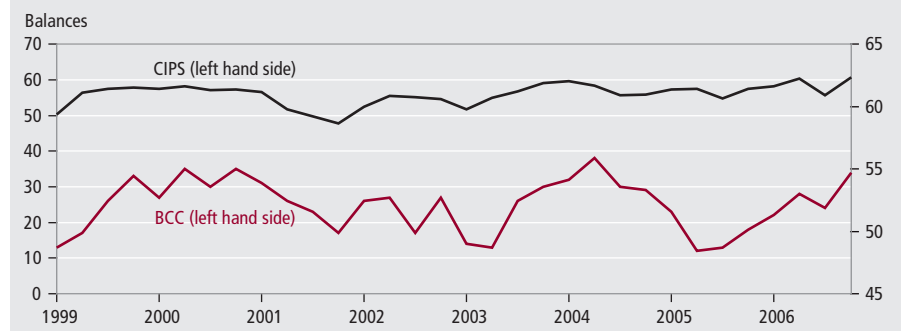
previous quarter, led by new orders. It should be noted that the CIPS survey has a narrow coverage of the distribution and government sectors.

The CBI and BCC also report a strengthening of service sector output **(Figure 7)**. The CBI in its latest services sector survey in November reported strong growth in business volumes. The CBI report that consumer services business volumes grew at their fastest rate since February 2005 with the balance at plus 30, reversing minus 35 in the previous survey. Business and professional services volumes also grew strongly with the balance at plus 33, up from plus 15 in the previous survey. The BCC in its 2006 quarter four survey reported a strengthening picture. The service sector's domestic balance rose ten points to plus 34, the highest since 2004 quarter two. The net balance for home orders rose 9 points in 2006 quarter four, the highest since 2000 quarter four.

EXPENDITURE

Consumers spending weakening in quarter three

Household consumption expenditure showed signs of weakening in 2006 quarter three following the strong bounce-back in quarter two. Growth achieved a fairly modest 0.4 per cent compared to 0.9 per cent in the previous quarter. Growth compared with the same quarter a year ago was 2.1 per cent, up from 2.0 per cent in the previous quarter, but still below the above 3 per cent growth rates achieved in 2003 and 2004 **(Figure 8)**. In terms of expenditure breakdown, the slowdown in household consumption was due to weaker growth in durable goods expenditure offset by higher expenditure on services.

Indications of consumer demand for 2006 quarter four appear mixed. One indicator of household expenditure is retail sales. Growth in household consumption expenditure has been modest in quarter three, partly due to weak retail sales. However, there appears to be a strong pick up in quarter four, with retail sales increasing by 1.4 per cent compared to 0.8 per cent in quarter three. Much of the pick up in consumer expenditure can be explained by shop prices (that is, the prices deflator which on average grew by just 0.2 per cent in 2006 quarter four).

It should be noted that household consumption accounts for a much broader range of spending than just retail sales. For

instance, household purchases of services, motor vehicles and housing (imputed rents) are not included in retail sales. Since the beginning of 2005, retail sales have grown faster than household consumption as a whole, and after narrowing in quarter three and could conceivably widen again in quarter four.

Retail sales figures are published on a monthly basis and the latest available figures for December showed a substantial strengthening **(Figure 9)**. According to the latest figures, the volume of retail sales in the three months to December 2006 was 1.4 per cent higher than the previous three months – the highest rate since September. This followed growth of 0.5 per cent in the three months to November. On an annual basis, retail sales grew by 3.6 per cent in the three months to December, up from 3.3 per cent compared to the previous months annual growth rate.

At a disaggregated level, retail sales growth during the three months to the end of December was driven by the 'Predominantly non-food' sector which grew by 2.1 per cent. Within this sector, growth was led by the 'Non-store retailing and repair' sector (which includes mail order and internet sales) which grew by 3.8 per cent. This was followed by growth

Figure 8
Household demand
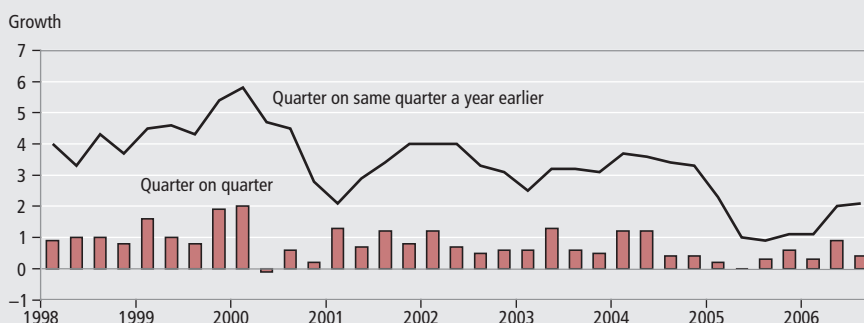
Growth

Figure 9
Retail sales
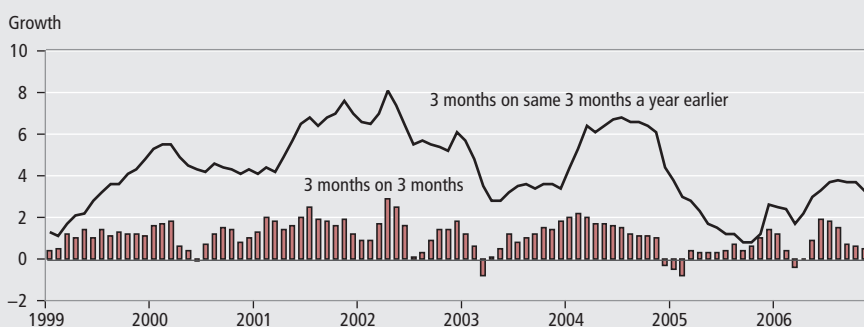
Growth

in 'Household goods stores' at 3.0 per cent. Growth in the 'Predominantly food-stores' growth in contrast was flat.

The increase in retail sales growth in December may be partly explained by the effects of pre-Christmas sales and discounting. The shop price deflator grew by just 0.2 per cent in December, down from 0.3 per cent in November, but a marked easing from growth of 0.7 per cent in September. This may have given continued encouragement to consumers to spend.

External surveys for retail sales echo the official picture. The CBI in its monthly Distributive Trades survey report that retail sales volumes grew strongly into December with the balance at the highest in two years. The balance was plus 25 following minus 9 in December. The BRC report that retail sales increased by 2.5 per cent on a like-for-like basis, up from 0.5 per cent in the previous month. Both attribute the increase to the effects of discounting (**Figure 10**).

Another possible upside to consumer expenditure may come from the continued strength in total net lending to individuals. According to Bank of England figures, total net lending increased to £10.9 billion in November 2006, marginally up from £10.8 billion in October. Lending secured on dwellings increased to £9.8 billion from £9.7 billion in October. Total approval secured on dwellings was £33 billion, up from £31.7 billion in October. The rise in strong mortgage lending continues to be fuelled by relatively high annual house prices of around 10 per cent. One source of consumer expenditure in recent years has been equity release. The rise in house prices may further increase the level of equity; and this may outweigh any concerns about increase in mortgage and equity release borrowing costs.

According to provisional estimates, the measure of broad money supply (M4) rose by £13.6 billion in December, up from £7.4 billion in November and this may further underpin expenditure.

The growth of secured lending may reflect households just choosing to incorporate some of their unsecured debts into their secured borrowing to lower the cost of re-financing. This may release expenditure for spending on household and durable goods.

Other possible upsides to consumer expenditure include the recent fall in oil prices which may lead to expenditure switching to non-petrol goods: Another factor could be the recent tightening in the labour market and which may result in an upward pressure on wages.

On the downside, the two 0.25 percentage point increases in interest rates in August and November may likely to impact on expenditure, but as mentioned above, doesn't seem to be having much of a discernible impact, particularly on secured borrowing. However, the effect on consumer expenditure may likely to be seen via unsecured borrowing which has generally been weak in quarter three. Household consumption has risen faster than disposable income in recent years as the household sector has become a considerable net borrower and therefore accumulated high debt levels. It is possible that the rise in interest rates may discourage borrowing in view of the higher re-financing costs. Indeed credit card and M4 (that is, bank cash deposits) lending has been relatively weak in 2006 quarter three and although there was a slight pick up in quarter four, is still weak compared to previous years. Consumer credit growth according to latest figures was £1.0 billion in November, down from £1.1 billion

in October, with net credit card lending growing by just £0.2 billion in November.

In recent years, a source of consumption expenditure has come via equity release. A rise in interest rates may impact on consumer expenditure in quarter four in terms of reduced spending on household durable goods, by making re-financing of the equity release costlier.

Other downsides to expenditure include the potential of future rate rises; actual and potential increases in utility and tax bills; indicators for consumer expenditure such as MORI and GfK generally report a negative picture for the fourth quarter. The labour market although tightened recently, may still be loose enough to maintain subdued wage growth.

BUSINESS DEMAND

Business investment accelerates in quarter three

Total investment grew relatively strongly in 2006 quarter three. Growth was 1.8 per cent compared to 0.5 per cent in the previous quarter. On an annual basis it grew by 4.9 per cent. Growth on an annual basis was primarily driven by business investment.

Business investment for the third quarter of 2006 showed a fairly robust growth of 3.1 per cent, up from 2.0 per cent in the previous quarter. On an annual basis it grew by 8.2 per cent, up from 5.3 per cent in the previous quarter (**Figure 11**). In terms of assets, the annual growth was broadly driven, led by a strong growth in 'other machinery and equipment' expenditure of 8.9 per cent followed by 'dwellings' investment of 7.5 per cent. The data suggests an improving climate for business investment. Profitability is one factor determining investment. The expectations of future higher profits may provide an explanation for the increased investment in quarter three. It also may be provided by a positive outlook of the global economy aided by improved export prospects.

Evidence on investment intentions from the latest BCC and CBI surveys showed a somewhat mixed but slightly improving picture in quarter four. According to the quarterly BCC survey, the balance of manufacturing and services firms' investment in plant and machinery rose by one point to plus 23. The CBI in its 2006

Figure 10
External retailing indicators
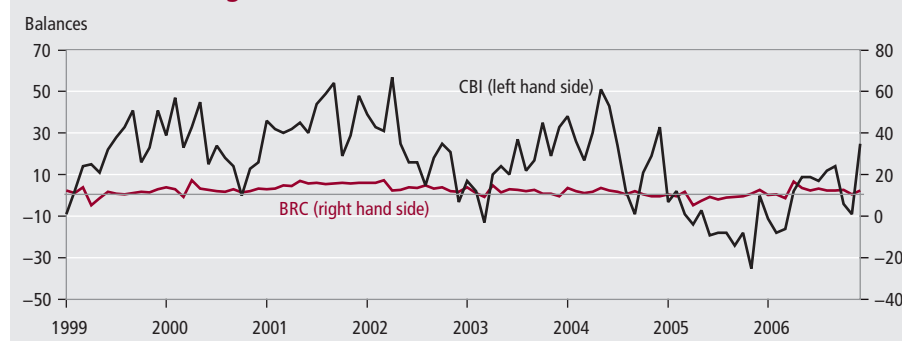
Balances

Figure 11
Total fixed investment
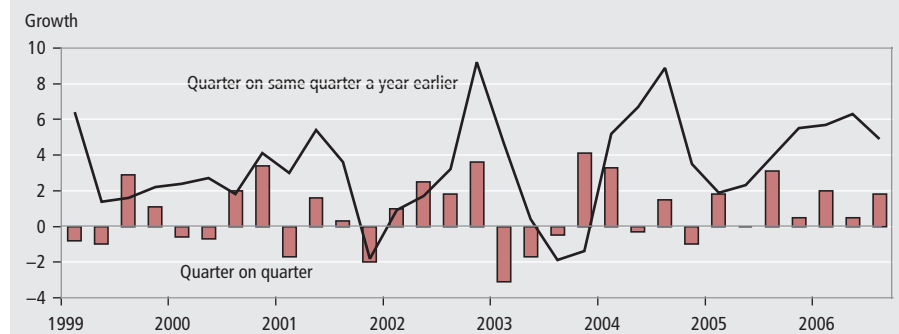
quarter four Industrial Survey reports an improvement in investment although the balance is still negative at minus 8.

GOVERNMENT DEMAND

Budget deficit improves; net borrowing widens in December

Government final consumption expenditure accelerated further in 2006 quarter three to 0.8 per cent, up from 0.6 per cent in the previous quarter. Growth quarter on quarter a year ago was 2.1 per cent, unchanged from the previous quarter **(Figure 12)**.

The latest figures on the public sector finances report in the current financial year to December 2006 and showed a mixed picture. Overall it showed the government continue to operate a financial deficit, with government expenditure continuing to exceed revenues. Over the financial year April to December 2006/07, the current budget was in deficit by £21.4 billion, a lower deficit compared to £26.1 billion for financial year April to December 2005/06. In contrast, net borrowing (which includes capital investment) increased to £39.7 billion in the financial year April to December 2006/07 from £38.8 billion in the financial year April to December 2005/06. The mixed picture reflects a combination of higher growth in corporation tax receipts, particularly from oil companies and higher income tax and VAT receipts. This has lead to a lower current budget deficit in the current financial year. However, this continues to be exceeded by central government net borrowing, partly to fund capital spending.

Since net borrowing became positive in 2002, following the current budget moving from surplus into deficit, net debt as a proportion of annual GDP has risen steadily. Public sector net debt by the end of December 2006 was 38.1 per cent of GDP,

up from 37.2 per cent of GDP in November and up from 36.5 per cent of GDP over the financial year 2005/06.

TRADE AND THE BALANCE OF PAYMENTS

Current account deficit widens; goods deficit widens

The publication of the latest quarterly Balance of Payments shows that the current account deficit widened in 2006 quarter three to £ 9.4 billion from a deficit of £8.2 billion in the previous quarter **(Figure 13)**. As a proportion of GDP, the deficit rose to 2.9 per cent of GDP from 2.6 per cent in 2006 quarter two.

Figure 12
Government spending
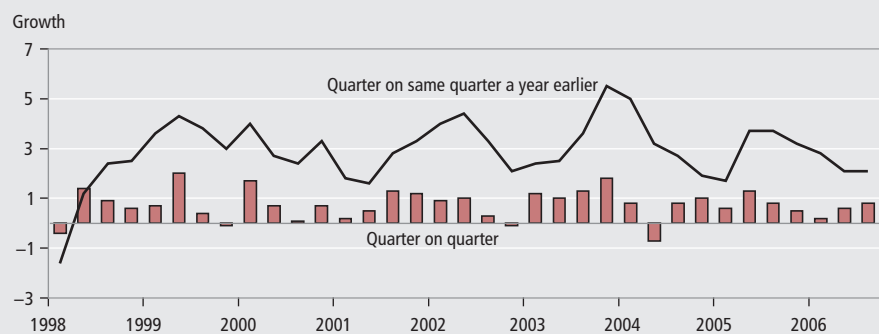
Figure 13
Balance of payments

The widening deficit in 2006 quarter three was due to a lower surplus in income partially offset by a higher surplus on trade in services and a fall in the deficit on trade in goods. The surplus on income fell to £6.5 billion, while the surplus in trade in services increased to £7.2 billion. The trade in goods narrowed to £20.5 billion. The deficit in current transfers was little changed at £2.7 billion.

The run of current account deficits since 1998 reflects the sustained deterioration in the trade balance. The UK has traditionally run a surplus on the trade in services, complemented by a surplus in investment income, but this has been more than offset by the growing deficit in trade in goods partly due to the UK's appetite for cheaper imports.

Data for 2006 quarter three shows the UK continuing to have a large trade deficit in goods with levels of imports rising faster than exports. This is provided a negative contribution towards GDP growth in the third quarter.

According to the latest trade figures, in November the UK's deficit on trade in goods and services was estimated at £4.7 billion, up from £4.1 billion in October. In the three months ending November, the deficit in trade in goods and services narrowed to £13.1 billion from a £13.5 billion deficit in the previous three months. In the same period, the goods

deficit widened marginally to £20.5 billion from £20.4 billion. The trade in goods deficit with the Non-EU widened to £12.4 billion from £11.7 billion. The deficit with the EU narrowed to £8.1 billion in the three months to November, from £8.7 billion in the previous three months.

The appreciation of the pound recently may have been a factor for the relatively high trade deficit, as a higher pound makes imports cheaper and exports more expensive. Lower GDP growth in the euro-zone and the US in the third quarter may also be factors in sustaining a relatively high UK trade in goods deficit, as they are major markets for UK exports.

However, these figures are distorted by volatility in VAT Missing Trader Intra-Community (MTIC) Fraud. Therefore, trade in goods figures need to be treated with caution, because more than half of the growth reflects distributions by changes to the pattern of trading associated with VAT MTIC fraud. This makes it difficult to analyse trade figures as increases inflate both imports and exports, though with no impact on net trade. In terms of level, estimated MTIC VAT fraud fell to £2.4 billion in 2006 quarter three, down from £13.6 billion in quarter two. These falls and changes between areas are related to significant falls in trading associated with MTIC fraud; but again these figures need to be treated with caution. According to the latest figures, the level of estimated fraud excluding MTIC fell further to £0.2 billion in November.

External surveys on exports show a generally weak picture. The BCC reported that the export sales net balance fell markedly in quarter four, by 14 points to plus 20. The CBI in its 2006 quarter four Industrial Trends Survey reports, that the balance for export deliveries improved to plus 9 from minus 3 in the previous quarter, but still remains fairly subdued.

LABOUR MARKET

Labour market activity strengthens

There appears to be a degree of tightening in the labour market in 2006 quarter four following the looser conditions prevalent in recent previous quarters. As the labour market operates on a time lag, this could be perhaps due to the pick up in demand conditions in 2005 quarter four beginning to feed through into a strengthening labour market picture. This may also imply a greater absorption capacity of the economy for workers.

The latest figures from the Labour Force Survey (LFS) pertain to the three-month period up to November 2006 and show a mixed but a mostly positive picture. The number of people in employment rose. The number of unemployed people, the unemployment rate and the claimant count fell. On the downside, the employment rate fell. Vacancies also fell. Average earnings remain unchanged from the previous month, but overall remain subdued with weak real wage growth.

Looking at a detailed level, the increase in employment levels appears to be mainly generated by an increase in part-time and self-employment jobs offset by a fall in full-time employee jobs. This continues the trend from the previous quarter but somewhat reverses the picture of the earlier quarters where there was a concurrent increase in the employment and unemployment levels; explained partly by the fall in the inactivity rate.

The current working age employment rate is 74.6 per cent, in the three months to November 2006, down 0.1 percentage point from the three months to August 2006 but unchanged from a year earlier. The number of people in employment increased by 14,000 over the quarter and by 274,000 over the year, to leave the employment level standing at 29.03 million in the three months to November. The unemployment rate was 5.5 per cent, in the three months to November, down 0.1 percentage point from the three months to August 2006 but up 0.4 percentage points from a year earlier (**Figure 14**) leaving the unemployment level standing at 1.67 million.

According to the LFS, in the period September to November 2006, the number of people in employment increased by 14,000. In the same reference period, the number of employees fell by 52,000. This was offset by a strong rise in the number

of people in self-employment of 49,000, continuing the trend from the previous quarter. From another perspective, the number of full-time employees fell by 77,000, whilst those in part-time jobs increased by 91,000, again, continuing the trend from the previous quarter.

Workforce jobs rises

According to employer surveys, there was an increase of 54,000 jobs in the three months to September 2006. The largest contribution came from an increase in finance & business services jobs at 29,000 followed by 'other services' at 23,000. Three sectors recorded a fall in jobs (Distribution, hotels & restaurants, manufacturing and agriculture and fishing). Over the year, education, health and public administration saw the largest increase in jobs at 133,000 followed by 'other services' at 80,000. Distribution, hotels & catering in contrast lost jobs of 42,000 over the year, followed by manufacturing at 39,000.

Claimant count falls

The claimant count measures the number of people claiming the job-seekers allowance. The latest figures for December show the claimant count level at 943, 100, down 5,500 on the month but up 35,200 on a year earlier. The claimant count rate in December 2006 was 3.0 per cent, unchanged from the previous month but up 0.1 percentage points from a year earlier.

Vacancies fall

There were 600,900 job vacancies on average in the three months to December 2006, down 2,500 from the previous three months but up 4,100 from the same period a year earlier.

Figure 14
Employment and unemployment
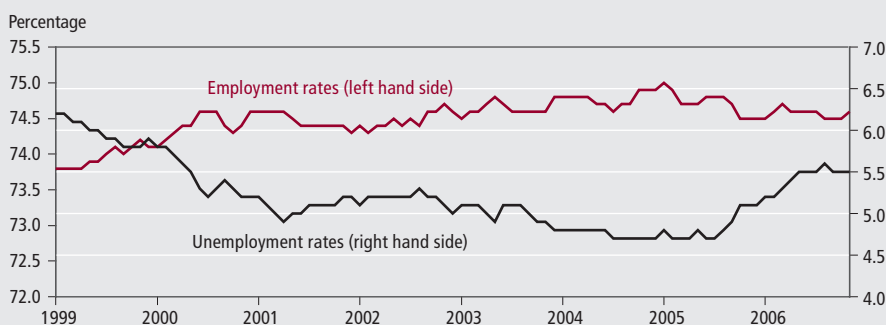
Inactivity rate up

The working age inactivity rate was 21.0 per cent in the three months to November 2006, up 0.2 percentage point from the three months to August 2006 but down 0.4 percentage points from a year earlier. The number of economically inactive people of working age was up 74,000 over the quarter to leave the level standing at 7.85 million in the three months to November 2006. The largest increase in the inactivity rate occurred amongst those categorised as 'retired' which increased by 24,000 followed by the 'temporary sick' category at 16,000 and the 'student' category at 14,000. On an annual basis, inactivity fell by 86,000, with the largest fall being amongst the 'long-term sick' at 51,000, followed by the 'looking after family/home' category at 36,000 and students at 33,000.

Average earnings remain unchanged

Average earnings growth, including and excluding bonuses, remained unchanged in the latest reference period. Average earnings growth, excluding bonuses, was 3.7 per cent in November, unchanged from October. Average earnings growth, including bonuses, grew by a rate of 4.1 per cent, again, unchanged from the previous month.

In terms of the public and private sector split, the gap in earnings growth was the same as in the previous month. Private sector wage growth was 3.9 per cent while public sector wage growth was 3.1 per cent in the three months to November.

Overall, the numbers point to a slightly strengthening labour market, although it is still loose compared to previous years, with employment increasing due mainly to higher activity rates, which is consistent with robust GDP growth. Average earnings which increased in the previous quarter, shows stable but subdued growth in current month, which could be still partly consistent with looser labour market conditions.

PRICES

Producer output prices rise; producer input prices fall in December 2006

The divergence between input and output price inflation narrowed further in 2006 quarter four, despite a pick up in output prices. Input prices grew by 2.0 per cent in the year to December, down from

3.5 per cent in the year to November and the weakest rate since March 2004. Prices on average increased by 3.0 per cent in quarter four compared to an increase of 8.0 per cent in quarter three. The main contribution to the fall came from a decrease in oil prices which fell by around 15 per cent in quarter four, partly as a result of warmer weather and partly due to higher US crude inventories. The core input price index, excluding food, beverages, tobacco and petroleum rose by 2.7 per cent in the year to December, down from 5.0 per cent in the year to November. Prices on average increased by 4.6 per cent in quarter four compared to 8.0 per cent in quarter three. The main driver of growth remains energy but the slower rate of growth in December mainly reflected a fall in gas prices at 3.8 per cent and on the year fell by around 30 per cent. This was partially offset by an increase of crude oil prices at 4.1 per cent in December, the first rise since July 2006, and which increased annually by 2.8 per cent. There was also an increase in home produced food prices by 2.3 per cent in December. The slower growth in input prices was to some extent helped by the appreciation of the pound relative to the dollar and euro, which had the effect of making exports dearer but imports cheaper. The fall in input prices seems to have a mixed impact on producer out prices.

The output price index rose by 2.2 per cent in the year to December, continuing the pick up of 1.8 per cent in the year to November. This may suggest an attempt by firms to re-build their profit margins. In 2006 quarter four prices on average increased by 1.8 per cent compared to 2.5 per cent in quarter three. The underlying picture however indicates reduced inflationary pressures compared to the previous month. On the core measure which excludes food, beverages, tobacco and petroleum, producer prices rose by 2.3 per cent, down from growth of 2.4 per cent in the year to October. This may suggest that firms are finding it difficult or

are reluctant to pass on lower input prices to customers. In quarter four, core prices increased by 2.4 per cent compared to 2.3 per cent in the previous quarter.

Growth in the consumer price index (CPI) – the Government's target measure of inflation – was 3.0 per cent in December; the highest on record and continues to exceed the Government's 2.0 per cent inflation target. The Retail Price Index (RPI) a broader measure of inflation, jumped to 4.4 per cent in the year to December, its highest rate since December 1991, and up from 3.9 per cent in November. The Retail Price Index, excluding mortgage interest payments (RPIX) was 3.8 per cent in December, up from 3.4 per cent in November (**Figure 15**).

The largest upward effect on the CPI annual rate came from transport costs. Prices of fuels and lubricants rose this year, in large part reflecting the increase in fuel duty which came into effect on 6 December 2006. Another large upward contribution came from furniture and household goods. Prices of furniture showed their largest month-on-month increase since January 1997 as retailers raised their prices across a broad range of items prior to the usual January sales period. A further large upward effect came from recreation and culture. The main upward effect came from games, toys and hobbies with prices rising this year but falling a year ago, particularly for computer games. There was a small upward contribution from housing, water, electricity, gas and other fuels, reflecting the continued phasing in of tariff increases from a number of major gas and electricity supplies.

The largest downward contribution came from clothing and footwear. Prices of women's outwear fell by more than a year ago due to widespread special offers. A further large downward effect came from food and non-alcoholic beverages, due to vegetable prices falling this year but rising a year ago.

Figure 15
Inflation

Growth, month on month a year ago
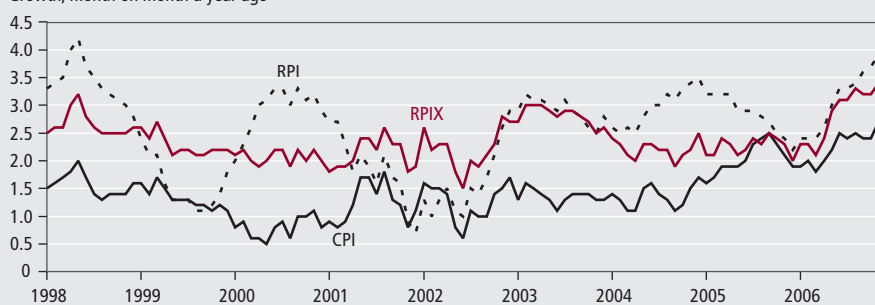
Independent forecasts

January 2007

The tables below supplement the Economic review by providing a forward-looking view of the UK and world economy.

UK forecasts

The UK tables show the average and range of independent forecasts for 2006 and 2007 and are extracted from HM Treasury's *Forecasts for the UK Economy*.

2006

	Average	Lowest	Highest
GDP growth (per cent)	2.6	2.4	2.7
Inflation rate (Q4, per cent)			
CPI	2.6	2.4	2.9
RPI	3.8	3.1	4.0
Claimant unemployment (Q4, million)	0.96	0.94	1.10
Current account (£ billion)	−33.8	−39.2	−25.0
Public sector net borrowing (2006–07, £ billion)	38.7	34.7	42.9

2007

	Average	Lowest	Highest
GDP growth (per cent)	2.5	0.8	2.9
Inflation rate (Q4, per cent)			
CPI	2.0	1.5	3.0
RPI	3.0	2.3	3.9
Claimant unemployment (Q4, million)	1.00	0.89	1.40
Current account (£ billion)	−34.3	−56.9	−18.3
Public sector net borrowing (2007–08, £ billion)	37.1	31.7	44.5

Notes

Forecasts for the UK economy gives more detailed forecasts, covering 27 variables, and is published monthly by HM Treasury. It is available on their website at www.hm-treasury.gov.uk/economic_data_and_tools/data_index.cfm

Selected world forecasts

The world tables show forecasts for a range of economic indicators taken from *Economic Outlook (preliminary edition)*, published by OECD (Organisation for Economic Co-operation and Development).

2007

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	2.4	2.0	2.2	2.5
Consumer price (percentage change from previous year)	2.6	0.2	2.0	2.2
Unemployment rate (per cent of the labour force)	4.8	3.9	7.4	5.8
Current account (as a percentage of GDP)	−6.5	4.5	−0.1	−1.9
Fiscal balance (as a percentage of GDP)	−2.8	−4.2	−1.1	−2.1

2008

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	2.7	2.0	2.3	2.7
Consumer price (percentage change from previous year)	2.6	0.6	2.0	2.1
Unemployment rate (per cent of the labour force)	5.1	3.6	7.1	5.7
Current account (as a percentage of GDP)	−6.6	5.3	−0.1	−1.8
Fiscal balance (as a percentage of GDP)	−2.9	−4.1	−1.2	−2.2

Notes

The OECD *Economic Outlook* is published biannually. Further information about this publication can be found at www.oecd.org/eco/Economic_Outlook

Key indicators

The data in this table support the Economic review by providing some of the latest estimates of Key indicators.

Seasonally adjusted unless otherwise stated

	Source CDID	2005	2006	2006 Q2	2006 Q3	2006 Q4	2006 Oct	2006 Nov	2006 Dec
GDP growth – chained volume measures (CVM)									
Gross domestic product at market prices	ABMI	1.9	2.7	0.7	0.7	0.8	..	..	..
Output growth – chained volume measures (CVM)									
Gross value added (GVA) at basic prices	ABML	4.2	..	1.6	1.9	..	..	..	..
Industrial production	CKYW	−1.9	−0.1	0.1	0.2	−0.3	−0.6	0.5	..
Manufacturing	CKYY	−1.1	1.2	0.9	0.7	−0.1	−0.4	0.3	..
Construction	GDQB	1.5	1.1	0.5	0.7	0.8	..	..	..
Services	GDQS	2.9	3.6	1.0	0.7	1.1	..	..	..
Oil and gas extraction	CKZO	−9.9	..	−4.5	−3.3	..	−0.8	0.5	..
Electricity, gas and water supply	CKYZ	−0.3	−3.2	−2.7	−0.2	−2.4	−3.3	2.6	..
Business services and finance	GDQN	4.3	5.4	1.5	1.5	0.9	..	..	..
Household demand									
Retail sales volume growth	EAPS	2.0	3.2	1.9	0.8	1.4	0.9	0.2	1.1
Household final consumption expenditure growth (CVM)	ABJR	1.3	..	0.9	0.4	..	..	..	..
GB new registrations of cars (thousands)[1]	BCGT	2,443	..	570	662	..	153	..	..
Labour market[2,3]									
Employment: 16 and over (thousands)	MGRZ	28,676	28,895	28,930	28,986	..	29,029	..	..
Employment rate: working age (%)	MGSU	74.7	74.6	74.6	74.5	..	74.6	..	..
Workforce jobs (thousands)	DYDC	30,810	31,064	31,064	31,118	..	..	..	..
Total actual weekly hours of work: all workers (millions)	YBUS	918.6	923.7	926.3	925.4	..	925.6	..	..
Unemployment: 16 and over (thousands)	MGSC	1,425	1,657	1,683	1,711	..	1,674	..	..
Unemployment rate: 16 and over (%)	MGSX	4.7	5.4	5.5	5.6	..	5.5	..	..
Claimant count (thousands)	BCJD	862	944	950	955	949	957	949	943
Economically active: 16 and over (thousands)	MGSF	30,101	30,552	30,613	30,696	..	30,703	..	..
Economic activity rate: working age (%)	MGSO	78.5	78.9	79.0	79.0	..	79.0	..	..
Economically inactive: working age (thousands)	YBSN	7,934	7,843	7,822	7,835	..	7,853	..	..
Economic inactivity rate: working age (%)	YBTL	21.5	21.1	21.0	21.0	..	21.0	..	..
Vacancies (thousands)	AP2Y	619.6	599.7	598.4	603.4	600.9	601.2	597.8	600.9
Redundancies (thousands)	BEAO	126	145	137	141	..	136	..	..
Productivity and earnings annual growth									
GB average earnings (including bonuses)[3]	LNNC	..	..	4.3	3.9	..	4.1	4.1	..
GB average earnings (excluding bonuses)[3]	JQDY	..	..	3.9	3.5	..	3.7	3.7	..
Whole economy productivity (output per worker)	A4YN	..	..	1.9	2.3	..	..	..	..
Manufacturing productivity (output per job)	LOUV	..	..	..	..	..	4.2	4.5	..
Unit wage costs: whole economy	LOJE	..	..	1.9	1.9	..	..	..	..
Unit wage costs: manufacturing	LOJF	..	..	..	..	..	1.0	0.5	..
Business demand									
Business investment growth (CVM)	NPEL	17.2	..	2.0	3.1	..	..	..	..
Government demand									
Government final consumption expenditure growth	NMRY	3.1	..	0.6	0.8	..	..	..	..
Prices (12-monthly percentage change – except oil prices)									
Consumer prices index[1]	D7G7	2.1	2.3	2.3	2.4	2.7	2.4	2.7	3.0
Retail prices index[1]	CZBH	2.8	3.2	3.0	3.5	4.0	3.7	3.9	4.4
Retail prices index (excluding mortgage interest payments)	CDKQ	2.3	2.9	2.8	3.2	3.5	3.2	3.4	3.8
Producer output prices (excluding FBTP)[4]	EUAA	2.1	2.2	2.6	2.3	2.5	2.5	2.5	2.4
Producer input prices	EUAB	11.7	9.5	13.3	8.0	3.3	4.7	3.3	1.9
Oil price: sterling (£ per barrel)	ETXR	30.358	35.929	38.569	37.748	31.637	31.854	31.239	31.817
Oil price: dollars ($ per barrel)	ETXQ	55.046	66.107	70.454	70.675	60.633	59.785	59.654	62.458

	Source CDID	2005	2006	2006 Q2	2006 Q3	2006 Q4	2006 Oct	2006 Nov	2006 Dec
Financial markets									
Sterling ERI (January 2005=100)	BK67	100.5	101.0	99.4	102.2	103.5	102.9	103.0	103.3
Average exchange rate /US$	AUSS	1.820	1.843	1.830	1.875	1.915	1.885	1.876	1.912
Average exchange rate /Euro	THAP	1.463	1.467	1.454	1.471	1.485	1.481	1.487	1.483
3-month inter-bank rate	HSAJ	4.57	5.26	4.71	5.02	5.26	5.02	5.14	5.20
Selected retail banks: base rate	ZCMG						4.75	4.75	5.00
3-month interest rate on US Treasury bills	LUST	3.92	4.87	4.88	4.77	4.87	4.77	4.95	4.90
Trade and the balance of payments									
UK balance on trade in goods (£m)	BOKI	−68,783	..	−20,929	−20,499	..	−6,601	−7,193	..
Exports of services (£m)	IKBB	114,255	..	30,768	31,019	..	10,239	10,194	..
Non-EU balance on trade in goods (£m)	LGDT	−31,953	..	−10,450	−12,330	..	−3,952	−4,631	..
Non-EU exports of goods (excl oil & erratics)[5]	SHDJ	119.9	..	121.1	111.8	..	110.7	111.5	..
Non-EU imports of goods (excl oil & erratics)[5]	SHED	116.8	..	124.4	122.8	..	124.4	129.5	..
Non-EU import and price index (excl oil)[5]	LKWQ	101.2	..	104.1	103.2	..	103.7	103.7	..
Non-EU export and price index (excl oil)[5]	LKVX	100.6	..	102.6	101.6	..	101.3	97.6	..
Monetary conditions/government finances									
M0 (year on year percentage growth)	VQMX	5.1	..	..	..	..	..	..	..
M4 (year on year percentage growth)	VQJW	11.4	..	13.6	14.3	..	14.0	13.0	..
Public sector net borrowing (£m)	−ANNX	39,134	37,812	16,289	5,859	17,578	−857	11,218	7,217
Net lending to consumers (£m)	RLMH	19,608	..	3,120	2,678	..	1,101	1,043	..

External indicators – non-ONS statistics

		2006 Jun	2006 Jul	2006 Aug	2006 Sep	2006 Oct	2006 Nov	2006 Dec	2007 Jan
Activity and expectations									
CBI output expectations balance	ETCU	14	14	11	14	9	5	11	12
CBI optimism balance	ETBV	..	−6	..	..	−10	..	..	−7
CBI price expectations balance	ETDQ	10	10	14	12	11	23	8	10

Notes

1 Not seasonally adjusted.
2 Annual data are for April except for workforce jobs (June), claimant count (average of the twelve months) and vacancies (average of the four quarters).
3 Monthly data for vacancies and average earnings are averages of the three months ending in the month shown. Monthly data for all other series except claimant count are averages of the three months centred on the month shown.
4 FBTP: food, beverages, tobacco and petroleum.
5 Volumes, 2003 = 100.
For further explanatory notes, see Notes to tables on page 69.

FEATURE

Emma Edworthy
Office for National Statistics

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HM Treasury

Treating research and development as a capital asset

SUMMARY

Treating research and development as an asset requires a number of important steps. The first step is to determine the components of research and development expenditure to be included as investment and then to translate those expenditure components into a National Accounts compatible format. The second step is the construction of appropriate deflators for research and development assets. The final step requires the estimation of appropriate depreciation rates for research and development capital. This article presents work undertaken by the Office for National Statistics on these three steps for the UK business sector and also some estimates of the productivity impact of research and development on business sector firms.

In the current environment of rapid technological change, research and development (R&D) has proved to be an important element of economic growth. R&D is considered one of a number of measures of innovation performance and various studies have shown that investment in R&D is an important source of productivity growth (for example Griliches, 1981). R&D investment reduces production costs, as inputs are more effectively transformed into outputs, and it alters output characteristics, thereby providing new products to the marketplace (Bernstein and Mamuneas, 2004). As a result, the promotion of investment in R&D has become a priority within the EU.

In Barcelona, in 2002, EU heads of government set a target for EU R&D to reach 3 per cent of gross domestic product (GDP) by 2010, with two-thirds of this coming from businesses. As a result, many EU countries set domestic targets, including the UK. The UK government set a target to increase R&D expenditure to 2.5 per cent of GDP by 2014. Total UK R&D currently stands at 1.78 per cent of GDP (Office for National Statistics (ONS), 2006).

The official guidelines for collecting R&D data come from the OECD Frascati Manual. This manual deals exclusively with the measurement of human and financial resources devoted to R&D, namely R&D 'input' data. It provides a platform for internationally comparable data on R&D. The manual describes R&D as 'comprising creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications'.

The manual acknowledges three types of R&D activities: basic research, applied research and experimental development. Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective. Experimental development is systematic work, drawing on the existing knowledge gains from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

Although it is widely accepted that expenditure on R&D by firms is a means to improving their productivity via new processes and product innovations, it is not recorded by National Accounts in a way that reflects this. R&D is currently treated as an intermediate input for businesses and current consumption for government and non-profit institutions.

At the Statistical Policy Committee (SPC) in November 2006, European Member States came to a conclusion on how to handle the introduction of R&D activity as capital formation in the update of the System of National Accounts (SNA). This

conclusion will be presented to the UN Statistics Commission meeting at the end of February, when the SNA revisions will be agreed upon (the SPC expects the European view to be accepted).

The SPC concluded that 'compulsory' satellite accounts should be developed in the short to medium term in order to address the 'substantial' conceptual and measurement difficulties involved with treating R&D as an asset. It is recommended that the final decision on including R&D expenditure in core National Accounts should be taken once sufficient evidence is gained through experience in satellite accounts, showing that it can be measured with appropriate confidence.

In preparation for revisions to the SNA relating to R&D, Eurostat have funded an ONS project to assess the practical and methodological issues involved in capitalising R&D in National Accounts. This article presents work that has been completed as part of the project.[1]

Developing methodology
Linking Frascati-based expenditure to the SNA

In order to capitalise R&D in the National Accounts, Frascati expenditure data needs to be translated into an SNA-compatible format. The value of R&D needed to be capitalised within the SNA framework is gross output minus intermediate inputs. The first step involves converting Frascati sectors into SNA sectors. **Table 1** is a link table adapted from Robbins (2006).

De Haan and van Horsten (2005) suggest three product groups to help translate gross expenditure on R&D (GERD) to the SNA.

- **Market R&D** – the value should be determined by estimated basic prices. Production costs should be used if reliable market prices are not available.

- **Non-market R&D** – by convention is valued by the sum of production costs. They suggest that, by convention, all non-market output of goods and services is consumed by the government sector. They highlight that the sum of outlays as reflected by GERD is not consistent with the sum of production costs in accordance with National Account principles. They suggest replacing the figures on capital expenditure included in GERD with an estimation of consumption of fixed capital (COFC). COFC represents the reduction in the value of the fixed asset used in production during the accounting period resulting from physical deterioration, normal obsolescence or normal accidental damage. Robbins (2006) identifies R&D as a non-market good based on its producer, either government, universities or non-profit institutions.

- **Own-account** – the SNA rule is to value own-account production using market prices. When a suitable market price cannot be used, the 'second best' option should be used, that is, the sum of the production costs.

In order to arrive at gross output figures, intermediate consumption, capital services and net value added need to be summed. Net value added is the sum of compensation of employees, other taxes on production and imports *less* subsidies *plus* net operating surplus. A bridge table adapted from Peleg (2006) between the Frascati Manual and SNA data on R&D would include the following.

I.   Output
A.   Frascati Manual GERD
(1)   **Plus** acquisition of R&D to be used as input in R&D production
(2)   **Plus** depreciation of capital goods owned by R&D producers and used in R&D production
(3)   **Plus** net operating surplus contained in R&D output measured at basic prices
(4)   **Plus** other taxes less other subsidies on production
(5)   **Minus** capital expenditures

B.   R&D output by SNA93 definitions
Equal to GERD + (1) + (2) + (3) + (4) – (5)

II.   Data for preparation of supply and use tables
Exports and imports of R&D
(1)   R&D exports
(2)   R&D imports

Not all the data implied by the above are available for R&D in the UK (operating surplus, exports and imports of R&D output). **Table 2** gives an indication of the UK data available and the adjustments needed to be made to come up with a satisfactory gross output figure.

Table 1
Link table – Frascati sectors to SNA sectors

Frascati Manual	SNA
Business enterprise sector	Non-financial corporations Financial corporations
Government sector	General government sector
Private non-profit sector	Non-profit institutions serving households (NPISH)
Higher education sector	General government NPISH
Abroad	Rest of the world

Table 2
UK data availability

Non-financial corporations	Financial corporations	General government	NPISH
Business Enterprise Research and Development (BERD) survey	BERD	GOVERD (HERD for public universities)	Non-profit expenditure on R&D (HERD for private universities)
Minus capital expenditure for financial corporations	**Minus** capital expenditure for non-financial corporations	**Minus** capital expenditure including those for land and structures	**Minus** capital expenditure by NPISH serving business
Plus expenditure for NPISH serving business	**Plus** expenditure for NPISH serving business	**Minus** current expenditure for non-plant machinery and equipment, as well as purchased and own-account software (estimated with ratio of equipment and software to gross output)	**Plus** capital services
Plus R&D purchased as an intermediate input to production of R&D in the corporate sector (includes cost of any purchased R&D)	**Plus** R&D purchased as an intermediate input to production of R&D in the corporate sector (includes cost of any purchased R&D)	**Plus** capital services	n/a
Minus historical cost depreciation	**Minus** historical cost depreciation	**Minus** payments for trade in R&D services	n/a
Plus capital services on structures, equipment and software owned by R&D performers and used to perform R&D in the UK	**Plus** capital services on structures, equipment and software owned by R&D performers and used to perform R&D in the UK	n/a	n/a

Key issues
Freely available research and development

The decision on whether or not to include freely available R&D as part of R&D gross fixed capital formation (GFCF) has proved to be controversial. The argument is focused largely on higher education and government sectors. At present the discussion is looking at excluding basic research for these two sectors, given that it would seem likely that there is no strategy in place to capture future economic benefits. Business enterprises, on the other hand, are assumed to have a profit motive and presumably think that their basic research will lead to future income, even if the results are published. Therefore, they can be expected to have a strategy in place to exploit the knowledge gained from their basic research (Aspden, 2006).

Since this article covers only business R&D, it is assumed that freely disseminated R&D is included. The case is also argued that unsuccessful R&D is a cost of producing R&D and is therefore indirectly incorporated into the market value of R&D assets given they are valued at cost. Therefore, unsuccessful R&D would not have an asset life independent of successful R&D in the National Accounts. This would see R&D being treated in the same way as mineral exploration, where it is viewed that the returns from the successes are sufficient overall to pay for failures.

Potential for double counting

There is a potential difficulty with an overlap with computer software. The Frascati Manual identifies the following types of capital expenditure:

- land and buildings
- instruments and equipment
- computer software

The UK BERD survey asks for data under land and buildings and plant and machinery and does not separate out software. Mandler and Peleg (2003) highlight two types of potential R&D software overlap:

- R&D may be performed with the aim of developing a software original
- the development of software may be part of an R&D project

Mantler and Peleg (2003) also distinguish between two types of products:

- an asset – the software – that can be used repeatedly in production

- R&D that is a product in itself, whether regarded as an asset or as intermediate consumption

Contrary to this view, de Haan and Van Horsten (2005) assume that R&D fully devoted to the development of a new software original will generally constitute an inseparable part of the production process, with a single identifiable output. Their view and current SNA93 says that all R&D with the specific goal of developing a software original should be identified as software and not as R&D. When it is not possible to separate R&D software development within an R&D project, then that software should not be recorded as a separate asset.

De Haan and Van Horsten (2005) agree with Mandler and Peleg (2003) accounting recommendations when software is developed as a supplementary tool. If it can be identified as such, then the software should be identified as a separate asset and the consumption of fixed capital of this software should be part of the production costs of R&D output.

The main issue for ONS is not so much double counting within the software industry, but the amount of R&D software being double counted within other industries. In BERD, software development outside the software industry is recorded under the product sold by the company. This software development (if classified as R&D by the company) will be included in their capital expenditure figures on the BERD form. This capital expenditure should already be counted as part of software expenditure in the National Accounts.

Developing solutions
Estimating current price gross fixed capital formation

In order to estimate 'at cost' GFCF, some adjustment to Frascati-based expenditure data needs to be made. **Figure 1** provides a diagrammatic representation of how to get from Frascati-based total expenditure on R&D to a position where R&D is capitalised in the National Accounts. Figure 1 identifies that capitalising R&D will impact on total National Accounts GFCF and also on capital consumption, with both these having an impact on measured GDP.

Three different methods are identified to derive the estimate of capital service flows from other asset classes. This capital service flow is essentially an estimate of the input of the other capital (mostly tangible capital),

used in the R&D process, to the R&D capital stock. In the first model, this input is proxied by COFC plus an assumed return on those assets. In the second and third models, the capital service flow from the assets used in the R&D process is measured directly. One method uses rental rates, the other capital services growth rates. More detail on the methodology for estimating R&D GFCF using the three different approaches is provided in the technical note at the end of this article.

The expenditure data used to calculate GFCF is broken down into two clear areas, intramural (current and capital) and extramural. Intramural expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy during a specified period, whatever the source of funds. Extramural expenditures are the amount a unit, organisation or sector reports having paid, or committed themselves to pay, another unit, organisation or sector for the performance of R&D during a specified period. This includes acquisition of R&D performed by other units and grants given to others for performing R&D. Intramural expenditure can be split further between:

- current expenditure:
  wages and salaries – includes all overtime payments, bonuses, redundancies, commissions and holiday pay and should be gross
  other – purchases of goods and services from outside the unit, including overseas purchases, and scientific services should be included, provided no R&D is involved. Contractors employed on R&D projects are included here

- capital expenditure:
  land and buildings
  plant and machinery

Capital expenditure should include annual gross expenditure on fixed assets used in R&D projects. Land and buildings comprises the acquisition of land and buildings, costs of major improvements and modifications or repairs.

For the purpose of calculating R&D GFCF, both extramural and intramural expenditure are included. Extramural expenditure will obviously include R&D purchased both within and outside the UK.

Figure 1
Capitalising research and development expenditure
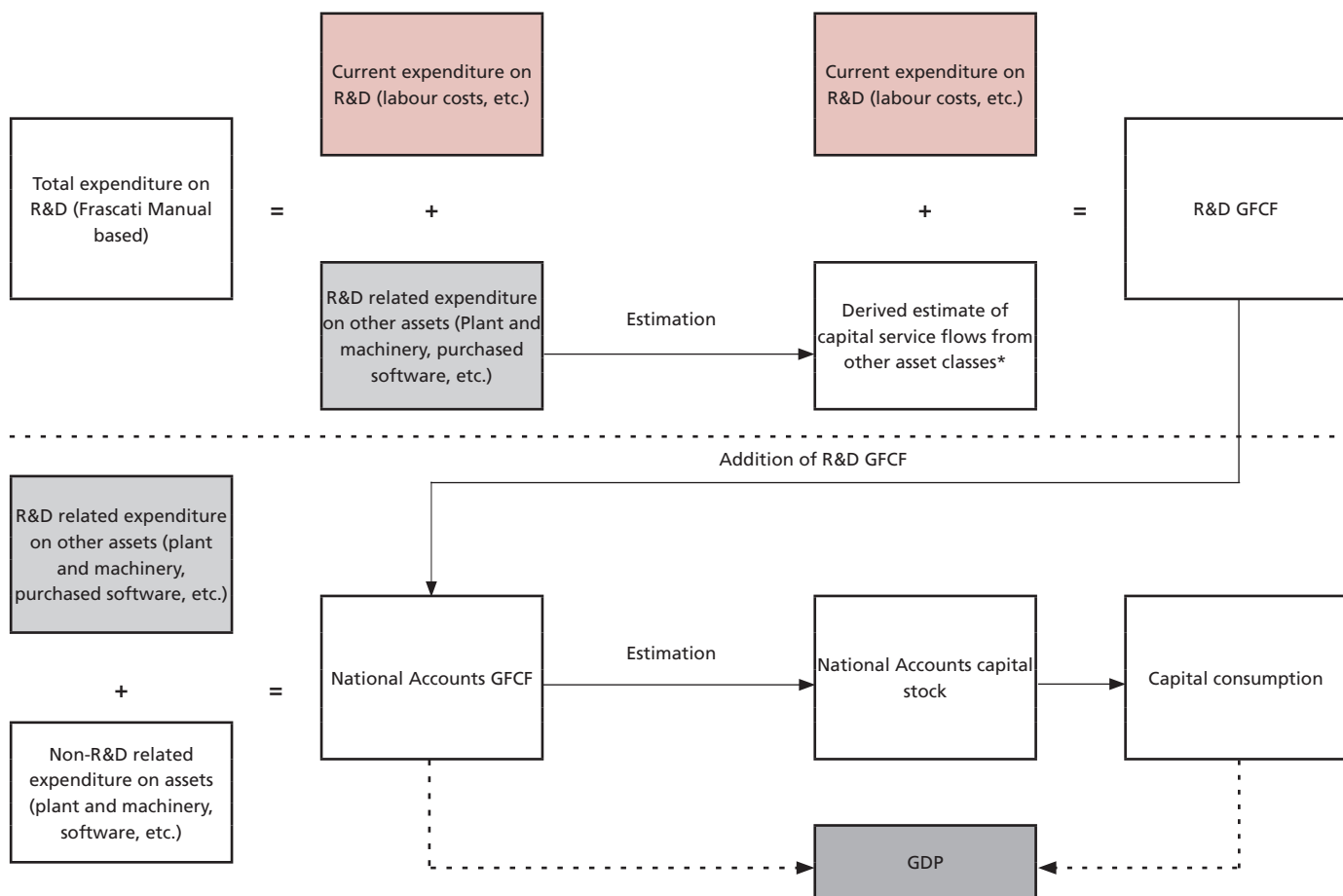
* Can either be derived as consumption of fixed capital COFC (capital consumption) plus a normal return on capital used, or direct capital services estimates

Constant price gross fixed capital formation: estimation of industry-specific deflators

To look at the contribution of R&D expenditure to economic growth and productivity, constant price R&D GFCF is the object of interest. This requires a suitable deflator in order to convert current price R&D GFCF into constant price GFCF.

The major problem associated with constructing a deflator for R&D is that it is a very heterogeneous product. By definition, every project is different. Given that the majority of R&D is carried out on own-account, this makes it hard, if not impossible, to calculate a market (output) price. As a result, the next best solution would appear to be the use of input prices.

The use of input-based indices to estimate output volumes may well seem inappropriate, but there are many other areas within National Accounts where they are used when a better alternative is not available. Industry-specific deflators for business R&D have been estimated using input prices for the following types of input:

- wages and salaries
- other current expenditure
- land and buildings
- plant and machinery

R&D cost components and appropriate weights are used to calculate a simple weighted index and a divisia index. Cameron (1996) argues that a divisia index is theoretically and empirically better at capturing changes in the cost of R&D than fixed weighted indices such as the Laspeyres or Paasche indices.

Table 3 shows data sources available for the UK for estimating input-based deflators for UK R&D. The availability of data sources determines the exact methodology that can be used when estimating input-based price indices.

The UK Business Enterprise Research and Development (BERD) survey form asks for firms to break down their average employment on R&D (number of full-time equivalents) into three areas:

- **scientists and engineers** – professional scientists or engineers engaged in the conception or creation of new knowledge, products, methods and systems

Table 3
Deflator data sources

R&D component	Proxied by	Source
Wages and salaries	Index of earnings of science and technology professionals	Annual Survey of Hours and Earnings (ASHE)
	Index of average earnings of technicians	ASHE
	Index of average earnings of administrative occupations	
Other current expenditure (materials, etc.)	PPI (input) materials and fuels purchased by manufacturing excluding food, beverages, tobacco and petroleum	Producer price indices
Capital	Separate index for plant and machinery, and land and buildings	National Accounts capital stock deflators

- **technicians** – qualified personnel who participate in R&D projects by performing scientific and technical tasks, normally under the supervision of professional scientists and engineers
- **other** – supporting staff include skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects

Wage information for these three occupational areas, in the form of gross weekly wages, is available from the Annual Survey of Hours and Earnings (ASHE). Data from ASHE are classified by standard occupational classification (SOC) and are available for 1997 to 2004 for the following occupations:

- science and technology professionals
- technicians
- administrative occupations

A simple weighting technique was used to create a deflator for wages and salaries and also a divisia index for comparison. Initially, a price index was calculated for each of the three employment areas, scientists, technicians and other workers and then the weights were applied to these indices:

$$W_s = \frac{E_s}{E_T} \quad ; \quad W_t = \frac{E_t}{E_T} \quad ; \quad W_o = \frac{E_o}{E_T}$$

where:

W_s: weight for scientists and engineers
W_t: weight for technicians
W_o: weight for 'other' workers
E_T: total Frascati-based expenditure on salaries and wages
E_s: Frascati-based expenditure on scientists and engineers
E_t: Frascati-based expenditure on technicians
E_o: Frascati-based expenditure on 'other' workers

The deflator for salaries and wages was then calculated as:

$$P_{WS} = P_s W_s + P_t W_t + P_o W_o$$

where P_s, P_t and P_o are the price indices for scientists and engineers, technicians and other workers.

For other current expenditure, the producer price index (PPI) for materials and fuels purchased by manufacturers excluding food, beverages, tobacco and petroleum products was used. For the

capital input to R&D, existing deflators from the National Accounts were used.

An aggregate R&D deflator for each of the 33 industries represented in BERD was estimated using the simple weighting technique and also as a divisia index for comparison.

Estimating depreciation rates for research and development capital

In calculating an R&D capital stock, evidence supports the use of the perpetual inventory method (PIM). The gross stock of R&D is then the measure of the cumulative value of past investment still in existence. The net capital stock would be equal to the gross stock less the accumulated depreciation on assets in the gross stock. Depreciation rates can be based on asset lives or they can be estimated using econometric methods.

Whereas some research treats R&D as a permanent part of the capital stock once added, the consensus thinking is that, once R&D capital has entered the capital stock, it is gradually removed by depreciation (consumption of fixed capital).

The empirical evidence on depreciation rates for R&D assets is limited. The research that has been carried out has either estimated depreciation rates using econometric models (for example, Bernstein and Mamuneas, 2004) or using a patent renewal method (for example, Pakes and Schankerman, 1979). The little evidence that has emerged from both types of analysis has on the whole produced a common message that industrial knowledge depreciates faster than physical capital. Mansfield (1979), Pakes and Schankerman (1979) suggest there is little knowledge capital left after ten years. Bernstein and Mamuneas (2004) estimate that R&D capital depreciates at two to seven times the rate of physical capital.

Bernstein and Mamuneas (2004) consider R&D depreciation within the context of intertemporal cost minimisation, where depreciation rates are estimated simultaneously with other parameters characterising the overall structure of production. They characterise R&D depreciation as a geometric or declining balance form. A geometric pattern is a specific type of accelerated pattern. An accelerated pattern assumes higher £ depreciation in the early years of an asset's service life than in the later years. This compares with a straight-line depreciation pattern that sees equal £ depreciation over the life of the asset. The justification for this comes from a

series of papers by Griliches (1979, 1990 and 1995). Griliches gives two main justifications for this:

- there is approximately a contemporaneous link between R&D and the services emanating from this investment through innovation and invention
- typically, innovation and invention are short-lived, and replaced at a rapid rate

These imply that efficiency declines relatively fast in the early part of the service life of R&D investment, and therefore R&D depreciation approximates declining balance.

Nadiri and Prucha (1996) estimate a geometric depreciation rate of 12 per cent for the US manufacturing sector. They estimated a model of factor demand that allowed for estimating jointly the depreciation rates of both physical and R&D capital for the US total manufacturing sector. Their 12 per cent estimate of depreciation is very close to the ad hoc assumption usually used as a starting point in most empirical analysis, 15 per cent. They used only gross investment data to generate estimates of the depreciation rates as well as consistent series for the stocks of R&D capital. The 12 per cent estimate is not too dissimilar to studies that use R&D capital stocks as an input in the production function, Griliches (1980) and Bernstein and Nadiri (1988, 1991).

On average, the estimates for depreciation rates of R&D stock in empirical literature range from 10 to 25 per cent, though these tend to be for certain sectors of the economy. This corresponds to an average service life of about five to ten years.

Here, a depreciation rate for the business sector is estimated using econometric methods. The method will be to look at the impact past R&D has on output (gross value added at market prices) to assess the rate of depreciation. That is, if R&D undertaken five years ago has, on average, zero impact on value added today, then the life length mean of R&D can be deduced as being five years. The following equation was estimated:

$$\Delta GVA_t = \sum_{S=1...T} \alpha_s C_{t-s} + N_t + K_t$$

where ΔGVA_t is the change in gross value added from time t to time $t-1$, C_t is investment in R&D, K_t is other capital inputs and N_t is labour input. Clearly there are various econometric issues surrounding the estimation of the equation above but these will not be discussed here.

Estimating research and development capital stock

With constant price R&D GFCF and an estimated depreciation rate, it is easy to estimate the R&D capital stock. The PIM is used to calculate the R&D capital stock with an assumption of geometric depreciation, and the methodology of Guellec and Van Pottelsberghe (2004) is used for calculating the net R&D capital stock in the initial year. Details are provided in the technical note at the end of this article.

UK data sources

Business Enterprise Research and Development (BERD)

The BERD survey is an annual survey designed to measure R&D expenditure and employment in the UK. Since 1995, it has used a stratified random sample, stratified by product group and employment sizebands, where sizeband 1 (400+) is sampled 1:1, sizeband 2 (100–399) is sampled roughly 1:5 and sizeband 3 (0–99) being sampled roughly 1:20. These sampling fractions were reduced in 1998 as 400 more forms were made available for sampling.

In the first stage of the sampling procedure, the largest 400 firms are chosen and in the 2003 survey this corresponded to those enterprises doing more than £2.6 million of R&D. These companies have either been identified from previous returns or from one of the other data sources. These 400 firms are then sent a long form (a long form is simply a survey form that has a larger number of questions than a short form).

There are a number of sources that contribute towards the sampling frame for the BERD. The Annual Business Inquiry survey asks a filter question about whether or not a firm engages in R&D. The Department of Trade and Industry and Scottish Executive provide ONS with R&D information on companies. Finally, the press is used to identify firms that are conducting R&D and these are added to the sampling frame.

For those firms not receiving a long form, they are broken down into the remaining two employment sizebands mentioned above. Enterprises are then selected randomly from each sizeband using the sampling fractions applicable to that band. Those identified are then sent a short form.

For non-selected firms, data is imputed on the basis that these enterprises have the same R&D to employment ratio as selected reporting units in their class.

Annual Respondents Database (ARD)

The other main source used is the ARD. This is a data set that combines information from ONS business surveys over time and contains a variety of useful variables, such as turnover and employment. Robjohns (2006) provides further detail on this data set, how it can be linked to other surveys such as the BERD, and recent developments.

National Accounts data

For the tangible capital used in the R&D process, data on life-length means and deflators is available from the National Accounts. Given a life-length mean for each type of tangible capital asset, the depreciation rate can be calculated as follows:

$$\delta = d/\bar{T}$$

where d is called the 'declining balance rate' and T is the life-length mean. d will differ across asset types, and the declining balance rates for different asset types can be found in Wallis (2005). When $d=2$, as it does for intangibles such as R&D, there is what is referred to as the 'double declining balance' method.

Capital services data

The estimates of capital services growth and rentals are based on Wallis (2005). Some aggregation was required to get from the 57 industries at which capital services estimates are published to the required 33 R&D product groups. Updates to the capital services estimates in Wallis (2005) will be published in a forthcoming issue of *Economic & Labour Market Review*.

UK estimates

Business investment in R&D and the R&D capital stock

Table 4 shows estimates for GFCF using three different methodologies and compares them with the current R&D expenditure-based measure as published in ONS (2006), *Research and Development in UK Businesses* (MA14). Table 4 shows that all three methods give GFCF above the MA14 estimate of total R&D expenditure. This means that the flow from the other capital assets being used as part of the R&D process, plant and machinery, and land and building, is greater than the expenditure on these assets. This reflects the fact that investment in the stock of these assets is greater than the depreciation of the stock, that is, there is an increasing stock of other assets that are being used in the R&D process.

The main thing to note from Table 4 is that the results from the three methods are quite similar. This means that despite methods 2 and 3 being preferable on theoretical grounds, as they directly measure capital services flows, using method 1 would give robust estimates. It is expected that some countries would not have the required capital services data to implement methods 2 or 3.

Research and development deflator

Figure 2 shows the estimated deflator for business sector R&D against the UK GDP deflator. A GDP deflator is commonly used in empirical studies as a proxy for an R&D deflator. It is clear from Figure 2 that the two differ quite a bit, suggesting that the GDP deflator is not a good proxy. Industry-specific deflators were also produced and these showed significant differences between industries.

Table 4
Business investment in R&D

£ billion

Year	MA14: total R&D expenditure	Method 1	Method 2	Method 3
1997	9.5	10.3	10.4	10.2
1998	10.1	10.9	11.1	10.8
1999	11.3	12.5	12.7	12.3
2000	11.5	12.4	12.5	12.1
2001	12.3	13.5	13.4	13.1
2002	13.1	15.0	15.1	14.5
2003	13.7	15.1	15.1	14.6

Source: MA14 (ONS, 2006), methods 1, 2 and 3 are authors' own calculations

Figure 2
GDP deflator and estimated R&D deflator

Index (1998=100)
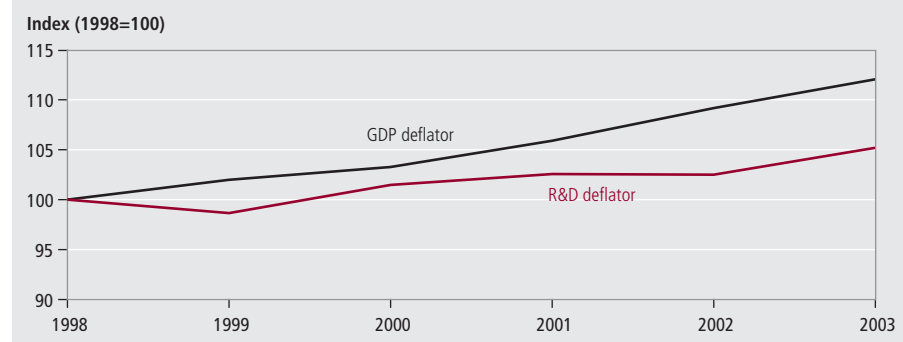
Research and development depreciation rate

Preliminary results are based on a panel of industry data for the period 1998 to 2003. From this industry-level panel, a business sector depreciation rate was estimated. In future it is planned to use a firm-level panel to estimate industry-specific depreciation rates. **Table 5** shows the results of the chosen regression specification.

As the fourth lag of R&D investment is insignificant, the results suggest a life length mean for UK R&D of four years. If a declining balance rate of two is assumed and the formula for depreciation discussed already ($\delta = d/\bar{T}$) is used, this implies a depreciation rate for UK R&D of 50 per cent, a rate much higher than those rates presented in the empirical studies discussed above. Although these results are preliminary, they do suggest that the approach could provide sensible estimates of depreciation for R&D capital following further development and investigation. It should also be noted that this is a business sector depreciation rate and there could be substantial industry variations.

Research and development capital stock

Table 6 shows estimates of business sector R&D capital stock when a depreciation rate of 15 per cent is used (the most commonly assumed depreciation rate in

empirical studies). **Table 7** shows estimates of UK business sector R&D capital stock using a 50 per cent depreciation rate, as estimated above. Clearly, the impact of using different depreciation rates is very large.

Contribution of research and development to productivity growth

After capitalising R&D, it is important to look at the impact this would have on productivity, as this can be used to help justify its treatment as an asset. The return of R&D investment was estimated using a firm-level panel created by merging BERD and ARD data for the period 1998 to 2003. The final data set used in the productivity analysis contained 16,095 firms.

The starting point was a model common to a lot of empirical studies of the R&D contributions to productivity growth, an extended Cobb-Douglas production function including time trends and firm specific effects:

$$Y = AN^{\alpha 1} K_T^{\alpha 2} K_R^{\alpha 3} E$$

where Y is a measure of value added, K_T is capital input (excluding R&D capital), N is labour, K_R is R&D capital, A is a parameter representing spillovers (proxied by the sum of R&D within the industry) and E is an error term. Taking logs and adding both

Table 6
Business R&D capital stock, 15 per cent depreciation

£ billion

Year	Method 1	Method 2	Method 3
1996	50.7	71.1	63.1
1997	53.4	70.8	63.9
1998	56.3	71.2	65.1
1999	60.4	73.2	67.7
2000	63.6	74.6	69.6
2001	67.6	76.8	72.2
2002	72.4	80.3	75.9
2003	76.5	83.4	79.0

Source: Authors' own calculations

Table 7
Business R&D capital stock, 50 per cent depreciation

£ billion

Year	Method 1	Method 2	Method 3
1996	19.6	19.7	19.8
1997	20.1	20.2	20.1
1998	20.9	21.2	20.8
1999	23.0	23.2	22.8
2000	23.9	24.1	23.4
2001	25.4	25.4	24.9
2002	27.6	27.7	26.9
2003	28.9	28.9	28.0

Source: Authors' own calculations

a firm index *i* and a time subscript *t,* the equation becomes:

$$Y_{it} = a + \alpha_1 n_{it} + \alpha_2 k_{T,it} + \alpha_3 k_{R,it} + e_{it}$$

A simple regression (equation 1 in **Table 8**) gives an estimated elasticity of 0.095 per cent on R&D capital. This implies that a 10 per cent increase in R&D capital is associated with an increase in productivity of 0.95 per cent.

The simple regression analysis was extended to allow for different dummies, including interaction dummies, to account for a distinction between services and manufacturing industries and to account for foreign ownership (US, Japan and Europe). Equations 2 to 6 in Table 8 show the resulting estimated regressions.

Equation 2 shows that there is an average difference between services and manufacturing productivity, with services more productive. Equation 3 shows the results of including an interaction dummy for services and the R&D capital stock. The result suggests that an increase in R&D capital stock leads to a bigger increase in productivity for services than for manufacturing although the difference is not statistically significant at conventional levels.

Table 5
Regression results for depreciation estimation

Dependent variable: change in gross value added

Lag of R&D expenditure	Coefficient	Standard error	t-value
Lag 1	−9.16	5.01	−1.83
Lag 2	25.67	7.15	3.59
Lag 3	−24.59	6.91	−3.56
Lag 4	5.42	6.86	0.79
Lag 5	2.95	5.76	0.51

Table 8
Regression results for productivity impacts of R&D

Equation		N	K_T	K_R	Services	UK	US	Japan	EU
1	Spillovers	0.64*** (26)	0.33*** (21)	0.095*** (8.76)	n/a	n/a	n/a	n/a	n/a
2	Services dummy	0.69*** (29)	0.29*** (18)	0.061*** (6.35)	0.12*** (2.75)	n/a	n/a	n/a	n/a
3	Interactive services dummy	0.69*** (29)	0.29*** (18.4)	0.061*** (6.15)	0.008 (1.85)	n/a	n/a	n/a	n/a
4	Country dummies	0.67*** (28)	0.32*** (20.7)	0.066*** (7.12)	n/a	n/a	n/a	n/a	n/a
5	Country dummies	0.67*** (28)	0.32*** (20.7)	0.066*** (7.12)	n/a	0.20*** (4.94)	0.32*** (5.87)	0.12 (1.27)	0.08 (1.42)
6	Interactive country dummies	0.67*** (28)	0.32*** (20.7)	0.05*** (4.2)	n/a	0.25*** (4.75)	0.39*** (5.70)	0.019 (1.72)	0.011 (1.52)

Note:
t-value in parentheses, *** significant at 1 per cent level, ** significant at the 5 per cent level.

Taking account of firm ownership suggests that UK firms add more to productivity. The base in this regression is all firms not UK-, US-, Japan- or EU-owned. Finally it appears that UK-owned firms and US firms have an additional effect from an increase in the R&D capital stock on productivity over and above other countries.

Conclusions and future work

This article has addressed several issues involved in the capitalisation of R&D for the UK National Accounts. Three separate methods were presented for calculating R&D GFCF. The results presented in Table 4 show that estimates are robust to the three methods.

The estimate for a business sector R&D-specific deflator showed that the use of a GDP deflator in R&D capitalisation calculations is not an accurate proxy. Preliminary results imply a depreciation rate for UK business R&D of 50 per cent. This is a somewhat higher rate of return to UK R&D than that estimated in empirical studies to date. However, these results are only preliminary and more empirical econometric analysis is needed in this area.

The most notable thing that comes out of work that has been completed so far is that, not only is calculating depreciation rates the most difficult element, but also that the estimated R&D capital stock is more sensitive to the depreciation rate than it is to changes in the way R&D GFCF and R&D deflators are calculated. Estimating a whole economy life length mean using industry-specific data implied a depreciation rate of 50 per cent. However, the econometric issues surrounding this early stage estimation are acknowledged.

Firm-level data gave an estimated elasticity of 0.095 per cent on R&D capital. This implies that a 10 per cent increase in R&D capital stock is associated with an increase in productivity of 0.95 per cent.

Note

1. This article presents the current stage of an ongoing project jointly funded by ONS and Eurostat. As such, its content is work in progress and we would welcome comments and suggestions. All the analysis presented here was carried out before the latest ONS BERD data revisions. The statistical data presented here is Crown Copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland. Opinions expressed here are those of the authors and do not necessarily represent the views of HM Government. A longer, more technical, version of this article will be available in a forthcoming issue of *Statistika – Journal for Economy and Statistics.*

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TECHNICAL NOTE

Methods for estimating R&D gross fixed capital formation
Method 1: Consumption of fixed capital (COFC) plus an assumed return
In method 1, the estimate of R&D GFCF is calculated as the following:

$$GFCF_t^{CP} = \left(C_t + \sum_a I_{at}^{CP}\right) - \sum_a I_{at}^{CP} + \sum_a COFC_{at} + \sum_a R_{at}$$

where C_t is current expenditure on R&D, I_{at}^{CP} is current price investment in the asset type a being used in the R&D process (using UK data only two asset types can be identified – land and buildings, and plant and machinery), $COFC_{at}$ is the consumption of asset type a being used in the R&D production process and R_{at} is the assumed return on asset type a being used in the production process.

COFC in time t for an asset of type a is given by the following:

$$COFC_{at} = K_{at} \cdot \delta_a$$

where K_{at} is the net stock of asset type a at time t and δ_a is the rate of depreciation of asset a. To calculate a net stock for each asset type, the perpetual inventory method (PIM) was used. A geometric PIM was used to calculate net stock as follows:

$$K_{at} = \sum_{\tau=0}^{\infty} (1-\delta_{a,t-\tau})^{\tau} \cdot I_{a,t-\tau}$$

where I is constant price investment in asset a. In constructing this PIM the following assumption was made about the net capital stock in the initial year, assuming a steady state:

$$K_{a0} = I_{a0} / \delta_a$$

Finally for this model, an estimate of R_{at} is needed. The Australian Bureau of Statistics assumption that the rate of return on capital used in the R&D process is 5 per cent was used:

$$R_{at} = 0.05 \cdot K_{at}$$

Method 2: Capital services estimated using rentals
In method 2, the estimate of R&D GFCF is calculated as the following:

$$GFCF_t^{CP} = \left(C_t + \sum_a I_{at}^{CP}\right) - \sum_a I_{at}^{CP} + \sum_a CS_{at}$$

where variables are as defined above and CS_{at} is the capital service flow at time t from the asset type a being used as part of the R&D process. Capital services refer to the flow of productive services from the stock of capital. Capital services estimates recognise that the same stock of capital may be used more or less efficiently.

For method 2 CS_{at} is calculated as the real level of capital services:

$$CS_{at} = K_{at} \cdot r_{at}$$

where r_{at} is the rental for asset a at time t. The rental is calculated using the Hall-Jorgenson (Hall and Jorgenson, 1967) formula for the cost of capital in discrete time t:

$$r_{at} = T_{at} [\delta_a \cdot P_{at} + R_t P_{a,t-1} - (P_{at} - P_{a,t-1})]$$

where P_{at} is the price of an asset of type a at time t, δ_a is the rate of depreciation, and R_t is the rate of return. T_{at} is the tax adjustment factor which is given by the following:

$$T_{at} = \left[\frac{1 - u_t D_{at}}{1 - u_t}\right]$$

where u_t is the corporation tax rate and D_{at} is the present value of depreciation allowances as a proportion of the price of asset type a.

Method 3: Capital services estimated using capital services growth rates

In method 3, the estimate of R&D GFCF is calculated as the following:

$$GFCF_t^{CP} = \left(C_t + \sum_a I_{at}^{CP}\right) - \sum_a I_{at}^{CP} + \sum_a CS_{at}$$

This is as in method 2. Here, however, CS_{at} is calculated using a different method. In the initial year, the capital services input to R&D is estimated using the real level of capital services as in method 2:

$$CS_{a0} = K_{a0} \cdot r_{a0}$$

Subsequent years are calculated as follows:

$$CS_{at+1} = CS_{at} \cdot g_{at} \text{ for } t = 1,2,...$$

where g_{at} is the growth rate of capital services for asset a at time t.

Estimating research and development capital stock

A geometric PIM was used to calculate the R&D net capital stock as follows:

$$RD_t = \sum_{\tau=0}^{\infty} (1 - \delta_{t-\tau})^\tau \cdot GFCF_{t-\tau}$$

where RD_t is the R&D capital stock at time t, $GFCF_t$ is constant price R&D GFCF at time t and δ is the depreciation rate of R&D (constant over time). The methodology of Guellec and Van Pottelsberghe (2004) is used to calculate R&D net capital stock in the initial year, RD_0. Guellec and Van Pottelsberghe (2004) assume a constant annual rate of growth of past investment:

$$RD_0 = \frac{GFCF_0}{1 - \lambda(1 - \delta)}$$

with $\quad \lambda = \dfrac{1}{1 + \eta}$

where η is the mean annual rate of growth of $GFCF_t$.

FEATURE

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Ethnicity data for Jobseeker's Allowance claimants

SUMMARY

Ethnicity data for Jobseeker's Allowance (JSA) claimants were published for the first time in November 2006. The data are now available via the two existing channels for accessing JSA data – the Office for National Statistics claimant count data on the NOMIS website and JSA caseload data on the Tabulation Tool on the Department for Work and Pensions website.

The purpose of this article is to announce the publication of ethnicity data within existing National Statistics releases for JSA claimants; summarise the methodology for matching ethnicity data to JSA claimants; describe what variables will be available through both publication channels and explain key differences between the two; and provide some summary analysis based on the newly-released data.

JSA benefit claimant statistics have been published for many years as a key labour market indicator.

The official source of JSA data is the claimant count which is produced by the Office for National Statistics (ONS), and disseminated via the NOMIS website at www.nomisweb.co.uk/. From this website, users can access data for 100 per cent stocks and flows of JSA claimants, for a wide range of variables, including age band, sex, duration, occupation, destination and various geographical levels.

More recently, the Department for Work and Pensions (DWP) has also started publishing National Statistics for the 100 per cent JSA caseload, via the DWP website at www.dwp.gov.uk/asd/tabtool. asp. Previously, estimates from a 5 per cent sample were published.

In November 2006, JSA claimant data by ethnicity were published for the first time, through both dissemination routes.

Methodology

The DWP has been collecting ethnicity data for Jobseekers since the introduction of the New Deal in 1998. This information is stored on the Labour Market System (LMS), used in Jobcentre Plus offices in Great Britain. However, until recently, only a subset of this ethnicity information – for New Deal participants – was published.

Advances in linking between the LMS and the JSA payment system mean that we can now match an ethnicity marker to around 99 per cent of the ONS claimant count (including around 8 per cent who preferred not to state their ethnic origin).

Box 1
Two ethnicity variables

1) Summary ethnicity
White
Mixed
Asian or Asian British
Black or Black British
Chinese or Other Ethnic Group
Prefer not to say
Unknown

2) Detailed ethnicity
White: British
White: Irish
White: Other White
Mixed: White & Black Caribbean
Mixed: White & Black African

Mixed: White & Asian
Mixed: Other Mixed
Asian or Asian British: Indian
Asian or Asian British: Pakistani
Asian or Asian British: Bangladeshi
Asian or Asian British: Other Asian
Black or Black British: Black Caribbean
Black or Black British: Black African
Black or Black British: Other Black
Chinese or Other Ethnic Group: Chinese
Chinese or Other Ethnic Group: Other
    Ethnic Group
Prefer not to say
Unknown

The ethnicity information merged to the JSA claimants uses the same categorisation as used for the ONS Census in 2001 (see **Box 1**).

Dissemination

Ethnicity information for JSA claimants was published for the first time as a National Statistic in November 2006. The availability of these new data fills a significant gap in the published information on JSA claimants and represents a major improvement to Labour Market Statistics.

This information is now disseminated through two routes:

- the ONS claimant count, available via the NOMIS website, and
- DWP JSA claimant information, available via the DWP Tabulation Tool website

There are slight differences in volumes of claimants between the two data sources – for information on the reasons for this, please see **Box 2**.

Table 1 illustrates what information is available by ethnicity through the two dissemination channels.

On the NOMIS website, the ethnicity data are published as a new separate summary data set alongside the usual claimant count data (the data set is called 'Claimant count stocks and flows – ethnicity, age and duration'). It is published as a separate data set because the data are released a month in arrears of the usual claimant count data (due to additional time required for the merging process). The data set excludes clerical claims (similar to the existing 'Age and duration' data set), so totals will not match the headline claimant count figures, which include these non-computerised claims. It also includes data for Great Britain only, as ethnicity data are not available for Northern Ireland (due to the fact that the Labour Market System does not exist there).

On the DWP Tabulation Tool website, the ethnicity data is released within the Work and Pensions Longitudinal Study data sets, as additional variables for the JSA caseload data. In early 2007 it is planned that the ethnicity data will appear on the DWP Tabulation Tool for JSA flows as well. Data on the Tabulation Tool are limited to Great Britain, so do not include Northern Ireland JSA claims; they also exclude clerical claims.

A key difference between the two sources is that the ONS claimant count and DWP 100 per cent JSA data have been produced using slightly different statistical disclosure

Box 2

Explanation of reasons for differences between ONS claimant count and DWP 100 per cent JSA caseload statistics

Both the ONS claimant count and DWP 100 per cent JSA data are measures of the numbers of people claiming JSA. However, there are differences in the statistics published from these two sources.

The difference in overall numbers claiming JSA on the ONS claimant count and DWP 100 per cent data is small (usually less than 20,000 – 2 per cent) and both data sources follow the same trend over time.

The main reason for the disparity between the overall numbers reported on the ONS claimant count and DWP 100 per cent data is timing differences. The count day is different for the two data sources – the ONS claimant count includes JSA claims that are live on the second Thursday of each month, while the DWP 100 per cent data counts live claims on the last day of the month (approximately 19 days apart).

JSA is a benefit with a high rate of on- and off-flow activity, which will result in a difference in overall numbers reported on the two sources and also a difference in individual claimants that appear on each data set.

Other explanatory factors for the difference include retrospection, late terminations, data extraction rules and coverage differences (see the full report via the link below for more details).

It is recommended that, whenever possible, JSA statistics from the ONS claimant count are used. If the information needed is not available from the ONS claimant count, then the DWP 100 per cent data should be used in the first place, or finally the DWP 5 per cent data.

A more comprehensive report into these differences is available on the DWP website at www.dwp.gov.uk/asd/asd1/tabtools/differences.pdf

Table 1
Details of variables available

	ONS claimant count (monthly)	DWP 100 per cent JSA data (quarterly)
Ethnicity summary – 7 groups	✓	✓
Ethnicity full breakdown – 18 groups	✓	✓
Geography (down to local authority/ parliamentary constituency)	✓	✓
Caseloads	✓	✓
Inflows/off-flows	✓	Planned in 2007
Claim duration (for off-flows and caseloads)	✓	
Sex	✓	✓
Age band	✓	✓
Number of children/age youngest child		✓
Average amount of JSA payment		✓
Partner flag		✓

control methods – this will further explain the small difference in volumes between the two data sets.

Analysis

The following section presents a sample of the analysis made possible by the publication of the ethnicity data for JSA claimants.

The ethnic distribution of the claimant count is presented in **Table 2**.

A higher proportion of the ethnic minority working age population in England are claiming JSA compared with the white population (**Table 3**). This finding

reflects the well-known labour market disadvantage faced by ethnic minorities – ILO unemployment rates show ethnic minorities have a higher unemployment rate compared with the overall rate (latest data for spring 2006 show ethnic minorities have an unemployment rate of 11.2 per cent compared with 5.2 per cent overall). Within the ethnic minority population, however, there is considerable variation.

The Black or Black British ethnic group has the highest proportion of their working age population on the claimant count, with 10.2 per cent of the Other Black group on JSA. However, the small numbers in

Table 2
Claimant count by ethnicity, September 2006

Great Britain

		Thousands	Percentage of total
Total		**919.99**	
Total - Ethnic minorities		285.97	*31*
Total - White		**678.31**	*74*
	British	653.88	*71*
	Irish	7.16	*1*
	Other	17.28	*2*
Total - Mixed		**13.88**	*2*
	White and Black Caribbean	6.39	*1*
	White and Black African	2.03	*0*
	White and Asian	1.68	*0*
	Other Mixed	3.79	*0*
Total - Asian or Asian British		**56.57**	*6*
	Indian	17.71	*2*
	Pakistani	21.11	*2*
	Bangladeshi	10.64	*1*
	Other Asian	7.12	*1*
Total - Black or Black British		**60.70**	*7*
	Caribbean	28.38	*3*
	African	25.64	*3*
	Other Black	6.68	*1*
Total - Chinese or Other Ethnic Group		**23.70**	*3*
	Chinese	2.38	*0*
	Other Ethnic Group	21.32	*2*
Prefer not to say		**74.18**	*8*
Unknown		**12.69**	*1*

Source: NOMIS

Table 3
Proportion of resident working age population on claimant count, September 2006

England

		Percentages
Total		*2.5*
Total - Ethnic minorities		*4.4*
Total - White		***2.0***
	British	*2.1*
	Irish	*1.8*
	Other	*1.4*
Total - Mixed		***3.6***
	White and Black Caribbean	*5.5*
	White and Black African	*3.8*
	White and Asian	*1.4*
	Other Mixed	*3.7*
Total - Asian or Asian British		***3.2***
	Indian	*2.1*
	Pakistani	*4.1*
	Bangladeshi	*5.6*
	Other Asian	*3.3*
Total - Black or Black British		***6.7***
	Caribbean	*7.3*
	African	*5.8*
	Other Black	*10.2*
Total - Chinese or Other Ethnic Group		***4.7***
	Chinese	*0.9*
	Other Ethnic Group	*8.7*

Note:

Proportions are calculated by dividing the claimant count by the resident working age population estimates for England, from mid-2004, from an experimental series published by ONS. There is not an exact definitional match between the two series to the extent that claimant count figures show separate categories for those whose ethnicity is recorded as 'prefer not to say' or 'unknown' while population estimates do not.

Source: NOMIS and ONS experimental series

this group cast some uncertainty over this figure. The ethnic group with the most similar claimant count proportion to White residents is the Indian population, with 2.1 per cent of their working age population on JSA. Those ethnic groups with claimant proportions below that of the overall rate are White Irish, White Other, White and Asian, and Chinese.

Figure 1 (overleaf) shows that the same proportion of White, Mixed, and Asian or Asian British JSA claimants in September 2006 had been on JSA for less than six months
(64 per cent). Claimants of Black or Black British ethnicity are more likely to have longer claim durations – 21 per cent of claimants in this ethnic group had been on JSA for over a year (compared with 17 per cent of White claimants).

Further analysis of the duration of claims for the September 2006 caseload shows that Black or Black British claimants have the longest claims – at an average of 35 weeks per claim, compared with 30 weeks for White claimants, and 27 weeks for both Mixed, and Asian or Asian British claimants. Chinese or Other Ethnic Group claimants have an average claim duration of 31 weeks.

A high proportion of both white and ethnic minority 18 to 24 year old JSA claimants flow off JSA within six months, as they enter the Options stage of the mandatory New Deal for Young People. However, **Figure 2 (overleaf)** shows that a lower proportion of ethnic minority JSA claimants aged 18 to 24 flowing off JSA have flowed off after both 6 and 12 months, compared with white claimants (though the gap is smaller after 12 months).

Since the earliest data available, in April 2005, the gap between white and ethnic minority claimants who had flowed off after 6 and 12 months has been decreasing. Over this period, the gap between white and ethnic minorities who had flowed off after 6 months has dropped by 3 percentage points.

Figure 1

Duration of claim for live JSA claims, September 2006

Percentages

Legend: 13 weeks or less | 14 to 26 weeks | 27 to 52 weeks | 53 to 78 weeks | 79 to 104 weeks | over 104 weeks
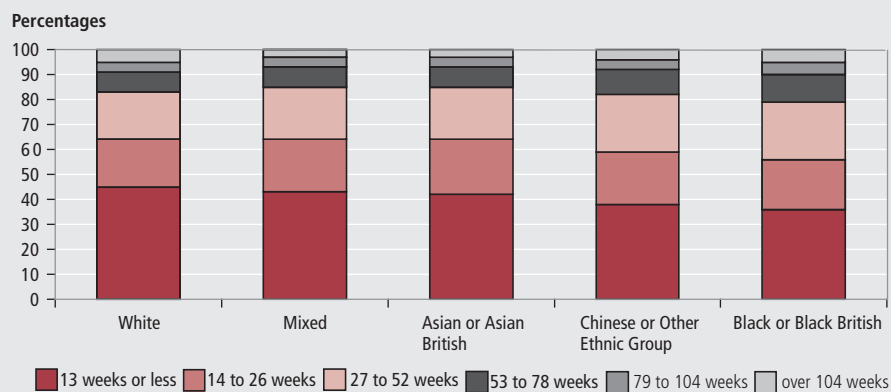
Source: NOMIS

Figure 2

Duration of claims for those 18–24 year olds flowing off the claimant count, by ethnic group
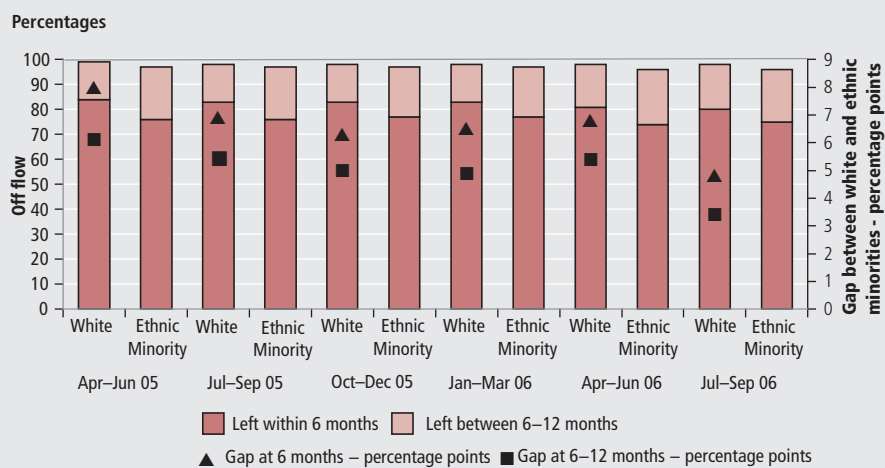
Percentages

Legend: Left within 6 months | Left between 6–12 months | ▲ Gap at 6 months – percentage points | ■ Gap at 6–12 months – percentage points

Source: NOMIS

FEATURE

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Health and Safety Executive

The ageing workforce: A health issue?

SUMMARY

Due to demographic changes, the average age of the working population in the UK is rising. Research shows that physical and mental ability changes with age. There are small differences between the age groups considering their reported ill health across occupations and industries. Workers in administrative professions and sales and customer service occupations are less likely to be affected by work than their overall share in the workforce would suggest. Older employees who are working long hours are less likely to report negative effects on their health than other employees or than the share of employees working these hours. Overall, the data and literature show that similarities between the age groups with respect to their health being affected by work outweigh the differences.

Overall, the population of the UK is ageing. The proportion of the population aged under 16 has been falling from 25 per cent in mid-1971 to 19 per cent in mid-2005.[1] At the same time, the proportion of the population aged over 65 is increasing. Whiting (2005) shows that, in addition, the employment rate of older workers has continuously gone up since 1992. As a result, workers aged 50 and over will increasingly be a defining part of the British labour market (Taylor, 2000).

The probable shortage of younger workers (aged 16 to 54) suggests in particular that the Government will need to encourage increasing numbers of people who are still in the labour market not to retire before they reach their current or future statutory pension age but instead to encourage them to extend the length of their paid working lives beyond current practice. It is therefore a relevant question whether the change in the age structure has an implication for the health and safety of workers.

The July 2002 Treasury report to the European Commission on the UK labour market argued:

> 'As the retired proportion of the population rises, boosting activity rates among those of working age becomes increasingly important. With the share of younger workers set simultaneously to decline, low participation rates at the older end of the age range – which in the context of longer active lives, is no longer as old as it once was – are a luxury the economy cannot afford.'

It is true that by continental European standards, the UK can claim to have a more substantial work participation rate for its over 50s. At present, just over half of all adults aged 55 to 64 in this country are still working in some form of paid employment (Ihlebaek *et al*, 2002). Whiting shows that, in addition, a larger share of older people has left the labour market because of ill health or disability.

Statistics published by the Health and Safety Commission (2006) show that safety at work has improved. The overall number of fatalities has fallen from 339 in 1992/93 to 223 in 2004/05. **Figure 1** shows that, taking into account the expected random variation, the trend is smooth, apart from 1999/2000 and 2000/01.

A similar trend can be observed for serious injuries of workers during their work. The number of non-fatal reportable injuries of employees has fallen from about 180,000 in 1986/87 to 146,000 in 2005/06 (HSE, 2006).

Work-related ill health is more difficult to monitor than injuries and fatalities. The most broadly-based data on ill health are based on self-reporting. In 2004/05, more than 2 million people in Great Britain believed they were suffering from an illness caused or made worse by work (past and current). This is less than the 2.2 million in 2003/04 and 2.3 million in 2001/02 (Jones *et al* 2006).

While more needs to be done to reduce accidents at work, the Government has now focused its attention on ill health at work and the impact of work on wellbeing

Figure 1
Fatal injuries to workers
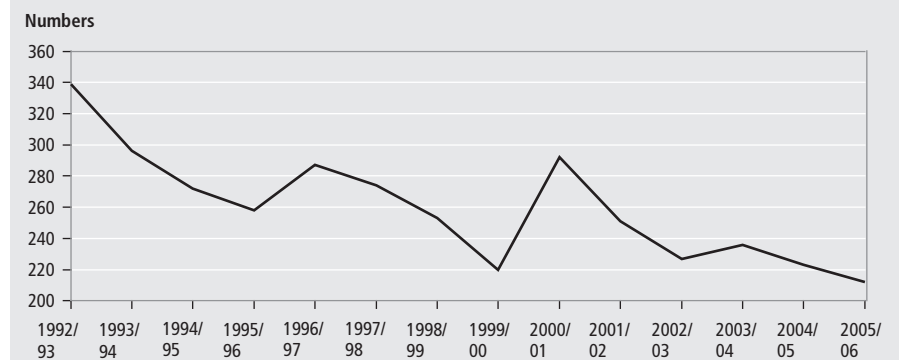
Source: Health and Safety Commission, Statistics of Fatal Injuries, 2005/06

in more general terms. The Department for Work and Pensions, Department of Health and the Health and Safety Executive published jointly 'Health, work and well-being – Caring for our future', a strategy which addresses the issue of the wellbeing also mentioned for the working age population (DWP, 2005).

Given the increasing proportion of older employees, wellbeing of the workforce gains an additional dimension. This article uses the Labour Force Survey (LFS) to describe whether there are particular occupations, industries or work patterns which are related to ill health in the group of older employees.

The ageing population and the UK labour market

The employment rate of older workers has increased over the last decade. This has been shown by various researchers. Despite this, employment rates still fall with increasing age (DWP, 2006). The Government aims to increase the participation of older workers in the labour market even further. A number of papers, including Hotopp (2005), show that the determinants of the increase in the employment rate of these workers are complex. They include the ethnic mix of the workforce, the change in behaviour of members of ethnic minorities and women,

and changes in gross domestic product.

Work by Metcalf and Meadows shows that some employers consider age as one of the determinants of suitability for particular jobs. Characteristics such as reliability and skills were also mentioned by employers. Ill health was not mentioned as a negative factor in the employment of older workers.

Taylor collected data of sickness absence by age group as one indicator for health for 1992 and 2000.

Table 1 shows that older workers are less likely to take time off work than younger workers.

Ageing and health: physical impacts

The effects of ageing on health and the ability to work are not straightforward. Work published in Eurohealth (2004) shows that any of the musculoskeletal problems are considered to be an inevitable part of ageing. A French cohort study by Cassou et al (2002) of about 21,000[2] individuals shows that incidence and prevalence of chronic neck and shoulder pain increases with age, especially in women. The authors argue that the age effects can be explained by the normal ageing process and the accumulation of years working in situations which have this negative impact on workers' health. Prevalence (men 7.8 per cent, women 14.8 per cent in 1990) and incidence

(men 7.3 per cent, women 12.5 per cent for the period 1990 to 1995) of chronic neck and shoulder pain increased with age, and were more frequent among women than men in every birth cohort. At the same time, the remission rate of chronic neck and shoulder pain decreased with age. Some adverse working conditions (repetitive work under time constraints, awkward work for men, and repetitive work for women) contributed to the development of these disorders, independently of age.

Ilmarinen (2001) highlights the reduction in lung capacity with increase in age as an additional problem. This leads to a reduction in the ability to do physical work. On the other hand, there does not seem to be evidence for a reduction in the mental functioning. Instead, there appears to be even some evidence for an increased capacity of mental functioning with age. The resulting recommendation is that physical work should decline with age while mental work could increase. This pattern requires active age management.

Psychosocial factors seemed to play a role in both the development and disappearance of chronic neck and shoulder pain. The following section looks in more detail at the psychological effects.

Ageing and health: psychological impacts

In addition to musculoskeletal disorders, a Swedish quantitative study has found some links between age and psychosomatic health problems. Akerstedt et al (2002) considered sleep disturbances and their relationship to age. They used a number of indicators for the quality and quantity of sleep including experiencing 'Disturbed sleep', being 'Not rested' and 'Difficulties awakening'. While the experience of being 'Not rested' and 'Difficulties awakening' at first increases with age (up to the age of 45), it then decreases for the following age group. The probability of suffering from disturbed sleep increases with age over all three age groups in this study. Disturbed sleep seemed to be particularly affected by the inability to stop thinking about work, high work demands and low decision latitude.

Neary's (2000) study of university staff and stress identifies a large number of causes for stress. These include lack of understanding and leadership, poor overall management, and job insecurity. The last cause affected older workers particularly. Looking at different age groups, work by Smith (2000) has indicated that occupational stress is particularly associated with a number of characteristics: being aged

Table 1
Sickness absence in the last 12 months, 1992 and 2000

Percentages

Age	Year	Never	One	Twice	3 to 5	6 to 10	over 11
20–29	1992	32.2	28.1	21.2	5.3	2.0	1.2
	2000	34.8	26.7	20.1	13.6	3.4	1.2
30–39	1992	42.1	29.7	16.9	9.0	1.1	1.0
	2000	39.2	28.6	21.5	9.2	0.9	0.5
40–49	1992	49.0	29.9	13.0	6.4	0.9	0.8
	2000	43.6	31.6	17.6	5.2	0.6	1.3
50–60	1992	53.1	25.9	21.6	6.9	0.5	0.8
	2000	48.1	33.4	10.8	5.4	1.2	0.9

Source: Tayler R (2000)

41 to 50; divorced/separated or widowed; educated to degree level; in full-time work; earning over £20,000 per year; and being employed in teaching, nursing, professional or managerial positions.

Employment patterns and age

Before considering in detail the questions concerning health issues, this section describes the data with respect to age, occupation, industry and hours worked.

This article uses the LFS (winter 2004/05 except where stated otherwise). The LFS contains an element of self-reported ill health caused by work or made worse by work, referred to as SWI. HSE publishes the results of the SWI annually on its website.[3] The LFS, as used by HSE statisticians, has been adjusted to reflect the non-response rates for health-related questions. It only uses responses from people who are older than 16 and have ever worked. Details can be found on the HSE website.

The article mainly compares data for two age groups: those between 16 and 54 ('younger' workers), and those above 54 years ('older' workers).

Figure 2 shows the share of seven age groups in all employees for the three periods for which the SWI in its current form is available. People aged 35 to 44 form 26 per cent of employees. The smallest group are those above 64, followed by employees between 55 and 64. Over the three years considered here, there is a small increase in the share of older workers and a reduction in the share of younger workers between 25 and 34.

Looking at employment rates of older workers over a longer time period, the picture is different. Over time, the employment rates of older workers – men and women – have increased. In 1993, 38 per cent of males were employed compared with 44 per cent in 2004. The rates for females were 23 per cent in 1993 and 30 per cent in 2004 (Hotopp, 2005).

Distribution over occupations

Figure 3 shows the average distribution of employees by age group and all employees (total) across professions.

Comparing the bars for the 55 plus group with the total shows that older workers are over-represented in skilled trades and occupations, process, plant and machine operatives and elementary occupations. They are under-represented in associate technical and professional occupations and sales and customer service occupations. This difference in the share of older workers may be driven by changes in the focus of the

economy and education. Younger workers are more likely to work in occupations which include the use of IT, or which are service focused, such as sales and customer service occupations.

Distribution over industry

Accidents and ill health vary between industries. It is therefore important in the context of age and health to consider the distribution of the two age groups over the industries. **Figure 4** is structured in a similar way to Figure 3, considering the distribution of employees by age and in total.

The aggregation of electricity, gas, water

supply and construction, as well as the primary industries, was necessary to ensure that cell sizes were not too small once the additional variable for ill health was included.

The differences between the age groups are small. Where some difference can be observed, older workers are less likely to work in hotel and retail – a difference of three percentage points.

Distribution of hours worked

The last variable used for both surveys is the number of hours worked. The HSE enforces the maximum weekly working time part of

Figure 2
Share of age group in total employment

Figure 3
Distribution over occupations: by age, 2004/05

Figure 4
Distribution over industry: by age, 2004/05
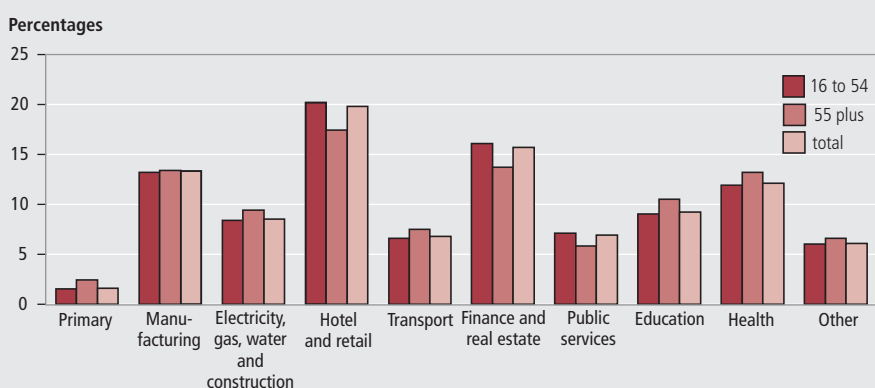
the Working Time Directive and therefore takes a particular interest in hours worked. One of the regulation's objectives is to promote health and safety, given that some evidence shows that people who work long hours are more at risk to have accidents or injuries (ETUC, 2006).

Figure 5 represents the distribution of the two main age groups and the total of employees over hours worked for 2004/05. Hours worked in this context means usual hours worked per week including overtime.

Older workers are more likely to work part time and less likely to work long hours. The main difference between the age groups is the share of older employees working between 20 and 29 hours – 11 per cent of older employees compared with 8 per cent of younger employees; 42 per cent of older employees work between 40 and 49 hours, compared with 48 per cent of younger employees.

Health and age

This article is mainly concerned with employees' health in relation to their age. Detailed results from SWI, the survey of self-reported work-related illness in 2004/05 have recently been published. The question asked of individuals during the survey is: Whether in past 12 months [the respondent], has suffered any (other) illness, disability or physical or mental problem caused or made worse by job or work done in the past.

Jones *et al* (2006) report that older workers up to retirement age are more likely to report an illness caused by work or made worse by work than younger workers. Looking at the prevalence of work-related ill health in more detail, the LFS[4] shows that ill health increases among those who were ever employed from 2.5 per cent for the youngest age group (16 to 24) to 8.5 per cent for those just before pension age. It then falls again for age groups above pension age. **Table 2** provides some detailed information over the three years available.

This pattern may suggest a selection bias due to retirement, leaving only those in work who are in comparatively good health for their age.

Industrial sectors and health affected by work

Figure 6 compares the distribution of workers whose health has been affected by work over the two main age groups considered, with the distribution of all employees across industries irrespective of their health (total).

Education and health are the two sectors where the share of employees whose health

Figure 5
Distribution over hours worked: by age, 2004/05
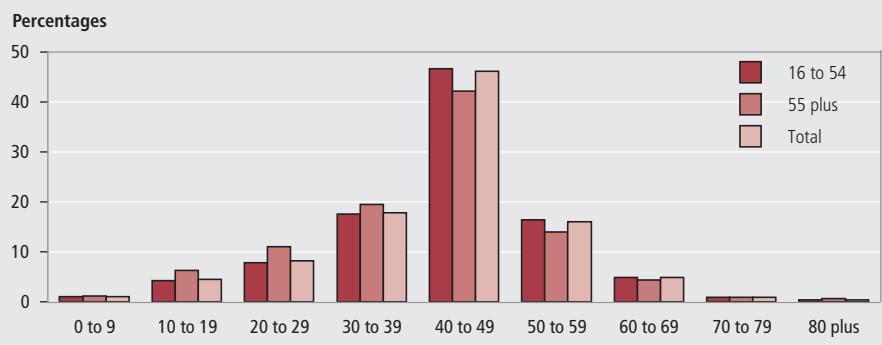
Percentages

Table 2
Those with self-reported illness reporting it was caused or made worse by work: by age

Percentages

	2001/02	2003/04	2004/05
16–24	2.5	2.3	1.7
25–34	4.4	4.1	3.6
35–44	5.3	5.1	4.5
45–54	6.9	6.6	6.1
55–SPA	8.5	8.0	7.3
SPA–74	5.4	5.8	5.2
75+	3.7	3.7	3.3
Total	5.3	5.2	4.7

Source: Self-reported work-related illness in 2004/05: results from the Labour Force Survey

Figure 6
Employees' illness caused or made worse by work: by age, in comparison with all employees, 2004/05

Percentages
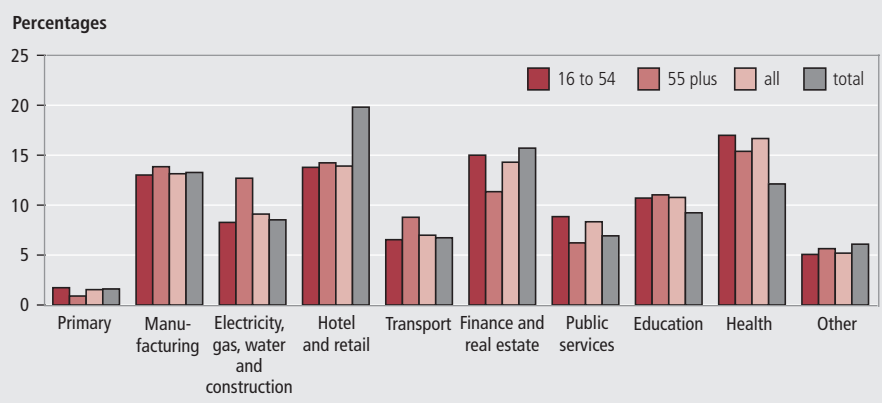
is affected by work is comparatively high. While about 12 per cent of all employees work in the health sector, 17 per cent of those between 16 and 54 who are affected by work are employed in this sector and 15 per cent of those aged 55 and over.

Hotel and retail, where about 20 per cent of all employees work, is under-represented with 14 per cent of younger and older employees reporting health effects.

Occupations and self-reported work-related ill health

Figure 7 gives a similar comparison as Figure 6 for industries, that is, it compares the distribution of employees affected

by work in the two age groups over occupations and compares this with the distribution of all employees with (all) and without health effects (total).

Figure 7 shows that more than 18 per cent of younger employees whose health has been affected work are associate professionals and in technical occupations. Overall, only 14 per cent of this age group work in this profession. Older employees whose health has been affected by work are more likely to work as process, plant and machine operatives than the overall share of this occupation would have suggested. This reflects the distribution of older employees over occupations (see Figure 3).

Figure 7
Employees' illness caused or made worse by work: by age, in comparison with all employees, 2004/05

Percentages
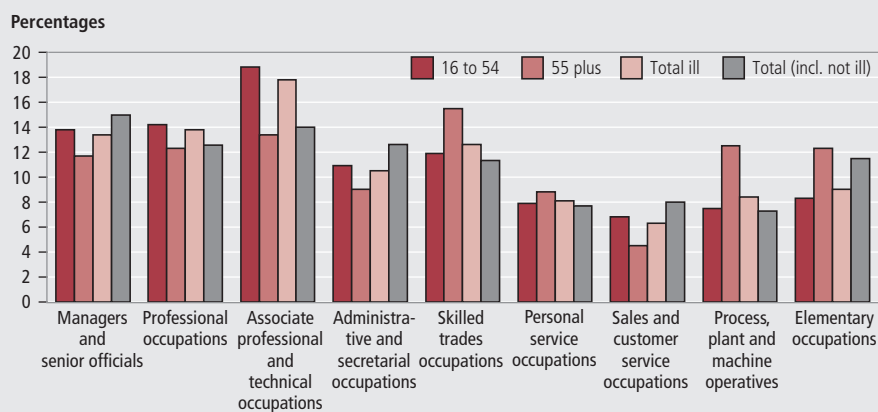
Figure 8
Employees' illness caused or made worse by work over hours worked, in comparison with all employees, 2004/05

Percentages
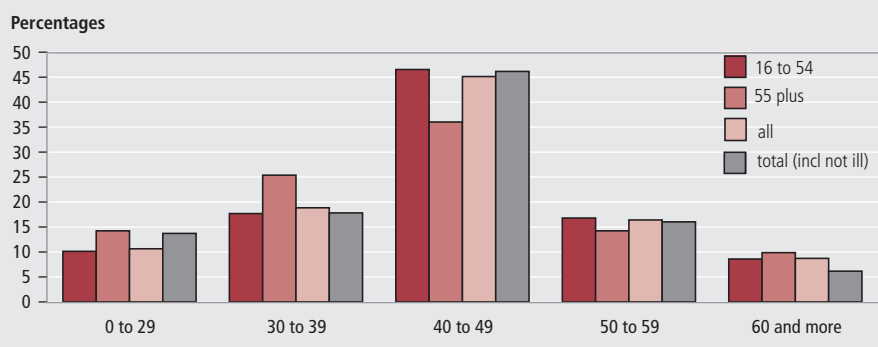
Self-reported ill health and hours worked

Long hours are often quoted as a reason for illness. In the following section, self-reported ill health, affected by work of different age groups, depending on the hours worked, is considered. As before, **Figure 8** compares the distribution of workers in different age groups over hours worked. Compared with Figure 5, some of the bands of hours have been aggregated to ensure sufficiently large cell sizes.

Those older employees who are working between 40 and 49 hours are less likely to report a health effect, while those who work up to 39 hours are more likely than others to express an impact of work on health. There may be a causal relationship – those whose health has been affected are no longer able to work 40 to 49 hours, leading to a higher share than the total share of employees working these hours.

Conclusion

Overall there is no evidence that older workers are more likely to have their health affected by work than younger workers.

An in-depth analysis of patterns of work-related ill health by two main age groups over industry, occupation and hours worked, shows that, in some of these subgroups, older workers are more likely to report work-related illness while in others they are less likely. The literature review has shown evidence that long-term cumulative effects of work positions on musculoskeletal conditions could be one cause for these patterns.

Longer hours do not appear to have a negative impact on the health of older employees, compared with younger ones; there are, however, significantly fewer older employees who work more than 40 hours a week than there are younger ones.

On the face of these results one could conclude that an increase in the number of older workers should not lead to concerns for the health of the UK workforce. But this conclusion would ignore the fact that a significant share of people in the over 55 age group has retired or moved onto different forms of benefits. Further research is needed to assess whether ill health caused by work induces workers above the age of 55 to leave the labour market.

Notes

1 Details are available at www.statistics.gov.uk/cci/nugget.asp?ID=949
2 21,378 individuals participated in 1990; 18,695 were again interviewed in 1995.
3 HSE uses particular weights in the analysis of the LFS; these have been applied here.
4 Prevalence: number of ongoing cases of ill health within the last 12 months. Incidence: number of new cases in the last 12 months. This article includes prevalence only. For more detail see Jones, Huxtable and Hodgson, 2006.

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Understanding statistics on full-time/part-time employment

SUMMARY

The Labour Force Survey (LFS) is the principal source of statistics on full-time and part-time employment, which labour market analysts often regard as a convenient shorthand measure of working patterns and labour input.

This article explains how full-time/part-time status is defined in the LFS and other sources; summarises recent LFS statistics on full-time/part-time employment; and highlights issues that users need to be aware of when interpreting these statistics. It also gives an overview of hours of work concepts, including actual hours worked, usual hours of work and paid hours.

Statistics on hours of work provide a more complete picture of the volume and nature of employment than can be obtained solely by measuring the number of people who have a job. Actual weekly hours of work statistics are used to measure the volume of labour input while usual weekly hours of work statistics are used to measure working patterns. The Labour Force Survey (LFS) is the principal source of both actual and usual weekly hours of work statistics. The Office for National Statistics (ONS) also produces statistics on full-time and part-time employment from the LFS, which labour market analysts often regard as a convenient shorthand measure. For example, the LFS full-time/part-time employment statistics are often used to assess whether changes in overall employment levels reflect changes in the number of people working a full week or less than a full week, and to compare the working patterns of different subgroups of the workforce. This article first summarises recent LFS statistics on full-time/part-time employment, then highlights issues that users need to be aware of when interpreting these statistics. An overview of the hours of work concepts mentioned in the article is given in **Box 1** overleaf.

Trends in full-time/part-time employment

The LFS is the principal source of statistics on full-time and part-time employment. The headline LFS statistics (published in Table 3 of the Labour Market Statistics First Release) indicate that the upward trend in total employment in recent years reflects increases in both full-time and part-time employment. Over the period March 1992 to August 2006, the full-time employment level increased by 10 per cent while the part-time employment level increased by 23 per cent (see **Figure 1** on page 38).

Part-time employment accounted for 25 per cent of total employment in June–August 2006, an increase of 2 percentage points since March–May 1992. The part-time employment rate (part-time as a percentage of total employment) was higher for self-employed women (50 per cent) and for female employees (42 per cent) than for their male counterparts, although part-time employment has increased among male workers in recent years. In June–August 2006, 13 per cent of self-employed men and 10 per cent of male employees were in part-time employment, an increase of 6 percentage points and 4 percentage points respectively since March–May 1992 (see **Figure 2** on page 38).

Box 1

Overview of hours of work concepts

ONS produces three main types of hours of work statistics: actual hours worked, usual hours of work and paid hours. They each measure a different concept and serve different purposes.

Actual hours worked

Actual hours worked statistics measure how many hours were actually worked in a particular reference period. They provide a more complete picture of the volume of employment than can be obtained solely by measuring the number of people in work or the number of jobs in the economy. Actual hours worked statistics are directly affected by changes in the number of people in employment and the amount of hours that individuals work. They can also be affected by bank holidays, sickness and other absences during the reference period. The Labour Force Survey (LFS) is the principal source of statistics on actual hours worked. The headline LFS actual hours worked statistics, published in Table 7 of the Labour Market Statistics First Release, are:

Total actual weekly hours worked

The total number of hours actually worked in the survey reference week, by all in employment, in main and second jobs, including paid and unpaid overtime and excluding meal breaks. The LFS total actual weekly hours worked statistics are used as an indicator of how well the economy is performing and as a labour input measure in productivity models. Calculating productivity per hour, rather than productivity per head, enables comparisons that are less affected by changes in employment composition. For example, an increase in part-time working can result in an increase in the total number of people in employment, while the total number of hours worked in the economy is unchanged.

Average actual weekly hours worked

The mean number of hours worked in the reference week, by all in employment, in main and second jobs, including paid and unpaid overtime and excluding meal breaks. The LFS average actual weekly hours statistics are used to monitor changes in the economic cycle. An increase in average actual hours worked can signal an upturn in the economy before an increase in employment.

Usual hours of work

Usual hours of work statistics measure how many hours people usually work in a given period (typically, usual hours per week).

Compared with actual hours worked statistics, they are less affected by events such as bank holidays, sickness and other absences. In this respect, they provide a better measure of working patterns. They are used to assess whether growth in employment stems principally from growth in the number of people working a full week, or only a few hours a week. They are also used to compare working patterns among different subgroups of the workforce. The LFS is the principal source of statistics on usual hours of work. The headline LFS usual hours of work statistics, published in Table 8 of the Labour Market Statistics First Release, are:

Usual weekly hours of work

The total number of hours people usually work per week in their main job, including paid and unpaid overtime, for all in employment. The LFS usual hours of work statistics are used to analyse working patterns in more detail than is available from a simple full-time/part-time split.

Paid hours

Paid hours statistics measure the number of hours that employees were paid to work in a particular reference period. Since they are mainly used to calculate employees' hourly earnings, they measure the number of hours that employees were paid to work during the reference period, regardless of whether they actually worked those hours, or whether they usually work those hours. The Annual Survey of Hours and Earnings (ASHE), a business survey, is the principal source of paid hours statistics. The headline ASHE paid hours statistics, published in the ASHE First Release are:

Median weekly paid hours

The median number of total weekly paid hours (that is, hours paid at the basic rate plus paid overtime hours), for employees on adult rates of pay whose pay was not affected by absence during the pay period.

Paid overtime hours

The percentage of employees who worked paid overtime hours during the pay period, and their median paid overtime hours, for employees on adult rates of pay whose pay was not affected by absence during the pay period.

A breakdown by occupation (based on results from the LFS microdata) indicates that in April–June 2006, part-time employment was more common among women than men across all of the major occupation groups. The part-time employment rate was particularly high for women in elementary occupations, at 71 per cent, compared with 24 per cent for men in elementary occupations. The rate was much lower for women in managerial occupations (20 per cent) but this compares with a figure of only 4 per cent for men in this occupation group (see **Figure 3** on page 40).

The headline LFS statistics on actual weekly hours of work in main jobs by full-time/part-time status (published in Table 7 of the Labour Market Statistics First Release) indicate that the average number of hours actually worked in full-time main jobs in the survey reference week decreased by 1 hour (3 per cent) over the period March 1992 to August 2006, while the average actual weekly hours worked in part-time main jobs increased by 1 hour (7 per cent). In June–August 2006, the average number of hours actually worked in full-time main jobs was 37.2 hours, compared with 15.6 hours for part-time main jobs.

There are three main issues that users need to be aware of when interpreting these statistics, as described below under the following headings:

- definition of full-time/part-time status
- diversity of working patterns
- workers with second jobs

Definition of full-time/part-time status

Although the LFS is the principal source of statistics on full-time and part-time employment, a full-time/part-time split is also available for statistics on employee jobs and earnings that are produced from

Figure 1
Full-time and part-time employment levels,[1] March 1992 to August 2006, seasonally adjusted
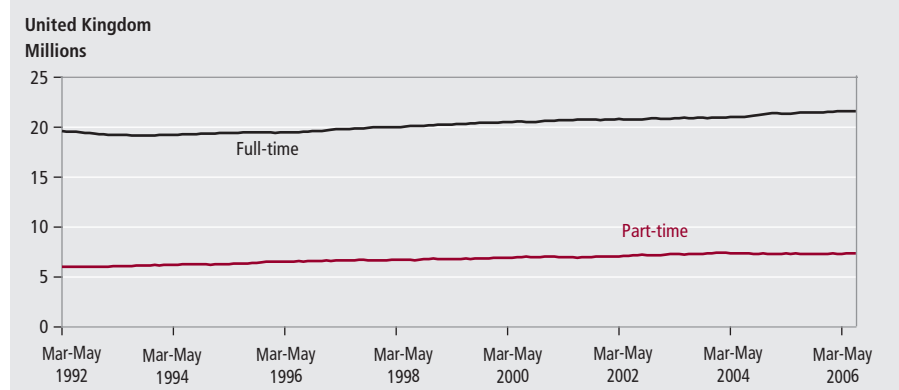
United Kingdom
Millions

1 The LFS full-time/part-time split is based on respondent self-classification.
Source: Labour Force Survey.

Figure 2
Part-time employment rates,[1] employees and the self-employed, by sex, March 1992 to August 2006, seasonally adjusted

United Kingdom
Percentages
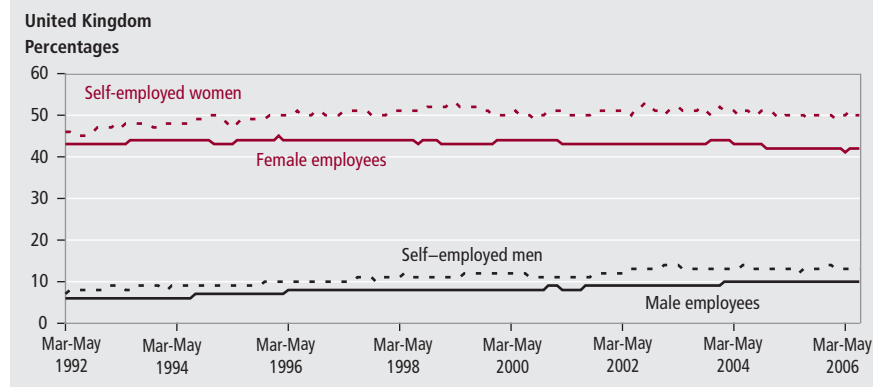
1 Part-time employees/self-employed as a percentage of all employees/self-employed. The LFS full-time/part-time split is based on respondent self-classification.
Source: Labour Force Survey

business surveys and other sources. While most of the other ONS sources use an hours of work threshold to distinguish between full-time/part-time status, the Statistical Office of the European Union (Eurostat) requires the LFS full-time/part-time split to be based on respondent self-classification (see **Box 2** overleaf).

The self-classification method of determining full-time/part-time status can make it difficult to interpret full-time/part-time employment statistics because individuals could classify their job as full-time/part-time according to a variety of criteria. Employees (particularly those with contracted hours of work) may tend to classify their full-time/part-time status based on whether their employer describes their job as being full-time or part-time. The full-time/part-time threshold may vary between organisations and it is likely to be based on the basic or contracted hours of the job rather than taking into account any paid

or unpaid extra hours the employee usually works. Other workers may classify their full-time/part-time status based on their total usual weekly hours of work (including any paid or unpaid extra hours they usually work); based on the norms within their occupation or industry; by comparing their own hours of work against the hours worked by colleagues, friends or relatives; or by comparing their current hours of work against the hours they used to work in the same or a previous job. Differences in part-time employment rates between subgroups of the workforce could therefore simply reflect differences in the way that individuals in those subgroups interpret the concept of part-time work. Also, if different subgroups tend to interpret part-time work in different ways, then changes in full-time/part-time employment levels (and in average actual hours worked in full-time/part-time jobs) could reflect changes in the composition of the workforce. This issue can be explored

by comparing results from the LFS full-time/part-time question with results from separate questions about usual weekly hours of work.

As well as asking people whether their main job is full-time or part-time, the LFS asks people how many hours they usually work per week in their main job excluding any paid or unpaid overtime; whether they ever work paid or unpaid overtime; and how many paid and unpaid overtime hours they usually work. It is therefore possible to compare results from the self-classified full-time/part-time question against the results for 'basic' usual weekly hours of work (excluding paid and unpaid overtime) or against the results for 'total' usual weekly hours of work (including paid and unpaid overtime). Although some respondents may classify their full-time/part-time status according to their basic usual weekly hours of work (particularly employees whose employer defines their job on this basis), their total usual weekly hours of work provide a more complete picture of their working pattern. The following analysis therefore focuses on total usual weekly hours of work, rather than basic usual weekly hours of work. The analysis is based on results from the LFS microdata.

The distributions for total usual weekly hours of work in full-time and part-time main jobs demonstrate that the self-classified full-time/part-time categories each cover a considerable range of hours of work, and the two categories overlap to a small degree. In April–June 2006 the usual weekly hours of work for people who classified their main job as part-time ranged from 1 to 40 hours, while the hours of work for people who classified their main job as full-time ranged from 16 to 97 hours (the maximum value that can be recorded in the LFS total usual weekly hours variable). These results include outliers (people who work exceptionally few or exceptionally long hours). The distributions by percentile indicate that 90 per cent of part-time jobs were within the range 5 to 32 hours, while 90 per cent of full-time jobs were within the range 34 to 60 hours. At the aggregate level, the degree of overlap between the full-time/part-time categories is small. Most people who classified their job as being part-time worked 30 hours or less per week (94 per cent) and most people who classified their job as being full-time worked more than 30 hours (96 per cent).

A breakdown of usual weekly hours of work for full-time and part-time main jobs by occupation and sex indicates that different subgroups may have different perceptions of whether their job is full-time

Box 2

Definitions of full-time/part-time status

The Labour Force Survey (LFS) full-time/part-time split is based on respondent self-classification. Respondents are asked whether they work full-time or part-time in their main job. Interviewers are instructed to let the respondent decide how to classify their job and not to give them a definition of full-time or part-time. However, if a respondent classifies their main job as part-time and then says, in answer to a subsequent question about their usual hours of work, that they usually work more than 40 hours per week in their main job (excluding overtime and meal breaks) a validation check is triggered and their status is reclassified as full-time. A similar validation check is triggered if a respondent classifies their status as full-time but later says that they usually work fewer than 16 hours per week in their main job, in which case their status is reclassified as part-time. People on college-based government employment and training schemes are, by convention, classified as being in part-time employment.

Most other ONS sources use an hours of work threshold to distinguish between full-time and part-time status. The thresholds are based on either contracted hours of work, usual hours of work, or basic paid hours and the boundary between full-time/part-time status varies between sources.

ASHE defines part-time as basic weekly paid hours less than 25 for teachers and academics, and 30 or less for other occupations. Basic weekly paid hours refers to the weekly average number of hours paid at the basic rate of pay during the pay period that includes the survey reference date. Employers are instructed to include all of the employee's guaranteed hours, even if not actually worked. The length of the pay period over which basic weekly paid hours are averaged can vary between organisations and between individual employees.

The Annual Business Inquiry defines part-time employees as those contracted to work fewer than 30 hours per week.

The Short-Term Employment Surveys define part-time employees as those contracted to work 30 or fewer hours per week.

The Quarterly Public Sector Employment Survey defines part-time employees as those working fewer than the organisation's normal working hours.

In the 2001 Census results, part-time workers were defined as those who usually work 30 or fewer hours in their main job.

These differences between sources reflect the fact that there is no internationally standard definition of full-time/part-time status. The Statistical Office of the European Union (Eurostat) requires the LFS definition of full-time/part-time status to be based on respondent self-classification. The EU Regulations covering statistics on earnings and labour costs define part-time workers as those whose regular working hours are less than the collectively agreed or customary hours worked in the enterprise. The Regulations covering structural business statistics define part-time workers as those whose usual weekly hours of work are less than what is regarded as a standard full-time working week in the Member State, region, industry or unit in question. The EU takes the view that it is impossible to establish an exact distinction between full-time and part-time work because working practices vary between countries and between industries.

or part-time, in relation to their hours of work. Overall, only 4 per cent of people who classified their main job as full-time worked 30 hours or less per week, but the equivalent figure for some groups was much higher than this. For example, 15 per cent of women with a full-time job in the elementary occupations group worked 30 hours or less per week. The equivalent figure for men in elementary occupations was 4 per cent. Similarly, although only 6 per cent of people who classified their main job as part-time worked more than 30 hours per week, this figure varied between different occupation groups. For example, 12 per cent of women and 9 per cent of men with a part-time job in the managerial and professional occupations groups worked more than 30 hours per week (see **Table 1**).

An analysis of the average usual weekly hours of work for full-time and part-time main jobs provides further evidence of variation between different subgroups of the workforce. In April–June 2006, the average (mean) usual weekly hours for men who classified their job as full-time was higher than the average for women with a full-time job (45 and 40 hours respectively). Self-employed people with a full-time job worked more hours per week on average than employees with a full-time job (48 and

Table 1

Percentage of 'full-time' main jobs where total usual weekly hours is 30 or less, and percentage of 'part-time' main jobs where total usual weekly hours is more than 30, by occupation and sex,[1,2] April to June 2006, not seasonally adjusted

United Kingdom
Percentages

		Men	Women	Total
Percentage of 'full-time' jobs where usual weekly hours = 30 hours or less:				
1	Managers and senior officials	1	3	2
2	Professional occupations	2	3	2
3	Associate professional and technical	2	4	3
4	Administrative and secretarial	2	4	4
5	Skilled trades occupations	2	12	2
6	Personal service occupations	6	14	13
7	Sales and customer service occupations	5	7	6
8	Process plant and machine operatives	2	6	2
9	Elementary occupations	4	15	7
	Total	**2**	**6**	**4**
Pecentage of 'part-time' jobs where usual weekly hours = more than 30:				
1	Managers and senior officials	9	12	11
2	Professional occupations	9	12	11
3	Associate professional and technical	5	10	9
4	Administrative and secretarial	4	6	6
5	Skilled trades occupations	6	4	5
6	Personal service occupations	9	7	7
7	Sales and customer service occupations	3	4	4
8	Process plant and machine operatives	8	5	6
9	Elementary occupations	4	3	3
	Total	**5**	**6**	**6**

1 Total usual weekly hours of work in main jobs including paid and unpaid overtime.
2 The LFS full-time/part-time split is based on respondent self-classification.
Source: ONS Labour Force Survey

Table 2
Average usual weekly hours of work in main jobs, by full-time/part-time status,[1,2] April to June 2006, not seasonally adjusted

United Kingdom
Average hours

		Full-time			Part-time		
		Men	Women	Total	Men	Women	Total
Employees							
1	Managers and senior officials	46	43	45	21	23	23
2	Professional occupations	44	44	44	19	21	21
3	Associate professional and technical	42	40	41	19	22	21
4	Administrative and secretarial	40	38	39	18	20	20
5	Skilled trades occupations	44	40	43	20	20	20
6	Personal service occupations	41	38	39	20	20	20
7	Sales and customer service occupations	41	38	39	16	18	17
8	Process plant and machine operatives	45	41	45	20	20	20
9	Elementary occupations	43	38	42	16	15	16
	Total	**44**	**40**	**42**	**18**	**19**	**19**
Self-employed							
1	Managers and senior officials	52	48	51	16	18	17
2	Professional occupations	48	43	47	17	18	18
3	Associate professional and technical	47	40	45	17	17	17
4	Administrative and secretarial	45	40	42	16	15	15
5	Skilled trades occupations	47	44	47	20	19	20
6	Personal service occupations	47	44	44	16	18	18
7	Sales and customer service occupations	53	42	49	15	13	13
8	Process plant and machine operatives	48	45	48	22	19	21
9	Elementary occupations	43	42	43	19	15	16
	Total	**48**	**44**	**47**	**18**	**17**	**17**
All in employment[3]							
1	Managers and senior officials	47	43	46	18	22	21
2	Professional occupations	45	44	45	18	21	20
3	Associate professional and technical	43	40	42	18	21	20
4	Administrative and secretarial	40	38	39	17	20	20
5	Skilled trades occupations	45	41	45	20	20	20
6	Personal service occupations	42	39	39	19	20	20
7	Sales and customer service occupations	41	38	40	16	17	17
8	Process plant and machine operatives	46	41	45	21	20	20
9	Elementary occupations	43	39	42	16	15	16
	Total	**45**	**40**	**43**	**18**	**19**	**19**

1 Average (mean) usual weekly hours of work in main jobs, including paid and unpaid overtime.
2 The LFS full-time/part-time split is based on respondent self-classification.
3 Includes employees, the self-employed, unpaid family workers and people on Government employment and training programmes.
Source: ONS Labour Force Survey

Figure 3
Part-time employment rates,[1] by occupation and sex, April to June 2006, not seasonally adjusted

United Kingdom
Percentages

1 Part-time as a percentage of total employment. The LFS full-time/part-time split is based on respondent self-classification.
Source: Labour Force Survey

45 hours), while managers and senior officials with a full-time job worked more hours than those in other occupations. The average usual weekly hours of work for men and women who classified their main job as part-time were reasonably close (18 and 19 hours respectively), but in most occupation groups employees with a part-time job worked more hours per week on average than self-employed people with a part-time job (see **Table 2**). The median values for usual weekly hours of work (which are less affected by outliers than the mean values are) show a similar pattern of differences between subgroups. For example, the median hours of work for men and women with a full-time job were 42 and 39 hours respectively, and the median hours for employees and self-employed people with a full-time job were 40 and 45 hours respectively. The median hours for managers and senior officials with a full-time job were 45 hours compared with 40 hours for the workforce as a whole.

The general pattern of results described above is broadly consistent over time, but there is evidence of a shift in the relationship between the self-classified measure of full-time/part-time status and usual weekly hours of work. Over the period 1992 to 2006, the average (both mean and median) usual weekly hours of work for people who classified their main job as full-time decreased by 1 hour, while the average for part-time main jobs increased by 2 hours. The shift was more pronounced for the self-employed subgroup, where the average hours for those with a full-time job decreased by 5 hours over the period 1992 to 2006. A shift in the relationship between full-time/part-time status and usual weekly hours of work is also evident when the headline full-time/part-time employment levels are compared with the headline LFS total usual weekly hours statistics. Over the ten years to 2002, the number of people who classified their main job as full-time is relatively close to the number who said they usually work more than 30 hours per week in their main job, but from 2003 onwards the two series diverge. In other words, the number of people who classified their job as full-time increased at a faster rate than the number of people who worked more than 30 hours per week. Conversely, the number of people who classified their main job as part-time increased at a slower rate than the number of people who worked fewer than 30 hours per week (see **Figure 4**).
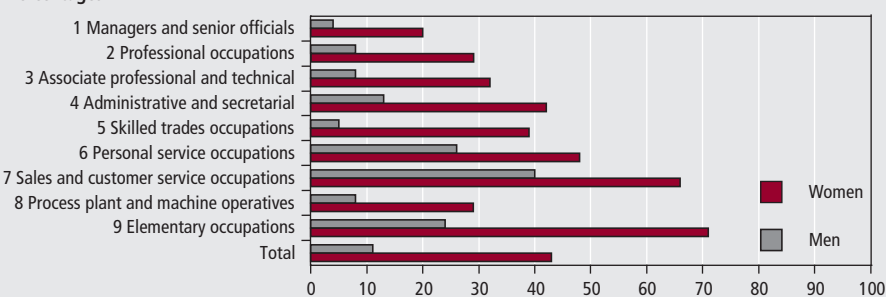
Diversity of working patterns

The analysis presented above illustrates that the self-classified full-time/part-time categories each cover a range of hours of work and there is an overlap between the two categories. In other words, there is evidence that some people who regard their job as being full-time work fewer hours per week than others who regard their job as part-time. Similarly, some people who regard their job as being part-time work more hours than others who regard their job as full-time. An alternative full-time/part-time split based on a usual weekly hours of work threshold would avoid an overlap between the two categories but it would still not capture the diverse range of working patterns that exist within the workforce. The headline LFS statistics on total usual weekly hours of work (published in Table 8 of the Labour Market Statistics First Release) are more useful in this respect since the figures are broken down into five categories. Alternative categories can be produced from the LFS microdata. The headline statistics indicate that in June–August 2006, only 2 per cent of the workforce worked fewer than 5 hours per week in their main job, while 7 per cent

worked between 5 and 15 hours, 18 per cent worked 16 to 30 hours and just over a half (53 per cent) worked 31 to 45 hours per week. A fifth of the workforce (20 per cent) worked over 45 hours per week in their main job. This proportion was 4 percentage points lower than in March–May 1992 (see **Figure 5**).

Workers with second and subsequent jobs

The LFS statistics on part-time employment are often misinterpreted as measuring the number of 'part-time workers' or the number of people who 'work part-time'. Analysts often describe the statistics in this way for the sake of brevity but, strictly speaking, this is incorrect because the LFS full-time/part-time split covers main jobs only. Some individuals who appear in the part-time employment figures may have two or more jobs in which they work as many hours per week in total as other individuals who appear in the full-time employment figures.

Results from the LFS microdata indicate that in April–June 2006, 3 per cent of people who classified their main job as full-time and 7 per cent of those who classified

their main job as part-time had a second job in the reference week. The proportion of people with a part-time main job who had a second job varied between different occupation groups. For example, 12 per cent of people with a part-time main job in the professional occupations group had a second job, compared with the average of 7 per cent for all occupations (see **Table 3**).

LFS interviewers are instructed that if a respondent has more than one job they should let the respondent decide which one is their main job, but if they are unable to decide, then the job in which they usually work the most hours should be regarded as their main job. Although the LFS asks people how many hours they actually worked in their second job in the survey reference week, it does not ask about usual weekly hours of work in second jobs, nor does it collect any information about third or subsequent jobs. Therefore, it is not possible to calculate how many hours people with two or more jobs usually work per week in all of their jobs combined.

Conclusions

This article has highlighted three main issues that users need to be aware of when interpreting the headline LFS statistics on full-time/part-time employment and average actual weekly hours worked in full-time/part-time main jobs. First, the LFS full-time/part-time split is based on respondent self-classification and individuals may interpret the concept of 'part-time' in different ways. Most people who classify their main job as full-time work more than 30 hours per week in their main job, and most people who classify their job as part-time work 30 hours or less. However, some people who regard their job as being full-time work fewer hours than others who regard their job as part-time. Similarly, some people who regard their job as being part-time work more hours than others who regard their job as full-time. The distinction between full-time and part-time employment may become increasingly blurred as working patterns diversify. Second, even if the full-time/part-time split were based on an hours of work threshold rather than on self-classification, a simple full-time/part-time dichotomy does not adequately capture the diverse range of working patterns that exist within the workforce. For in-depth analysis of working patterns, a more detailed breakdown based on usual weekly hours of work is recommended. Third, the LFS full-time/part-time employment statistics (and the usual weekly hours of work

Figure 4

Comparison of full-time/part-time employment levels based on self-classification and on a usual weekly hours of work threshold,[1] March 1992 to August 2006, seasonally adjusted
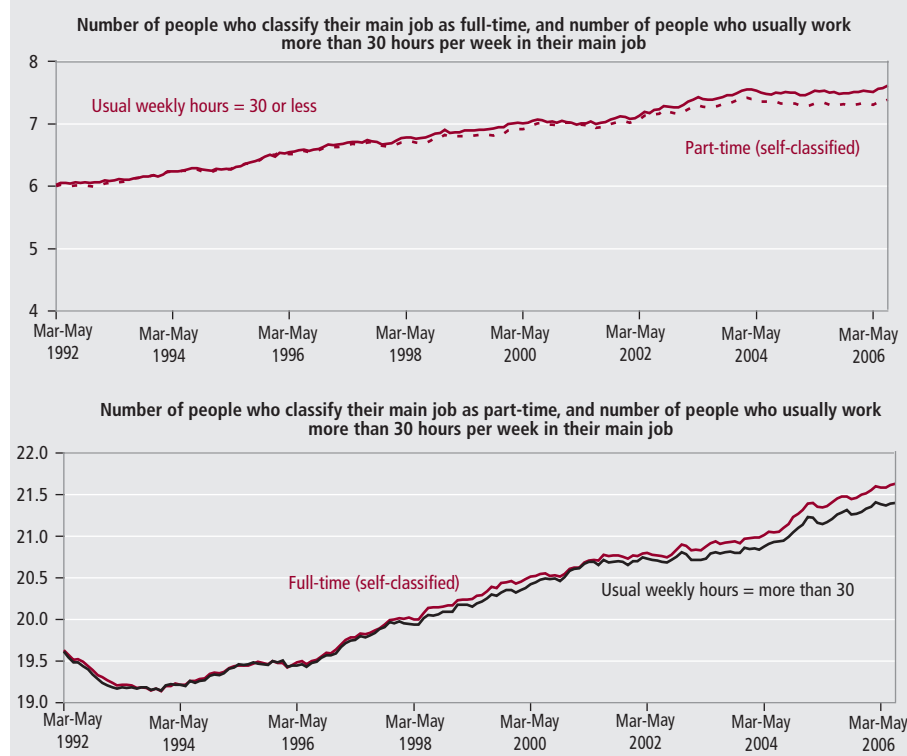
United Kingdom
Millions

Number of people who classify their main job as full-time, and number of people who usually work more than 30 hours per week in their main job

Number of people who classify their main job as part-time, and number of people who usually work more than 30 hours per week in their main job

1 Total usual weekly hours of work in main jobs including paid and unpaid overtime.
Source: ONS Labour Force Survey

Table 3

Percentage of workers with a second job by full-time/part-time status in main job, occupation and sex,[1] April to June 2006, not seasonally adjusted

United Kingdom
Percentages

Standard Occupation Classification (SOC) 2000	Men	Women	Total
Percentage with a full-time main job that have a second job:			
1 Managers and senior officials	2	2	2
2 Professional occupations	4	4	4
3 Associate professional and technical	3	4	3
4 Administrative and secretarial	3	3	3
5 Skilled trades occupations	2	3	2
6 Personal service occupations	4	3	3
7 Sales and customer service occupations	2	3	3
8 Process plant and machine operatives	2	2	2
9 Elementary occupations	2	4	2
Total	**2**	**3**	**3**
Percentage with a part-time main job that have a second job:			
1 Managers and senior officials	14	6	8
2 Professional occupations	14	11	12
3 Associate professional and technical	11	8	8
4 Administrative and secretarial	7	6	6
5 Skilled trades occupations	6	6	6
6 Personal service occupations	4	7	7
7 Sales and customer service occupations	4	3	3
8 Process plant and machine operatives	2	4	3
9 Elementary occupations	5	8	7
Total	**7**	**7**	**7**

1   The LFS full-time/part-time split is based on respondent self-classification. The occupation split refers to main jobs. Second jobs may be in a different occupation group.
Source: Labour Force Survey

Figure 5

People in employment by total usual weekly hours of work,[1] March 1992 to August 2006, seasonally adjusted

United Kingdom

1 Total usual weekly hours of work in main jobs including paid and unpaid overtime.
Source: ONS Labour Force Survey.

statistics, for that matter) measure working patterns in main jobs only. People with a part-time main job should not, strictly speaking, be described as 'part-time workers' because some of them may have other jobs which, when added together, keep them fully occupied.

Despite its limitations, there are advantages to the LFS self-classified measure of full-time/part-time status. The full-time/part-time question leads neatly into subsequent questions that ask part-timers why they took a part-time rather than a full-time job and, for those who did not want a full-time job, their reasons for not wanting a full-time job. The results from these questions provide an important insight into potential labour supply and barriers to full employment. If the LFS full-time/part-time split were based solely on an hours of work threshold it would be difficult to phrase appropriate questions about reasons for taking a part-time job without making the interview more complicated, bearing in mind that some individuals whose hours of work fall below the full-time threshold may not actually regard their job as being part-time. Another consideration is that individuals whose hours of work vary considerably from week to week may find it difficult to calculate their usual weekly hours of work, but relatively easy to classify their job as being full-time/part-time. Proxy respondents may find it particularly difficult to report usual weekly hours of work accurately. An ONS study of proxy response error in the LFS found considerably more agreement between proxy and personal responses for the full-time/part-time question than for the hours of work questions. That said, the net proxy response error for usual weekly hours results was estimated to be small and any bias introduced into the results was estimated to be very small when the results are banded or used to produce averages.

Differences in the way that individuals and subgroups interpret the concept of part-time employment, the changing composition of the workforce, and the increasing diversity of working patterns can make it difficult to interpret statistics that are based on a self-classified measure of full-time/part-time status. However, the same factors also make it difficult to arrive at an hours-based threshold that is appropriate for all subgroups and is internationally comparable. This is why Eurostat requires the LFS definition of full-time/part-time employment to be
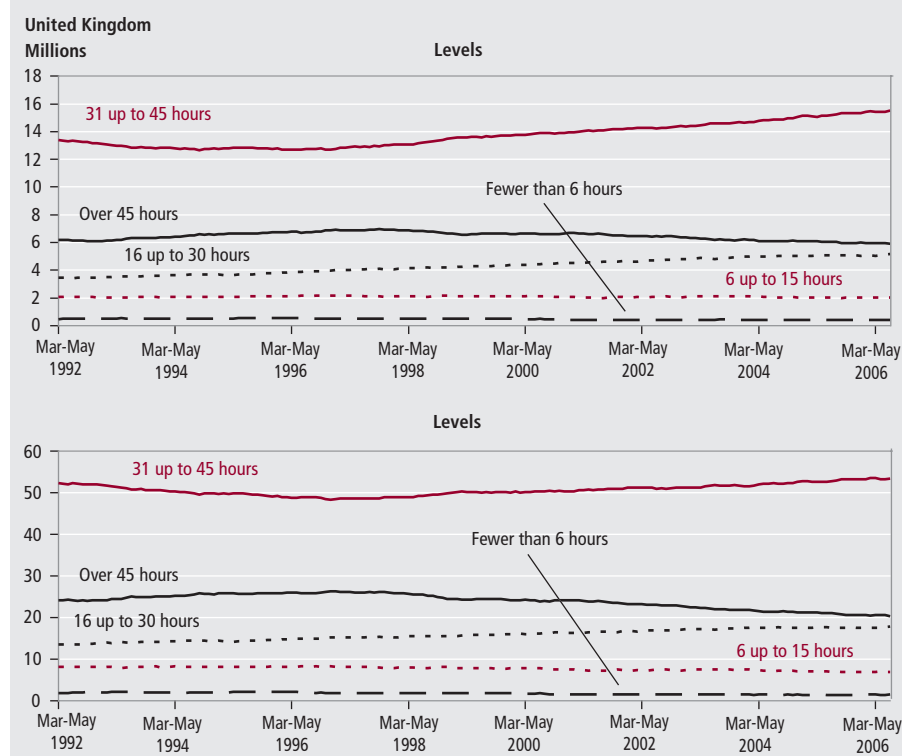
based on respondent self-classification. A collection of labour statisticians from national statistical institutes (including ONS) and international organisations (including the ILO, OECD and Eurostat), known as the Paris Group, is developing a new Resolution on the measurement of working time for submission to the International Conference of Labour Statisticians in 2008. The Paris Group has acknowledged the importance that users attach to the concept of part-time employment but it has concluded that it will not be possible to reach an international agreement on an hours of work threshold that is appropriate for all countries.

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FEATURE

Clive Dobbs
Office for National Statistics

Patterns of pay: results of the Annual Survey of Hours and Earnings, 1997 to 2006

SUMMARY

The Annual Survey of Hours and Earnings (ASHE) is the Office for National Statistics' main source for information on the distribution of earnings. It is the most detailed and comprehensive source of national information on levels of earnings, make-up of total earnings and distribution of the earnings of individual employees.

The first few sections of this article present summary analyses (overall medians, make-up and distribution of earnings) from the results of the 2006 ASHE, comparing them with the 2005 results (and where relevant the 1997 to 2005 back series). While these figures are of interest, they can hide wide variations between different industries, occupations, regions and age groups. The concluding sections of the article give summary analyses of each of these factors.

The Annual Survey of Hours and Earnings (ASHE) is the Office for National Statistics' (ONS's) main source for information on the distribution of earnings. It is the most detailed and comprehensive source of UK information on:

- levels of earnings (separately for type of worker and for gender)
- make-up of total earnings (split between basic pay and other components)
- distribution of the earnings of individual employees (the extent to which they are dispersed around the median)

It focuses on medians rather than means and on the distributions of paid hours worked (in total and on overtime).

More details on the methodology for the survey were published in November 2004 (Bird, 2004).

The first few sections of this article present summary analysis: overall medians, make-up and distribution of earnings for the 2006 ASHE, comparing the analysis with the 2005 results (and where relevant with the 1997 to 2005 back series). While these estimates are of interest, they can hide wide variations between different industries, occupations, regions and age groups. The concluding sections of the article give summary analyses of each of these factors.

The results presented in this article mainly relate to the median. The median is preferred to the mean for earnings as it is less affected by extreme values and the skewed distribution of earnings data. The median is the value below which 50 per cent of employees fall. However, the means are still available in the annual published results.

Since the 2004 survey, supplementary information has been collected to improve coverage and make the survey more representative. This includes employees who have either changed or started new jobs between sample selection from HM Revenue & Customs records and the survey reference period in April. In 2005, a new questionnaire was introduced bringing significant improvement to the quality of the results for the 2005 survey. From 2006, the Labour Force Survey (LFS) has moved from using seasonal quarters to calendar quarters. As ASHE uses LFS data in the calculation of aggregation weights, it was necessary to move from using data taken from LFS spring to LFS quarter two.

The inclusion of supplementary information since 2004, the introduction of a new questionnaire in 2005, and the move to using new ONS geographies and LFS calendar quarters in 2006 has meant that the ASHE results are discontinuous since 2004. Therefore a consistent series which takes into account all of these identified changes has been produced going back to 2004. For 2004, results are also available that exclude supplementary information, to be comparable with the back series generated by imputation and weighting of the 1997 to 2003 New Earnings Survey (NES) data. More details on the survey changes since 2004 are included later in the article.

Both sets of 2004 results are included in tables supporting this article that can be

found on the National Statistics website at www.statistics.gov.uk/statbase/product.asp?vlnk=14123

Discontinuities are represented by a broken line in the figures.

Summary results for full-time employees

Median gross weekly earnings for full-time employees on adult rates working a full week in April 2006 were £447 (see **Figure 1**). At £387, the median gross weekly earnings of full-time women increased by 4.2 per cent compared with a 3.5 per cent rise for men (to £487).

Median gross annual earnings of all full-time employees on adult rates who have been in the same job for at least a year were £23,600 for the 2005/06 tax year. Median gross annual pay for full-time women was £20,100 compared with £25,800 for men.

Median gross hourly earnings of all

full-time employees were £11.21 in April 2006; this represented an increase of 4.1 per cent since April 2005. Full-time female employees saw an increase in median hourly earnings of 0.5 percentage points more than that for men (4.1 per cent compared with 3.6 per cent respectively).

There has been little change since 1997 in the median total paid hours worked per week by employees in full-time employment and for whom weekly paid hours were reported. In April 2006, men worked 39.0 paid hours per week and women worked 37.0 paid hours per week.

Pay differences between men and women

Various methods can be used to measure the earnings of women relative to men. ONS prefers to use hourly earnings excluding overtime for full-time employees. Including overtime can skew the results

because men work relatively more overtime than women; including part-time employees could have a similar effect because women make up a much bigger proportion of part-time employees than men. The current European standard measure is based on the mean hourly rate, so this is the statistic reported in this section, although the median is also reported.

The hourly earnings excluding overtime were £12.11 for full-time women on adult rates and £14.62 for men. The gender pay gap was 20.7 per cent in 1997; it narrowed slightly to 20.1 per cent in 2002, fell steadily to 17.1 per cent in 2005 and showed little change at 17.2 per cent in 2006 (see **Figure 2**). The gender pay gap for median hourly earnings excluding overtime is narrower than for means and has fallen from 17.4 per cent to 12.6 per cent over the same period.

Although mean hourly pay excluding overtime provides a useful comparison of men's and women's earnings, it does not reveal differences in rates of pay for comparable jobs. This is because such averages do not highlight the different employment characteristics of men and women, such as the proportion of each gender in different occupations and their length of time in jobs.

Figure 3 shows the mean and median gender pay gaps for 2006 broken down by the Standard Occupation Classification (SOC) 2000 main occupation groups. The mean gender pay gaps are narrowest for 'Administrative and secretarial occupations' (7.7 per cent) and 'Sales and customer service' (9.6 per cent). The widest mean gender pay gaps are for 'Managers and senior officials' (26.2 per cent) and for 'Skilled trades occupations' (21.7 per cent). The narrowest median gender pay gap is for 'Professional occupations' (4.6 per cent) and the widest is for 'Skilled trades occupations' (27.8 per cent).

The differences between median and mean gender pay gaps reflect the extent to which high earners skew the earnings distribution for men or women. For example, the higher mean pay gap relative to median for professional occupations reflects a small number of very high earning males in the distribution, whereas the lower mean pay gap relative to median in skilled trades occupations is due to the female mean being skewed by a relatively larger proportion of high earners in an occupation group with a small number of women.

A regional analysis and an age analysis of the pay difference between the sexes are included later in the article.

Figure 1
Median gross weekly earnings of full-time employees; by gender,[1] April 1997 to April 2006
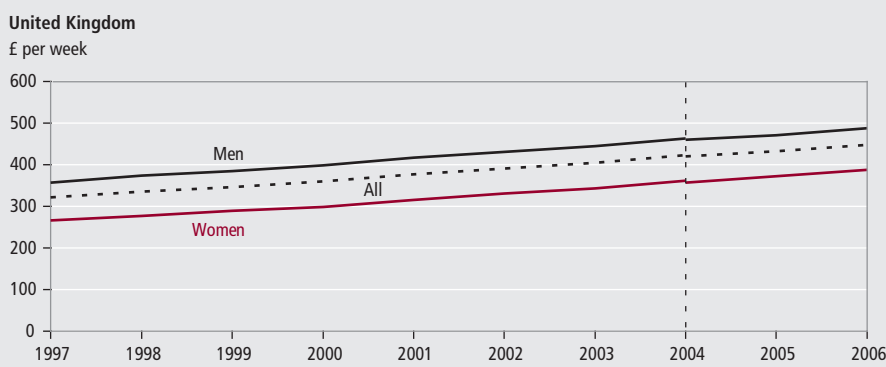
United Kingdom
£ per week

Note:
Vertical line represents discontinuity in 2004 ASHE results.
1   Full-time employees on adult rates whose pay for the survey period was unaffected by absence.
Source: Annual Survey of Hours and Earnings

Figure 2
Pay gap between women's and men's hourly earnings,[1] April 1997 to April 2006

United Kingdom
Percentages

Note:
Vertical line represents discontinuity in 2004 ASHE results.
1   Hourly earnings excluding overtime for full-time employees on adult rates, whose pay for the survey period was unaffected by absence.
Source: Annual Survey of Hours and Earnings

Figure 3
Pay gap between women's and men's hourly earnings: by occupation,[1] April 2006

United Kingdom
Percentages
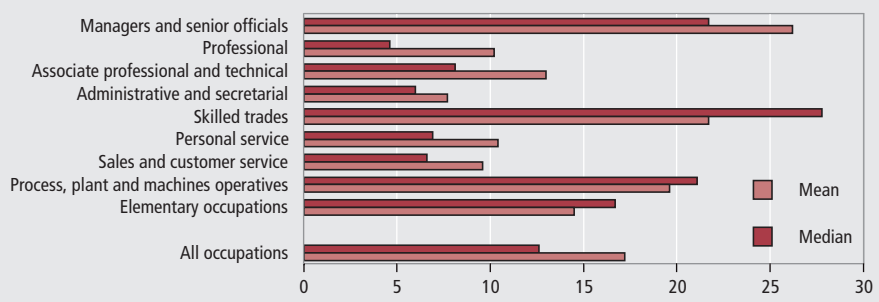
1 Hourly earnings excluding overtime for full-time employees on adult rates, whose pay for the survey period was unaffected by absence by Standard Occupational Classification (SOC) 2000.

Source: Annual Survey of Hours and Earnings

Figure 4
Median hourly earnings of part-time employees: by gender,[1] April 1997 to April 2006
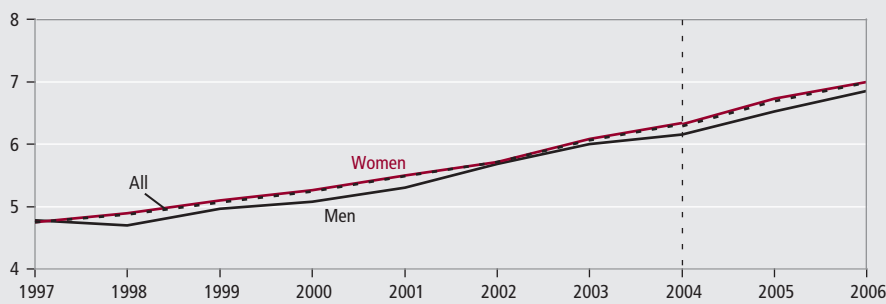
United Kingdom
£ per week

Note:
Vertical line represents discontinuity in 2004 ASHE results.
1 Hourly earnings excluding overtime for part-time employees on adult rates whose pay for the survey period was unaffected by absence.

Source: Annual Survey of Hours and Earnings

Figure 5
Ratio of part-time to full-time median hourly earnings,[1] April 1997 to April 2006
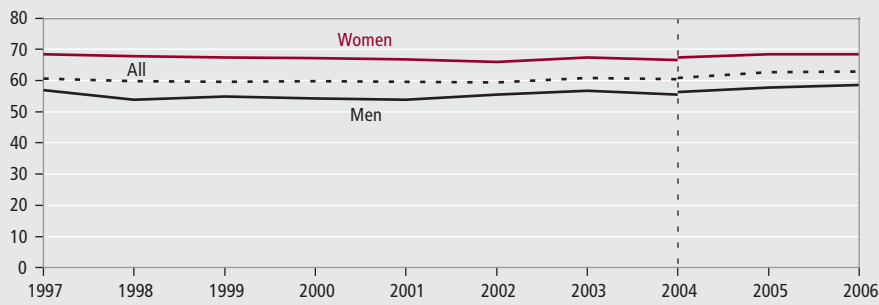
United Kingdom
Percentages

Note:
Vertical line represents discontinuity in 2004 ASHE results.
1 Hourly earnings excluding overtime for employees on adult rates whose pay for the survey period was unaffected by absence.

Source: Annual Survey of Hours and Earnings

Summary results for part-time employees

Part-time employees earned a median hourly rate excluding overtime of £6.99 in April 2006, an increase of 4.5 per cent over the year. For part-time men this increased by 4.9 per cent over the year to £6.85, while for part-time women it rose by 4.1 per cent to £7.00. Since 1998, female employee hourly rates have remained above the levels for male employees (see **Figure 4**) with little change to the pay gap during this period.

Median gross hourly earnings of all part-time employees increased by 4.1 per cent between April 2005 and April 2006 to £7.00, the same increase for the year as that for full-time employees.

There has been little change in the ratio of part-time to full-time median hourly earnings excluding overtime since 1997. Median hourly earnings excluding overtime of part-time workers were 62.9 per cent of those for full-time workers. The differential was significantly more for part-time men (58.5 per cent of full-time male earnings) than for women (68.4 per cent) (see **Figure 5**).

The proportion of part-time male employees in the total workforce rose from 3.7 per cent to 5.7 per cent between 1997 and 2006, but is still well below the proportion of part-time female employees, which rose from 19.5 to 20.6 per cent over the same period.

Part-time female median hourly pay is higher than part-time male hourly pay partly due to a higher proportion of females working part-time throughout their careers. **Figure 6** shows the distribution of part-time employees by gender and by age. It illustrates a higher proportion of females working part-time in the higher income age groups (aged 30 to 39 and aged 40 to 49). Male part-time working is higher in the younger age groups.

The make-up of earnings

ASHE splits gross weekly earnings into four components: overtime; payments by results/incentive payments; premium payments for shift work; and the residual – which includes basic pay and allowances. The first three elements vary quite considerably by type of worker.

The new ASHE questionnaire in 2005 introduced a discontinuity in the make-up of gross weekly earnings regarding payments by results/incentive payments. ASHE results for 2004 to 2006 include incentive pay paid and earned in the pay period, but exclude payments made less often than

Figure 6
Distribution of part-time employees: by gender and age group,[1] April 2006

United Kingdom
Percentages
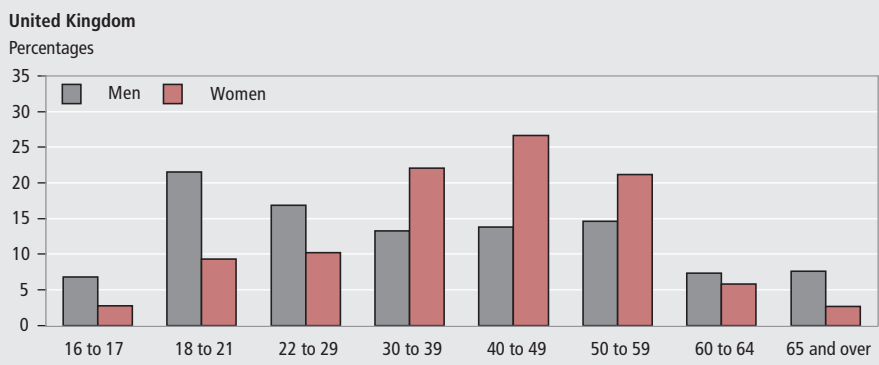
Note:
Results for 16 to 17 year olds include employees not on adult rates of pay.
1 Part-time employees on adult rates whose pay for the survey period was unaffected by absence.
Source: Annual Survey of Hours and Earnings

During the years since the introduction of the National Minimum Wage in 1998, the top decile increased by 39.4 per cent against a bottom decile increase of 35.2 per cent. **Figure 8** shows the pattern of growth in the top and bottom deciles of gross weekly earnings for full-time employees and for the Retail Prices Index (RPI) and Consumer Price Index (CPI) since 1997. For most years since 1997, median gross weekly earnings of full-time employees at both the top and bottom end of the distribution increased above both the RPI and CPI.

Results by industry
Median gross weekly earnings for full-time employees in April 2006 was highest in the 'Mining and quarrying' sector at £627. This was £63 per week more than

every pay period. As a result of this change in definition, there is a lower proportion of payments by results for these years than for earlier years. Because of this, the amount of incentive pay earned in the pay period is understated. However, the estimates are improved because the new definition results in greater consistency, as the data reported will not depend on the return date of the questionnaire or when bonuses are paid, as in previous years.

The proportion of additional payments for full-time male employees was higher than that of their female counterparts over the period 1997 to 2006.

The distribution of earnings
Figure 7 displays the distribution of gross weekly earnings among full-time employees for the years 1997 to 2006. The median level of gross full-time weekly earnings was £447 per week. This is lower than the mean (£537), since the latter is boosted by the number of people at the top end of the distribution, with extremely high earnings. For 2006, at the bottom of the distribution, a tenth of full-time employees earned less than £244 per week, whereas at the other end of the scale a tenth earned more than £886 per week. The ratio of the highest to the lowest decile for gross weekly earnings (3.6 in April 2006) gives a measure of the distribution of weekly pay. This measure has been almost unchanged since 1997, when it was 3.5.

In the year to April 2006, gross weekly earnings of full-time employees in the top decile of the distribution grew faster than those in the bottom decile (4.2 per cent against 3.7 per cent respectively). This has been true for seven of the past nine years.

Figure 7
Distribution of gross weekly earnings for full-time employees,[1] April 1997 to April 2006
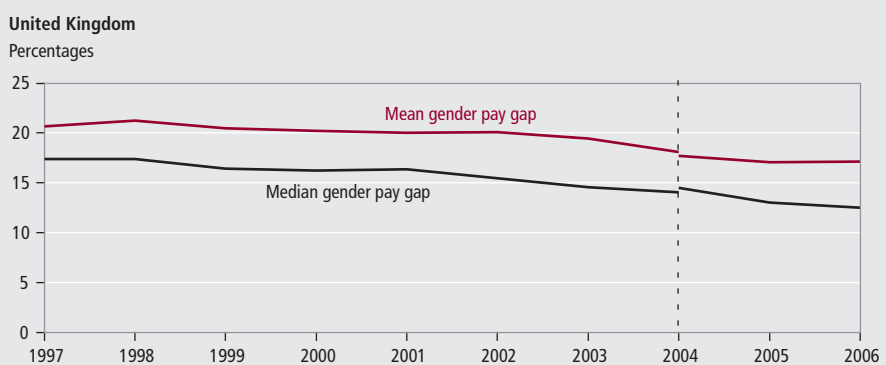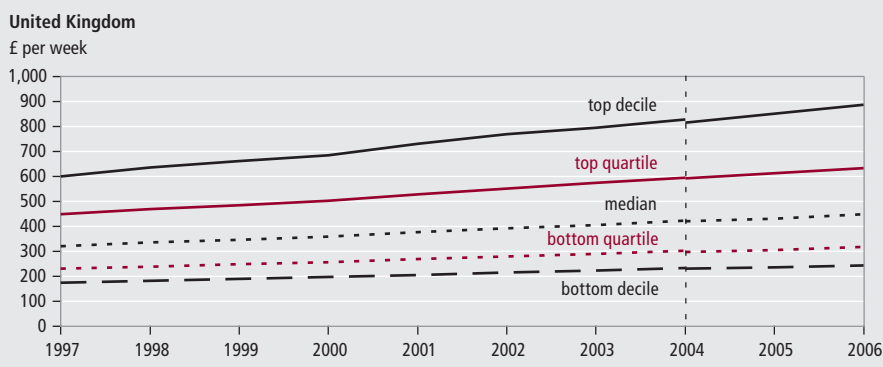
United Kingdom
£ per week

Note:
Vertical line represents discontinuity in 2004 ASHE results.
1 Full-time employees on adult rates whose pay for the survey period was unaffected by absence.
Source: Annual Survey of Hours and Earnings

Figure 8
Earnings growth in top and bottom deciles for full-time employees[1] and changes in RPI and CPI, April 1998 to April 2006
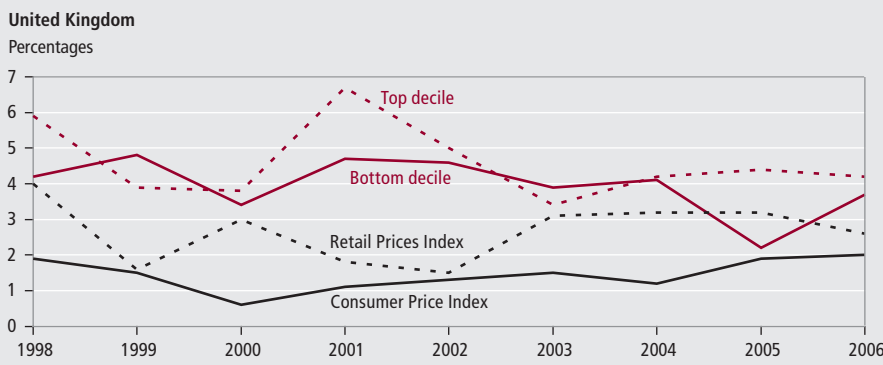
United Kingdom
Percentages

1 Full-time employees on adult rates whose pay for the survey period was unaffected by absence.
Source: Annual Survey of Hours and Earnings

the second highest, the 'Electricity, gas and water supply' sector. Over the period 1997 to 2006, 'Electricity, gas and water supply' and 'Financial intermediation' have also featured as the highest median gross weekly earning sector. The weekly earnings for the 'Mining and quarrying' sector and also the 'Electricity, gas and water supply' sector are boosted by longer paid hours worked by employees in these sectors relative to the 'Financial intermediation' sector.

The median gross annual earnings of £30,900 for the 'Mining and quarrying' sector were above that of the 'Financial intermediation' sector and more than double that of the 'Hotels and restaurants' sector which, for the years 1997 to 2006, was the lowest-paid sector.

The 'Financial intermediation' sector had the highest median hourly earnings excluding overtime for full-time employees (£14.92) followed by the 'Education' sector (£14.10).

Contrary to the findings above, the mean gross annual earnings for the 'Financial intermediation' sector are significantly higher than those of any other sector because of the skewed effect of extremely high earners on the earnings distribution.

The 'Hotels and restaurants' sector has the lowest median gross weekly earnings. At £279, full-time employees' earnings were some £63 per week lower than the median for 'Agriculture, hunting and forestry' (the second lowest-paid). Median hourly earnings excluding overtime for the 'Hotels and restaurants' sector were £6.50, once again lower than the 'Agricultural, hunting and forestry' sector (£7.25).

Median gross weekly earnings in manufacturing (£453) were higher than in services (£442).

The broad industrial groupings described above can hide substantial variation within the sectors. ASHE, however, allows more detailed industrial analyses. For example, it is possible to identify the highest and lowest-paid industry groups (two-digit Standard Industrial Classification 2003). Such analyses reveal that, in addition to those employees noted earlier within the 'Mining and quarrying', 'Financial intermediation' and 'Electricity, gas and water supply' sectors, full-time employees involved in the 'Manufacture of coke, refined petroleum products and nuclear fuel', and the 'Computer and related activities', were among the highest-paid per week in April 2006.

Various branches of the manufacturing and the retail sectors make up much of the ten lowest-paid industries. 'Hotels and restaurants' was the lowest-paid sector of all.

Public and private sector earnings

The adjustments made to the 2004 data in order to produce estimates comparable with the 2006 data also impact on the gap between public and private sector earnings. The exclusion of incentive payments paid outside the pay period pulls down the private sector estimates because private sector employees receive a higher proportion of incentive pay than public sector employees. Also, public sector employees receive greater proportions of pay for other reasons. Consequently, because of the adjustments to the 2004 data, private sector estimates have decreased and public sector estimates increased.

The gap between private and public sector median earnings for full-time employees decreased in April 2006. Private sector median gross weekly earnings were £430, up 4.5 per cent on 2005. For the public sector, the comparable figure was £488, up 2.5 per cent. Public sector mean gross weekly earnings (at £546) were higher than the private sector (at £536). As with gender pay, the difference in gross weekly earnings does not reveal differences in rates of pay for comparable jobs. This is due to the types of occupations in the public and private sector being quite different.

Results by occupation

ASHE 2006 data for occupation is coded to SOC 2000 which was introduced in 2002. Before this, SOC 1990 was used.

With median gross weekly earnings of £659, the occupational major group (as defined within SOC 2000) with the highest median gross weekly earnings for full-time employees was 'Managers and senior officials'. This group had the highest median gross annual salary (£34,900), which was £1,180 higher than that for 'Professional occupations'. Those in 'Professional occupations' had the highest median hourly earnings excluding overtime (£18.31). This was £1.21 higher than the median for 'Managers and senior officials' (£17.10), the second most highly-paid major group on an hourly basis.

'Professional occupations' have had the highest median hourly earnings excluding overtime since SOC 2000 was introduced in 2002. Apart from 2005, 'Managers and senior officials' had the highest median annual earnings and median gross weekly earnings over the same period. This can be explained by the fact that the 'Managers and senior officials' group receive higher annual incentives and also work longer paid hours per week than full-time employees in the 'Professional occupations' group.

'Sales and customer service occupations' were, as for the years since the introduction of SOC 2000, the lowest-paid median gross weekly major group, at £270 per week for full-time employees. This major group includes occupations that are generally acknowledged to be low-paid such as retail cashiers and checkout operators, and market and street traders and assistants.

In April 2006, the increase in median gross weekly earnings was highest for 'Sales and customer service occupations' (5.0 per cent) and lowest for 'Associate professional and technical occupations' (1.8 per cent).

In the 2006 survey, looking at individual occupations, 'Directors and chief executives of major organisations' were the highest-paid full-time employees with median gross weekly earnings of £1,811. The next highest-paid occupation was 'Medical practitioners' with median gross weekly earnings of £1,232 per week. With median gross weekly earnings of £208, 'Leisure and theme park attendants' were the lowest-paid of all full-time adult employees.

Results by region

London tops the regional list in terms of median full-time gross weekly earnings, with £572 in April 2006. This was £102 higher than the next highest, the South East, where median gross weekly earnings were £470. London's high levels of pay are largely due to the fact that a high proportion of its labour force is employed in higher-paying industries and occupations, and also because many employees are entitled to allowances for working in the capital. The North East (with median full-time gross weekly earnings of £399) was at the bottom of the regional list with Wales (at £403) a close second. Median gross weekly earnings for UK full-time employees were £447.

Employees in Scotland received the largest increase in median gross weekly earnings (5.7 per cent, to £432) while employees in London received the smallest increase (3.0 per cent).

Since 1997, similar patterns were observed for median gross annual pay and median hourly pay excluding overtime, with London topping the list followed by the South East. The North East and Northern Ireland have the lowest pay levels across the regions.

It should be noted that earnings comparisons take no account of different price levels between regions and therefore do not indicate differences in the standard of living. Neither do they take account of the different mix of occupations and therefore cannot be used to claim that pay

Figure 9
Pay gap between women's and men's earnings: by country,[1] April 1997 to April 2006

United Kingdom
Percentages
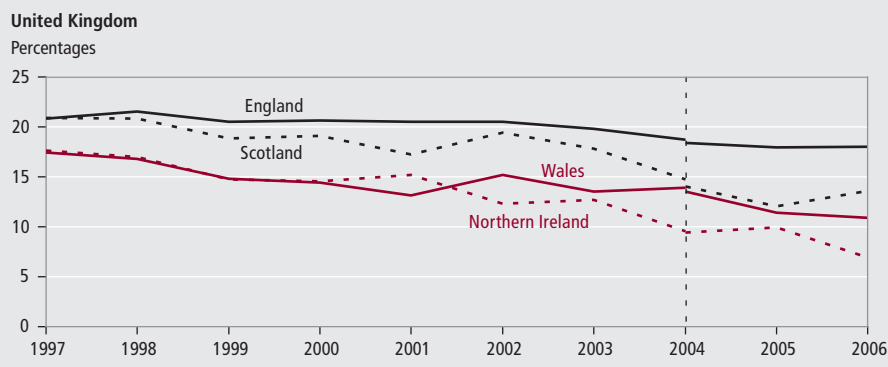
Note:
Vertical line represents discontinuity in 2004 ASHE results.
1 Mean hourly earnings excluding overtime for full-time employees on adult rates whose pay for the survey period was unaffected by absence.

Source: Annual Survey of Hours and Earnings

for like work is different. A region could have a lower level of median earnings than another if it has a higher proportion of employees in industries or occupations with relatively lower earnings.

In the UK, the gender pay gap (when measured using the mean full-time hourly earnings excluding overtime) was 17.2 per cent. The largest gender pay gap was 23.2 per cent in the London region; the smallest was in Northern Ireland (at 6.9 per cent). Over the period 1997 to 2006 the largest reduction in the gender pay gap was in Northern Ireland (17.6 to 6.9); the smallest was in the East (18.7 to 18.2). **Figure 9** illustrates the gender pay gap for mean hourly earnings excluding overtime for the four home countries.

Results by age group

In 2006, median gross weekly earnings for full-time employees climbed steadily with age, to reach a maximum for those aged 40 to 49, and declined thereafter. However, if the median earnings of men and women are considered separately, then women's earnings peaked earlier than those of men. This pattern is repeated over the period 1997 to 2006. Median gross weekly earnings of full-time women climbed with age to reach a maximum of £449 for those aged 30 to 39. Full-time men's median gross weekly earnings reach their maximum of £564 for those aged 40 to 49 (see **Figure 10**).

The largest increase in the median gross weekly wage between April 2005 and April 2006 was recorded among full-time employees aged 65 and over, whose weekly

earnings increased by 10.6 per cent to £361.

Figure 11 shows the mean and median gender pay gaps by age group. There is no median gender pay gap in those aged 22 to 29. After this, the gender pay gap increases and peaks in those aged 40 to 49 but remains at a high level in the 50 to 59 age group. It then falls significantly, in terms of the median measure, for those aged 60 and over, but shows a much lower fall when measured using the mean.

Comparisons with the Average Earnings Index

Each month ONS also collects information on earnings from the survey used to construct the Average Earnings Index (AEI). This survey asks 8,700 employers to provide information about total pay and numbers of employees, but does not

Figure 10
Median gross weekly earnings: by gender by age group,[1] April 2006

United Kingdom
£ per week
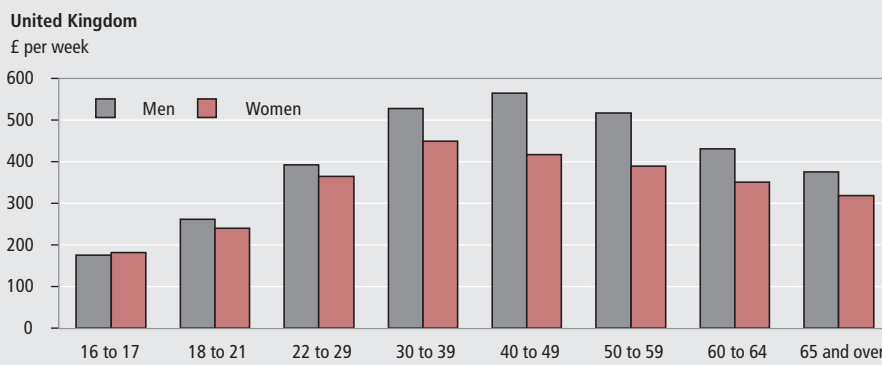
Note:
Results for 16 to 17 year olds include employees not on adult rates of pay.
1 Full-time employees on adult rates whose pay for the survey period was unaffected by absence.

Source: Annual Survey of Hours and Earnings

Figure 11
Pay gap between women's and men's hourly earnings: by age,[1] April 2006
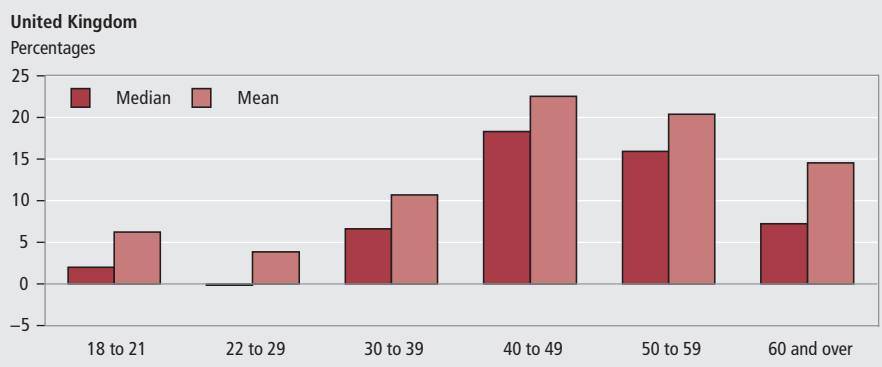
United Kingdom
Percentages

1 Hourly earnings excluding overtime for full-time employees on adult rates, whose pay for the survey period was unaffected by absence.

Source: Annual Survey of Hours and Earnings

ask more detailed questions about, for example, the gender and occupations of their staff. The AEI itself is used to provide an estimate of the growth in earnings per head, and is not used to produce estimates of levels of pay. It is therefore not possible to make detailed comparisons of the level in earnings between the AEI and ASHE.

The closest measure that can be derived from both surveys is for gross pay. In the year to April 2006, the ASHE estimate of the growth in mean gross weekly pay was 4.2 per cent. The comparable estimate from the AEI was 3.6 per cent. For the public sector, the comparable growth rates were 3.0 per cent (ASHE) and 2.6 per cent (AEI), and for the private sector 4.8 per cent (ASHE) and 3.9 per cent (AEI).

Low pay jobs

The number of UK jobs paid below the National Minimum Wage in spring 2006 was 336,000, amounting to 1.3 per cent of all jobs in the labour market. The estimate was produced using a methodology based solely on ASHE, which replaced NES.

In spring 2006 there were three rates for the National Minimum Wage: one for those aged between 16 and 17 (£3.00 per hour), one for those aged between 18 and 21 (£4.25 per hour) and one for those aged 22 and over (£5.05 per hour).

The number of jobs paid below the National Minimum Wage were:

- 15,000 jobs (4.3 per cent) held by those aged 16 to 17
- 48,000 jobs (2.5 per cent) held by those aged 18 to 21
- 274,000 jobs (1.2 per cent) held by those aged 22 and over

People in part-time work were almost three times as likely as people in full-time work to be paid less than the minimum wage, with 2.6 per cent of part-time jobs and 0.9 per cent of full-time jobs falling below the minimum wage. Jobs held by women were more likely to pay less than the minimum wage than jobs held by men (1.6 per cent compared with 1.1 per cent), but this was entirely due to the greater number of women in part-time jobs.

It is important to note that these estimates do not measure non-compliance with the National Minimum Wage legislation. ASHE does not indicate whether individuals fall into a category that is exempt from the legislation, such as apprentices or new trainees.

Survey details

ASHE is based on a 1 per cent sample of employee jobs. Information on earnings and paid hours is obtained in confidence from employers. It does not cover the self-employed nor does it cover employees not paid during the reference period. In 2006, the information related to the pay period which included 26 April.

ASHE replaced NES as ONS's main source of information on the distribution of earnings. Articles describing the ASHE methodology and the impact for 1997 to 2004 are available on the National Statistics website. The main differences between ASHE and NES are:

- ASHE results are weighted to the number of jobs given by the Labour Force Survey
- ASHE imputes for item non-response
- the coverage of employees for ASHE extends that of NES
- the median replaces the mean as the headline statistic. The median is the value below which 50 per cent of employees fall. It is preferred over the mean for earnings data as it is less influenced by extreme values and because of the skewed distribution of earnings

Changes since 2004

Since the 2004 survey, supplementary information has been collected to improve coverage and make the survey more representative. This includes employees who have either changed or started new jobs between sample selection from HM Revenue and Customs records and the survey reference period in April.

Changes in 2005

A new questionnaire was introduced for the 2005 survey. This questionnaire brings significant improvement to the quality of the results. More details on the impact of introducing the new questionnaire can be found at www.statistics.gov.uk/cci/article.asp?id=1294

Changes to the wording and definitions mean that some of the information requested from respondents will differ from that supplied in past surveys. The introduction of the pay 'for other reasons' question has resulted in the inclusion of earnings information which may not have been collected in the past. Results for 2004 including supplementary information have been reworked to allow for this missing pay. For more details on the methodology involved in estimating pay for other reasons see the National Statistics website at www.statistics.gov.uk/cci/article.asp?id=1299

Also, the definition of incentive/bonus pay changed for 2005 to only include payments that were paid and earned in April. This brings the definition more in line with that used in the AEI and will result in greater consistency of ASHE results. Results for 2004, including supplementary information, have been reworked to exclude irregular bonus/incentive payments to make them consistent with 2005 and 2006 results.

Changes in 2006

In 2006, ASHE moved to the ONS standard for geographic areas using Output Areas (OAs) as the building block to higher-level geographic breakdowns. Previously, ASHE geographies were created by matching returned postcode information against the Inter-Departmental Business Register to give various levels of geographic information. The key points are:

- ASHE results for geographic areas are produced in line with the ONS standard and this allows further geographic analysis variables to be produced
- the quality of geographic results has improved

In addition, from 2006, the LFS has moved from using seasonal quarters to calendar quarters. As ASHE uses LFS data in the calculation of aggregation weights, it was necessary to move from using data taken from LFS spring to LFS quarter two.

The inclusion of supplementary information since 2004, the introduction of a new questionnaire in 2005, and the move to using new ONS geographies and LFS calendar quarters in 2006 has meant that the ASHE results are discontinuous in 2004. Therefore, a consistent series which takes

into account all of these identified changes has been produced going back to 2004. For 2004, results are also available that exclude supplementary information, to be comparable with the back series generated by imputation and weighting of the 1997 to 2003 NES data.

Definitions

The earnings information collected relates to gross pay before tax, National Insurance or other deductions, and generally excludes payments in kind. With the exception of annual earnings, the results are restricted to earnings relating to the survey pay period and so exclude payments of arrears from another period made during the survey period. Any payments due as a result of a pay settlement but not yet paid at the time of the survey will also be excluded.

For particular groups of employees, changes in median earnings between successive surveys may be affected by changes in the timing of pay settlements, in some cases reflecting more than one settlement and in other cases no settlement at all.

Most of the published ASHE analyses relate to full-time employees on adult rates whose earnings for the survey pay period were not affected by absence. They do not include the earnings of those who did not work a full week, and those whose earnings were reduced because of sickness, short-time working, and so on. Also they do not include the earnings of employees not on adult rates of pay, most of whom will be young people. Some more information on the earnings of young people and part-time employees is available in the detailed annual published ASHE results. Full-time employees are defined as those who work more than 30 paid hours per week or those in teaching professions who work more than 25 paid hours per week.

Factors contributing to earnings growth

The increase in average earnings from one year to the next reflects several factors: pay settlements implemented between the April survey dates; changes in the amount of paid overtime and other payments relative to basic pay; and the structural effects of changes in the composition of the ASHE sample and the employed labour force.

Revisions to 2004 and 2005 results

In line with normal practice, this article contains revised estimates from the 2005 survey results published on 10 November 2005. These take account of some corrections to the original 2005 data which were identified during the validation of the results for 2006, as well as late returns.

In addition, results produced for 2004 and 2005 have also been revised to take account of the new ONS geographies and LFS weights based on calendar quarters.

Other earnings information

The monthly AEI, based on the Monthly Wages and Salaries Survey of 8,700 employers, provides information on changes in mean earnings for broad industrial sectors. No information is available on occupation, paid hours worked, and other characteristics of the workforce.

The LFS collects information on the earnings and hours of about 15,000 households over each quarter. In addition, it collects data on a wide range of personal characteristics, including education level and origin. This enables the preparation of statistics on levels and distribution of earnings similar to ASHE but with lower precision due to the much smaller sample size.

Publication arrangements

National averages of earnings hide wide variations between different collective agreements, industries, occupations, regions and age groups. The published tables containing the detailed annual ASHE results for UK include analyses of each of these and are now available on the National Statistics website at www.statistics.gov.uk/StatBase/Product.asp?vlnk=13101

Low pay estimates show the number of jobs paid below the National Minimum Wage in the UK. The estimates were produced using a methodology based solely on ASHE. Further information on the low pay methodology and detailed results are now available at www.statistics.gov.uk/StatBase/Product.asp?vlnk=5837

FEATURE

Claire Swadkin and David Hastings
Office for National Statistics

Regional economic indicators
February 2007
with a focus on the differences in regional economic performance

SUMMARY

This article continues the quarterly Regional Economic Indicators series previously published in *Economic Trends*, primarily based on the same information sources. The new Focus section brings a more detailed perspective to a specific issue. In this edition, it extends onto a time series, some past analysis that helps understand the factors that contribute to the differences in regions' performance, based on an Organisation for Economic Co-operation and Development methodology. The headline indicators provide the underlying picture of regional economic performance, productivity and welfare. The indicators that drive productivity are also discussed and labour market figures included as before. This article covers the nine English Government Office Regions, Northern Ireland, Scotland and Wales; the European Nomenclature of Units for Territorial Statistics level 1 regions of the United Kingdom. The term 'region' is used for convenience.

Focus: Analysing differences in regional economic performance extending an OECD methodology to a time-series, 2001–04

The 'Analysing Differences in Regional Economic Performance' article[1] utilised an Organisation for Economic Co-operation and Development (OECD) methodology[2] to explain and understand the differences that exist in economic performances of different regions. Regional economic performance is traditionally measured as Gross Value Added (GVA) per head and is broken down by the OECD methodology into four components:

- average labour productivity
- employment rate
- activity rate
- commuting rate

In this article, average labour productivity (in this case GVA per job) is further separated into two elements:

- GVA per hour worked
- hours worked per job

Each of these five components are influenced by regional factors that affect their contribution to the regional divergences from the UK average. These regional characteristics may be natural endowments (such as geographical location or natural resources that cannot be changed except in the long run) or untapped resources (such as skills or transport infrastructure). Using these definitions to explain the reasons for the differences in regional economic performance is helpful in identifying the specific issues that need to be addressed by policies in each region.

Each component is calculated independently based on the most appropriate source data available. Only published data available in the public domain is used. This analysis does not utilise the data sources currently used in the GVA per head calculation but shows what factors in the economy can explain the differences in GVA per head from the UK average when using other data sources. For example, the commuting rate is based on the numbers of people commuting between regions, obtained from employment data. An alternative could be to use a measure of income.

This article extends the Nomenclature of Units for Territorial Statistics (NUTS)1 analysis previously done for the calendar year 2001 to a time-series from 2001 to 2004. The GVA data used is consistent with the December 2006 publication. As a result, the GVA per hour worked results may differ slightly to those published in 2006 which were based on the 2005 GVA publication. GVA used in this analysis is workplace-based. The current method for estimating workplace-based GVA at the NUTS1 level

Figure 1
Comparison of indicators measuring economic performance: 2004, NUTS1 Regions

Percentage difference from UK average (UK=0)

Legend: GVA per head | GVA per job | GVA per hour worked

assumes that residence-based GVA is equal to workplace-based GVA in all regions except London, the South East and the East of England. Workplace employment data was taken from the published civilian workforce jobs series (Labour Market Statistics, Office for National Statistics (ONS)). For consistency across the model, residence-based employment was calculated by applying the regional breakdown of residence-based employment data (from the published Labour Force Survey results) to the civilian workforce jobs UK total. Other data sources remain as before.[1]

Figure 1 is based on 2004 data and shows how the choice of indicator can paint a different picture of regional economic performance. The regional differences (in terms of the region's percentage difference from the UK average for each indicator) are more evident when looking at GVA per head and become smaller when average labour productivity indicators are used instead. This demonstrates the rationale behind the OECD methodology; that average labour productivity is just one component in understanding why there are regional differences in GVA per head.

Table 1 summarises the regional percentage differences of GVA per head from the UK average. The 2004 result is also presented in Figure 1. Wales had the largest negative divergence from the UK average in 2004 at –22 per cent. The North East and Northern Ireland followed close behind at –21 and –19 per cent respectively. London is the region with the largest positive divergence, at 53 per cent. Table 1 shows relatively little change over the time series; the relative differences between regions are consistent over time.

Figures 2 and 3 break down the overall regional differences identified in Table 1 for the years 2001 and 2004, respectively, into the

components previously mentioned. The 0 per cent vertical line on each chart represents the UK average of GVA per head for the relevant year. The factors that contribute negatively to the economic performance of each region are shown on the left side, whereas the factors that increase performance are shown on the right. The methodology is outlined in the technical note at the back of the article. This analysis attempts to highlight the primary trends in these components over the period 2001 to 2004.

In London, GVA per head was considerably greater than the UK average and this divergence explained primarily by GVA per hour worked and the commuting rate. These commuting effects in London also help explain the inflated GVA per head indicator in Figure 1, which occurs when a workplace-based numerator is used against a residence-based denominator in the presence of large commuting effects.

The opposite effect of commuting on GVA per head is notable in other regions, particularly the South East, the South West, the East of England and East Midlands, where economic performance was negatively impacted by the commuting rate. The conceptual logic follows that these regions lose potentially productive resources when members of their labour force commute to work to another region (such as London) that in turn benefits. In 2004 in London the commuting rate contributed less to the difference with the UK average than it did in 2001. The negative impact of the commuting rate in the South West and South East did become smaller by two percentage points in each region. However, in the East Midlands the commuting rate negatively contributed towards the region's divergence of GVA per capita from the UK average by two more percentage points in 2004 than in 2001.

In London, the decreasing impact of the commuting rate was offset by an upward trend in GVA per hour worked. By 2004 the contribution of GVA per hour worked to London's divergence in GVA per head from the UK average had increased to nearly one half. This was because the number of workforce hours in London actually decreased between 2001 and 2004 but GVA continued to grow.

The negative effects in Northern Ireland are largely due to GVA per hour worked and activity rate which outweigh the positive effects from the above-average hours per job component. The activity rate of an area could be affected by the demographics of

Table 1
Regional percentage differences in GVA per head from the UK average (UK=0): NUTS1 Regions

				Per cent
	2001	2002	2003	2004
North East	–21	–21	–21	–21
North West	–11	–12	–12	–12
Yorkshire and The Humber	–12	–12	–12	–13
East Midlands	–8	–8	–8	–7
West Midlands	–8	–9	–10	–10
East of England	–5	–5	–4	–4
London	51	52	53	53
South East	9	9	8	8
South West	–6	–6	–6	–6
Wales	–21	–22	–22	–22
Scotland	–5	–5	–4	–5
Northern Ireland	–19	–20	–20	–19

Figure 2
Factors contributing to differences in regional GVA per head from the UK average in 2001: NUTS1 Regions

Per cent

Legend: GVA per hour worked · Hours per job · Employment rate · Commuting rate · Activity rate
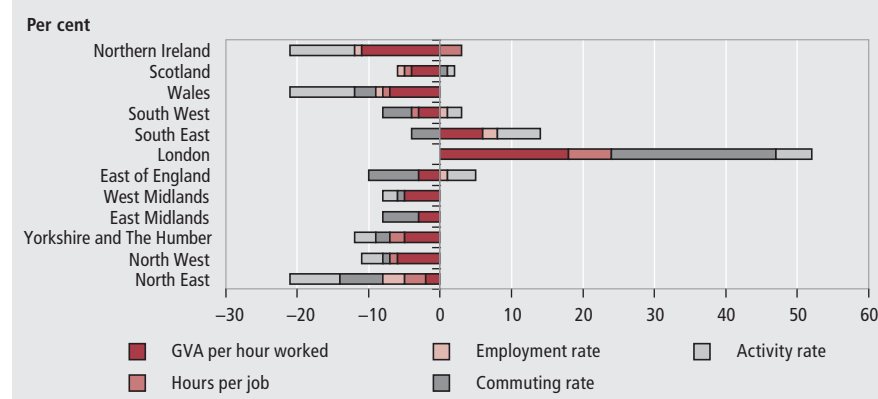
Figure 3
Factors contributing to differences in regional GVA per head from the UK average in 2004: NUTS1 Regions

Per cent

Legend: GVA per hour worked · Hours per job · Employment rate · Commuting rate · Activity rate
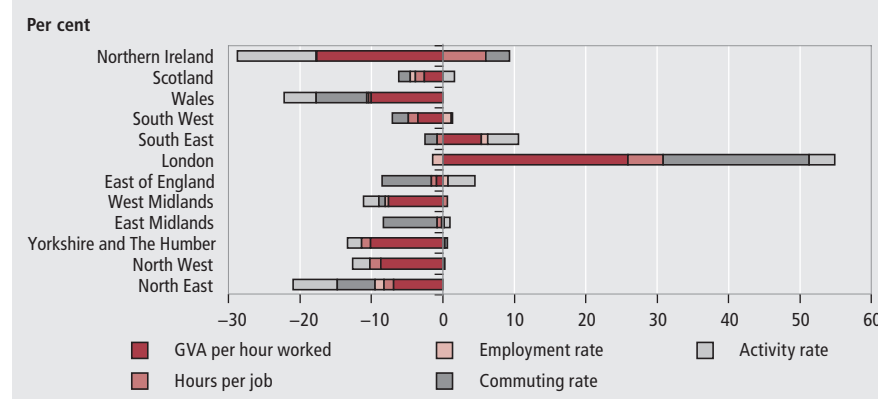
its population, a natural endowment. The positive contribution of the hours per job component increased from 2001 to 2004 because the number of hours worked per job in Northern Ireland increased by 1 per cent over this period compared to a 2.4 per cent decline across the UK.

Even if the hours per job component increases it has the potential to make a positive contribution to a region's performance provided workers' output increases by at least a comparable amount. For example, when assuming that output remains constant and fewer hours are worked per given number of jobs this suggests workers are being more productive. Northern Ireland was one of only three regions in 2004 (with London and the West Midlands) where the hours per job component positively contributed to the regional difference in GVA per head from the UK average. However from 2001 onwards, productivity (in terms of GVA per hour worked) had an increasingly negative contribution to the region's difference

in GVA per head from the UK average. Between 2001 and 2004, GVA per hour worked in Northern Ireland grew less, at 10 per cent, than the UK growth of 19 per cent. Figure 1 additionally illustrates this lower than average productivity.

This shows that the trends in productivity in London and in Northern Ireland were in opposite directions between 2001 and 2004, whereas both regions showed similar positive contributions from the hours per job component. The difference between these regions may be the result of differences in industry mix. For example, agriculture is important in Northern Ireland (nearly 3 per cent of headline GVA was produced in the agriculture sector in 2004, compared to the UK-wide contribution of only 1 per cent[3]) whereas in London concentration is in the service industries.[4]

In Wales, by 2004, the proportion of the region's divergence of GVA per head below the UK average attributable to the activity rate had decreased to one-fifth. The number of unemployed people as a proportion of

the residence-based labour force in the region decreased over this period, yet there was an increase in the negative contribution of GVA per hour worked to the region's difference in GVA per head from the UK average; to nearly a half by 2004. This offset the improvement in the activity rate relative to the UK average, and is suggestive that although the rate of economic activity increased, the activity carried out by the labour force did not contribute to productivity by a comparable amount.

Figure 2 shows that in the North East in 2001 GVA per hour worked only contributed to one-tenth of the region's divergence in GVA per head below the UK average. By 2004, Figure 3 shows that this component accounted for a third of the region's performance below the UK average. The lower annual growth of GVA per hour worked (5 per cent) in this region compared to the UK (5.8 per cent) contributed to this in 2004. Separating GVA per hour worked into its numerator (GVA) and denominator (hours worked) helps to explain this. Annual GVA growth in the North East in 2004 is equal to that for the UK at 6 per cent. This is an improvement compared to previous years when GVA in the North East grew slower than the UK. However, since 2001 the region's annual growth in hours worked has been greater than that in the UK. For example, in 2004 the number of hours worked in the North East grew by 1.1 per cent compared to only 0.25 per cent across the UK. Therefore, GVA per hour worked in the North East declined against the UK average because this region's growth in hours worked was greater relative to the UK than the relative GVA growth.

This analysis has identified the main components that contribute to each region's GVA per head diverging from the UK average, and how these components have changed over time. It is recognised that further work may be needed to further explain these factors, and ensure that the best data sources are used, particularly when it is extended in due course to more detailed geographies at NUTS 2 and 3 levels.

Overview

■ In 2005, London and the South East were the highest performing regions in terms of GVA per head, and the only two regions above the UK average. Wales and the North East had the lowest absolute level of GVA per head in 2005, but were among the regions with the highest annual growth rate.

- London, the North East and the East Midlands had the highest rate of annual nominal GVA growth in 2004 at 4.4 per cent, while the South East had the lowest at 3.3 per cent.
- The North East recorded the largest annual increase in the employment rate of 1.2 percentage points.

Headline indicators

This section presents a selection of regional economic indicators that provide an overview of the economic activity of the UK regions. Indicators presented include the latest data on headline workplace-based nominal GVA and GVA per head. New statistics for 2005 and revisions to previous years were published by ONS in December 2006. Data on GVA per hour worked (based on the December 2005 GVA publication) present an indicator of labour productivity. Gross Disposable Household Income (GDHI) and average gross weekly earnings are welfare indicators of the people living in each region.

Regional performance

Tables 2 and 3 represent economic performance in terms of headline workplace based nominal Gross Value Added (GVA) and GVA per head respectively for the UK regions. It should be noted that nominal figures do not take account of inflation or regional differences in prices.

The regional breakdown of GVA changed little in 2005. Table 2 shows that London and the South East remained the regions with the largest share of UK GVA (19.1 per cent and 14.6 per cent respectively) while Northern Ireland (2.3 per cent) and the North East (3.4 per cent) had the smallest.

In Table 2 it is evident that all regions experienced growth in nominal GVA in 2005 but that this growth was considerably lower than in 2003 and 2004. In 2005 overall UK growth was only 4 per cent compared with 6 per cent in the preceding two years. London, the North East and the East Midlands had the highest annual percentage growth (at 4.4 per cent) in 2005. The North East region had one

Table 2

Headline Workplace – based Gross Value Added at current basic prices: NUTS1 Regions

£ million

	United Kingdom	UK *less* extra-regio and statistical discrepency	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland	Extra-Regio[2]
2000	840,979	819,114	27,996	83,684	60,637	53,076	67,402	70,877	153,456	120,289	63,736	31,744	67,113	19,104	21,865
2001	882,753	862,123	29,352	87,763	63,758	56,126	70,526	74,880	161,197	127,469	67,520	33,416	70,050	20,066	20,630
2002	930,297	910,374	30,707	91,859	67,221	59,418	73,678	79,157	172,442	134,430	71,572	35,024	73,917	20,948	19,923
2003	985,558	965,850	32,428	96,828	71,187	63,634	77,490	84,622	183,455	142,175	76,368	37,115	78,331	22,218	19,709
2004	1,044,165	1,024,088	34,419	102,366	75,260	67,884	81,741	90,161	195,087	150,007	81,322	39,316	82,952	23,573	20,077
2005[1]	1,086,859	1,064,322	35,940	106,142	78,079	70,841	84,838	93,686	203,642	154,927	84,554	40,867	86,324	24,480	23,460
2003 growth[3]	5.9	6.1	5.6	5.4	5.9	7.1	5.2	6.9	6.4	5.8	6.7	6.0	6.0	6.1	−1.1
2004 growth[3]	5.9	6.0	6.1	5.7	5.7	6.7	5.5	6.5	6.3	5.5	6.5	5.9	5.9	6.1	1.9
2005 growth[3]	4.1	3.9	4.4	3.7	3.7	4.4	3.8	3.9	4.4	3.3	4.0	3.9	4.1	3.8	16.9
2005 percentage regional breakdown[4]	N/A	100	3.4	10.0	7.3	6.7	8.0	8.8	19.1	14.6	7.9	3.8	8.1	2.3	N/A

Notes

1 Provisional.
2 Extra-regio is the contribution to economic activity that cannot be allocated to any region.
3 Year-on-year percentage growth.
4 Regional breakdown is the proportion of each region as a percentage share of total UK GVA (excluding extra-regio).

Source: Regional Accounts, Office for National Statistics

Table 3

Headline Workplace – based Gross Value Added at current basic prices per head of population: NUTS1 Regions

£ million

	United Kingdom[1]	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
2000	13,910	11,007	12,353	12,229	12,734	12,791	13,187	21,205	15,054	12,962	10,920	13,256	11,352
2001	14,584	11,556	12,958	12,811	13,396	13,355	13,865	22,014	15,887	13,659	11,482	13,832	11,878
2002	15,346	12,099	13,542	13,463	14,070	13,891	14,598	23,394	16,712	14,408	11,980	14,623	12,347
2003	16,218	12,770	14,230	14,211	14,965	14,566	15,490	24,832	17,595	15,276	12,633	15,488	13,049
2004	17,115	13,524	14,994	14,936	15,862	15,325	16,419	26,262	18,496	16,141	13,316	16,334	13,782
2005[2]	17,677	14,048	15,504	15,419	16,451	15,812	16,906	27,088	18,976	16,685	13,813	16,944	14,196
Relative to UK average; 2005	1.00	0.79	0.88	0.87	0.93	0.89	0.96	1.53	1.07	0.94	0.78	0.96	0.80
2005 growth[3]	3.3	3.9	3.4	3.2	3.7	3.2	3.0	3.1	2.6	3.4	3.7	3.7	3.0

Notes

1 UK less extra-regio and statistical discrepancy.
2 Provisional.
3 Year-on-year percentage growth.

Source: Regional Accounts, Office for National Statistics

of the smallest absolute values of GVA and accounted for the second smallest proportion of total GVA, yet in 2005 the year-on-year growth in this region was comparable with the region with by far the largest share of GVA (London). This may not be evidence that the regional extremes are converging but is suggestive that even the lower performing regions in terms of the absolute measure of GVA are capable of performing well in relative terms.

Among UK regions there is a wide variation in geographical size, which makes it difficult to compare the regions' economic performance using absolute values. Comparisons are therefore generally expressed in terms of GVA per head of population, as shown in **Table 3**. UK average GVA per head in 2005 was £17,677. London was again the region with the highest GVA per head in 2005 at £27,088, well above (at 53 per cent) the UK average. However, the GVA per head measure for London is artificially inflated because the numerator (GVA) includes the activity of the residents (who work and live there) and also the in-commuters, whereas the latter are excluded from the population denominator. GVA per head for the South East was also above the UK average (by 7 per cent), at £18,976 per head. Wales and the North East had the lowest GVA per head at £13,813 and £14,048

respectively. Despite these figures being less than 80 per cent of the UK average, growth on the 2004 figure in these regions was high at 3.9 and 3.7 per cent respectively; supporting findings from Table 2.

Labour productivity

Labour productivity indicators provide the most effective comparisons of regional economic performance. The commuting problem identified above is overcome by using workplace-based measures for both the numerator and denominator. This apportions output against a measure of all those who contribute to production. GVA per hour worked is the preferred indicator as it takes into account any variations in labour market structures across the regions, such as the proportions of full-time and part-time workers or job share availability.

At the time of this article, the productivity release incorporating the newly published GVA data for 2005 had not been published. The most recent publication[5] is consistent with the GVA data published in December 2005 and shows the GVA per hour worked indices by region up to 2004. The most productive regions in terms of GVA per hour worked in 2004 were London and the South East. They were also the only regions, with the East of England, to have higher productivity

than the UK average. Northern Ireland and Wales had the lowest values of regional productivity, at only 82 and 91 per cent of the UK level respectively.

Welfare

Table 4 contains the most recent data available for Gross Disposable Household Income (GDHI) per head. Published in May 2006 it covered data up to 2004. GDHI per head is a residence-based measure that can be used as an indicator of the welfare of people living in a region. Table 3 shows London was the region with the highest GDHI per head in 2004 (£15,298), followed by the South East (£14,656) and the East of England (£13,889). These were also the only regions above the UK average of £12,816. The regions with the lowest GDHI per head were the North East (£10,906) and Northern Ireland (£10,988).

Median gross weekly earnings data for 2006 and revised data for 2004 and 2005 were published in the Annual Survey of Hours and Earnings First Release (October 2006) and are shown in **Table 5**. All regions experienced increases in median gross weekly earnings in 2006, with the largest percentage increases in Scotland (5.7 per cent) and Northern Ireland (5.2 per cent). In absolute terms, the North East had the lowest average earnings at £399, followed

Table 4
Gross Disposable Household Income (GDHI) £ per head: NUTS1 Regions

£ million

	United Kingdom[1]	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
1998	9,917	8,534	9,140	9,164	9,161	9,078	10,554	12,045	11,303	9,888	10,103	8,628	9,325	8,526
1999	10,369	8,861	9,545	9,520	9,515	9,486	11,053	12,702	11,845	10,321	10,573	8,980	9,683	8,881
2000	10,950	9,293	10,044	10,016	10,032	10,011	11,729	13,437	12,532	10,860	11,166	9,479	10,215	9,376
2001	11,621	9,822	10,620	10,554	10,670	10,600	12,549	14,183	13,348	11,546	11,848	10,096	10,840	9,935
2002	11,948	10,127	10,908	10,851	11,009	10,891	12,964	14,431	13,723	11,870	12,169	10,437	11,225	10,233
2003	12,476	10,583	11,377	11,352	11,554	11,383	13,525	15,004	14,310	12,407	12,701	10,924	11,763	10,667
2004[2]	12,816	10,906	11,723	11,705	11,918	11,729	13,889	15,298	14,656	12,721	13,040	11,278	12,116	10,988

Notes:

1 UK less extra-regio.
2 Provisional.

Source: Regional Accounts, Office for National Statistics

Table 5
Median Gross Weekly Pay of full-time employees: NUTS1 Regions

£ million

	United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
2004	419.2	370.2	394.1	389.4	383.6	392.0	419.1	537.4	447.2	392.6	381.3	390.4	372.6
2005	431.2	383.7	406.4	398.8	405.2	402.4	427.7	555.9	450.4	400.0	389.7	408.6	385.2
2006	447.1	399.0	420.8	412.4	421.6	415.5	443.9	572.4	470.1	417.0	402.5	432.0	405.2

Source: Annual Survey of Hours and Earnings, Office for National Statistics

Table 6
Expenditure on Research and Development performed in UK businesses: NUTS1 Regions

£ million

	United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
2001	11,978	119	1,554	298	895	735	2,768	649	3,141	988	150	532	150
2002	12,469	124	1,602	336	972	773	2,650	847	3,124	1,157	186	550	149
2003	12,677	152	1,545	345	868	809	2,936	709	3,252	1,229	207	508	116
2004	12,816	153	1,742	348	960	772	2,703	792	3,214	1,297	226	494	116
2005	13,410	158	1,887	350	1,019	735	3,316	630	3,163	1,201	231	584	136
Percentage share of UK total	100	1.2	14.1	2.6	7.6	5.5	24.7	4.7	23.6	9.0	1.7	4.4	1.0
2005 percentage growth[1]	4.6	3.3	8.3	0.6	6.1	-4.8	22.7	-20.5	-1.6	-7.4	2.2	18.2	17.2

Notes:

1   Year-on-year percentage growth.

Source: Office for National Statistics

by Wales at £403 and Northern Ireland at £405. London maintains a noticeable lead as the region with the highest gross weekly earnings, the median of which increased to £572 in 2006. However, earnings in London increased the least in 2006 by only 3.0 per cent compared to the UK growth of 3.7 per cent. This is in contrast to 2005 when London earnings grew more than the UK average (3.4 per cent compared to 2.9 per cent). The other regions that showed similarly lower growth in earnings in 2006 compared to the UK average were the North West, Yorkshire and The Humber, the West Midlands and Wales.

Drivers of productivity

The following indicators represent the drivers of productivity as identified by HM Treasury (HMT) and the Department for Trade and Industry (DTI).[6] Research and Development (R&D) statistics provide an indicator for innovation, VAT statistics on net registration change and business survival rates are indicators for enterprise and UK regional trade in goods is regarded as a suitable indicator for competition. This article also introduces indicators on investment, represented by net capital expenditure, and skills, represented by the qualifications of the population.

Innovation

Innovation is a necessary, although not sufficient, condition for economic success and therefore is recognised as an important driver of productivity. Innovation can mean either the invention of new and more valuable products or services, or the development of new processes that increase efficiency. Research and Development (R&D) is an input to the innovation process and defined by the OECD[7] as 'creative work undertaken on a systematic basis in order to

increase the stock of knowledge, including knowledge of man, culture and society and the use of the stock of knowledge to devise new applications'.

Statistics on Business Expenditure on Research and Development (BERD) consistent with these internationally agreed standards were published in November 2006 (ONS). New data for 2005 and revisions since 2001 were published at the NUTS1 level. Updates on R&D expenditure in the Government and Higher Education sectors are not yet available.

Table 6 presents expenditure on R&D performed in UK businesses by region from 2001 to 2005. The East of England and the South East had the highest business expenditure on R&D in 2005 and were the only regions to have expenditure higher than £3 billion. Northern Ireland, the North East and Wales remained the regions with the lowest R&D expenditure. The East of England had the highest percentage growth in 2005 at 23 per cent. Scotland and Northern Ireland were the regions with the next highest growth in 2005 at

18 and 17 per cent respectively, despite being ranked low when comparing their absolute expenditure on R&D with other regions.

The East of England accounted for 24.7 per cent of total UK expenditure on R&D in 2005, replacing the South East which had contributed the largest per cent in 2004 (25.1 percent). The high growth in the East of England identified above, coupled with the reduction in the South East (of 1.6 per cent) explains this change of rankings in 2005. London had the greatest decline, at 20 per cent, that reduces R&D expenditure in the region to a lower level than that seen in 2001.

Analysing R&D as a percentage of GVA is a measure commonly used in international comparisons and can further explain the above trends. **Figure 4** shows the East of England was the region with the highest share of R&D expenditure in terms of GVA (3.5 per cent in 2005) and that this has been the case since 2001. The large percentage growth in this region identified in Table 6 could be attributed to a recovery from the
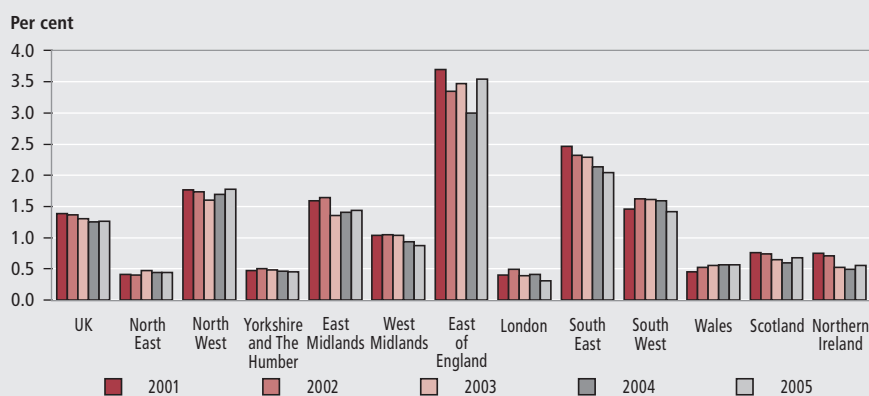
Figure 4
R&D expenditure as a percentage of headline workplace based GVA: NUTS1 Regions

Table 7
VAT registrations and de-registrations: net change[1]: NUTS1 Regions

Thousands

	United Kingdom	North East	North West	Yorkshire and The Humer	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
1999	26.6	0.4	1.5	1.1	1.5	2.0	2.8	7.8	6.1	2.2	0.0	0.5	0.6
2000	23.2	0.6	1.3	1.1	1.6	2.2	2.8	5.8	4.6	1.6	0.5	0.6	0.5
2001	14.1	0.1	1.0	0.5	1.3	1.4	1.4	2.6	3.3	1.4	0.6	0.0	0.6
2002	14.5	0.4	1.2	0.9	1.8	1.5	2.3	0.3	3.3	1.7	0.0	0.3	0.8
2003	25.7	0.9	3.1	2.7	2.1	1.6	2.6	4.0	4.2	2.4	0.5	1.1	0.7
2004	20.4	0.6	2.4	1.8	1.8	1.3	1.8	3.2	2.9	1.8	1.0	1.1	0.6
2005	25.0	0.9	3.2	1.9	2.3	2.0	3.1	3.7	3.1	2.2	0.9	1.4	0.3

Note:

1 Net change is the net gain or loss in the stock of registered enterprises each year – equal to registrations *less* de-registrations.

Source: Small Business Service, DTI

relatively low level of R&D expenditure in 2004 evident in Figure 4. Additionally, Figure 4 shows that relative R&D expenditure in terms of GVA in the East of England was highest in 2001, despite Table 6 presenting highest absolute expenditure in this region in 2005.

The large decline in expenditure in London in 2005 (identified in Table 6) is interesting in the context where it has the lowest R&D expenditure in terms of GVA at just 0.31 per cent. This may not be suggestive of low levels of innovation in London but could reflect how regional industry composition affects R&D as an indicator of innovation. London has a large concentration of service industries; accounting for 87 per cent of total headline GVA[4] but service industries may not be R&D intensive, if for example, they rely heavily on human capital. If innovation occurs in other forms it will not be captured by the R&D measure.

The decline in the South East identified in Table 6 is reinforced by Figure 4 in which a steady decline of R&D expenditure in terms of GVA since 2001 is evident. The South East was one of the five regions in 2005 with a level of R&D expenditure in terms of GVA above the UK average of 1.3 percent. The other four regions were the North West, the East of England, the East Midlands and the South West. This highlights the North West as the exception in a concentration towards southern regions.

Enterprise

Table 7 shows the net changes in VAT registered businesses for UK regions in the years 1999 to 2005. Data for 2005 and revisions to previous years were published in October 2006 by the Small Business Service (SBS) at the DTI. VAT registrations and de-registrations are the best official guide to the pattern of business start-ups and closures. They are an indicator of the level of entrepreneurship and of the health of the business population. Many factors influence the pattern of business start-ups. Among these, the most important is economic growth which encourages new ventures and creates demand for business.

Table 7 shows an overall positive net change in VAT registrations and de-registrations during 2005 at the UK level which means more enterprises became registered than de-registered in that period. This is reflected in all UK regions, with the smallest net increase of 300 seen in Northern Ireland and the highest in London at 3,700. Wales and Northern Ireland were the only regions that saw a smaller net increase in 2005 compared with 2004. For Wales however, despite this relative decline, the figures for 2005 were still the second highest seen since 1999 because of the high level of net registrations recorded in 2004. In Northern Ireland however, the figure for 2005 was the lowest seen over the same period. A possible explanation may be that in all nine English regions, and in Scotland and Wales, fewer businesses de-registered in 2005 compared to 2004.[8] The only region where the number of de-registrations actually increased (by 410) in 2005 was Northern Ireland. This increase caused net registrations to be lower in 2005 than in other years because even though it was the only region in which the number of registrations also increased in 2005, this did not offset the increased number of de-registrations.

The regional variations are linked geographically in that three of the four regions with a net change over 3,000 are situated next to each other (London, East and South East), with the exception (the North West) interestingly being situated next to the North East – the region with the lowest net change in England.

Business survival rates data on the proportion of businesses that remain registered for VAT three years after their initial registration has not been updated. The most recently available data[9] will not be updated until later in February 2007. The data shows that although there has been a general increase in business survival rates since 1994, these rates vary greatly between regions. Northern Ireland had the highest survival rate (75 per cent) for businesses that registered in 2001 and London had the lowest (64 per cent).

Competition

Data from HM Revenue and Customs provides regional trade statistics, which are an indicator of competition within a region. **Table 8** shows regional export trade in goods by statistical value, for both exports to other European Union (EU) member states and exports to countries outside the EU. Due to the change in number of member states this data is only available back to 2004. Trade in goods, by definition, excludes intangibles and services. The statistical value of this trade is computed by the value of the goods plus the cost of movement to the country's border.

New data for the third quarter of 2006 were published by HM Revenue and Customs (HMRC) in December 2006 with revisions to previously published 2006 data.[10] The latest data are provisional and subject to the normal revisions when late declarations are received. These usually result in EU trade rising for the most recent quarter in subsequent releases.

Estimates for UK exports to both the EU25 and non-EU25 countries declined in Quarter 3 of 2006. All regions experienced a decline in exports to the EU25, with the largest drop in London of 61 per cent. The value of exports to non-EU countries also declined in all but four regions, the North East, Yorkshire and The Humber, the South West and Wales. This downward trend can be partly attributed to the recent fall in the

Table 8
UK Regional Trade in goods by statistical value of exports; Quarters 1–3 NUTS1 Regions

£ million

	EU25			Non-EU25		
	2004	2005	2006[1]	2004	2005	2006[1]
North East	3,928	4,017	4,071	2,087	2,167	2,111
North West	7,070	7,758	11,129	6,094	6,202	7,436
Yorkshire and The Humber	4,506	5,163	5,915	2,875	3,579	3,644
East Midlands	5,809	6,761	8,548	4,301	4,872	5,360
West Midlands	5,729	6,088	8,951	4,371	4,885	5,134
East of England	7,846	8,082	9,285	5,245	5,732	5,887
London	7,092	7,194	11,888	9,855	12,119	11,131
South East	11,977	12,798	14,519	9,168	10,275	11,104
South West	4,526	4,601	5,052	2,667	2,867	3,084
Wales	3,996	4,079	4,252	2,011	2,401	2,798
Scotland	4,619	4,685	5,068	4,074	4,683	5,003
Northern Ireland	1,994	2,133	2,407	1,198	1,258	1,374

Note:

1 Provisional.

Source: HM Revenue and Customs

value of Missing Trader Intra-Community VAT Fraud (MTIC Fraud). Comparing the quarter 3 data for 2006 to quarter 2 alone may be misleading. As the 2006 data for quarters 1 and 2 are not subject to any further revisions, these figures are likely to be more comparable. Table 8 compares the 2006 year-to-date figures with the totals for quarters 1 to 3 in previous years.

Table 8 shows export trade to the EU25 countries increased in all regions in the first three quarters in 2006 compared to the same quarters in 2005. All regions except London and the North West experienced an increase in export trade to non-EU25 countries for the corresponding periods. The large percentage growth in exports to EU25 countries from London and the North West (at 65 and 43 per cent respectively) offset the decline in exports to non-EU25 countries. Total exports from these regions increased.

Table 9 shows the value of export goods as a percentage of headline workplace based regional Gross Value Added (GVA). In 2005 the North East remained the region where exports accounted for the highest percentage of GVA (nearly a quarter). Despite this high share of GVA as accounted for by exports it is the only region where this percentage share declined from 2004. Also, Table 8 shows that in this region in 2005, exports to both EU25 and non-EU25 countries had the second lowest value in the UK in front of only Northern Ireland. Table 9 shows that in 2005 exports from London accounted for a larger share of its GVA at 12.9 per cent than they did in 2004. This increase is not mirrored elsewhere. The South West

Table 9
Value of total export goods as a percentage of headline GVA: NUTS1 Regions

Per cent

	2004	2005
UK[1]	18.2	19.5
North East	23.6	23.4
North West	17.4	18.2
Yorkshire and The Humber	13.5	15.2
East Midlands	20.5	22.6
West Midlands	16.8	18.0
East of England	20.0	20.4
London	11.5	12.9
South East	19.6	20.8
South West	12.0	12.3
Wales	21.2	21.2
Scotland	14.4	14.7
Northern Ireland	18.6	18.9

Note:

1 UK figures include trade and GVA that cannot be allocated to regions.

Source: HM Revenue and Customs and Office for National Statistics

was the region where exports account for the lowest share of its GVA.

Investment

Physical capital stock directly influences how much one unit of labour can produce and therefore investment in this is closely correlated to productivity improvements. Net capital expenditure can provide a measure of investment. A regional breakdown of this is available from the Annual Business Inquiry (ABI). The latest data were published in September 2006 (ONS).

Table 10 shows the different levels of net capital expenditure in the regions;

suggestive of different levels of investment occurring. London and the South East had considerably higher investment levels in 2004, at £13.1 billion and £12.4 billion respectively. The only three regions where expenditure was below £3 billion were Northern Ireland, Wales and the North East, and this reflects the relative sizes of the economies of these regions. The industry sector mix of each region may also impact on these results if, for example, capital intensive industries are concentrated in a certain region.

The picture changes when net capital expenditure is compared as a percent of headline GVA. This is represented in **Figure 5** where the regional differences in investment in terms of headline GVA appear to be less significant. The higher absolute expenditure in London and the South East identified in Table 10 is evident but must be correlated to a higher headline GVA because in percentage terms the investment levels in these regions were little different. Scotland is the only exception, where historically a much higher percent of GVA has been allocated to net capital. Since 1998 the percentage of GVA spent on investment has been steadily declining in all regions.

Skills

The skills of workers are imperative to productivity as they define the capabilities the labour force can input to the production process. It is useful to be able to analyse the skills from two perspectives; the qualifications of young people as a representation of the future capabilities of the labour force and the qualifications of the currently economically active adults. The economically active are the employed and unemployed (according to the International Labour Organisation's definition) and therefore represent the skills currently available in the labour market. Analysis of Labour Force Survey data on qualifications has been carried out by the Department for Education and Skills (DfES) and published by the DTI (Table 9).[12]

The data show that there were improvements in the qualifications of the economically active in all regions since 1998. The proportion of adults who have no qualifications declined in all regions. Comparing the autumn quarters for 1998 and 2005, the largest declines were in the North East and the West Midlands, at 6.0 and 5.2 percentage points respectively. In comparison, the decline across the UK was only 3.4 percentage points. These regions also had the largest improvements (at 8.6 and 7.6 percentage points respectively) in the proportion of

Table 10
Net Capital Expenditure: NUTS1 Regions

£ million

	United Kingdom	North East	North West	Yorkshire and The Humer	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
1998	86,557	3,624	9,106	5,781	4,978	6,912	6,585	16,895	11,894	5,289	3,362	10,251	1,881
1999	85,168	3,728	8,822	5,385	5,237	5,806	6,845	16,006	13,269	6,313	3,164	8,662	1,931
2000	86,768	3,353	7,995	5,791	4,453	6,538	7,836	16,933	14,034	6,952	2,499	8,447	1,938
2001	85,276	3,560	9,032	5,632	4,440	6,986	6,641	15,747	12,830	6,603	2,836	8,886	2,083
2002	80,839	3,098	8,468	6,303	3,948	6,090	6,276	13,133	13,607	6,541	2,802	8,874	1,699
2003	80,295	2,482	8,321	6,460	4,305	5,615	6,706	14,921	12,285	5,640	2,704	8,950	1,906
2004	81,176	2,874	8,991	6,537	5,433	5,586	6,577	13,133	12,407	5,723	2,817	9,247	1,852

Note:

1 The accuracy of regional variables taken from the ABI are dependent on their relationship with local employment. Capital expenditure has a weak relationship, so the reliability of this data as an indicator of regional investment is uncertain.

Source: Annual Business Inquiry[1] Office for National Statistics

Figure 5
Net Capital Expenditure in 2004: Absolute expenditure (£ million) and expenditure as a percentage of headline GVA: NUTS1 Regions
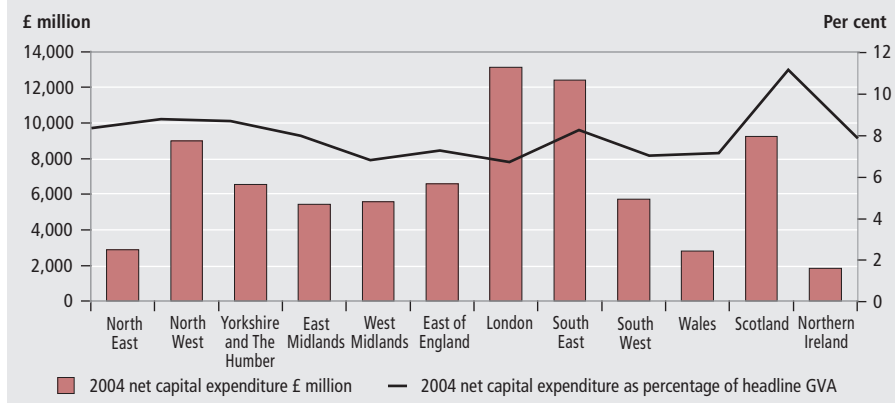
economically active adults qualified to at least NVQ level 3, compared to the UK average improvement of 6.3 percentage points. All regions saw positive educational improvements among the economically active over this period, whereas such improvements among the young were not so evident.

The proportion of 19-21 year olds educated to NVQ level 2 (for example, five GCSE passes at grade A* – C) actually declined at the UK level between 1999 and 2005, by 0.2 percentage points, with the North West and the East of England seeing the worse decline at 4.6 and 4.4 percentage points respectively. Among the 16–19 year olds in these regions however, this indicator did improve. In the North East, the East Midlands and Northern Ireland there were declines in the proportion of 16-19 year olds educated to level 2. The

Table 11
Employment[1] rates for persons of working age: NUTS 1 regions

Per cent, seasonally adjusted

		United Kingdom	North East	North West	Yorkshire and The Humer	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2003	Jul–Sep	74.6	68.5	73.5	74.3	75.6	73.3	78.4	70.4	79.1	78.7	74.9	72.9	74.2	68.1
	Oct–Dec	74.6	69.5	73.4	74.1	76.1	73.4	79.7	69.8	78.9	79.1	75.1	72.1	73.9	66.8
2004	Jan–Mar	74.8	69.8	73.9	74.2	76.4	73.9	79.6	70.2	78.6	79.3	75.2	72.6	74.4	67.1
	Apr–Jun	74.7	69.8	73.8	74.1	76.3	73.9	79.0	70.1	78.7	78.1	75.0	72.6	74.7	66.8
	Jul–Sep	74.7	70.1	73.5	74.3	75.6	75.1	78.9	69.4	79.0	78.7	75.1	71.3	75.0	67.0
	Oct–Dec	74.9	69.8	74.1	74.5	76.1	74.9	78.8	69.3	79.1	78.7	75.2	72.3	75.1	69.2
2005	Jan–Mar	74.9	70.3	73.3	74.5	76.4	74.7	78.8	69.8	78.9	78.8	75.1	71.7	75.3	68.8
	Apr–Jun	74.7	70.2	73.3	74.3	76.5	74.4	78.7	69.3	79.0	78.8	75.0	71.4	75.0	68.5
	Jul–Sep	74.8	69.7	73.5	74.7	77.2	74.0	78.5	69.5	78.9	78.3	75.0	72.3	75.2	69.9
	Oct–Dec	74.5	70.1	72.9	74.4	77.2	73.4	77.5	69.3	78.8	77.8	74.6	71.8	75.4	68.7
2006	Jan–Mar	74.6	70.9	73.4	74.2	77.0	73.8	77.4	69.9	78.8	78.1	74.9	71.5	75.3	69.4
	Apr–Jun	74.6	71.7	73.3	74.1	76.9	73.8	76.9	69.5	79.0	78.4	74.8	71.5	74.8	70.1
	Jul–Sep	74.5	70.9	73.5	73.5	77.1	73.9	77.0	69.5	78.9	77.8	74.7	72.1	75.2	68.9

Note:

1 Includes employees, self-employed, participants on government-supported training schemes and unpaid family workers.

Source: Labour Force Survey, Office for National Statistics

Table 12
Unemployment rates for persons aged 16 and over: NUTS1 regions

Per cent, seasonally adjusted

		United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2003	Jul–Sep	5.1	6.6	5.0	4.9	4.6	5.9	4.0	7.2	3.9	3.3	5.0	4.7	5.9	5.6
	Oct–Dec	4.9	6.3	4.7	4.9	4.5	5.7	3.4	7.0	3.8	3.0	4.8	4.8	5.8	6.2
2004	Jan–Mar	4.8	5.6	4.5	4.8	4.7	5.5	3.4	7.0	3.8	3.0	4.7	4.6	5.8	5.3
	Apr–Jun	4.8	5.5	4.4	4.6	4.2	5.5	3.8	7.0	3.7	3.7	4.7	4.2	6.0	5.1
	Jul–Sep	4.7	5.9	4.5	4.6	4.1	5.0	3.6	7.2	3.6	3.3	4.6	4.9	5.3	5.0
	Oct–Dec	4.7	6.4	4.6	4.6	4.2	4.7	3.8	7.2	3.5	3.3	4.6	4.2	5.7	4.6
2005	Jan–Mar	4.7	5.8	4.7	4.4	4.3	4.7	3.8	6.7	3.7	3.6	4.6	4.6	5.5	4.8
	Apr–Jun	4.8	6.8	4.4	4.8	4.2	4.7	3.9	7.2	3.8	3.2	4.7	4.6	5.4	4.9
	Jul–Sep	4.8	6.7	4.5	4.5	4.4	4.7	4.1	6.7	4.0	3.7	4.8	4.6	5.5	4.3
	Oct–Dec	5.1	6.5	4.9	5.4	4.6	5.3	4.5	7.4	4.2	3.9	5.2	4.9	5.2	4.5
2006	Jan–Mar	5.2	6.6	4.9	5.4	5.0	5.2	4.8	7.7	4.5	3.6	5.3	4.8	5.3	4.4
	Apr–Jun	5.5	6.1	5.3	5.7	5.4	5.7	5.0	7.9	4.7	3.7	5.5	5.7	5.4	4.2
	Jul–Sep	5.6	6.9	5.6	6.0	5.3	6.1	5.0	8.0	4.5	3.9	5.7	5.4	5.0	4.7

Source: Labour Force Survey, Office for National Statistics

largest improvements were in Wales and the West Midlands at 5.3 and 4.6 percentage points respectively, compared to the UK improvement of 1.6 points.

The Labour market

Table 11 shows seasonally adjusted employment rate, the number of people of working age in employment, expressed as a proportion of the population, from the Labour Force Survey (LFS).

In quarter 3 (July–September) of 2006, the UK employment rate was 74.5 per cent, 0.3 percentage points lower than a year ago and 0.1 percentage point lower than quarter 2 (April–June). Regional rates varied from 78.9 per cent (South East) to 68.9 per cent in Northern Ireland.

The only region with an increase over the year was the North East where the employment rate rose by 1.2 percentage points although compared with quarter 2 there was a fall of 0.8 percentage points. The rates were unchanged on a year earlier, for two regions, London and the South East. All other regions showed an annual fall with the largest decreases in the East of England (1.5 percentage points), Yorkshire and The Humber (1.2 percentage points) and Northern Ireland (0.9 percentage points).

Table 12 shows the unemployment rate (according to the internationally consistent ILO definition) for persons aged 16 and over from the LFS. The UK rate in 2006 quarter three was 5.6 per cent, up 0.1 percentage point from the previous quarter and up

0.8 percentage points on a year earlier. Regionally, the rates ranged from 8.0 per cent in London to 3.9 per cent in the South West.

Over the year, unemployment has increased in all but one of the 12 regions. Four regions had an increase of more than 1 percentage point – Yorkshire and The Humber (1.5 percentage points), West Midlands (1.4 percentage points), London (1.3 percentage points) and North West (1.1 percentage points). Scotland was the only region with an annual decrease of 0.4 percentage points.

Table 13 shows economic inactivity rates for persons of working age from the LFS. The UK rate in 2006 quarter three was 21.0 per cent, unchanged from the previous quarter and down 0.3 percentage points

Table 13
Economic inactivity rates for persons of working age: NUTS1 regions

Per cent, seasonally adjusted

		United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2003	Jul–Sep	21.3	26.6	22.6	21.8	20.6	22.0	18.3	24.0	17.6	18.5	21.1	23.4	21.0	27.7
	Oct–Dec	21.5	25.7	22.9	22.0	20.3	22.1	17.4	24.8	17.8	18.3	21.1	24.2	21.5	28.6
2004	Jan–Mar	21.3	25.9	22.5	22.0	19.8	21.7	17.5	24.5	18.2	18.3	21.0	23.7	20.9	29.1
	Apr–Jun	21.5	26.0	22.7	22.3	20.3	21.6	17.8	24.5	18.2	18.9	21.2	24.1	20.5	29.4
	Jul–Sep	21.5	25.4	23.0	22.1	21.1	20.9	18.1	25.1	17.9	18.6	21.2	24.9	20.7	29.4
	Oct–Dec	21.3	25.3	22.3	21.8	20.5	21.3	18.0	25.3	17.9	18.6	21.1	24.5	20.2	27.4
2005	Jan–Mar	21.4	25.3	23.0	22.0	20.2	21.6	18.0	25.0	18.0	18.2	21.2	24.7	20.1	27.6
	Apr–Jun	21.5	24.6	23.2	21.9	20.1	21.8	18.1	25.2	17.8	18.5	21.2	25.1	20.6	27.8
	Jul–Sep	21.3	25.3	22.9	21.6	19.2	22.2	18.0	25.3	17.8	18.6	21.2	24.1	20.3	26.9
	Oct–Dec	21.4	25.0	23.3	21.2	18.9	22.4	18.7	25.1	17.7	18.9	21.2	24.4	20.4	28.0
2006	Jan–Mar	21.1	23.9	22.7	21.5	18.8	22.0	18.6	24.2	17.4	18.9	20.8	24.8	20.4	27.3
	Apr–Jun	21.0	23.5	22.5	21.3	18.6	21.6	18.9	24.4	17.1	18.4	20.7	24.0	20.8	26.7
	Jul–Sep	21.0	23.8	22.1	21.7	18.5	21.2	18.9	24.2	17.3	18.9	20.7	23.7	20.8	27.5

Source: Labour Force Survey, Office for National Statistics

Table 14
Employee jobs[1]: NUTS1 regions

Thousands, not seasonally adjusted

	United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
Sep 02	26,136	1,006	2,948	2,125	1,752	2,309	2,262	3,948	3,649	2,092	22,091	1,103	2,277	664
Sep 03	26,186	1,004	2,957	2,175	1,759	2,309	2,281	3,929	3,596	2,102	22,112	1,118	2,285	671
Sep 04	26,398	1,023	2,988	2,239	1,783	2,298	2,282	3,907	3,607	2,137	22,265	1,161	2,291	681
Sep 05	26,640	1,021	3,040	2,254	1,808	2,307	2,271	3,955	3,621	2,166	22,443	1,174	2,334	688
Dec 05	26,814	1,025	3,046	2,266	1,815	2,325	2,293	3,995	3,652	2,182	22,598	1,176	2,342	698
Mar 06	26,615	1,014	3,018	2,249	1,802	2,296	2,265	3,971	3,623	2,176	22,415	1,173	2,330	697
Jun 06	26,782	1,022	3,031	2,259	1,813	2,305	2,285	3,995	3,646	2,197	22,552	1,189	2,344	697
Sep 06	26,815	1,018	3,022	2,267	1,822	2,304	2,298	3,992	3,648	2,193	22,564	1,205	2,344	701

Notes:

1 Employee jobs figures come from quarterly surveys of employers carried out by ONS and administrative sources. Employee jobs figures are of a measure of jobs rather than people. For example, if a person holds two jobs, each job will be counted in the employee jobs total.

Source: Employer Surveys

on a year earlier. Across the regions, rates varied from 17.3 per cent (South East) to 27.5 per cent (Northern Ireland).

Compared to a year earlier, four regions had an increase in the inactivity rate, and thus a corresponding decrease in the working-age activity rate. The East of England had the largest rise of 0.9 percentage points, Northern Ireland, Scotland and the South East also had increases. Seven regions had a decrease including three regions with falls of more than 1 percentage point – North East (1.5 percentage points); London and West Midlands (both 1.1 percentage points).

The rate for Yorkshire and The Humber was unchanged.

Table 14 shows the number of employee jobs (from the Employers Surveys). The UK number of employee jobs was 26,815,000, an increase of 175,000 over the year to September 2006.

In percentage terms, this was a 0.7 per cent increase. There were rises in all regions except the North East, North West and the West Midlands. The largest percentage increases were in Wales (2.6 per cent), Northern Ireland (1.8 per cent), South West (1.3 per cent) and the East of England (1.2 per cent).

Table 15 shows the claimant count rate

(referring to people claiming Jobseeker's Allowance benefits as a proportion of the workforce). The UK rate was 3.0 per cent in December 2006, unchanged for the tenth month in a row but 0.1 percentage point up on a year earlier. This national rate masks large variations between regions and component countries of the UK. The North East continues to have the highest claimant count rate in the UK and in December 2006 stood at 4.4 per cent. This region has had the highest rate in every year since 1999. The North East is followed by the West Midlands (4.0 per cent), London and the North West, both at 3.4 per cent. The South

Table 15
Claimant count rates[1]: NUTS1 regions

Per cent, seasonally adjusted

		United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2002		3.1	5.0	3.5	3.6	2.9	3.5	2.1	3.6	1.6	1.9	2.9	3.6	3.8	4.4
2003		3.0	4.5	3.2	3.3	2.8	3.5	2.1	3.6	1.7	1.9	2.9	3.3	3.7	4.1
2004		2.7	4.0	2.8	2.8	2.5	3.3	2.0	3.5	1.6	1.6	2.6	3.0	3.5	3.6
2005		2.7	3.9	2.9	2.9	2.5	3.4	2.1	3.4	1.6	1.6	2.6	3.0	3.2	3.3
2006		3.0	4.3	3.3	3.3	2.9	4.0	2.4	3.5	1.9	1.8	2.9	3.2	3.3	3.2
2005	Dec	2.9	4.0	3.1	3.2	2.7	3.7	2.2	3.5	1.8	1.7	2.8	3.2	3.2	3.3
2006	Jan	2.9	3.9	3.1	3.2	2.7	3.7	2.2	3.5	1.8	1.6	2.8	3.1	3.1	3.3
	Feb	2.9	4.1	3.2	3.2	2.8	3.8	2.3	3.5	1.8	1.7	2.9	3.2	3.2	3.3
	Mar	3.0	4.2	3.2	3.3	2.8	3.9	2.3	3.5	1.9	1.8	2.9	3.2	3.3	3.3
	Apr	3.0	4.2	3.3	3.3	2.9	4.0	2.4	3.5	1.9	1.8	2.9	3.3	3.3	3.3
	May	3.0	4.3	3.3	3.3	2.9	4.0	2.4	3.5	1.9	1.8	3.0	3.2	3.3	3.3
	Jun	3.0	4.3	3.3	3.4	2.9	4.0	2.4	3.6	1.9	1.9	3.0	3.2	3.3	3.2
	Jul	3.0	4.3	3.3	3.4	2.9	4.0	2.4	3.5	1.9	1.9	3.0	3.2	3.3	3.2
	Aug	3.0	4.3	3.3	3.4	3.0	4.0	2.4	3.5	1.9	1.9	3.0	3.2	3.3	3.2
	Sep	3.0	4.3	3.4	3.4	3.0	4.0	2.4	3.5	1.9	1.9	3.0	3.2	3.3	3.2
	Oct	3.0	4.4	3.4	3.4	2.9	4.0	2.5	3.5	1.9	1.9	3.0	3.2	3.3	3.2
	Nov	3.0	4.4	3.3	3.3	2.9	4.0	2.5	3.5	1.8	1.9	3.0	3.1	3.2	3.2
	Dec	3.0	4.4	3.4	3.3	2.9	4.0	2.4	3.4	1.8	1.9	2.9	3.1	3.2	3.1

Note:

1 Count of claimants of Jobseeker's Allowance expressed as a percentage of the total workforce – that is, workforce jobs plus claimants.

Source: Jobcentre Plus administrative system

East and the South West had the lowest claimant count rates at 1.8 per cent and 1.9 per cent respectively. Among the devolved administrations, the claimant count rate in Scotland has been 3.2 per cent. Both Wales and Northern Ireland have a rate of 3.1 per cent for December 2006.

On a year earlier, seven regions had a higher claimant count rate. The North East had the largest increase of 0.4 percentage points. Three regions experienced a fall in the claimant count rate – London (0.1 percentage point), Wales (0.1 percentage point) and Northern Ireland (0.2 percentage points). Rates for two regions, the South East and Scotland, were unchanged from the previous year.

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TECHNICAL NOTE

Methodology for decomposing GVA per head

The OECD methodology decomposes GVA per capita into four components of average labour productivity, employment rates, activity rates and commuting rates. In the expression below **(1)**, the labour productivity component (GVA per job) is further broken down into GVA per hour worked and hours per job.

$$\frac{GVA_i}{P_i} = \frac{GVA_i}{HW_i} \times \frac{HW_i}{EW_i} \times \frac{EW_i}{LFW_i} \times \frac{LFW_i}{LFR_i} \times \frac{LFR_i}{P_i} \tag{1}$$

This multiplicative model can then be transformed into an additive model by taking logarithms of each term, which allows the above GVA per capita formula to be decomposed into the expression below (**2**). Using an additive model enables the contributing effect of each component to be calculated, which means it is possible to identify what is determining a region's level of GVA per capita.

$$\log\left(\frac{GVA_i}{P_i}\right) = \log\left(\frac{GVA_i}{HW_i}\right) + \log\left(\frac{HW_i}{EW_i}\right) + \log\left(\frac{EW_i}{LFW_i}\right) + \log\left(\frac{LFW_i}{LFR_i}\right) + \log\left(\frac{LFR_i}{P_i}\right) \tag{2}$$

This model is used to explain the estimate of GVA per capita for a particular region. However it can also be extended to decompose the difference in GVA per capita of each region (subscripted by i) compared to the UK average. By definition, the logarithm of the difference between a region's GVA per capita and the UK average will equal the sum of the logarithms of the difference of each component from the UK average. This is shown in **3**.

$$= \log\left(\frac{GVA_i}{P_i}\right) - \log\left(\frac{GVA_{UK}}{P_{UK}}\right) \qquad \text{i denotes the region}$$

$$= \left[\log\left(\frac{GVA_i}{HW_i}\right) - \log\left(\frac{GVA_{UK}}{HW_{UK}}\right)\right] \tag{3}$$

$$+ \left[\log\left(\frac{HW_i}{EW_i}\right) - \log\left(\frac{HW_{UK}}{EW_{UK}}\right)\right]$$

$$+ \left[\log\left(\frac{EW_i}{LFW_i}\right) - \log\left(\frac{EW_{UK}}{LFW_{UK}}\right)\right]$$

$$= \left[\log\left(\frac{LFW_i}{LFR_i}\right) - \log\left(\frac{LFW_{UK}}{LFR_{UK}}\right)\right]$$

$$+ \left[\log\left(\frac{LFR_i}{P_i}\right) - \log\left(\frac{LFR_{UK}}{P_{UK}}\right)\right]$$

Using these terms, it is then possible to decompose the differences in GVA per capita for each region relative to the UK by looking at the differences in each of the five components. This will then show the relative effect of each component in terms of what is driving the differences between a region's estimate of GVA per capita and the UK average.

Key time series

National accounts aggregates

Seasonally adjusted

	£ million		Indices (2003 = 100)							
	At current prices		Value indices at current prices		Chained volume indices			Implied deflators[2]		
	Gross domestic product (GDP) at market prices	Gross value added (GVA) at basic prices	GDP at market prices[1]	GVA at basic prices	Gross national disposable income at market prices	GDP at market prices	GVA at basic prices	GDP at market prices	GVA at basic prices
	YBHA	ABML	YBEU	YBEX	YBFP	YBEZ	CGCE	YBGB	CGBV
2001	996,987	882,753	89.8	89.6	93.8	95.4	95.7	93.6	93.6
2002	1,048,767	930,297	94.5	94.4	97.2	97.4	97.4	96.9	96.9
2003	1,110,296	985,558	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2004	1,176,527	1,044,165	106.0	105.9	103.4	103.3	103.3	102.6	102.6
2005	1,225,339	1,087,868	110.4	110.4	104.5	105.3	105.3	104.8	104.8
2006						108.1	108.3		
2001 Q1	246,345	217,972	88.7	88.5	93.2	95.0	95.4	93.4	92.7
2001 Q2	248,058	219,362	89.4	89.0	93.4	95.1	95.4	94.0	93.3
2001 Q3	249,447	220,955	89.9	89.7	94.5	95.7	95.9	93.9	93.5
2001 Q4	253,137	224,464	91.2	91.1	94.2	96.0	96.1	95.0	94.8
2002 Q1	257,368	228,051	92.7	92.6	95.9	96.5	96.6	96.1	95.8
2002 Q2	261,028	231,626	94.0	94.0	96.3	97.1	97.0	96.9	96.9
2002 Q3	264,049	234,316	95.1	95.1	98.4	97.8	97.7	97.3	97.3
2002 Q4	266,322	236,304	95.9	95.9	98.3	98.3	98.2	97.6	97.6
2003 Q1	270,918	240,577	97.6	97.6	99.4	98.8	98.8	98.8	98.8
2003 Q2	275,130	244,438	99.1	99.2	98.9	99.3	99.3	99.8	99.9
2003 Q3	280,024	248,520	100.9	100.9	100.0	100.4	100.4	100.5	100.5
2003 Q4	284,224	252,023	102.4	102.3	101.7	101.5	101.6	100.9	100.7
2004 Q1	286,975	254,169	103.4	103.2	101.9	102.2	102.2	101.1	100.9
2004 Q2	293,120	260,148	105.6	105.6	103.2	103.1	103.2	102.4	102.4
2004 Q3	295,998	262,789	106.6	106.7	103.0	103.5	103.5	103.0	103.0
2004 Q4	300,434	267,059	108.2	108.4	105.4	104.1	104.2	103.9	104.0
2005 Q1	301,743	267,783	108.7	108.7	104.3	104.5	104.5	104.1	104.0
2005 Q2	304,407	270,286	109.7	109.7	105.5	104.9	105.0	104.5	104.5
2005 Q3	306,650	271,811	110.5	110.3	103.9	105.5	105.5	104.7	104.6
2005 Q4	312,539	277,988	112.6	112.8	104.3	106.2	106.3	106.0	106.2
2006 Q2	319,232	283,113	115.0	114.9	107.0	107.7	107.9	106.7	106.5
2006 Q3	325,034	288,489	117.1	117.1	107.4	108.5	108.6	107.9	107.8
2006 Q4						109.4	109.5		

Percentage change, quarter on corresponding quarter of previous year[3]

2001 Q1	5.0	5.3	5.0	5.4	3.3	2.9	2.9	2.0	2.3
2001 Q2	4.6	5.0	4.6	5.0	3.1	2.3	2.1	2.3	2.8
2001 Q3	4.1	4.5	4.2	4.5	3.1	2.4	1.9	1.7	2.5
2001 Q4	4.7	5.1	4.7	5.2	3.7	2.0	1.6	2.7	3.5
2002 Q1	4.5	4.6	4.5	4.6	2.9	1.6	1.3	2.9	3.3
2002 Q2	5.2	5.6	5.1	5.6	3.1	2.1	1.7	3.1	3.9
2002 Q3	5.9	6.0	5.8	6.0	4.1	2.2	1.9	3.6	4.1
2002 Q4	5.2	5.3	5.2	5.3	4.4	2.4	2.2	2.7	3.0
2003 Q1	5.3	5.5	5.3	5.4	3.6	2.4	2.3	2.8	3.1
2003 Q2	5.4	5.5	5.4	5.5	2.7	2.3	2.4	3.0	3.1
2003 Q3	6.1	6.1	6.1	6.1	1.6	2.7	2.8	3.3	3.3
2003 Q4	6.7	6.7	6.8	6.7	3.5	3.3	3.5	3.4	3.2
2004 Q1	5.9	5.6	5.9	5.7	2.5	3.4	3.4	2.3	2.1
2004 Q2	6.5	6.4	6.6	6.5	4.3	3.8	3.9	2.6	2.5
2004 Q3	5.7	5.7	5.6	5.7	3.0	3.1	3.1	2.5	2.5
2004 Q4	5.7	6.0	5.7	6.0	3.6	2.6	2.6	3.0	3.3
2005 Q1	5.1	5.4	5.1	5.3	2.4	2.3	2.3	3.0	3.1
2005 Q2	3.9	3.9	3.9	3.9	2.2	1.7	1.7	2.1	2.1
2005 Q3	3.6	3.4	3.7	3.4	0.9	1.9	1.9	1.7	1.6
2005 Q4	4.0	4.1	4.1	4.1	-1.0	2.0	2.0	2.0	2.1
2006 Q1	4.1	4.1	4.0	4.0	1.2	2.4	2.5	1.6	1.5
2006 Q2	4.9	4.7	4.8	4.7	1.4	2.7	2.8	2.1	1.9
2006 Q3	6.0	6.1	6.0	6.2	3.4	2.8	2.9	3.1	3.1
2006 Q4						3.0	3.0		

Notes

Source: Office for National Statistics

1 "Money GDP".
2 Based on chained volume measures and current price estimates of expenditure components of GDP.
3 For index number series, these are derived from the rounded figures shown in the table.

Gross domestic product: by category of expenditure

Last updated: 24/01/07

£ million, chained volume measures, reference year 2003, seasonally adjusted

	Domestic expenditure on goods and services at market prices											Gross domestic at product market prices
	Final consumption expenditure			Gross capital formation								
	Households	Non-profit institutions[1]	General government	Gross fixed capital formation	Changes in inventories[2]	Acquisitions less disposals of valuables	Total	Exports of goods and services	Gross final expenditure	less imports of goods and services	Statistical discrepancy (expenditure)	Gross domestic at product market prices
	ABJR	HAYO	NMRY	NPQT	CAFU	NPJR	YBIM	IKBK	ABMG	IKBL	GIXS	ABMI
2001	653,326	27,155	217,359	171,639	5,577	342	1,075,760	277,694	1,353,632	294,449	0	1,059,648
2002	676,833	27,130	224,868	178,066	2,289	183	1,109,596	280,593	1,390,217	308,706	0	1,081,469
2003	697,160	27,185	232,699	178,751	3,983	-37	1,139,741	285,397	1,425,138	314,842	0	1,110,296
2004	721,434	27,327	240,129	189,492	4,597	-42	1,182,937	299,289	1,482,225	335,703	0	1,146,523
2005	730,994	28,132	247,489	195,913	3,611	-354	1,205,785	322,792	1,528,577	359,179	-685	1,168,713
2006												1,200,614
2001 Q1	161,204	6,873	53,609	42,555	1,643	-26	265,928	71,295	337,389	73,841	0	263,631
2001 Q2	162,333	6,788	53,894	43,242	1,802	202	268,431	69,333	337,813	73,937	0	263,935
2001 Q3	164,239	6,762	54,600	43,357	1,743	30	270,836	67,921	338,708	73,327	0	265,519
2001 Q4	165,550	6,732	55,256	42,485	389	136	270,565	69,145	339,722	73,344	0	266,563
2002 Q1	167,588	6,762	55,756	42,927	1,047	66	274,166	69,440	343,608	75,709	0	267,948
2002 Q2	168,803	6,756	56,288	43,981	385	48	276,273	71,533	347,850	78,367	0	269,392
2002 Q3	169,715	6,793	56,429	44,765	511	62	278,337	71,056	349,422	78,006	0	271,368
2002 Q4	170,727	6,819	56,395	46,393	346	7	280,820	68,564	349,337	76,624	0	272,761
2003 Q1	171,828	6,843	57,099	44,934	-571	-8	280,285	72,662	352,958	78,836	0	274,119
2003 Q2	174,146	6,779	57,684	44,161	-644	94	282,367	70,611	352,971	77,283	0	275,712
2003 Q3	175,140	6,790	58,445	43,924	2,264	-68	286,503	70,334	356,830	78,089	0	278,748
2003 Q4	176,046	6,773	59,471	45,732	2,934	-55	290,586	71,790	362,379	80,634	0	281,717
2004 Q1	178,197	6,830	59,969	47,256	-381	112	291,983	73,389	365,373	81,648	0	283,725
2004 Q2	180,362	6,805	59,530	47,102	1,050	-90	294,759	74,861	369,620	83,313	0	286,307
2004 Q3	181,032	6,826	60,002	47,813	1,025	-96	296,603	75,097	371,700	84,300	0	287,400
2004 Q4	181,843	6,866	60,628	47,321	2,903	32	299,592	75,942	375,532	86,442	0	289,091
2005 Q1	182,294	7,040	60,974	48,171	1,754	-158	300,076	75,931	376,007	85,846	-218	289,943
2005 Q2	182,222	7,013	61,737	48,162	177	86	299,397	80,048	379,445	87,949	-217	291,280
2005 Q3	182,723	7,028	62,232	49,663	835	-201	302,280	82,027	384,307	91,383	-171	292,753
2005 Q4	183,755	7,051	62,546	49,917	845	-81	304,032	84,786	388,818	94,001	-79	294,737
2006 Q1	184,218	7,194	62,657	50,919	1,585	-128	306,446	92,701	399,147	102,540	263	296,869
2006 Q2	185,902	7,191	63,027	51,173	1,332	233	308,858	95,847	404,705	105,991	370	299,084
2006 Q3	186,632	7,205	63,510	52,116	1,512	-29	310,946	84,149	395,096	94,413	444	301,126
2006 Q4												303,535

Percentage change, quarter on corresponding quarter of previous year[3]

2001 Q1	2.1	3.9	1.8	3.0			2.8	9.7	4.3	9.0	2.9
2001 Q2	2.9	0.6	1.6	5.4			3.2	3.0	3.1	6.1	2.2
2001 Q3	3.4	-1.6	2.8	3.6			3.0	1.0	2.6	3.6	2.3
2001 Q4	4.0	-3.0	3.3	-1.8			2.7	-1.6	1.7	0.7	2.0
2002 Q1	4.0	-1.6	4.0	0.9			3.1	-2.6	1.8	2.5	1.6
2002 Q2	4.0	-0.5	4.4	1.7			2.9	3.2	3.0	6.0	2.1
2002 Q3	3.3	0.5	3.3	3.2			2.8	4.6	3.2	6.4	2.2
2002 Q4	3.1	1.3	2.1	9.2			3.8	-0.8	2.8	4.5	2.3
2003 Q1	2.5	1.2	2.4	4.7			2.2	4.6	2.7	4.1	2.3
2003 Q2	3.2	0.3	2.5	0.4			2.2	-1.3	1.5	-1.4	2.3
2003 Q3	3.2	0.0	3.6	-1.9			2.9	-1.0	2.1	0.1	2.7
2003 Q4	3.1	-0.7	5.5	-1.4			3.5	4.7	3.7	5.2	3.3
2004 Q1	3.7	-0.2	5.0	5.2			4.2	1.0	3.5	3.6	3.5
2004 Q2	3.6	0.4	3.2	6.7			4.4	6.0	4.7	7.8	3.8
2004 Q3	3.4	0.5	2.7	8.9			3.5	6.8	4.2	8.0	3.1
2004 Q4	3.3	1.4	1.9	3.5			3.1	5.8	3.6	7.2	2.6
2005 Q1	2.3	3.1	1.7	1.9			2.8	3.5	2.9	5.1	2.2
2005 Q2	1.0	3.1	3.7	2.3			1.6	6.9	2.7	5.6	1.7
2005 Q3	0.9	3.0	3.7	3.9			1.9	9.2	3.4	8.4	1.9
2005 Q4	1.1	2.7	3.2	5.5			1.5	11.6	3.5	8.7	2.0
2006 Q1	1.1	2.2	2.8	5.7			2.1	22.1	6.2	19.4	2.4
2006 Q2	2.0	2.5	2.1	6.3			3.2	19.7	6.7	20.5	2.7
2006 Q3	2.1	2.5	2.1	4.9			2.9	2.6	2.8	3.3	2.9
2006 Q4											3.0

Notes

Source: Office for National Statistics

1 Non-profit institutions serving households (NPISH).
2 This series includes a quarterly alignment adjustment.

Labour market summary

United Kingdom (thousands), seasonally adjusted

All aged 16 and over								
All	Total economically active	Total in employment	Unemployed	Economically inactive	Economic activity rate (%)	Employment rate (%)	Unemployment rate (%)	Economic inactivity rate (%)
1	2	3	4	5	6	7	8	9
All persons								
MGSL	MGSF	MGRZ	MGSC	MGSI	MGWG	MGSR	MGSX	YBTC
47,512	29,952	28,552	1,400	17,560	63.0	60.1	4.7	37.0
47,915	30,289	28,755	1,534	17,625	63.2	60.0	5.1	36.8
48,007	30,410	28,835	1,574	17,598	63.3	60.1	5.2	36.7
48,100	30,552	28,895	1,657	17,548	63.5	60.1	5.4	36.5
48,193	30,717	29,015	1,702	17,476	63.7	60.2	5.5	36.3
48,285	30,703	29,029	1,674	17,583	63.6	60.1	5.5	36.4
Male								
MGSM	MGSG	MGSA	MGSD	MGSJ	MGWH	MGSS	MGSY	YBTD
23,014	16,256	15,429	826	6,758	70.6	67.0	5.1	29.4
23,234	16,419	15,517	902	6,816	70.7	66.8	5.5	29.3
23,285	16,453	15,543	910	6,832	70.7	66.8	5.5	29.3
23,336	16,533	15,563	971	6,803	70.8	66.7	5.9	29.2
23,387	16,609	15,632	977	6,778	71.0	66.8	5.9	29.0
23,439	16,617	15,664	953	6,822	70.9	66.8	5.7	29.1
Female								
MGSN	MGSH	MGSB	MGSE	MGSK	MGWI	MGST	MGSZ	YBTE
24,498	13,697	13,123	573	10,802	55.9	53.6	4.2	44.1
24,680	13,870	13,238	632	10,810	56.2	53.6	4.6	43.8
24,722	13,956	13,292	664	10,766	56.5	53.8	4.8	43.5
24,764	14,019	13,332	686	10,745	56.6	53.8	4.9	43.4
24,806	14,108	13,383	726	10,697	56.9	54.0	5.1	43.1
24,846	14,086	13,365	721	10,760	56.7	53.8	5.1	43.3

Row labels for each group (dates): Sep-Nov 2004, Sep-Nov 2005, Dec-Feb 2006, Mar-May 2006, Jun-Aug 2006, **Sep-Nov 2006**

All aged 16 to 59/64								
All	Total economically active	Total in employment	Unemployed	Economically inactive	Economic activity rate (%)	Employment rate (%)	Unemployment rate (%)	Economic inactivity rate (%)
10	11	12	13	14	15	16	17	18
All persons								
YBTF	YBSK	YBSE	YBSH	YBSN	MGSO	MGSU	YBTI	YBTL
36,808	28,940	27,557	1,383	7,868	78.6	74.9	4.8	21.4
37,098	29,159	27,649	1,509	7,940	78.6	74.5	5.2	21.4
37,164	29,252	27,703	1,549	7,912	78.7	74.5	5.3	21.3
37,230	29,388	27,757	1,631	7,843	78.9	74.6	5.5	21.1
37,296	29,517	27,841	1,676	7,779	79.1	74.6	5.7	20.9
37,337	29,484	27,837	1,647	7,853	79.0	74.6	5.6	21.0
Male								
YBTG	YBSL	YBSF	YBSI	YBSO	MGSP	MGSV	YBTJ	YBTM
19,023	15,906	15,089	817	3,117	83.6	79.3	5.1	16.4
19,196	16,027	15,136	891	3,169	83.5	78.8	5.6	16.5
19,238	16,060	15,160	900	3,178	83.5	78.8	5.6	16.5
19,280	16,138	15,178	960	3,142	83.7	78.7	5.9	16.3
19,322	16,209	15,244	965	3,113	83.9	78.9	6.0	16.1
19,360	16,203	15,260	943	3,156	83.7	78.8	5.8	16.3
Female								
YBTH	YBSM	YBSG	YBSJ	YBSP	MGSQ	MGSW	YBTK	YBTN
17,785	13,034	12,467	567	4,751	73.3	70.1	4.3	26.7
17,902	13,131	12,513	618	4,771	73.4	69.9	4.7	26.6
17,926	13,192	12,543	649	4,734	73.6	70.0	4.9	26.4
17,950	13,249	12,578	671	4,701	73.8	70.1	5.1	26.2
17,975	13,308	12,598	711	4,666	74.0	70.1	5.3	26.0
17,977	13,280	12,577	704	4,697	73.9	70.0	5.3	26.1

Row labels for each group (dates): Sep-Nov 2004, Sep-Nov 2005, Dec-Feb 2006, Mar-May 2006, Jun-Aug 2006, **Sep-Nov 2006**

Notes

Relationship between columns: 1=2+5; 2=3+4; 6=2/1;7=3/1;8=4/2;9=5/1;10=11+14;11=12+13; 15=11/10;16=12/10;17=13/11;18=14/10
The Labour Force Survey is a survey of the population of private households, student halls of residence and NHS accommodation.

Prices

Last updated: 16/01/07

Percentage change over 12 months

| | Consumer prices | | | | | | Not seasonally adjusted, except for series PLLW, RNPE and RNPF Producer prices | | | |
| | Consumer prices index (CPI) | | | Retail prices index (RPI) | | | Output prices | | Input prices | |
	All items	CPI excluding indirect taxes (CPIY)[1]	CPI at constant tax rates (CPI-CT)	All items	All items excluding mortgage interest payments (RPIX)	All items excluding mortgage interest payments and indirect taxes (RPIY)[2]	All manufactured products	Excluding food, beverages, tobacco and petroleum products	Materials and fuels purchased by manufacturing industry	Excluding food, beverages, tobacco and petroleum products
	D7G7	EL2S	EAD6	CZBH	CDKQ	CBZX	PLLU[3]	PLLW[3]	RNPE[3]	RNPF[3]
2003 Jan	1.3			2.9	2.7	2.9	1.3	0.9	1.7	-2.2
2003 Feb	1.6			3.2	3.0	3.1	1.5	1.1	2.5	-2.0
2003 Mar	1.5			3.1	3.0	3.2	2.1	1.3	0.8	-1.5
2003 Apr	1.4			3.1	3.0	2.9	1.6	1.3	-1.3	-0.6
2003 May	1.3			3.0	2.9	2.7	1.1	1.2	-0.1	-0.2
2003 Jun	1.1			2.9	2.8	2.7	1.1	1.2	0.0	-1.2
2003 Jul	1.3			3.1	2.9	2.8	1.3	1.3	0.6	-0.5
2003 Aug	1.4			2.9	2.9	2.7	1.5	1.2	1.9	0.0
2003 Sep	1.4			2.8	2.8	2.7	1.4	1.4	1.3	1.0
2003 Oct	1.4			2.6	2.7	2.4	1.5	1.3	2.5	1.2
2003 Nov	1.3			2.5	2.5	2.1	1.7	1.4	4.6	1.7
2003 Dec	1.3	1.1	1.1	2.8	2.6	2.2	1.8	1.5	2.0	0.4
2004 Jan	1.4	1.5	1.3	2.6	2.4	2.0	1.6	1.4	-0.3	0.0
2004 Feb	1.3	1.3	1.1	2.5	2.3	1.9	1.6	1.5	-1.3	-0.5
2004 Mar	1.1	1.1	1.0	2.6	2.1	1.7	1.4	1.5	0.9	-0.1
2004 Apr	1.1	1.1	1.0	2.5	2.0	1.8	1.8	1.3	2.9	-0.2
2004 May	1.5	1.4	1.3	2.8	2.3	2.2	2.5	1.4	5.6	0.7
2004 Jun	1.6	1.5	1.4	3.0	2.3	2.3	2.6	1.4	3.7	1.3
2004 Jul	1.4	1.4	1.2	3.0	2.2	2.0	2.6	1.7	3.7	1.4
2004 Aug	1.3	1.3	1.1	3.2	2.2	2.0	2.8	2.2	4.6	2.3
2004 Sep	1.1	1.0	0.9	3.1	1.9	1.7	3.1	2.3	8.1	3.8
2004 Oct	1.2	1.2	1.1	3.3	2.1	2.0	3.5	2.9	9.2	4.8
2004 Nov	1.5	1.4	1.4	3.4	2.2	2.2	3.5	2.9	6.7	4.6
2004 Dec	1.7	1.7	1.6	3.5	2.5	2.5	2.9	2.5	4.4	4.2
2005 Jan	1.6	1.7	1.5	3.2	2.1	2.0	2.6	2.5	9.6	7.5
2005 Feb	1.7	1.7	1.6	3.2	2.1	2.0	2.7	2.5	11.0	8.2
2005 Mar	1.9	2.0	1.8	3.2	2.4	2.3	2.9	2.4	11.1	7.4
2005 Apr	1.9	2.0	1.9	3.2	2.3	2.3	3.3	2.6	10.0	7.0
2005 May	1.9	2.0	1.8	2.9	2.1	2.2	2.7	2.5	7.6	6.5
2005 Jun	2.0	2.2	1.9	2.9	2.2	2.2	2.5	2.3	12.0	7.4
2005 Jul	2.3	2.5	2.3	2.9	2.4	2.5	3.1	2.2	13.9	8.6
2005 Aug	2.4	2.6	2.3	2.8	2.3	2.3	3.0	1.9	12.8	7.5
2005 Sep	2.5	2.6	2.4	2.7	2.5	2.5	3.3	2.1	10.5	5.7
2005 Oct	2.3	2.5	2.3	2.5	2.4	2.3	2.6	1.4	8.9	7.0
2005 Nov	2.1	2.3	2.1	2.4	2.3	2.3	2.3	1.3	13.6	9.6
2005 Dec	1.9	2.1	1.8	2.2	2.0	2.0	2.4	1.7	17.9	12.1
2006 Jan	1.9	2.1	1.9	2.4	2.3	2.3	2.9	1.7	15.6	10.2
2006 Feb	2.0	2.1	2.0	2.4	2.3	2.3	2.9	1.8	15.0	10.5
2006 Mar	1.8	1.9	1.7	2.4	2.1	2.2	2.5	1.9	13.0	10.0
2006 Apr	2.0	2.1	2.0	2.6	2.4	2.3	2.5	2.3	15.2	10.0
2006 May	2.2	2.3	2.2	3.0	2.9	2.8	3.1	2.5	13.6	8.6
2006 Jun	2.5	2.6	2.4	3.3	3.1	3.2	3.4	2.9	11.1	8.7
2006 Jul	2.4	2.4	2.3	3.3	3.1	3.2	2.9	2.5	10.5	8.2
2006 Aug	2.5	2.6	2.4	3.4	3.3	3.4	2.7	2.3	8.0	7.8
2006 Sep	2.4	2.6	2.3	3.6	3.2	3.3	1.9	2.1	5.4	7.0
2006 Oct	2.4	2.7	2.3	3.7	3.2	3.3	1.6	2.5	4.7	6.1
2006 Nov	2.7	3.0	2.6	3.9	3.4	3.6	1.8	2.5	3.3	4.6
2006 Dec	3.0	3.2	2.9	4.4	3.8	3.9	2.2	2.4	1.9	2.6

Notes

Source: Office for National Statistics

1 The taxes excluded are VAT, duties, insurance premium tax, air passenger duty and stamp duty on share transactions.
2 The taxes excluded are council tax, VAT, duties, vehicle excise duty, insurance premium tax and air passenger duty.
3 Derived from these identification (CDID) codes.

Identification (CDID) codes

The four-character identification code at the top of each alpha column of data is the ONS reference for that series of data on our time series database. Please quote the relevant code if you contact us about the data.

Conventions

Where figures have been rounded to the final digit, there may be an apparent slight discrepancy between the sum of the constituent items and the total shown. Although figures may be given in unrounded form to facilitate readers' calculation of percentage changes, rates of change, etc, this does not imply that the figures can be estimated to this degree of precision as they may be affected by sampling variability or imprecision in estimation methods.

The following standard symbols are used:

- ..   not available
- -   nil or negligible
- P   provisional
- –   break in series
- R   revised
- r   series revised from indicated entry onwards

CONCEPTS AND DEFINITIONS

Labour Force Survey 'monthly' estimates

Labour Force Survey (LFS) results are three-monthly averages, so consecutive months' results overlap. Comparing estimates for overlapping three-month periods can produce more volatile results, which can be difficult to interpret.

Labour market summary

Economically active

People aged 16 and over who are either in employment or unemployed.

Economically inactive

People who are neither in employment nor unemployed. This includes those who want a job but have not been seeking work in the last four weeks, those who want a job and are seeking work but not available to start work, and those who do not want a job.

Employment and jobs

There are two ways of looking at employment: the number of people with jobs, or the number of jobs. The two concepts are not the same as one person can have more than one job. The number of people with jobs is measured by the Labour Force Survey (LFS) and includes people aged 16 or over who do paid work (as an employee or self-employed), those who have a job that they are temporarily away from, those on government-supported training and employment programmes, and those doing unpaid family work. The number of jobs is measured by workforce jobs and is the sum of employee jobs (as measured by surveys of employers), self-employment jobs from the LFS, people in HM Forces, and government-supported trainees. Vacant jobs are not included.

Unemployment

The number of unemployed people in the UK is measured through the Labour Force Survey following the internationally agreed definition recommended by the ILO (International Labour Organisation) – an agency of the United Nations.

Unemployed people:
- are without a job, want a job, have actively sought work in the last four weeks and are available to start work in the next two weeks, or
- are out of work, have found a job and are waiting to start it in the next two weeks

Other key indicators

Claimant count

The number of people claiming Jobseeker's Allowance benefits.

Earnings

A measure of the money people receive in return for work done, gross of tax. It includes salaries and, unless otherwise stated, bonuses but not unearned income, benefits in kind or arrears of pay.

Productivity

Whole economy output per worker is the ratio of Gross Value Added (GVA) at basic prices and Labour Force Survey (LFS) total employment. Manufacturing output per filled job is the ratio of manufacturing output (from the Index of Production) and productivity jobs for manufacturing (constrained to LFS jobs at the whole economy level).

Redundancies

The number of people who:

- were not in employment during the reference week, and
- reported that they had been made redundant in the month of, or the two calendar months prior to, the reference week

plus the number of people who:

- were in employment during the reference week, and
- started their job in the same calendar month as, or the two calendar months prior to, the reference week, and
- reported that they had been made redundant in the month of, or the two calendar months prior to, the reference week

Unit wage costs

A measure of the cost of wages and salaries per unit of output.

Vacancies

The statistics are based on ONS's Vacancy Survey of businesses. The survey is designed to provide comprehensive estimates of the stock of vacancies across the economy, excluding those in agriculture, forestry and fishing. Vacancies are defined as positions for which employers are actively seeking recruits from outside their business or organisation. More information on labour market concepts, sources and methods is available in the *Guide to Labour Market Statistics* at www.statistics.gov.uk/about/data/guides/LabourMarket/default.asp

Directory of online tables

Weblink: www.statistics.gov.uk/elmr_tables

Title	Frequency of update	Updated since last month
UK economic accounts		
1.01 National accounts aggregates	M	✔
1.02 Gross domestic product and gross national income	M	✔
1.03 Gross domestic product, by category of expenditure	M	✔
1.04 Gross domestic product, by category of income	M	•
1.05 Gross domestic product and shares of income and expenditure	M	•
1.06 Income, product and spending per head	Q	•
1.07 Households' disposable income and consumption	M	•
1.08 Household final consumption expenditure	M	•
1.09 Gross fixed capital formation	M	•
1.10 Gross value added, by category of output	M	•
1.11 Gross value added, by category of output: service industries	M	✔
1.12 Summary capital accounts and net lending/net borrowing	Q	•
1.13 Private non-financial corporations: allocation of primary income account	Q	•
1.14 Private non-financial corporations: secondary distribution of income account and capital account	Q	•
1.15 Balance of payments: current account	M	✔
1.16 Trade in goods (on a balance of payments basis)	M	✔
1.17 Measures of variability of selected economic series	Q	•
Selected labour market statistics		
2.01 Summary of Labour Force Survey data	M	✔
2.02 Employment by age	M	✔
2.03 Full-time, part-time and temporary workers	M	✔
2.04 Public and private sector employment	Q	•
2.05 Workforce jobs	Q	✔
2.06 Workforce jobs by industry	Q	✔
2.07 Actual weekly hours of work	M	✔
2.08 Usual weekly hours of work	M	✔
2.09 Unemployment by age and duration	M	✔
2.10 Claimant count levels and rates	M	✔
2.11 Claimant count by age and duration	M	✔
2.12 Economic activity by age	M	✔
2.13 Economic inactivity by age	M	✔
2.14 Economic inactivity: reasons	M	✔
2.15 Educational status, economic activity and inactivity of young people	M	✔
2.16 Average earnings – including bonuses	M	✔
2.17 Average earnings – excluding bonuses	M	✔
2.18 Productivity and unit wage costs	M	✔
2.19 Regional labour market summary	M	✔
2.20 International comparisons	M	✔
2.21 Labour disputes	M	✔
2.22 Vacancies	M	✔
2.23 Vacancies by industry	M	✔
2.24 Redundancies: levels and rates	M	✔
2.25 Redundancies: by industry	Q	•
2.26 Sampling variability for headline labour market statistics	M	✔

Weblink: www.statistics.gov.uk/elmr_tables

Prices

3.01	Producer and consumer prices	M	✔
3.02	Harmonised Indices of Consumer Prices: EU comparisons	M	✔

Selected output and demand indicators

4.01	Output of the production industries	M	✔
4.02	Engineering and construction: output and orders	M	✔
4.03	Motor vehicle and steel production	M	✔
4.04	Indicators of fixed investment in dwellings	M	✔
4.05	Number of property transactions	M	✔
4.06	Change in inventories	Q	•
4.07	Inventory ratios	Q	•
4.08	Retail sales, new registrations of cars and credit business	M	✔
4.09	Inland energy consumption: primary fuel input basis	M	✔

Selected financial statistics

5.01	Sterling exchange rates and UK reserves	M	✔
5.02	Monetary aggregates	M	✔
5.03	Counterparts to changes in money stock M4	M	✔
5.04	Public sector receipts and expenditure	Q	✔
5.05	Public sector key fiscal indicators	M	✔
5.06	Consumer credit and other household sector borrowing	M	✔
5.07	Analysis of bank lending to UK residents	M	✔
5.08	Interest rates and yields	M	✔
5.09	A selection of asset prices	M	✔

Further labour market statistics

6.01	Working-age households	A	•
6.02	Local labour market indicators by unitary and local authority	Q	•
6.03	Employment by occupation	Q	•
6.04	Employee jobs by industry	M	✔
6.05	Employee jobs by industry division, class or group	Q	✔
6.06	Employee jobs by region and industry	Q	✔
6.07	Key productivity measures by industry	Q	✔
6.08	Total workforce hours worked per week	Q	✔
6.09	Total workforce hours worked per week by region and industry group	Q	✔
6.10	Job-related training received by employees	Q	•
6.11	Unemployment rates by previous occupation	Q	•
6.12	Average Earnings Index by industry: excluding and including bonuses	M	✔
6.13	Average Earnings Index: effect of bonus payments by main industrial sector	M	✔
6.14	Median earnings and hours by main industrial sector	A	•
6.15	Median earnings and hours by industry section	A	•
6.16	Index of wages per head: international comparisons	M	✔
6.17	Regional Jobseeker's Allowance claimant count rates	M	✔
6.18	Claimant count area statistics: counties, unitary and local authorities	M	✔
6.19	Claimant count area statistics: UK parliamentary constituencies	M	✔

Weblink: www.statistics.gov.uk/elmr_tables

6.20	Claimant count area statistics: constituencies of the Scottish Parliament	M	✔
6.21	Jobseeker's Allowance claimant count flows	M	✔
6.22	Number of previous Jobseeker's Allowance claims	Q	✔
6.23	Interval between Jobseeker's Allowance claims	Q	•
6.24	Average duration of Jobseeker's Allowance claims by age	Q	•
6.25	Vacancies by size of enterprise	M	✔
6.26	Redundancies: re-employment rates	Q	•
6.27	Redundancies by Government Office Region	Q	•
6.28	Redundancy rates by industry	Q	•
6.29	Labour disputes: summary	M	✔
6.30	Labour disputes: stoppages in progress	M	✔

Notes

A Annually
B Biannually
Q Quarterly
M Monthly

More information

Time series are available from www.statistics.gov.uk/statbase/tsdintro.asp
Subnational labour market data are available from www.statistics.gov.uk/statbase/Product.asp?vlnk=14160 and www.nomisweb.co.uk
Labour Force Survey tables are available from www.statistics.gov.uk/statbase/Product.asp?vlnk=14365
Annual Survey of Hours and Earnings data are available from www.statistics.gov.uk/StatBase/Product.asp?vlnk=13101

Contact points

Recorded announcement of latest RPI
☎ 020 7533 5866
✉ rpi@ons.gsi.gov.uk

Labour Market Statistics Helpline
☎ 020 7533 6094
✉ labour.market@ons.gsi.gov.uk

Earnings Customer Helpline
☎ 01633 819024
✉ earnings@ons.gsi.gov.uk

National Statistics Customer Contact Centre
☎ 0845 601 3034
✉ info@statistics.gsi.gov.uk

Skills and Education Network
☎ 024 7682 3439
✉ senet@lsc.gov.uk

DfES Public Enquiry Unit
☎ 0870 000 2288

For statistical information on

Average Earnings Index (monthly)
☎ 01633 819024

Claimant count
☎ 020 7533 6094

Consumer Prices Index
☎ 020 7533 5874

Earnings
Annual Survey of Hours and Earnings
☎ 01633 819024

Basic wage rates and hours for manual workers with a collective agreement
☎ 01633 819008

Low-paid workers
☎ 01633 819024
✉ lowpay@ons.gsi.gov.uk

Labour Force Survey
☎ 020 7533 6094
✉ labour.market@ons.gsi.gov.uk

Economic activity and inactivity
☎ 020 7533 6094

Employment
Labour Force Survey
☎ 020 7533 6094
✉ labour.market@ons.gsi.gov.uk

Employee jobs by industry
☎ 01633 812318

Total workforce hours worked per week
☎ 01633 812766
✉ productivity@ons.gsi.gov.uk

Workforce jobs series – short-term estimates
☎ 01633 812318
✉ workforce.jobs@ons.gsi.gov.uk

Labour costs
☎ 01633 819024

Labour disputes
☎ 01633 819205

Labour Force Survey
☎ 020 7533 6094
✉ labour.market@ons.gsi.gov.uk

Labour Force Survey Data Service
☎ 01633 655732
✉ lfs.dataservice@ons.gsi.gov.uk

New Deal
☎ 0114 209 8228

Productivity and unit wage costs
☎ 01633 812766

Public sector employment
General enquiries
☎ 020 7533 6178

Source and methodology enquiries
☎ 01633 812362

Qualifications (DfES)
☎ 0870 000 2288

Redundancy statistics
☎ 020 7533 6094

Retail Prices Index
☎ 020 7533 5874
✉ rpi@ons.gsi.gov.uk

Skills (DfES)
☎ 0114 259 4407
Skill needs surveys and research into skill shortages
☎ 0114 259 4407

Small firms (DTI)
Small Business Service (SBS)
☎ 0114 279 4439

Subregional estimates
☎ 01633 812038

Annual employment statistics
✉ annual.employment.figures@ons.gsi.gov.uk

Annual Population Survey, local area statistics
☎ 020 7533 6130

LFS Subnational Data Service
☎ 020 7533 6135
✉ snds@ons.gsi.gov.uk

Trade unions (DTI)
Employment relations
☎ 020 7215 5934

Training
Adult learning – work-based training (DWP)
☎ 0114 209 8236

Employer-provided training (DfES)
☎ 0114 259 4407

Travel-to-Work Areas
Composition and review
☎ 020 7533 6114

Unemployment
☎ 020 7533 6094

Vacancies
Vacancy Survey:
total stocks of vacancies
☎ 020 7533 6162

ONS economic and labour market publications

ANNUAL

Financial Statistics Explanatory Handbook
2007 edition. Palgrave Macmillan, ISBN 1-4039-9783-7. Price £45.
www.statistics.gov.uk/products/p4861.asp

Foreign Direct Investment (MA4)
2004 edition
www.statistics.gov.uk/products/p9614.asp

Input-Output analyses for the United Kingdom
2006 edition
www.statistics.gov.uk/products/p7640.asp

Share Ownership
2004 edition
www.statistics.gov.uk/products/p930.asp

United Kingdom Balance of Payments (Pink Book)
2006 edition. Palgrave Macmillan, ISBN 1-4039-9387-4. Price £45.
www.statistics.gov.uk/products/p1140.asp

United Kingdom National Accounts (Blue Book)
2006 edition. Palgrave Macmillan, ISBN 1-4039-9388-2. Price £45.
www.statistics.gov.uk/products/p1143.asp

First releases
- Annual survey of hours and earnings
- Business enterprise research and development
- Foreign Direct Investment
- Gross domestic expenditure on research and development
- Low pay estimates
- Regional gross value added
- Share Ownership
- UK trade in services
- Work and worklessness among households

QUARTERLY

Consumer Trends
2006 quarter 3
www.statistics.gov.uk/products/p242.asp

United Kingdom Economic Accounts
2006 quarter 3. Palgrave Macmillan, ISBN 978-0-230-52616-7. Price £32.
www.statistics.gov.uk/products/p1904.asp

UK trade in goods analysed in terms of industry (MQ10)
2006 quarter 3
www.statistics.gov.uk/products/p731.asp

First releases
- Business investment
- Government deficit and debt under the Maastricht Treaty (six-monthly)
- GDP preliminary estimate
- International comparisons of productivity (six-monthly)
- Internet connectivity
- Investment by insurance companies, pension funds and trusts
- Productivity
- Profitability of UK companies
- Public sector employment
- UK Balance of Payments
- UK National Accounts
- UK output, income and expenditure

MONTHLY

Financial Statistics
January 2007. Palgrave Macmillan, ISBN 978-0-230-52584-9. Price £45.
www.statistics.gov.uk/products/p376.asp

Focus on Consumer Price Indices
December 2006
www.statistics.gov.uk/products/p867.asp

Monthly review of external trade statistics (MM24)
December 2006
www.statistics.gov.uk/products/p613.asp

Producer Price Indices (MM22)
December 2006
www.statistics.gov.uk/products/p2208.asp

First releases
- Consumer Price Indices
- Index of distribution
- Index of production
- Labour market statistics
- Labour market statistics: regional
- Producer Prices
- Public Sector Finances
- Retail Sales Index
- UK Trade

OTHER

Labour Market Review
2006 edition. Palgrave Macmillan, ISBN 1-4039-9735-7. Price £40.
www.statistics.gov.uk/products/p4315.asp

National Accounts Concepts, Sources and Methods
www.statistics.gov.uk/products/p1144.asp

Sector classification guide (MA23)
www.statistics.gov.uk/products/p7163.asp

Recent articles

All authors are from the Office for National Statistics unless stated.

Future articles

List is provisional and subject to change.