national STATISTICS

Economic & Labour Market Review

March 2008 | Volume 2 | Number 3

Contents

REGULARS

In brief 3

Collection and publication of construction statistics moves to ONS; Update on the recommendations from the Workforce Jobs Review; Local area labour markets

Updates and forthcoming releases 5
Economic review 6
Independent forecasts 15
Key indicators 16

FEATURES

Comparison of statistics on jobs: September 2007 18

Andrew Machin

Presents latest comparisons from the Labour Force Survey and Workforce Jobs statistics, reconciling the estimates from both sources

Monitoring the quality of the National Accounts 24

Ross Meader and Geoff Tily

Proposes an extended quality framework for meeting commitments to monitor closely quarterly estimates and publish material on specific data sets

International comparisons of productivity: an update to understanding revisions 34

Sumit Dey-Chowdhury

Provides an overview of ONS methodology used in constructing ICP estimates and the impact of revisions on latest published data

Revisions to workforce jobs: December 2007 40

Nick Barford

Describes the changes made to Annual Business Inquiry methods in the transition to a new survey, and the associated discontinuities

Regional gross value added 44

Eddie Holmes

Presents estimates published in December 2007, an overview of the methodology used and future plans for regional economic data

Methods explained: household saving ratio 55

Graeme Chamberlin and Sumit Dey-Chowdhury

Outlines why users may be interested in this macroeconomic statistic and possible reasons for its downward trend since 1997

DATA AND SUPPORT

Key time series 62

National accounts aggregates; Gross domestic product: by category of expenditure; Labour market summary; Prices
Notes to tables; Concepts and definitions

Directory of online tables 67
Contact points 70
ONS economic and labour market publications 71
Recent and future articles 72

palgrave macmillan

ISBN 978-0-230-20567-3

ISSN (online) 1751-8334

ISSN (print) 1751-8326

National Statistics are produced to the professional standards set out in the National Statistics Code of Practice. They are produced free from political influence. Not all of the statistics reported on in this publication are within the scope of National Statistics.

The inclusion of reports on studies by non-governmental bodies does not imply endorsement by the Office for National Statistics or any other government department of the views or opinions expressed, nor of the methodology used.

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.

Subscriptions

Annual subscription £210
Single issue £37.50
To subscribe, contact Palgrave Macmillan at www.palgrave.com/ons or
01256 357893

This issue is now available at www.palgrave-journals.com/elmr and at www.statistics.gov.uk/elmr

Editorial office

For enquiries about this publication, contact the Editor, David Harper, *Economic & Labour Market Review*, Zone GG116, Office for National Statistics, 1 Myddelton Street, London EC1R 1UW.
020 7014 2036
elmr@ons.gsi.gov.uk

Statistical enquiries

For general enquiries, contact the National Statistics Customer Contact Centre.
0845 601 3034
(minicom: 01633 812399)
info@statistics.gsi.gov.uk
Post: Room 1015, Government Buildings, Cardiff Road, Newport, South Wales, NP10 8XG.

You can also find National Statistics on the Internet at: www.statistics.gov.uk

A fuller list of contact points can be found on page 70.

This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.

Printed and bound in Great Britain by Latimer Trend & Company Ltd, Plymouth, Devon.

In brief

Collection and publication of construction statistics moves to ONS

On 1 March 2008, the Office for National Statistics (ONS) took on the collection and publication of construction statistics from Business Enterprise and Regulatory Reform (BERR – formally the Department of Trade and Industry).

Responsibility for six construction surveys collected at Bristol has been transferred to ONS:

- Quarterly Inquiry of Activity for Construction and Allied Trades
- The Building and Civil Engineering Employment and Output Enquiry
- Monthly Inquiry of Contracts and New Orders
- Annual Inquiry
- Quarterly Inquiry of Projects in Progress, and
- Key Performance Indicators

Construction statistics are a large component of the National Accounts, and ONS envisages that it can bring the same methodological expertise to this area as it does to other industry statistics. The collection of data for large-scale surveys is not a core part of BERR's business, although statisticians in the department will continue to analyse and interpret construction data for policy colleagues and for industry customers in the same way as in the past.

The data collection work will remain in Bristol for the next 12 months. At the end of that time, it will transfer to the ONS headquarters in Newport. The period between March 2008 and March 2009 will give ONS time to familiarise itself fully with the work and plan for its physical transfer. Results and publication work will transfer to the ONS office in Newport in a staged manner also allowing for knowledge to be transferred between the two departments. BERR staff carrying out this work have been seconded to ONS for the transition year in order to aid this transfer.

ONS published the first publication on Output and Employment in the Construction Industry following the transfer on 7 March 2008. This publication and future quarterly publications can be accessed from the National Statistics website at the address given below.

The first New Construction Orders publication following the transfer was published on 13 March 2008. The monthly New Orders publications can be accessed from the address given below.

More information

Output and Employment in the Construction Industry
www.statistics.gov.uk/statbase/product.asp?vlnk=725

New Construction Orders
www.statistics.gov.uk/statbase/product.asp?vlnk=720

Contact

Catrin Ormerod
01633 456344
catrin.ormerod@ons.gsi.gov.uk

Update on the recommendations from the Workforce Jobs Review

In March 2007, the Office for National Statistics (ONS) published an Implementation plan from the recommendations that came out of the Workforce Jobs Benchmarking review. The review was set up to investigate the large revision to the business surveys estimate of jobs, known as Workforce Jobs (WFJ), that arose as a result of benchmarking the Short Term Employment Surveys results on the 2005 Annual Business Inquiry (ABI/1). It also examined the difference in the annual growth in jobs measured by the Labour Force Survey (LFS) and WFJ. This provides an update on the work undertaken and the progress on the recommendations to date.

An article, contained within this edition of *Economic & Labour Market Review*, details a comparison of job statistics from the LFS and WFJ and reconciles estimates between the two sources. Developments to improve the estimate of undercoverage of foreign workers in the LFS series are also included within the article.

A further recommendation was for Sources Directorate to improve coherence between outputs. Analysis has been conducted comparing Short Term Employment Survey returns against annual survey returns from the Business Register Survey which feed into the ABI/1 results. This is now part of the regular validation checks when producing ABI/1 employment estimates.

It was noted that the redevelopment of the Workforce Jobs estimation system to a ratio estimator would be implemented in 2008. Work has begun on this but implementation has been delayed due to resource constraints.

There were several recommendations regarding Managed Service Companies (MSCs) and their scheme providers. The actions implemented include:

- ONS has investigated with HM Revenue & Customs how best to identify the MSC scheme providers. ONS now has a good knowledge of MSCs and their scheme providers and is confident all major scheme providers and associated MSCs have been identified
- all MSCs have been removed from the scope of business surveys due to the difficulty in obtaining an accurate geographical and industrial breakdown. The main impact is for those surveys with employment as the auxiliary variable
- ABI1 published a supplementary note alongside the 2006 employment figures estimating the impact of MSCs on the survey results

Due to a change in legislation in 2007, the incentives for setting up an MSC for both workers and businesses have been removed, so it is anticipated the number will begin to fall. Due to this legislative change, businesses are finding alternative ways to continue to receive such incentives by setting up alternative forms of Scheme Providers. ONS is monitoring the situation and continuing to investigate the impact on business surveys.

More information

www.statistics.gov.uk/statbase/product.asp?vlnk=9765

Contact

Jon Gough
01633 456720
jon.gough@ons.gsi.gov.uk

Local area labour markets

The latest local area labour market data show that the area with the highest employment rate was the City of London with 100.0 per cent (note that this estimate is based on a very small sample). Excluding the City of London, the highest employment rate was Hart, Hampshire (88.4 per cent) while the lowest rate was in Tower Hamlets (53.2 per cent). There is a considerable variation within each region. For example, in the region with the highest average rate, the South East (78.5 per cent), employment varies between 88.4 per cent in Hart and 66.7 per cent in Thanet.

The area with the highest unemployment rate in the 12 months ending June 2007 was in Tower Hamlets (14.0 per cent), while the lowest rate was in Eden, Cumbria and Ribble Valley, Lancashire (both 2.4 per cent). Again, there were considerable variations within regions. In the region with the lowest average rate, the South West (3.8 per cent), unemployment varied between Plymouth (6.1 per cent) and North Dorset (2.5 per cent). London had the highest average rate (7.3 per cent), but individual boroughs varied between Tower Hamlets (14.0 per cent) and Richmond upon Thames (3.6 per cent).

The latest estimates of jobs density (2005) show there were 0.84 jobs per working-age resident in the UK. London had the highest jobs density at 0.94 compared with 0.75 in the lowest region, the North East. The local area with the highest jobs density was the City of London, with almost 60 jobs per working-age resident, while the lowest was in Carrickfergus, Northern Ireland, with 0.39 jobs per resident.

People who work in the City of London had the highest earnings, with median full-time gross pay of £834 a week as at April 2007. The lowest pay was for people who work in Torridge, South West, at £313 a week.

The report, 'Local area labour markets: Statistical indicators January 2008', was published on the National Statistics website on 12 February 2007. It also contains sections looking at economic inactivity, ethnicity and the labour market, claimants of Jobseeker's Allowance (the claimant count), and earnings by place of residence. It brings together data from a number of different sources – the Annual Population Survey, Annual Business Inquiry, Annual Survey of Hours and Earnings, and administrative data on benefits from the Department for Work and Pensions – to give an overall picture of the labour market looking at both labour supply and demand in each area.

Also available are spreadsheets giving data for key indicators such as employment, unemployment, economic inactivity, claimant count and jobs for both local authorities and parliamentary constituencies.

More information

www.statistics.gov.uk/statbase/product.asp?vlnk=14160

Contact

Bob Watson
01633 455070
bob.watson@ons.gsi.gov.uk

UPDATES

Updates to statistics on www.statistics.gov.uk

7 February

Index of production

Manufacturing: 0.1% quarterly fall in Q4
www.statistics.gov.uk/cci/nugget.asp?id=198

11 February

Producer prices

Factory gate inflation rises to 5.7% in January
www.statistics.gov.uk/cci/nugget.asp?id=248

UK trade

Deficit narrowed to £4.7 billion in December 2007
www.statistics.gov.uk/cci/nugget.asp?id=199

12 February

Inflation

January: CPI up to 2.2%; RPI up to 4.1%
www.statistics.gov.uk/cci/nugget.asp?id=19

Local employment

Highest rate outside London of 88.4% in Hart, Hampshire
www.statistics.gov.uk/cci/nugget.asp?id=252

Local inactivity

Lowest rate of 8.2% in Surrey Heath
www.statistics.gov.uk/cci/nugget.asp?id=1013

Local unemployment

Lowest rate of 2.4% in Eden, Cumbria
www.statistics.gov.uk/cci/nugget.asp?id=1606

13 February

Average earnings

Pay growth steady in the year to December 2007
www.statistics.gov.uk/cci/nugget.asp?id=10

Employment

Rate increases to 74.7% in three months to December
www.statistics.gov.uk/cci/nugget.asp?id=12

19 February

International comparisons of productivity

USA continues to lead in 2006
www.statistics.gov.uk/cci/nugget.asp?id=160

21 February

Public sector

January: £17.0 billion current budget surplus
www.statistics.gov.uk/cci/nugget.asp?id=206

Retail sales

Steady underlying growth in three months to January
www.statistics.gov.uk/cci/nugget.asp?id=256

26 February

Business investment

0.5% fall in Q4 2007
www.statistics.gov.uk/cci/nugget.asp?id=258

27 February

GDP growth

Economy rose by 0.6% in Q4 2007
www.statistics.gov.uk/cci/nugget.asp?id=192

Index of services

0.6% three-monthly rise into December
www.statistics.gov.uk/cci/nugget.asp?id=558

Service prices

SPPI inflation at 2.9% in Q4 2007
www.statistics.gov.uk/cci/nugget.asp?id=253

FORTHCOMING RELEASES

Future statistical releases on www.statistics.gov.uk

4 March

Mergers and acquisitions involving UK companies – Q4 2007

7 March

Output and employment in the construction industry – Q4 2007

10 March

Index of production – January 2008

Producer prices – February 2008

12 March

MM19: Aerospace and electronic cost indices – December 2007

Public sector employment – Q4 2007

UK trade – January 2008

13 March

New construction orders – January 2008

Public and private sector breakdown of labour disputes

SDQ7: Assets and liabilities of finance houses and other credit companies – Q4 2007

17 March

Changes to the CPI and RPI shopping basket

Consumer prices index and retail prices index: the 2008 basket of goods and services

18 March

Consumer price indices – February 2008

Digest of engineering orders and turnover – January 2008

MM22: Producer prices – February 2008

19 March

Gross domestic expenditure on research and development – 2006

Labour market statistics – March 2008

Public sector employment – Q4 2007

20 March

MM17: Price Index Numbers for Current Cost Accounting (PINCCA) – February 2008

Public sector finances – February 2008

Retail sales – February 2008

SDM28: Retail sales – February 2008

25 March

Focus on consumer price indices – February 2008

26 March

Average weekly earnings – March

International trade in services – 2006

27 March

Business investment revised results – Q4 2007

Distributive and service trades – January 2008

Investment by insurance companies, pension funds and trusts – Q4 2007

Public sector finances: supplementary (quarterly) data

28 March

Balance of payments – Q4 2007

Quarterly National Accounts – Q4 2007

United Kingdom Economic Accounts – Q4 2007

31 March

Financial Intermediation Services Indirectly Measured (FISIM) experimental

Government deficit and debt under the Maastricht Treaty

Index of services – January 2008

Productivity – Q4 2007

1 April

Profitability of UK companies – Q4 2007

Economic review

March 2008

Anis Chowdhury
Office for National Statistics

SUMMARY

GDP output continued to grow fairly robustly in 2007 quarter four, although at a slightly slower pace than in quarter three. Growth continued to be driven by the service sector offset by declining output in the manufacturing sector. On the expenditure side, household spending and business investment weakened in quarter four in comparison with quarter three. The current account deficit widened in quarter three; the trade deficit widened in quarter four contributing negatively to growth. The labour market continues to be buoyant in quarter four but average earnings remain relatively subdued. The public sector finance position deteriorated in January 2008. Consumer price inflation rose marginally in January and was above the Government's target. Producer output and input price inflation accelerated in January.

GROSS DOMESTIC PRODUCT

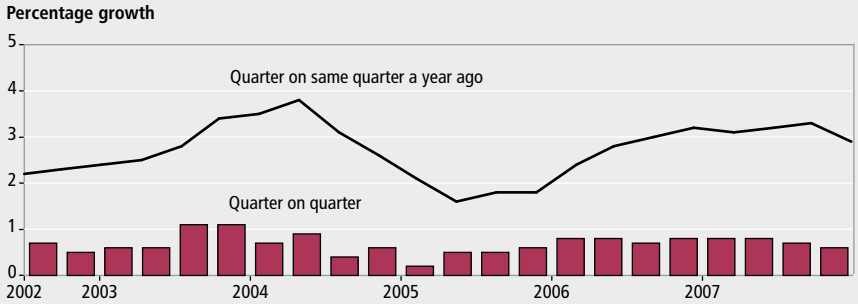
Fourth quarter growth of 0.6 per cent

GDP growth for the fourth quarter of 2007 is estimated to have grown fairly strongly despite a modest slowing since the third quarter. The latest estimate of GDP growth is 0.6 per cent, unchanged from the preliminary estimate. This compares with growth of 0.7 per cent in the third quarter. The annual rate of growth also slowed, reaching 2.9 per cent, down from 3.3 per cent in quarter three.

The latest GDP release for 2007 quarter four contains more information than the preliminary estimate. It provides the first estimates for expenditure and more complete data on the output side. It is still, however, based on incomplete information. (**Figure 1**).

The growth rate in the UK economy in quarter four continued to be driven by strong although slightly lower service sector output compared with the previous quarter. This was offset by virtually stagnant total production growth. Within total production, there was a sharp acceleration in the output of the electricity, gas and water supply industries and a modest pick up in mining and quarrying (including oil and gas) output. This continued to be outweighed by a marginal contraction in manufacturing output growth. The construction sector continued to grow strongly.

Figure 1
Gross domestic product



OTHER MAJOR ECONOMIES

Global growth weakens in quarter four

Preliminary data for 2007 quarter four are now available for most major Organisation for Economic Co-operation and Development (OECD) countries. Data for quarter four reported a mixed but a broadly weakening picture of global growth, reversing the generally strong picture of growth recorded in the previous quarter.

US GDP data for the fourth quarter of 2007 showed a sharp deceleration compared with quarter three. Growth was just 0.2 per cent on a quarter on quarter basis compared with 1.2 per cent growth in the previous quarter. The marked slowdown in growth was primarily due to a contraction in inventories after showing positive growth in the previous quarter; a slowdown in net exports but still contributing positively to growth, with exports exceeding imports and slower consumption growth. Residential investment also contributed to lower growth with continued contraction in this sector.

Japan's GDP growth showed a marked acceleration in 2007 quarter four. Growth was 0.9 per cent compared with 0.3 per cent in the previous quarter. Growth was mainly driven by an increase in business investment and net exports. Government expenditure also added to growth, though to a lesser extent. This was offset by continued contraction in residential investment growth. Private consumption made a relatively subdued contribution to growth.

Data for Italy was not available at the time of writing this article. Growth for the other two big mainland EU economies – Germany and France – showed a weakening in 2007 quarter four compared with the previous quarter. According to Eurostat's estimate, euro area GDP decelerated to 0.4 per cent in 2007 quarter four compared

with the strong 0.8 per cent growth in quarter three.

German GDP grew by only 0.3 per cent in 2007 quarter four, a marked slowdown from growth of 0.7 per cent in quarter three. The breakdown to the growth was not available at the time of the headline release; indications are that the slowdown in growth was likely to be led by lower private consumption growth.

French GDP growth decelerated to 0.3 per cent in 2007 quarter four, from 0.8 per cent growth in the previous quarter. The weakening in growth was mainly due to a marked slowing in private consumption growth and decelerating inventories. This was offset by solid investment growth and a positive net trade picture.

FINANCIAL MARKETS

Share prices flat; pound depreciates

Equity performance has been volatile recently, and recorded muted growth in 2007 quarter four. The FTSE All – Share index rose by just 0.5 per cent. This follows a fall of 3.1 per cent in quarter three. The weakness in equity growth can mainly be attributed to global growth concerns, particularly regarding the US economy, brought on by continued problems regarding the credit squeeze, attributable to the US housing and the sub-prime mortgage market. Increasing interest rates in the UK further contributed to this lack lustre performance.

In the currency markets, 2007 quarter four saw sterling's average value broadly depreciate compared with the previous quarter. The pound appreciated against the dollar by around 1 per cent in 2007 quarter four, a lower rate of appreciation compared with 1.7 per cent in the previous quarter. Against the euro, sterling's value depreciated by around 3 per cent after depreciating by 0.2 per cent in the previous quarter. Overall, the quarterly effective exchange rate depreciated by approximately 3 per cent in quarter four after flat growth in the previous quarter (**Figure 2**). In January 2008, the pound depreciated by 2.4 per cent against the dollar. Against the euro, the pound depreciated by 3.5 per cent. Overall, the effective exchange rate depreciated by 3.4 per cent.

The recent movements in the exchange rate might be linked to a number of factors. First, exchange rate movements can be related to the perceptions of the relative strengths of the US, the euro and UK economy. The lower rate of appreciation in quarter four may have come in response to fears about lower growth in the UK economy and therefore prospects of lower interest rates to stimulate the economy. Indeed, the Bank of England reduced interest rates by 25 basis points in February 2008 to 5.25 per cent. This followed the 25 basis points cut in December 2007, and was mainly in response to the effects of the sub-prime crisis in terms of downward risks to growth and inflation. Another reason could have been due to concerns about the size of the UK current account deficit.

In the US, however, there have been particular concerns in recent months regarding the relative weakness of GDP growth, compounded by housing market weakness and the sub-prime crisis. In fact, US interest rates were lowered by 0.75 basis points in January 2008, from 4.25 per cent to 3.5 per cent in response to fears about a possible recession. This followed the 25 basis points cut in December to 4.25 per cent. These interest rate reductions will have made the dollar less appealing to investors compared with other currencies.

Another factor could be the lack of international appetite for US dollar denominated assets, particularly from central banks, who are choosing to spread their currency assets on their balance sheets (for portfolio and risk management purposes), thereby further undermining the value of the dollar.

In contrast in the euro area, the depreciation of the pound against the euro in the fourth quarter of 2007 may have come in response to prospects of monetary tightening in the euro-zone. The euro-zone interest rate is currently at 4 per cent, having been maintained there since the 0.25 basis point increase in June 2007, partly in response to concerns about inflationary pressures.

Figure 2
Exchange rates

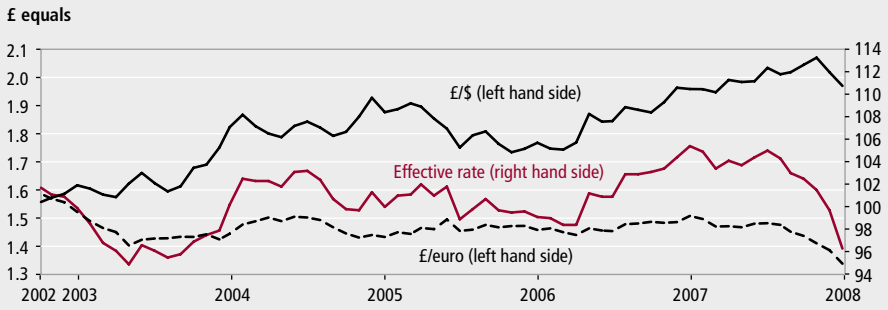
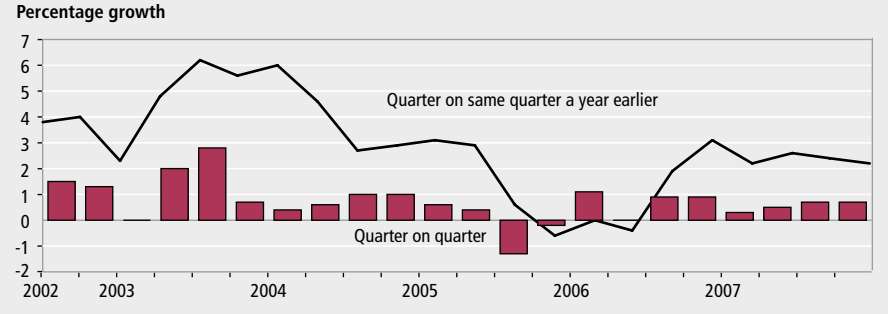


Figure 3
Construction output



OUTPUT

Services sector slows but continues to drive economic growth

GDP growth in 2007 quarter four was estimated at 0.6 per cent, down marginally from 0.7 per cent in the previous quarter. On an annual basis it was 2.9 per cent, down from 3.3 per cent in the previous quarter.

Construction activity continued to grow strongly in the fourth quarter of 2007. Construction output is estimated to have grown by 0.7 per cent, similar to the rate in the previous quarter. Comparing the quarter on the same quarter a year ago,

construction output rose by 2.2 per cent following growth of 2.5 per cent in the previous quarter (**Figure 3**).

In terms of external surveys of the construction sector, the Chartered Institute of Purchasing & Supply (CIPS) survey signalled weakening activity in 2007 quarter four with the average headline index at 55.9, down from 62.3 in the previous quarter, but still indicative of strong growth. In January 2008, the headline index fell further to 53.9. The Royal Institute of Chartered Surveyors construction survey for 2007 quarter four reported an easing in the growth of construction workloads with the balance at plus 16, down from plus 17 in the previous quarter.

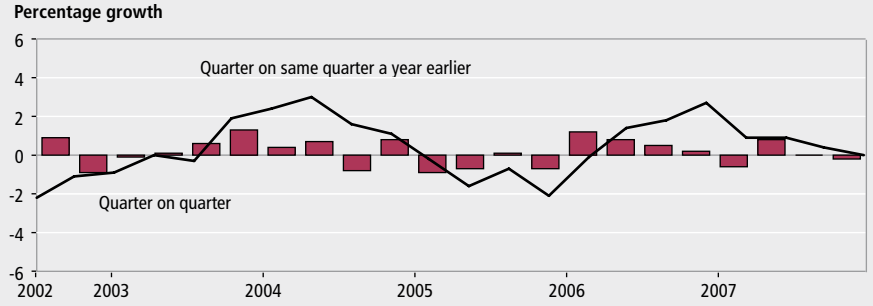
Total output from the production industries recorded virtually stagnant growth in 2007 quarter four, roughly similar to the performance in the previous quarter. Growth was just 0.1 per cent, up marginally from flat growth in the previous quarter. On an annual basis growth rose by 0.6 per cent, up from 0.4 per cent in the previous quarter.

The weakness in total production continued to be led by a lacklustre performance in the manufacturing sector. Manufacturing output contracted by 0.1 per cent in the latest quarter, a slight weakening from flat growth in the previous quarter. On an annual basis, manufacturing output slowed to 0.1 per cent from 0.4 per cent growth in the previous quarter (**Figure 4**).

This was partially offset by an acceleration in the output of the electricity, gas and water supply industries. Growth was 1.7 per cent in 2007 quarter four compared with 0.7 per cent in quarter three. On an annual basis, growth was 4.3 per cent, up markedly from 0.5 per cent in the previous quarter. Mining and quarrying output also provided a partly offsetting effect with modest growth of 0.3 per cent in the latest quarter, reversing the contraction of 1.4 per cent growth in 2007 quarter three. On an annual basis, growth was 2.3 per cent, up sharply from 0.1 per cent in quarter three.

Production growth has generally been slow since the second quarter of 2006 due to weakness in mining and quarrying and utilities output, offset through most of this period by relatively strong manufacturing output. There was a pick up in production in 2007 quarter two, but this appears not to have been sustained in quarter three and four, due to weak manufacturing output growth in the latest two quarters. However, manufacturing output has been volatile in recent quarters.

Figure 4
Manufacturing output



The output of the agriculture, forestry and fishing industries strengthened in the latest quarter, with output increasing by 1.7 per cent after growing by 0.4 per cent in the previous quarter.

External surveys of manufacturing for 2007 quarter four showed a fairly positive picture (**Figure 5**). In the past, it has not been 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 indicated a stable but robust picture in the latest quarter. The headline index was 53.4, down from 55.4 in the previous quarter. In January 2008, the CIPS headline index fell to near-stagnation levels with the index at 50.6, the lowest since August 2005, particularly driven by weakening external demand. The CBI in its 2007 quarter four Industrial Trends survey reported a strengthening in its total order books with the balance at plus two, up from minus six in the previous quarter. That strong position was maintained according to the latest figures with the balance at plus three in February 2008. The BCC in its 2007 quarter four survey reported a

Figure 5
External manufacturing

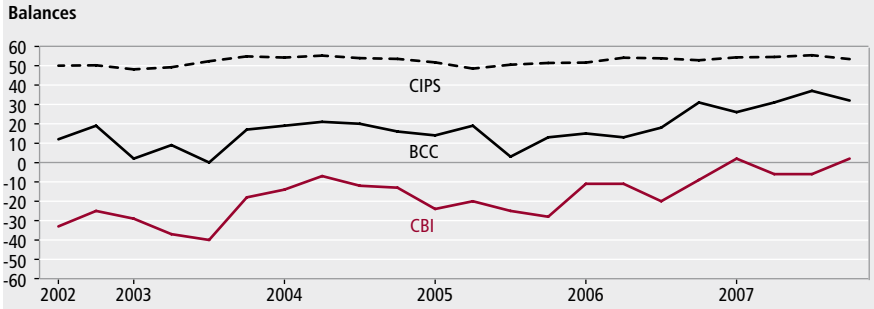
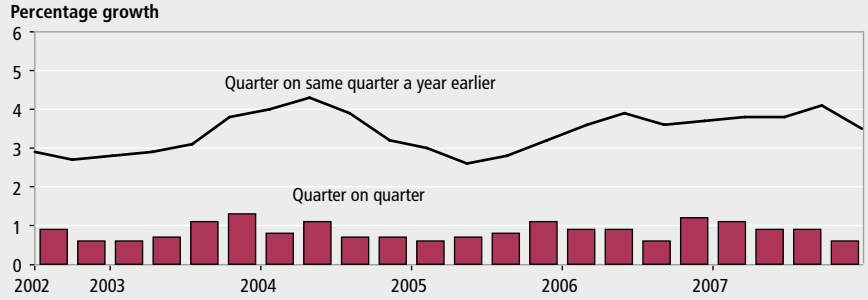


Figure 6
Services output



mixed but overall fairly buoyant picture of manufacturing activity. The home sales balance was plus 32 from plus 37 in the previous quarter.

Overall the service sector, the largest part of the UK economy, continues to be the main driver of UK economic growth. However, growth slowed in the latest quarter compared with the previous quarter, contributing to the overall marginal slowdown in GDP output.

Services output grew by 0.6 per cent in 2007 quarter four, a moderate reduction from 0.9 per cent growth in the previous quarter (**Figure 6**). On an annual basis, services output expanded by 3.4 per cent, down from 4 per cent in the previous quarter.

Growth was recorded in varying degrees across all four broad sectors. The main contribution to the decline in the growth rate came from businesses services and finance, where output decelerated sharply in the latest quarter to 0.5 per cent from 1.3 per cent in quarter three. On an annual basis growth was 4.3 per cent, down from 5.1 per cent in the previous quarter. The distribution, hotels and catering sector also contributed but to a lesser extent towards the downward adjustment to services output. Growth was only 0.1 per cent compared with 0.7 per cent in the previous quarter. On an annual basis growth was 2.7 per cent, down from 4.4 per cent in quarter three. The weakening in the above two sectors was offset by the strengthening in the output of the transport, storage and communication sector with growth of 1.9 per cent, an acceleration from growth of 0.2 per cent in quarter three. Growth annually was 5.3 per cent, slightly down from 5.5 per cent in quarter three. Government and other services output also grew fairly strongly at 0.7 per cent, up marginally from growth of 0.6 per cent in the previous quarter. Growth annually was 2 per cent, up from 1.9 per cent in the previous quarter.

The external surveys on services showed a weakening but still fairly robust picture in line with official data. The CIPS average headline index in 2007 quarter four was 52.5, markedly down from 57.1 in the previous quarter but still above the long-run average. In January 2008, the headline index was stable at 52.5. It should be noted that the CIPS survey has a narrow coverage of the distribution and government sectors.

The Confederation of British Industry (CBI) and British Chambers of Commerce (BCC) reported a generally weakening picture of service sector activity (**Figure 7**). The CBI service sector survey for November reported modest growth in business volumes for the business and professional services sector and the consumer service sector. The consumer services volume balance was at plus 15, unchanged from the previous quarter. For business and professional services, the balance was at plus 19, down from plus 31 in the previous quarter. The BCC survey for 2007 quarter four survey reported a weakening picture of service sector activity, but overall balances for home orders and sales remained positive at plus 18 and plus 28, from plus 26 and plus 29 respectively.

Figure 7
External services

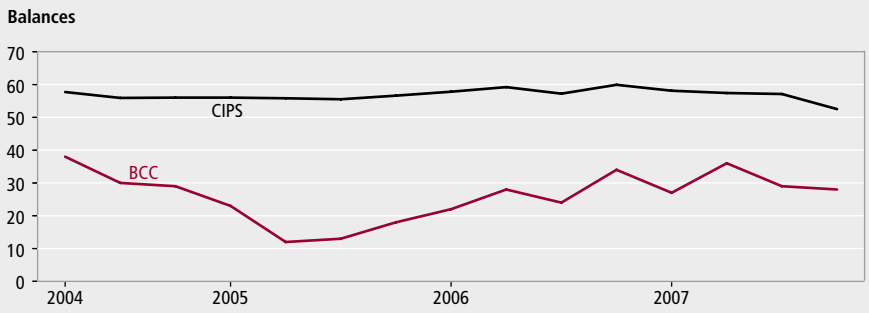
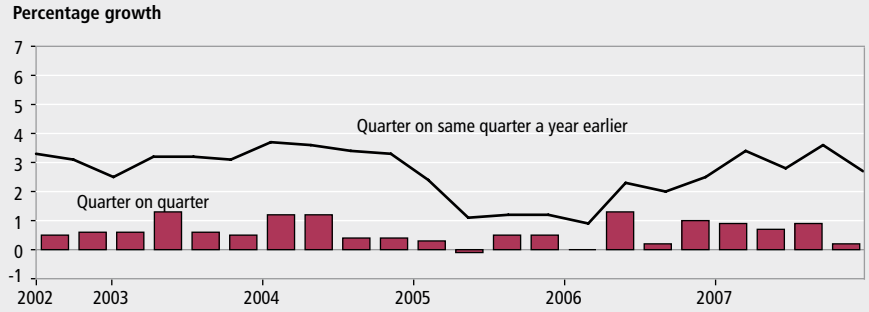


Figure 8
Household demand



EXPENDITURE

Consumers' spending weakens

Household consumption expenditure decelerated in 2007 four compared with the previous quarter. Growth was only 0.2 per cent, down markedly from that of 0.9 per cent in quarter three. Compared with the same quarter a year ago, growth was 2.7 per cent, down from 3.6 per cent in quarter three (**Figure 8**). Lower spending was primarily driven by a fall in durable goods expenditure and slower growth in semi-durables and non-durable goods expenditure. There was fairly buoyant growth in services expenditure.

There are a number of reasons why consumer spending could have slowed; primarily the impact of the credit crisis and past interest rate rises feeding through to spending decisions. Early indications tentatively suggest that both these factors may have contributed to some extent towards spending weakening. In particular, the Bank of England's recent quarter four Credit Conditions Survey (CCS) indeed highlighted increased tightening in credit conditions for some households.

One key indicator of household expenditure is retail sales, which slowed in quarter four compared with quarter three and grew by 0.4 per cent in quarter four, a deceleration from growth of 1.5 per cent in the previous quarter.

Retail sales figures are published on a monthly basis and the latest available figures for January signalled a marginal upturn from December and indicative of fairly buoyant growth (**Figure 9**). In the three months to January the volume of retail sales increased by 0.6 per cent compared with a 0.5 per cent increase in the three months to December. On an annual basis in January, the latest three months growth

compared with the same three months a year ago recorded growth of 4.1 per cent, up from 3.6 per cent growth in December.

The slowdown in retail sales in the latest quarter occurred despite widespread discounting and early sales which are reflected in the price deflator (i.e. shop prices) which fell on average by around 1.1 per cent in 2007 quarter four. This could suggest the impact of previous interest rate rises and the effects of the credit crunch may have been a constraining factor in retail sales growth, together with diminished confidence on the part of consumers. However, despite this, retail sales growth is still holding up fairly well with discounting still playing a considerable part, as evident in the latest retail sales figures. The price deflator fell by 1.2 per cent in January 2008.

Retail sales can be disaggregated into 'predominantly food' and 'predominantly non-food' sectors. In the three months to January 2008 the 'predominantly non-food' sector recorded flat growth, down from 0.2 per cent in the three months to December. Within this sector 'non-store retailing and repair' stores grew by 8.2 per cent, followed by growth in the 'household goods' stores with growth of 3.7 per cent. This was offset by a fall of 3.9 per cent in the 'non-specialised' stores, followed by 'textile, clothing and footwear' stores and 'other' stores, each decreasing by 0.6 per cent respectively. The 'predominantly food' sector grew by just 0.1 per cent in the three months to January, down from 0.2 per cent in the three months to December.

External surveys for retail sales presented a mixed picture of growth for January 2008. The CBI's monthly Distributive Trades survey for January reported a further slowdown, with the balance at plus four, falling from plus eight in December. The BRC reported an increase of 2.6 per cent in retail sales on a like-for-like basis in January 2008, up from 0.3 per cent in the previous month. This result, however, was heavily skewed by a strong performance in the first week of January (**Figure 10**).

Another indicator of household consumption expenditure is borrowing. 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. Bank of England data on stocks of household debt outstanding to banks and building societies shows household debt at unprecedented levels relative to disposable income.

There are two channels of borrowing available to households: i) secured lending, usually on homes; and ii) unsecured lending, for example on credit cards. On a general level, an increase in the interest rates increases debt servicing costs, may discourage borrowing and in the process displace consumer expenditure on certain goods.

According to the latest figures from the Bank of England, there are signs that past interest rate rises may have begun to impact on lending and borrowing in 2007 quarter four and possibly due to the credit crunch. With regards to total net lending, figures showed a slowdown with total net lending at £27.82 billion in 2007 quarter four, down from £30.80 billion in quarter three. This was driven by lower growth on lending for secured dwellings which grew by £24.42 billion in quarter four, down from £27.31 billion in the previous quarter. Unsecured lending was around £34.0 billion in the latest quarter, roughly similar to growth in the previous quarter.

An alternative measure of expenditure also showed a weakening picture. M4 (a broad money aggregate of UK money supply) rose by around £35.0 billion in 2007 quarter four compared with around £50.0 billion in quarter three. M4 lending (including cash and bank deposits) also fell sharply from around £77.0 billion in quarter three to around £51.0 billion in 2007 quarter four.

The slowdown in lending could possibly be as a result of tighter lending criteria adopted by some banks and building societies, particularly towards first-time buyers and those considered higher risk. There may also be an impact in the form of higher interest rates charged by banks for customers who have borrowed on variable interest rate mortgages in the short term, and in the longer term, there may be an impact on those who took out fixed rate mortgages. However, the recent decrease in UK interest rates may reverse some of this trend.

Household expenditure may be linked to household equity withdrawal (HEW) and developments in the housing market. The situation regarding house prices in terms of contribution to consumer expenditure remains uncertain. Both Nationwide and Halifax report an easing in growth in house prices in quarter four compared with quarter three; however, despite this slowdown, house price growth is still holding up fairly well. According to the Nationwide, annual house price growth in quarter four was 6.9 per cent compared with 9.3 per cent in the previous quarter. Halifax reported annual house price growth

Figure 9
Retail sales

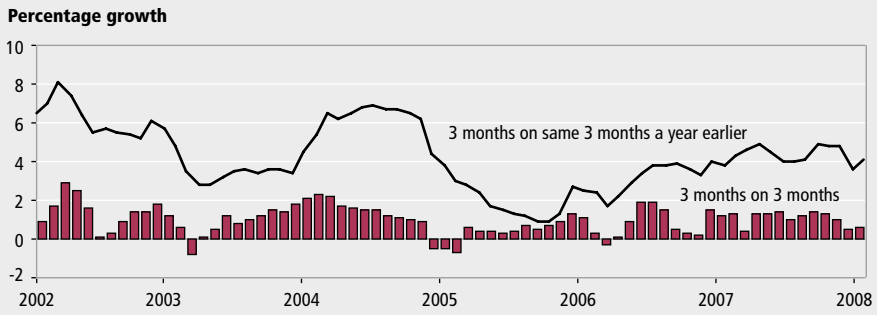
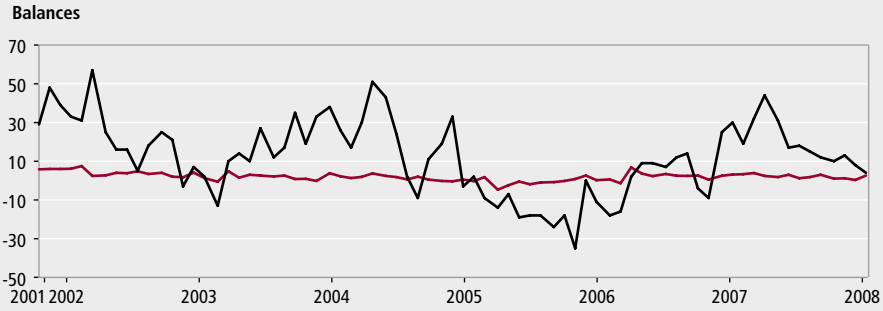


Figure 10
External retailing



of 5.2 per cent in quarter four, down from 9.8 per cent in quarter three and below the long-run average of 8 per cent.

The saving ratio is also a determinant of household expenditure. In quarter three, household spending was given a boost by the fall in the saving ratio which fell to 3.4 per cent, down from 4 per cent in quarter two. However, in 2007 quarter four, there may have been some reorientation towards higher savings particularly in light of ongoing economic uncertainty.

Finally, pressures on current disposable income, together with uncertainty regarding future projection of incomes, may have been factors in reducing consumption expenditure in quarter four.

BUSINESS DEMAND

Business investment decelerated

Total investment fell by 0.5 per cent in quarter four compared with growth of 1.7 per cent in the previous quarter. On an annual basis, total investment decelerated sharply with growth of 0.9 per cent, down from 4.8 per cent in the previous quarter. The weakness in total investment was primarily driven by a fall in private sector dwellings investment as well as capital and transport equipment investment (**Figure 11**).

Business investment weakened markedly in 2007 quarter four compared with quarter three. Business investment has been volatile throughout 2007. In the latest quarter, growth fell by 0.5 per cent after increasing by a strong 2 per cent. On an annual basis, business investment also decelerated, to 1.7 per cent from growth of 6.9 per cent in the previous quarter.

Business investment could have declined for a number of reasons. Firstly, increased uncertainty and pessimism, particularly with regards to global demand, may have deterred investment; secondly, the downturn in investment could have come on the back of lower corporate profits; thirdly, the weakness in the equity market in recent quarters may have constrained revenue generation and hence investment; and last but not least, the general weakness in the property market in terms of lower price growth may have inhibited investment spending.

Evidence on investment intentions from the latest BCC and CBI surveys painted a weak picture. According to the latest quarterly BCC survey, the balance of manufacturing firms planning to increase investment in plant and machinery fell from plus 33 to plus 21. The CBI's Quarterly Industrial Survey for January 2008 reported a subdued investment picture, with the investment balance of plant and machinery weakening at minus 12 from minus 14 in the previous quarter.

Figure 11
Total fixed investment

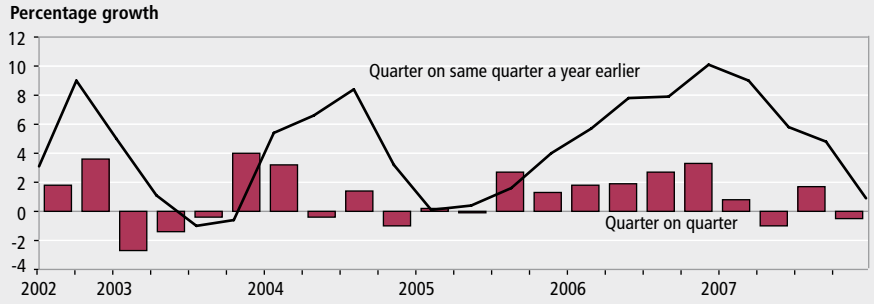
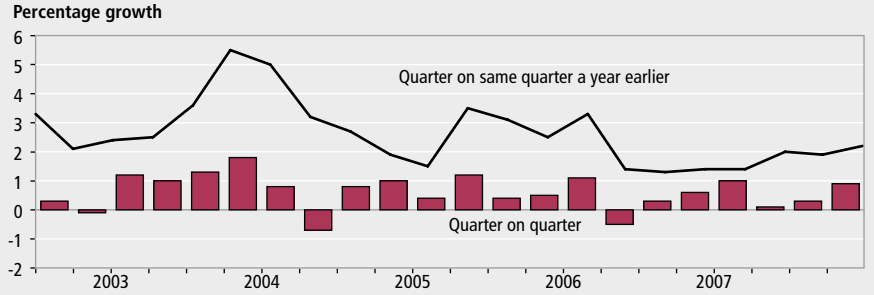


Figure 12
Government spending



GOVERNMENT DEMAND

Government expenditure strengthens

Government final consumption expenditure accelerated in the latest quarter. Growth increased by 0.9 per cent from 0.3 per cent in the previous quarter. On an annual basis, growth was 2.2 per cent, up from 1.9 per cent in the previous quarter (**Figure 12**).

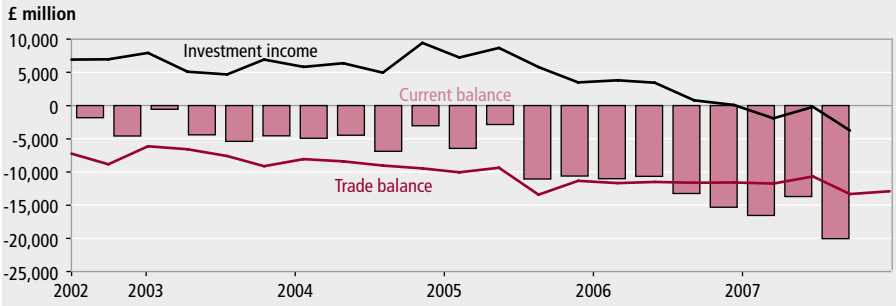
Public sector finances deteriorate

The latest figures on the public sector finances reported a deterioration in the current financial year to January 2008, compared with the last financial year. It showed a higher current budget deficit and a higher level of net borrowing. Overall, the Government continued to operate a financial deficit, with government expenditure continuing to exceed revenues, partly to fund capital spending. In the financial year April to January 2007/08, the current budget deficit was £8.5 billion; this compares with a deficit of £3.7 billion in the financial year to April to January 2006/07. In the financial year April to January 2007/08, net borrowing was £26.5 billion; this compares with net borrowing of £20.5 billion in the financial year April to January 2006/07. Although there was an increase in VAT and corporation and income tax receipts in January 2008, this was outweighed by a larger increase in total current expenditure, particularly on capital projects by central government, leading to the higher current budget deficit together with the higher net borrowing.

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 in January 2008 was 35.9 per cent of GDP, up from 35.5 in January 2007. In the financial year 2006/07, net debt as a percentage of GDP was 36.6 per cent.

TRADE AND THE BALANCE OF PAYMENTS

Figure 13
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 2007 quarter three to £20 billion, from a revised deficit of £13.7 billion in the previous quarter (**Figure 13**). As a proportion of GDP, the deficit rose to 5.7 per cent of GDP from 4 per cent in 2007 quarter two. The widening in the current account deficit in 2007 quarter three was due to a higher deficit on income and on trade in goods, partially offset by a higher surplus on trade in services. The deficit on income increased to £3.8 billion and the deficit on trade in goods widened to £22.6 billion. The surplus in trade in services increased to £9.3 billion. The deficit in current transfers was little changed at £3.0 billion. The increase in the income deficit was driven by a rise in earnings on other investment abroad, which outweighed a fall in earnings on direct investment abroad.

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 2007 quarter four recorded a continuation of the large trade deficit in goods. Exports of goods fell but imports of goods fell by a lesser amount resulting in a widening of the deficit. The goods trade deficit widened to £14.2 billion from a £13.8 billion deficit in the previous quarter. In terms of growth, exports of goods fell by 0.7 per cent while goods imports fell by 0.4 per cent. Services exports fell by 0.2 per cent and services imports fell by 3.7 per cent.

Over the quarter, total trade contracted by 1.2 per cent following growth of 3.9 per cent in the previous quarter.

However, these figures are distorted by volatility in VAT Missing Trader Intra-Community (MTIC) fraud and therefore need to be treated with caution. According to the latest figures, the level of trade in goods excluding trade associated with MTIC fraud is estimated to be to £0.1 billion in December, unchanged from the previous month, and by £0.2 billion in the fourth quarter of 2007.

External surveys on exports reported a mixed picture for exports in the latest quarter. The BCC reported that the export sales net balance fell by nine points to plus 22 and the export orders balance fell ten points to plus 19. The latest CBI quarterly survey in contrast reported an improving picture. The export orders balance was plus ten, up from plus six in the previous quarter. In January 2008, the export orders balance fell to minus four.

LABOUR MARKET

Labour market activity buoyant

The labour market in the latest reference period illustrated a continued strong picture – with high levels of employment and low levels of unemployment as seen throughout 2006 and in 2007. The robust labour market continues to be a reflection of relatively strong demand conditions in the UK economy.

The latest figure from the Labour Force Survey (LFS) pertains to the three-month period up to December 2007. The number of people in employment and the employment rate rose. The number of unemployed people and the unemployment rate fell. The claimant count fell. The inactivity rate and the number of inactive people of working age have both fallen. The number of vacancies rose. Average earnings, including bonuses fell while excluding bonuses, rose. Overall average earnings remain subdued with weak real wage growth.

Looking at a detailed level, the increase in the employment level was mainly driven by employees and full-time employment. The current working age employment rate was 74.7 per cent in the three months to December, up 0.3 percentage points from the three months to September 2007, and up 0.2 percentage points from a year earlier (**Figure 14**). The number of people in employment rose by 175,000 in the three months to December 2007 compared with the three months to September, to an employment level of 29.40 million in the three months to December, the highest since 1971. The unemployment rate was 5.2 per cent in the three months to December, down 0.2 percentage points from the three months to September 2007 and down 0.3 percentage points from a year earlier. The number of unemployed people decreased by 61,000 in the three months to December and was down 86,000 from a year earlier, leaving the current level of unemployment at 1.61 million, the lowest level for almost two years.

According to the LFS, in the period October to December 2007, the number of people in employment rose by 175,000. The increase was led by a rise in employees of 154,000 and a 17,000 rise in self-employment. In terms of full- and part-time workers, the numbers of people in full-time employment rose by 105,000, while the number of people in part-time employment increased by 70,000.

Workforce jobs increases

According to employer surveys, there was an increase of 63,000 jobs in the three months to September 2007. The largest quarterly contribution to the increase came from finance and business services (up 57,000), followed by manufacturing (up 5,000), and other services (up 4,000). This was offset by small decreases across a number of sectors with the largest decrease in transport and communication (down 3,000), followed by construction and distribution, hotels & restaurants (down 1,000 respectively). Over the year, total workforce jobs increased by 287,000. Of the total, the largest contribution to the increase over

the year came from finance and business services (up 201,000), followed by distribution, hotels and restaurants (up 75,000) and construction (up 40,000). The manufacturing sector, in contrast, lost the largest number of jobs on the year (down 37,000), followed by transport and communication (down 19,000).

Claimant count level continues to fall

The claimant count measures the number of people claiming Jobseeker's Allowance. The latest figures for January 2008 showed the claimant count level at 794,600, the lowest level since June 1975. The claimant level was down 10,800 on the previous month and down 128,500 on a year earlier. The claimant count rate in January 2007 was 2.5 per cent, unchanged from the previous month but down 0.4 percentage points from a year earlier.

Vacancies rise

The number of vacancies created in the UK continued to show a healthy demand position for the economy. There were 677,400 job vacancies in the three months to January 2008, up 7,300 from the previous three months and up 72,000 from the same period a year earlier.

Inactivity level falls

The working age inactivity rate was 21.0 per cent in the three months to December 2007, down 0.2 percentage points on the three months to September 2007 but unchanged from a year earlier. In level terms, the number of economically inactive people of working age was down 54,000 over the quarter, but increased by 51,000 over the year to reach a level of 7.92 million in the three months to December 2007. Inactivity falls in level terms were recorded across most groups. The largest level falls in inactivity were recorded for those categorised as 'looking after family/home' (down 40,000), followed by the 'other' category (down 28,000) and the 'temp sick' category (down 13,000).

Average earnings subdued

Growth in whole economy average earnings showed a mixed picture in the three months to December compared with the three months to November, but overall remains relatively subdued. Average earnings including bonuses increased by 3.8 per cent in the three months to December, down 0.2 percentage points from the previous month. Average earnings excluding bonuses rose by 3.7 per cent, up 0.1 percentage points from the previous month. In terms of the public and private sector split, the gap in average earning (excluding bonuses) narrowed in December. Public sector wage growth was 3.6 per cent, up 0.2 percentage points from November. Private sector wages grew by 3.7 per cent, up 0.1 percentage points from the previous month.

Overall, the numbers still point to a fairly buoyant labour market, with employment at high levels and unemployment at a stable level. This is consistent with higher workforce participation rates, underpinned by robust GDP growth. Average earnings show stable but fairly modest growth, consistent with increased supply in the labour force.

PRICES

Producer output and input prices accelerate

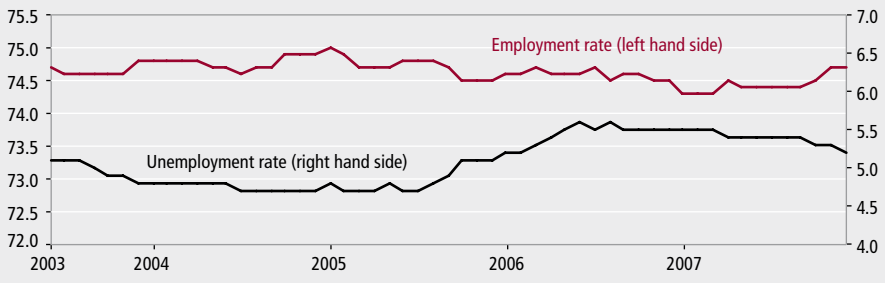
Industrial input and output prices are an indication of inflationary pressures in the economy. During quarter four, output prices exhibited further signs of an acceleration of growth from quarter three 2007 and therefore provided signs of continued inflationary pressures. Input prices also accelerated in the fourth quarter compared with quarter three. This suggests that firms were attempting to maintain their profit margins by passing on the higher costs of inputs to customers after facing a profit squeeze earlier in 2007.

Input prices on average rose by 10.6 per cent in 2007 quarter four. This compares with 2.8 per cent in 2007 quarter three. The core input price index, excluding food, beverages, tobacco and petroleum, rose by an average of 3 per cent in 2007 quarter four (12 month non-seasonally adjusted growth), an acceleration from growth of 2.3 per cent in the previous quarter. The sharp rise in input prices came mainly on the back of rising crude oil and home food materials prices. According to the latest figures, input prices rose by 19.1 per cent in the 12 months to January 2008. The largest contributions to the increase came from crude oil and home food materials, which increased by 70.3 and 36.0 per cent respectively. The core input price inflation measure also accelerated to 7.3 per cent, up from 4 per cent in December.

Output prices grew on average by 4.5 per cent in 2007 quarter four, an acceleration from growth of 2.6 per cent in the previous quarter. The underlying picture also suggests inflationary pressures. On the core measure which excludes food, beverages, tobacco and petroleum, producer output prices rose on average by 2.3 per cent in 2007 quarter four, up from 2.2 per cent in the previous quarter. The main contributions to the increase in output prices were provided by rises in petroleum products and food prices. In January 2008, output prices increased further to 5.7 per cent from 5.0 per cent in December 2007. The largest contributions to the increase came from petroleum product and food prices which rose by 22.9 and 8.5 per cent respectively. Core output prices also showed signs of inflationary pressures with growth of 0.8 per cent in January 2008, up from 0.4 per cent in December 2007.

Figure 14
Employment and unemployment

Percentages



Consumer prices rise and still above target

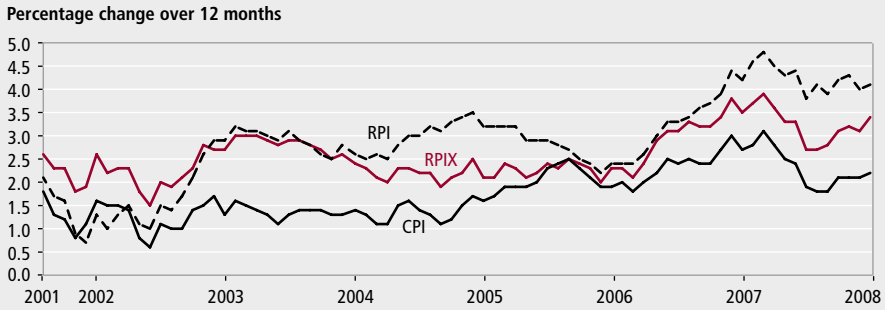
Growth in the consumer prices index (CPI) – the Government's target measure of inflation – was 2.2 per cent in January 2008, up from 2.1 per cent in December 2007. This is lower than the peak in March when inflation reached 3.1 per cent but above Government's 2 per cent inflation target (**Figure 15**).

The largest upward pressure came from an increase in the price of road fuels. Average petrol prices rose by 1.3p in January to stand at 103.9p per litre, compared with a fall of 0.8p a year ago. There was also a large upward affect from food, particularly fruit, such as grapes and grapefruit, where prices fell by less than last year.

There was a further large upward contribution from furniture where, overall, price reductions in the January sales were less than in the previous year. There was a large downward affect from clothing and footwear. Overall, the prices of garments fell by more than last year.

RPI inflation rose to 4.1 per cent in January, up from 4 per cent in December.

Figure 15
Inflation



The main factors affecting the CPI also affected the RPI. Additionally, mortgage interest payments had a downward affect on RPI this month. RPIX inflation – the all items RPI excluding mortgage interest payments – was 3.4 per cent in January, up from 3.1 per cent in December.

Independent forecasts

February 2008

UK forecasts

The tables below supplement the Economic Review by providing a forward-looking view of the UK economy. The tables show the average and range of independent forecasts for 2008 and 2009 and are extracted from HM Treasury's Forecasts for the UK Economy.

2008

	Average	Lowest	Highest
GDP growth (per cent)	*1.8*	*–0.1*	*2.1*
Inflation rate (Q4, per cent)			
CPI	*2.2*	*1.7*	*2.9*
RPI	*2.6*	*1.5*	*3.8*
Claimant count (Q4, million)	0.91	0.78	1.23
Current account (£ billion)	–58.5	–88.0	–36.9
Public Sector Net Borrowing (2008–09, £ billion)	41.6	25.0	53.0

2009

	Average	Lowest	Highest
GDP growth (per cent)	*2.0*	*-1.3*	*2.7*
Inflation rate (Q4, per cent)			
CPI	*2.0*	*1.6*	*3.5*
RPI	*2.6*	*1.7*	*4.1*
Claimant count (Q4, million)	0.97	0.74	1.31
Current account (£ billion)	–52.5	–90.7	–33.0
Public Sector Net Borrowing (2008–09, £ billion)	40.9	25.7	59.3

Notes

Forecast for the UK economy gives more detailed forecasts, and is published monthly by HM Treasury. It is available on the Treasury's website at: www.hm-treasury.gov.uk/economic_data_and_tools/data_index.cfm

Selected world forecasts

The tables below supplement the Economic Review by providing a forward-looking view of the world economy. The tables show forecasts for a range of economic indicators taken from Economic Outlook (Dec 2007), published by OECD (Organisation for Economic Co-operation and Development).

2007

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	*2.2*	*1.9*	*2.6*	*2.7*
Consumer price (percentage change from previous year)	*2.8*	*0.0*	*2.1*	*4.5*
Unemployment rate (per cent of the labour force)	*4.6*	*3.8*	*6.8*	*5.4*
Current account (as a percentage of GDP)	*–5.6*	*4.7*	*0.2*	*–1.4*
Fiscal balance (as a percentage of GDP)	*–2.8*	*–3.4*	*–0.7*	*–1.6*

2008

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	*2.0*	*1.6*	*1.9*	*2.3*
Consumer price (percentage change from previous year)	*2.7*	*0.3*	*2.5*	*4.2*
Unemployment rate (per cent of the labour force)	*5.0*	*3.7*	*6.4*	*5.4*
Current account (as a percentage of GDP)	*–5.4*	*4.8*	*–0.1*	*–1.4*
Fiscal balance (as a percentage of GDP)	*–3.4*	*–3.8*	*–0.7*	*–2.0*

Notes

The OECD *Economic Outlook* is published bi-annually. 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	2006	2007	2007 Q2	2007 Q3	2007 Q4	2007 Nov	2007 Dec	2008 Jan
GDP growth - chained volume measures (CVM)									
Gross domestic product at market prices	ABMI	2.9	3.1	0.8	0.7	0.6	..	..	..
Output growth - chained volume measures (CVM)									
Gross value added (GVA) at basic prices	ABMM	3.0	3.1	0.8	0.7	0.6	..	..	..
Industrial production	CKYW	0.1	0.4	0.7	0.0	0.1	–0.1	–0.1	..
Manufacturing	CKYY	1.5	0.5	0.8	0.0	–0.2	–0.1	–0.2	..
Construction	GDQB	1.0	2.4	0.5	0.7	0.7	..	..	..
Services	GDQS	3.6	3.8	0.9	0.9	0.6	..	..	..
Oil and gas extraction	CKZO	–9.3	–2.2	0.8	–2.2	1.3	–1.5	0.6	..
Electricity, gas and water supply	CKYZ	–2.5	0.3	–0.2	0.7	1.7	1.1	0.6	..
Business services and finance	GDQN	5.4	4.7	1.4	1.3	0.5	..	..	..
Household demand									
Retail sales volume growth	EAPS	3.2	4.2	1.4	1.5	0.4	0.4	–0.3	0.9
Household final consumption expenditure growth (CVM)	ABJR	1.9	3.1	0.7	0.9	0.2	..	..	..
GB new registrations of cars (thousands)[1]	BCGT	2,340	2,390	573	671	468	161	140	..
Labour market[2,3]									
Employment: 16 and over (thousands)	MGRZ	28,947	29,152	29,153	29,223	29,398	29,398	..	..
Employment rate: working age (%)	MGSU	74.6	74.5	74.4	74.4	74.7	74.7	..	..
Workforce jobs (thousands)	DYDC	31,294	31,536	31,536	31,599	..	..	..	..
Total actual weekly hours of work: all workers (millions)	YBUS	925.4	932.8	937.6	937.9	935.6	935.6	..	..
Unemployment: 16 and over (thousands)	MGSC	1,660	1,666	1,661	1,667	1,606	1,606	..	..
Unemployment rate: 16 and over (%)	MGSX	5.4	5.4	5.4	5.4	5.2	5.2	..	..
Claimant count (thousands)	BCJD	944.7	863.7	877.1	846.8	814.5	814.1	805.4	794.6
Economically active: 16 and over (thousands)	MGSF	30,607	30,818	30,814	30,890	31,004	31,004	..	..
Economic activity rate: working age (%)	MGSO	78.9	78.8	78.8	78.8	79.0	79.0	..	..
Economically inactive: working age (thousands)	YBSN	7,851	7,946	7,965	7,973	7,919	7,919	..	..
Economic inactivity rate: working age (%)	YBTL	21.1	21.2	21.2	21.2	21.0	21.0	..	..
Vacancies (thousands)	AP2Y	594.7	657.8	647.5	668.9	677.9	676.9	677.9	677.4
Redundancies (thousands)	BEAO	145	2,882	120	134	111	111	..	..
Productivity and earnings annual growth									
GB average earnings (including bonuses)[3]	LNNC	..	..	3.4	4.1	3.8	4.0	3.8	..
GB average earnings (excluding bonuses)[3]	JQDY	..	..	3.4	3.7	3.7	3.6	3.7	..
Whole economy productivity (output per worker)	A4YN	..	..	2.5	2.6	..	..	..	..
Manufacturing productivity (output per job)	LOUV	..	..	..	..	..	2.0	2.0	..
Unit wage costs: whole economy	LOJE	..	..	1.4	1.5	..	..	..	..
Unit wage costs: manufacturing	LOJF	..	..	..	..	..	0.8	1.4	..
Business demand									
Business investment growth (CVM)	NPEL	–4.7	6.7	0.5	2.0	–0.5	..	..	..
Government demand									
Government final consumption expenditure growth	NMRY	1.9	1.9	0.1	0.3	0.9	..	..	..
Prices (12-monthly percentage change – except oil prices)									
Consumer prices index[1]	D7G7	2.3	2.3	2.6	1.8	2.1	2.1	2.1	2.2
Retail prices index[1]	CZBH	3.2	4.3	4.4	3.9	4.2	4.3	4.0	4.1
Retail prices index (excluding mortgage interest payments)	CDKQ	2.9	3.2	3.4	2.7	3.1	3.2	3.1	3.4
Producer output prices (excluding FBTP)[4]	EUAA	2.3	2.4	2.2	2.3	2.5	2.4	2.7	3.2
Producer input prices	EUAB	9.7	3.4	0.9	3.0	11.3	11.3	12.7	18.9
Oil price: sterling (£ per barrel)	ETXR	35.93	36.11	34.05	36.93	43.51	44.58	45.59	46.63
Oil price: dollars ($ per barrel)	ETXQ	66.11	72.44	67.64	74.67	88.91	92.30	91.83	97.89

Seasonally adjusted unless otherwise stated

	Source CDID	2006	2007	2007 Q2	2007 Q3	2007 Q4	2007 Nov	2007 Dec	2008 Jan
Financial markets									
Sterling ERI (January 2005=100)	BK67	101.2	103.5	104.1	104.1	101.2	101.5	99.7	96.3
Average exchange rate /US$	AUSS	1.8429	2.0018	1.9870	2.0211	2.0444	2.0701	2.0185	1.9698
Average exchange rate /Euro	THAP	1.4670	1.4619	1.4732	1.4705	1.4129	1.4106	1.3863	1.3383
3-month inter-bank rate	HSAJ	5.26	5.95	5.93	6.18	5.95	6.53	5.95	5.50
Selected retail banks: base rate	ZCMG						5.75	5.50	5.50
3-month interest rate on US Treasury bills	LUST	4.89	3.29	4.68	3.62	3.29	2.92	3.29	2.16
Trade and the balance of payments									
UK balance on trade in goods (£m)	BOKI	–77,399	–87,425	–20,094	–23,187	–23,299	–7,910	–7,574	..
Exports of services (£m)	IKBB	127,139	138,613	34,530	35,010	35,197	11,395	11,354	..
Non-EU balance on trade in goods (£m)	LGDT	–45,468	–47,253	–9,956	–12,954	–12,898	–4,405	–4,085	..
Non-EU exports of goods (excl oil & erratics)[5]	SHDJ	118.0	116.6	116.0	119.1	115.5	119.1	112.3	..
Non-EU imports of goods (excl oil & erratics)[5]	SHED	124.4	131.4	128.9	135.7	134.2	135.4	131.1	..
Non-EU import and price index (excl oil)[5]	LKWQ	103.9	104.2	104.4	103.4	104.4	104.0	105.4	..
Non-EU export and price index (excl oil)[5]	LKVX	101.5	102.5	101.9	102.2	103.8	103.5	104.5	..
Monetary conditions/government finances									
Narrow money: notes and coin (year on year percentage growth)[6]	VQUU	5.1	5.8	4.8	5.4	5.8	5.3	5.8	6.2
M4 (year on year percentage growth)	VQJW	12.9	12.8	13.0	12.9	12.5	11.9	12.5	13.1
Public sector net borrowing (£m)	–ANNX	29,117	38,398	16,935	8,245	15,480	10,518	6,942	–14,138
Net lending to consumers (£m)	RLMH	13,051	12,251	2,574	3,512	3,567	1,288	594	941

External indicators – non-ONS statistics

		2007 Jul	2007 Aug	2007 Sep	2007 Oct	2007 Nov	2007 Dec	2008 Jan	2008 Feb
Activity and expectations									
CBI output expectations balance	ETCU	10	13	17	10	9	3	9	11
CBI optimism balance	ETBV	–2			–13			–18	
CBI price expectations balance	ETDQ	16	17	19	15	22	17	14	18

Notes:

1 Not seasonally adjusted.
2 Annual data are for April except for workforce jobs (June), claimant count (average of the 12 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.
6 Replacement for series M0 which has ceased publication.

Further explanatory notes appear at the end of the 'Key time series' section.

FEATURE

Andrew Machin
Office for National Statistics

Comparison of statistics on jobs: September 2007

SUMMARY

This article presents the latest comparisons of jobs statistics from the Labour Force Survey (LFS) and the Workforce Jobs (WFJ) statistics, and reconciliation of the estimates from the two sources. It introduces new evidence on the level of overcounting of self-employment in the LFS, and consequent double-counting in the WFJ figures. This improvement is based on the available responses to a new question on payment of tax and National Insurance, which was introduced to the LFS in 2007. Developments to improve the estimate of undercoverage of foreign workers in the LFS series are also discussed.

This is one of a series of articles (see Heap and Walling 2006, Walling 2006) designed to enhance users' understanding of employment and jobs statistics. It gives the latest comparisons, for September 2007, between estimates of the total number of jobs in the UK from the Labour Force Survey (LFS) and Workforce Jobs (WFJ) statistics. It also discusses developments in estimating two important components of the reconciliation between the jobs figures from these two sources: over-reporting of self-employment and the estimated undercoverage of temporary foreign workers in the LFS.

Comparison of LFS and WFJ statistics on total UK jobs

Section A of **Table 1** illustrates how the LFS estimate of total UK jobs is calculated by adding together the headline LFS figures for total employment and those for workers with second jobs. Section B of Table 1 compares the LFS total UK jobs figure for August to October 2007 and its components with the equivalent WFJ figure for September 2007 as first published in the December 2007 Labour Market Statistics First Release (see Technical Note).

The LFS estimate of total UK jobs is 1.195 million (3.9 per cent) lower than the WFJ estimate. This mainly reflects the difference in estimates of employee jobs because now there is no difference between the estimated number of self-employment jobs from the two different sources. Self-employed second jobs used to be excluded from the WFJ series but this treatment was changed following investigation in 2006, as recommended by the Review of Employment and Jobs Statistics (2006). The current, more appropriate, treatment reflects the finding that most of the second self-employment jobs identified in the LFS were in a different industry and/or occupation from the first job, which suggested that they should be regarded as two distinctly different self-employed jobs with both being included in the WFJ total.

Reconciliation of the LFS and WFJ jobs estimates

The Review of Employment and Jobs Statistics (2006) identified about 30 reasons for the differences between the LFS and WFJ estimates of total UK jobs. Some of these can be quantified using information from the LFS and other sources, while others are much more difficult to measure. Section C of Table 1 shows the measurable factors causing differences between the LFS and WFJ figures for total UK jobs.

The final row of Table 1 (D) shows estimates of the total UK jobs that have been adjusted to take account of these measurable factors. A description of each item and how it has been measured is given on the National Statistics website, although there are improvements to some components as reported below. Once these measurable factors have been taken into consideration, the adjusted LFS estimate of total UK jobs is lower than the adjusted WFJ estimate for September 2007 by 65,000 (0.2 per cent).

The 65,000 difference between the

Table 1

Labour Force Survey and Workforce Jobs statistics of jobs contributing to UK output, September 2007

Thousands and percentges, seasonally adjusted

	Labour Force Survey[1] ('000s)	Workforce Jobs[2] ('000s)	Difference: LFS-WFJ ('000s)	% difference: LFS-WFJ as % of LFS
A. LFS employment and jobs estimates				
LFS total employment (main jobs)[3]	29,291	..	..	..
LFS workers with second jobs	1,113	..	..	..
Total LFS jobs	**30,404**	**..**	**..**	**..**
B. Components of LFS and WFJ total jobs				
Employee jobs[4]	25,961	27,118	*–1,156*	*–4.5*
Employee main jobs	25,224	..	..	..
Employee second jobs	737	..	..	..
Self-employment jobs	4,232	4,232	*0*	*0.0*
Self-employment main jobs	3,856	3,856	*0*	*0.0*
Self-employment second jobs	376	376	*0*	*0.0*
Government-supported trainees	111	54	*56*	*50.9*
Unpaid family workers[5]	100	..	*100*	..
HM Forces[4]	..	195	*–195*	..
Total UK jobs	**30,404**	**31,599**	***–1,195***	***–3.9***
C. Adjustments for survey coverage and response issues[6]				
Jobs not covered by the LFS				
Temporary foreign workers[7]	110	..	..	..
Armed forces not living in private accommodation[8]	110	..	..	..
Workers living in communal establishments[9]	80	..	..	..
Third and subsequent employee jobs[10]	80	..	..	..
Jobs not covered by the WFJ series				
Employee jobs in private households[11]	..	60	..	..
Unpaid family workers[12]	..	100	..	..
Employment in Managed Service Companies excluded from business survey sample frame[13]	..	120	..	..
Survey response issues				
Overcounting due to over-reporting of self-employment[14]	..	–460	..	..
LFS non-response bias[15]	230	..	..	..
LFS proxy response error (main jobs)[16]	150	..	..	..
LFS proxy response error (second jobs)[16]	90		..	..
ABI/STES response errors[17]	..	–100	..	..
D. Adjusted estimates of total UK jobs	**31,254**	**31,319**	*–65*	*–0.2*

Notes:

The sampling variability of the difference between the LFS and WFJ estimates of jobs (95 per cent confidence interval) is estimated to be roughly ± 300,000 to ± 400,000.

1 Labour Force Survey estimates for Aug–Oct 2007.
2 Workforce Jobs series estimates for September 2007.
3 The headline LFS employment figure comprises: employee and self-employment main jobs; government-supported trainees and unpaid family workers.
4 The LFS employee jobs figures include armed forces employees living in private households.
5 Unpaid family workers are not included in the WFJ estimate of total UK jobs.
6 For details of each issue, see www.statistics.gov.uk/statbase/product.asp?vlnk=14358
7 Based on ONS experimental short-term migration estimates.
8 WFJ armed forces figure minus LFS microdata estimate of armed forces employees in private households (Jul–Sep 2007).
9 Estimate from pilot survey of communal establishments, Great Britain, autumn 2000.
10 Annual estimate from Family Resources Survey: 2005–06.
11 Estimate based on LFS microdata (Jul–Sep 2007).
12 LFS figure for unpaid family workers Aug–Oct 2007.
13 Based on IDBR estimated employment in Managed Service Companies which are removed from the sample frame to prevent distortion of detailed results as recommended by the Review of Workforce Jobs Benchmarking.
14 Estimate based on LFS microdata (Jul–Sep 2007).
15 Estimate based on ONS study of non-response bias (Freeth, Greenwood and Lound 2005).
16 Estimate based on proxy response study (Dawe and Knight 1997) and LFS microdata (Jul–Sep 2007).
17 Estimate taken from ABI follow-up survey, 2004.
.. Not applicable

adjusted LFS and WFJ total jobs estimates is well within the bounds of the sampling variability (95 per cent confidence interval), which is roughly ±300,000 to ±400,000. However, it should be noted that the adjustments are themselves subject to a margin of uncertainty, and there are other factors causing differences between the two sources which have not been adjusted for. These include, for example, timing effects. The LFS estimates are averages for three-month periods, whereas business surveys measure the number of jobs on a particular day.

Estimates for some components of the reconciliation have been improved in the light of new information about self-employment and short-term migrants, as described below. The reconciliation now also includes a new item to allow for the exclusion of Managed Service Companies from the sample frame for the business surveys, to prevent distortion of detailed results by industry and by region, as recommended by the Review of Workforce Jobs Benchmarking (2007). Any employees in these companies would therefore not be covered by the WFJ series.

Over-reporting of self-employment in the LFS

The breakdown of employment estimates from the LFS by employee/self-employed is based on respondents' self-classification in response to the question: 'Were you working as an employee or were you self-employed?' This is in line with practice throughout the EU to meet Eurostat requirements. There is evidence from further questions that self-employment is likely to be over-reported in the LFS, and employee jobs underestimated by a corresponding amount. Some individuals in the LFS who classify their main job as 'self-employed' subsequently say that they are either the sole director of a limited company, or paid by an agency, or both. These people are likely to be counted as employees in business surveys, resulting in double-counting in the WFJ series when the self-employment estimates from the LFS are added. The LFS results for second jobs may also suffer from this type of reporting error, but it is difficult to substantiate because the survey does not ask equivalent questions to clarify employment status for second jobs.

In August to October 2007, some 400,000 people, who classified themselves as self-employed, were sole directors and/or paid by an agency, in response to the 'SELF' question in the LFS, indicating that the WFJ figure for September 2007 could double-count main jobs by around this amount. The double-counting could be greater than this because there may be other reasons for people who are employees to regard themselves as self-employed. On the other hand, the extent of the double-counting could be lower than 400,000, depending on whether the sole directors take a salary or wage from their business, and depending on whether those that are paid by an agency have a contract with the agency. (These criteria determine whether they should be counted as employees in business surveys, but the numbers in these categories are not known as the LFS does not ask for these further details.) It is also likely that some people wrongly classify themselves as employees when they are really self-employed. In July to September 2007, according to the LFS microdata, 122,000 people who described themselves as 'employees' subsequently said that they were not paid a salary or wage by an employer. While many of these could well be employees, perhaps working for an agency, a proportion could be self-employed.

In order to help clarify respondents' employment status, and to try to provide better information about self-employment as a follow up to the Review of Employment and Jobs Statistics Final Report (2006), a new question (NITAX) was added to the LFS in 2007, to those who say they are self-employed and also to those who say they are employees but then go on to say that they are not paid a salary or a wage:

'Do you pay your own National Insurance or Tax or are these usually deducted by the organisation(s) you work for, for example, your client, employer, agency, etc?'

Responses are coded: 1. Pay own NI and Tax; 2. Pay own NI or Tax but not both; or 3. NI and Tax is deducted by organisation.

The range of responses allows for the possibility of special arrangements that can apply, for example, in the case of actors or construction workers who are self-employed but who may only pay tax or NI directly themselves, not both. Preliminary results from this new question are now available for the first three quarters of 2007. As with any new question, the results still need to be treated with some caution at this early stage.

Figure 1 illustrates how an estimate of overcounting of self-employment in the LFS may be obtained using the combination of the responses to new (NITAX) and existing (SELF) LFS questions.

Previously, the estimate of overcounting was based on those in the bold boxed area of the table on the right hand side of Figure 1, that is, those who say they are self-employed and then say that they are paid a salary or wage by an agency, or that they are the sole director of a limited company, or both. For the period July to September 2007, these amounted to 388,000 according to the LFS microdata.

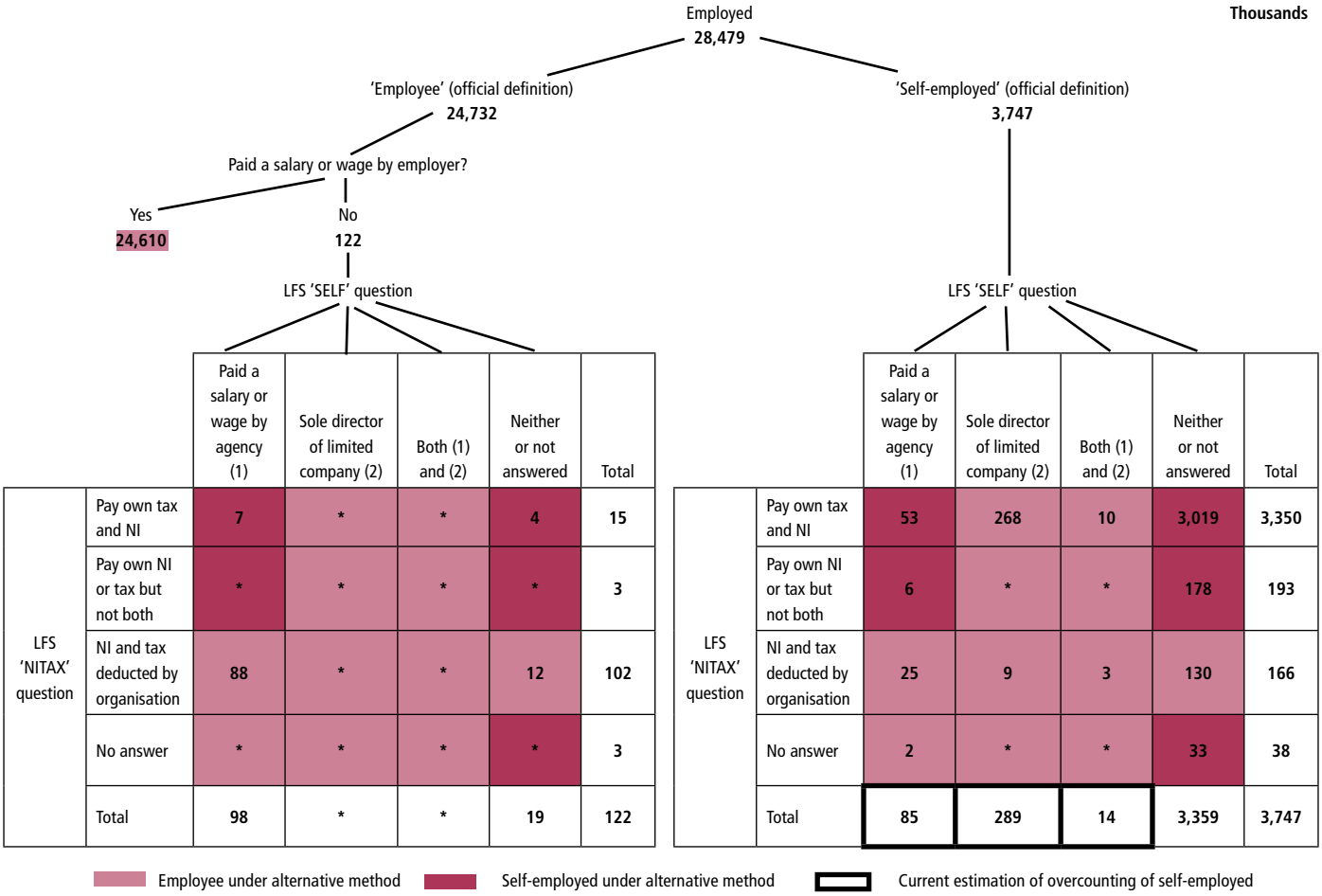
Using the new NITAX question, along with the SELF question, the method of identifying employees and the self-employed can be improved as follows, and applied not just to those responding as 'self-employed', but also to those who respond as 'employees' and then say they are not paid a salary or wage by an employer:

- sole directors of limited companies (including those who also say they are paid by an agency) – it is reasonable still to treat all these as employees. In these cases, the response to the NITAX question does not really help further, as sole directors will generally tend to regard themselves as paying their own tax and NI, as they would be responsible for this anyway as director of the company. In practice, they may not make the distinction between this corporate responsibility and their responsibility as a private individual
- those paid a salary or wage by an agency – it seems appropriate to treat these as self-employed if they confirm that they pay their own tax or NI, or both. Otherwise, in all cases, they should be treated as an 'employee'
- neither of the above in response to the SELF question – it is reasonable to treat these as employees only if they confirm that both NI and tax are deducted by the organisation for which they work; otherwise they should be treated as self-employed

The light shaded areas in Figure 1 represent those in the LFS who are identified as employees in the LFS using the NITAX and SELF questions. The dark shaded areas represent those identified as self-employed. For the period July to September 2007, this new method of estimation gives net overcounting of 443,000 according to the microdata. This is based on approximately 459,000 'self-employed' identified as employees (the sum of the right hand grid light shaded area), which is partly offset by 16,000 'employees' identified as self-employed (the sum of the left hand grid dark shaded areas).

Table 2 shows the previous existing

Figure 1
Flow diagram for alternative method for measuring employees and self-employed, July to September 2007



Note:

* Sample size too small to give an estimate.

Source: LFS Microdata

estimates of overcounting of self-employment for the first three quarters of 2007, the corresponding new estimates of overcounting, and the difference in each case. Note that the figures in this table are based on analysis of the LFS microdata, but they have been adjusted by a factor to be approximately consistent with the headline LFS figures included in Table 1, which are weighted to 2006-based mid-year population estimates. The figures are thus on a higher basis than the corresponding microdata figures, as used in Figure 1, which are currently weighted to the 2003-based mid-year population estimates.

In due course, a process along the above lines, illustrated by Figure 1, may provide an improved basis for estimates of self-employment, at least for some purposes, in particular for producing estimates of self-employed jobs which are added to estimates of employees in compiling the WFJ series. Note that, for the foreseeable future, self-employment figures on the usual self-classification will need to continue to be provided according to the agreed international concepts.

Coverage of temporary foreign workers

The LFS is not designed to cover everyone who is living and working in the UK.

Table 2
Previous and new estimates of overcounting of self-employed

Thousands

	Previous estimate of overcounting	New estimate of net overcounting	Change in estimate of overcounting
Jan–Mar 2007	360	440	80
Apr–Jun 2007	380	440	60
Jul–Sep 2007	400	460	60

Source: Labour Force Survey

Foreign workers are likely to be under-represented in the LFS, particularly those who visit the UK for periods of less than a year, and those living in communal establishments. This is because:

- The LFS sampling frame covers private households and NHS accommodation only. Students in halls of residence are also covered, but only those with a parent living in a UK household. The sample does not cover students in halls of residence without a UK-resident parent, nor does it cover people living in other types of communal establishment such as hotels, hostels, boarding houses and caravan sites. Many temporary foreign workers may live in these other types of accommodation
- Individuals living at sampled addresses are generally included in the survey only if they regard the address as their main residence. Until 2008, LFS interviewers were instructed to include anyone who had been living continuously at the address

for six months or more, even if they considered their main address to be elsewhere (either in the UK or abroad). However, the exclusion of persons here for less than six months was not instructed.
The interviewers' instructions are inevitably complex. Feedback from LFS interviewers has indicated that six-month residency rules have not been applied consistently and many temporary foreign workers living in the UK for less than six months were probably included in the LFS results. The six-month residency rules have now been dropped following the recommendations of the Inter-departmental Migration Statistics Task Force (2006).
There is evidence of including temporary resident foreign workers from the LFS microdata. Analysis for April to June 2007 shows that there were on average, for that period, 79,000 foreign-born migrants aged 16 or over who had arrived in the UK during 2007, of which 43,000 were employed. In all these cases, they would have been in the UK for less than six months. It is highly likely that there were many more additional migrants, perhaps as many as half again, who had also stayed less than six months, in particular those who came in November 2006 and were included in the LFS in April 2007 and those who came in December 2006 and were included in the LFS in April or May 2007. Unfortunately, it is not possible to estimate the numbers involved precisely, because the LFS collects information about year of arrival only, not month of arrival

- the LFS survey results are weighted to estimates of the 'usually resident' population (those persons intending to be resident in the UK for longer than 12 months) living in private households, NHS accommodation, and student halls of residence. These resident population estimates do not exclude people moving out of the UK for less than 12 months. This means that the LFS is weighted to a definition of people who intend to stay for 12 months, while it is collected on a different basis as described above

Temporary foreign workers are more likely to be included in the WFJ employee jobs figures, since these are mainly based on business surveys which ask employers how many employees were on their payroll on the survey reference date, regardless of the employees' actual or intended length of stay in the UK.

Self-employed temporary foreign workers are also likely be under-represented in the LFS, but this should not materially affect coherence between the LFS and WFJ estimates of total UK jobs, since the self-employment jobs figures used in the WFJ total jobs series are taken from the LFS.

It is worth noting that the issues listed above have different impacts on the quality of LFS employment data. The second one will affect the make-up of the results, for example, the proportion of workers who are migrants, but will tend to have relatively little impact on the overall level of the employment estimates. The last issue affects the total numbers covered by the LFS but not necessarily their characteristics, while the first one, in particular the exclusion of people in communal establishments, will have an effect on both the overall numbers estimated and their make-up.

It is very difficult to estimate the number of temporary foreign workers excluded from the LFS results. The Review of Workforce Jobs Benchmarking (2007) (see Annex F) estimated the undercoverage to be in the range of 60,000 to 300,000, based on various sources, and a central estimate of 180,000 has since been used in the reconciliation of LFS and WFJ jobs estimates. The recent development of short-term migration statistics and the publication of these figures on an experimental basis provide an opportunity to improve this estimate (see Research Report on Short-term Migration (2007)).

Table 5 of the above report indicated the average monthly population present (in-stock) of short-term migrants (for a duration of one to 12 months) in England and Wales, for the period from the end of June 2004 to June 2005, was 67,000. This comprised some 24,000 for whom employment was their reason for visit, and a further 44,000 who came to study. In relation to the estimates developed for the Review of Workforce Jobs Benchmarking (2007), the employment figure, in particular, seems to be low. As part of the development from 'experimental statistics' to 'National Statistics' status, ONS is continuing to assess the short-term migration estimates.

For the time being and for the purposes of reconciling the LFS and WFJ series, it seems reasonable to take a combined estimate of workers and students (67,000) as an indication of short-term migrant workers missing from the LFS. Some migrants may just study and not work at all. However, there will be others who come to the UK for reasons other than work or study, but take a job.

Further enhancement of the 67,000 figure is also required to allow for coverage of the UK as a whole, and also for the likely increase in migrant workers since 2004/05. An estimate of this has been obtained using the recent growth in National Insurance registrations. On this basis, a revised estimate of 110,000 can be obtained for the LFS undercoverage of temporary foreign workers and this is the figure included in Table 1.

Further improvements of the estimate are likely to be made in due course. ONS is investigating the feasibility of extending the LFS sample to improve its coverage of temporary foreign workers. The feasibility of extending the coverage of the 2011 Census is also being investigated, and this may allow mid-year population estimates to be supplemented, to which LFS results are weighted.

CONTACT

elmr@ons.gsi.gov.uk

REFERENCES

Heap D, Walling A (2006) 'Comparison of statistics on jobs: December 2005', *Labour Market Trends* 113(5), pp 147–56

Office for National Statistics 2006 'Factors causing differences between the LFS and WFJ statistics on jobs' at www.statistics.gov.uk/statbase/product.asp?vlnk=14358

Office for National Statistics (2006) 'Report of the Inter-departmental Task Force on Migration Statistics' at www.statistics.gov.uk/statbase/product.asp?vlnk=14731

Office for National Statistics (2006) 'Review of Employment and Jobs Statistics Final Report' at www.statistics.gov.uk/about/data/methodology/quality/reviews/labour.asp#nsqremf

Office for National Statistics (2007) 'Research Report on Short-term Migration' at www.statistics.gov.uk/about/data/methodology/specific/population/future/imps/updates/default.asp

Office for National Statistics (2007) 'Review of Workforce Jobs Benchmarking' at www.statistics.gov.uk/statbase/product.asp?vlnk=9765

Walling A (2007) 'Comparison of statistics on jobs: June 2006', *Labour Market Trends* 114(11), pp 373–88

TECHNICAL NOTE

Concepts and sources

The statistical concept of employment differs from the concept of jobs, since a person can have more than one job and some jobs may be shared by more than one person. The Labour Force Survey (LFS) is the principal source of statistics on the number of people in employment. The LFS collects information from residents of private households and NHS accommodation. Students in halls of residence are also covered, by collecting information from their parents' households. The headline LFS series (total UK employment) comprises: people aged 16 or over who did paid work in the survey reference week, either as an employee or as a self-employed person; those who had a job they were temporarily away from; people on government-supported employment and training programmes; and unpaid family workers.

The LFS can also be used to produce estimates of the total number of jobs in the UK, by adding together the headline LFS employment figures (which count employed people and so are equivalent to main jobs) and those for workers with second jobs. However, the Workforce Jobs Series (WFJ), which is compiled mainly from surveys of businesses, is the principal source of statistics on jobs by industry because it provides a more reliable industry breakdown than the LFS.

The WFJ total UK jobs series is the sum of: employee jobs (measured mainly through business surveys); self-employment jobs (from the LFS); jobs in HM Forces, and government-supported trainees (both compiled from administrative sources). Vacant jobs are not included.

FEATURE

Monitoring the quality of the National Accounts

Ross Meader and Geoff Tily
Office for National Statistics

SUMMARY

The Office for National Statistics (ONS) regularly monitors and publishes indicators of the quality of its statistics. However, when publishing plans for the modernisation of the National Accounts, ONS said in February 2007 that it would monitor closely the quality of quarterly estimates through 2007 and 2008. In its response to the Treasury Committee report on the ONS efficiency programme, the Government noted that 'ONS plans to publish material on the quality of specific National Accounts data sets early next year'. This article proposes an extended quality framework for meeting these two commitments.

The Office for National Statistics (ONS) regularly monitors and publishes indicators of the quality of the National Accounts. However, there is currently concern that there is an increased risk to quality as a result of the transition to modernised systems and methods, as well as aspects of ONS's efficiency programme, including the relocation from London to Newport.

When publishing plans for the modernisation of the National Accounts, ONS said, in February 2007, that carrying forward modernisation would involve some reprioritisation, including reducing the scope of the 2007 *Blue Book*, so that expert resources could be directed to testing and analysis of modernised systems and methods. The scope of the *Blue Book* was reduced in two main respects:

- benchmarking to annual surveys through input-output supply and use balancing of income, output and expenditure was postponed to 2008, and
- certain methodological improvements were also postponed

The effect, in particular of the former, was some additional uncertainty about the path of the economy. ONS said that it would therefore be monitoring closely the quality of quarterly estimates through 2007 and 2008.

In its report on the efficiency programme in the Chancellor's departments, including ONS, the Treasury Committee said that its task in assessing the overall impact of the efficiency programme in ONS had been rendered more difficult by the absence of measurements of the quality of service provided. It recommended that ONS undertake consultations about the formulation of agreed measurements of quality of outputs. In its response, the Government noted that ONS provides quality analyses of its statistical releases and that it also monitors the internal coherence of the National Accounts estimates, their coherence with other data sets and with external surveys, and planned to publish material on the quality of specific National Accounts data sets early in 2008.

This article summarises existing quality analyses and proposes an extended framework for monitoring the quality of the National Accounts to help meet the commitments made when announcing plans for National Accounts modernisation and to the Treasury Committee. The article is primarily concerned with providing a benchmark for future quality assessments, rather than providing an assessment of the quality of the accounts at present.

The assessment of quality has long been recognised as a complex task. The measures proposed in this article are mostly mechanistic, using published figures on revisions and coherence to make statements about the quality of the data set as a whole. Other measures proposed are novel and based on information that is difficult to extract, and their validity and usefulness will only emerge in time. Before the main analysis, the section 'Quality and the 2007

Blue Book' examines specific issues that arise from the restricted exercise conducted for the 2007 *Blue Book*. The next section presents the main material on revisions analysis. The analysis of coherence is split into two parts: in the first part, measures of the internal consistence of the National Accounts data are proposed; in the second part, possible measures of the consistency of National Accounts data with other official and then external measures are examined. The last section looks, in a very preliminary way, at measures of the quality of the survey data that underpin National Accounts aggregates.

Quality analysis

The concept of Summary Quality Reports, published for a range of ONS outputs, was first introduced in Jenkinson (2005). A Summary Quality Report for GDP was published in Robinson (2005) and this provides a very general overview of how the accounts meet certain quality characteristics. The report is based on six dimensions (or 'building blocks') of quality, in line with European recommendations, which are outlined in **Figure 1**. These building blocks are:

- relevance – measures the degree to which the statistical product meets user needs for both coverage and content
- accuracy – measures the closeness an estimated result is to the (unknown) true value
- timeliness and punctuality – timeliness is the lapse of time between publication and the period to which the data refer; punctuality measures the time lag between the actual and planned dates of publication
- accessibility and clarity – accessibility measures the ease with which users are able to access the data, also reflecting the formats in which data are available and the availability of supporting information; clarity measures the quality and sufficiency of the metadata, illustrations and accompanying advice
- comparability – measures the degree to which data can be compared over time and domain, and
- coherence – measures the similarity between data from different sources or methods that refer to the same phenomenon

Of the six dimensions, this article will focus on two – accuracy and coherence. These are the two aspects of quality potentially most affected by the reduced scope of the 2007 *Blue Book*.

Accuracy is largely measured through revisions analysis, although it should be noted that revisions analysis measures reliability as a proxy to accuracy. In theory, a reliable estimate (one that it is revised only slightly over time) could be very inaccurate (in its closeness to the underlying 'true' value), and vice versa. Coherence is best measured by analysing how easily the data set is balanced without the need to incorporate adjustments. While these are the approaches taken, they may be distorted by the current risks and issues outlined earlier. It is possible that an apparent improvement to revisions and coherence may be a function of decreasing accuracy. The real position cannot be known until the full benchmarking exercise for the relevant years is done.

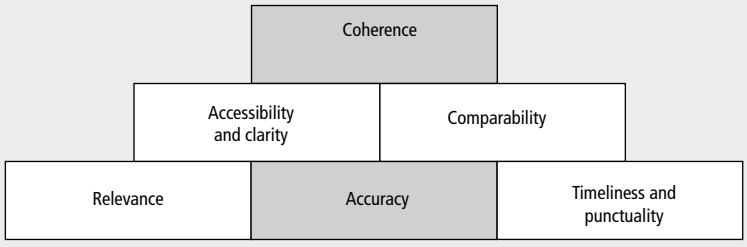
In order to measure quality changes in the National Accounts over time, it is important to understand the concept of 'real time'. The world of National Accounts is ever changing, with figures being regularly revised, due to improved data replacing forecasts and methodological improvements, to give just two examples. When analysing quality, it is often the case that presenting a time series at the current time can be misleading, because historical values have had an opportunity to develop and evolve, whereas recent data have not. Therefore a real-time data set should be built up of values as they were when they were first published. Real-time analysis is particularly relevant for the analysis of coherence.

The most important tools for monitoring the accuracy and coherence of quarterly GDP growth estimates are:

- revisions analysis – the main tool for measuring reliability of estimates
- internal coherence – the analysis of published adjustments (alignment adjustments and statistical discrepancies) as well as unpublished adjustments. These three measures together contribute to understanding coherence within the GDP data set
- wider coherence – measures that indicate the degree of coherence between GDP and other ONS and external sources
- sources – the monitoring of the quality of source data that feed into GDP. While the above three measures concentrate on GDP output, this one looks at the accuracy of ONS surveys and administrative information

Although GDP will be used as the principal data set throughout discussions, the quality will also be looked at through the household saving ratio and other sector accounts measures.

Figure 1
'Building blocks' of quality



Quality and the 2007 *Blue Book*

The aim of modernising National Accounts systems and methods is to improve the quality of the estimates, in particular by reducing the size of revisions. However, the 2007 *Blue Book* (BB07) was reduced in scope so that resources could be redirected towards the modernisation of the National Accounts. The reduction in scope meant some temporary additional uncertainty about the path of the economy; the rest of the article attempts to assess whether this is evident in a deterioration of the quality of the estimates. The reduced scope of BB07 impacted in several ways, as indicated below.

Previously planned methodological improvements were postponed

The only methodological improvements were the incorporation of new methodology for calculating private sector own-account software and some improvement of indicators used for service sector output estimates.

The major postponement was that the implementation of the improved method for measuring banking sector output

through Financial Intermediation Services Indirectly Measured (FISIM) will not be included until 2008. However, GDP figures incorporating the improved FISIM estimates are presently being published as experimental statistics and extensive analysis has been carried out, showing potential effects of taking on FISIM. For instance, there are small differences in the quarterly growth rate, although these never exceed 0.2 percentage points in either direction. Incorporating FISIM would also raise the level of GDP by an average of 1.7 per cent. Further analysis is provided in Akritidis (2007). A number of other changes, such as the incorporation of the reclassification of London and Continental Railways, were also postponed.

Annual supply and use balancing was not carried out

Each year, annual estimates of production, expenditure and income are balanced through the input-output supply and use framework (see **Box 1**) and annual benchmark sources incorporated. With the suspension of this process for BB07, the estimate of GDP for 2004 was not rebalanced through the supply and use framework, the estimate for 2005 was not balanced for the first time, and the detail not confronted at industry and product level. Instead, the output measure has continued to determine the estimate of GDP for 2005.

Annual benchmarking was not carried out fully

For the production measure, no benchmarking was incorporated, except data from retail sales. The most important source used in the benchmarking process is the ABI, which was not incorporated. Some benchmark sources were included within expenditure and income, specifically contributing to trade in services, compensation of employees and non-financial company profits. These results are provisional, because any benchmarking carried out for expenditure and income components was constrained to the unbenchmarked production measure, and full benchmarking relies on the supply and use process. While benchmarked data have helped to improve some components of GDP, they have had little impact on the aggregate total.

Analysis of revisions in previous *Blue Books* may be used to give an indication of the size of revisions that have been postponed. Table 1 in Beadle (2007) calculates that the average revision to the level of current price GDP is an addition of £5.2 billion and the average revision to annual volume growth is 0.15 per cent (at its first *Blue Book* rather than in total). However, since historical figures are so variable, it is impossible to make future predictions with any certainty.

A base year of 2003 has continued to be used for recent volume estimates

Since the implementation of annual chain-linking, price base years have been updated annually for the most recent years. The justification for chain-linking is that updating the price base each year permits volume measures to respond more quickly to structural change. This was not done in 2007, with 2003 continuing to be used as the base year. Moreover, volume measurement for the latest quarters depends on approximating movements in value added with deflated output indicators. The validity of this depends on the ratios of value added to output being constant. Not reweighting also involves extending the period for which the output approximation is used, which might impact if intermediate consumption is taking an increasing or reducing share of economic activity.

Revisions analysis

A range of factors needs to be considered when analysing revisions. The size of revisions is clearly important. Large revisions over time raise concerns over the reliability of a particular estimate. In addition to the scale of revisions, the direction is also important. If estimates on average tend to be revised up, it needs to be established whether this is indicative of a statistically significant bias. Historically, GDP estimates are revised up on average.

Much work has routinely been carried out to record and analyse the nature of revisions within National Accounts output. Detailed revisions analysis of GDP and its components have been discussed in regular annual articles since Barklem (2000). The latest update relates to data from 1996 to 2004. See Meader (2007) for the latest assessment.

As explained in an article in the March 2004 edition of *Economic Trends*, each First Release now contains a section analysing revisions. This analysis records the average revision and the average absolute revision to quarters. It also shows whether the average revision is significant, according to a statistical significance test. If the test is not significant, then the observed revisions might have occurred by chance. More details about this test can be found in Jenkinson and Stuttard (2004). Average revisions are calculated over the latest 20 quarters.

Table 1 of each GDP First Release provides this information for short-term revisions. These summarise revisions made between month one (M1), month two (M2) and month three (M3). Table 2 of each First Release gives this information for longer-term revisions (M3 to the published value three years later). Analysis of longer-term revisions is also shown for the household saving ratio.

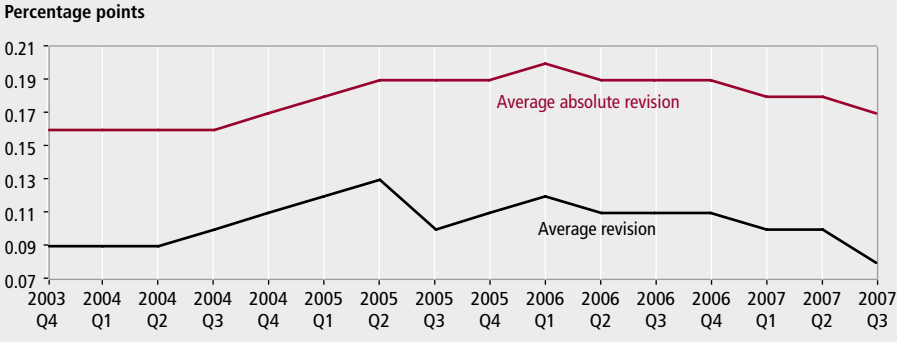
Box 1

Constructing timely and benchmarked annual data

GDP is published on a quarterly basis. In the short term, the principal aim is to provide a timely indicator of growth. The UK publishes a preliminary estimate of GDP about 25 days after the end of the quarter (month one), which is one of the fastest estimates of GDP in the world. At seven (month two) and 12 (month three) weeks after the end of the quarter, more detailed and complete data are published, culminating in the Quarterly National Accounts. The headline measure of growth is based on the output measure of GDP, with the expenditure and income estimates constrained to that measure.

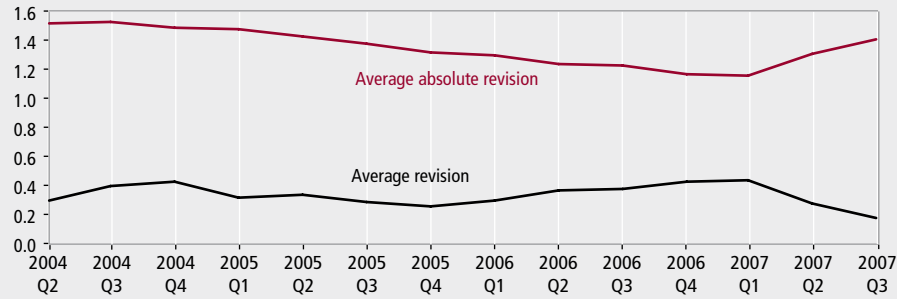
GDP estimates remain based on the output measure until the input-output supply and use process. This process permits the confronting of industry and product detail underpinning the three measures of GDP, and builds an estimate of GDP from bottom up, with growth no longer constrained to the production measure. At the same time, annual sources for a number of components are introduced, in particular the Annual Business Inquiry (ABI) for production and some expenditure components, and HM Revenue and Customs administrative sources for income data. This process takes place around two years after first publication, so that benchmark data for 2004 were incorporated into the accounts in 2006. The supply and use balancing is normally revised in the following year. After that, historic estimates are only revised following methodological change.

Figure 2
Quarterly revisions to GDP growth (M3 to three years later) in real time[1]



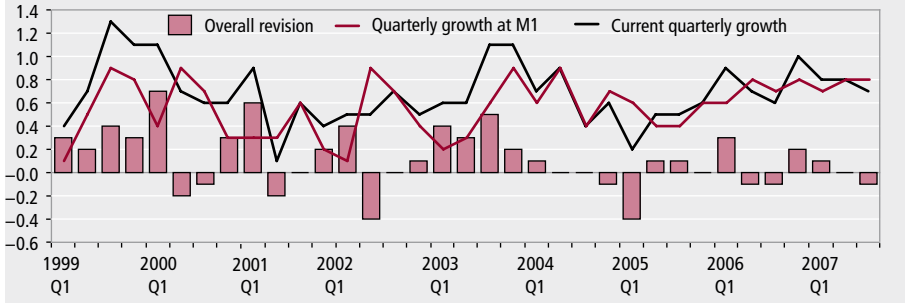
Note:
1 X-axis labels represent date of publication.

Figure 3
Quarterly revisions to household saving ratio (M3 to three years later) in real time[1]



Note:
1 X-axis labels represent date of publication.

Figure 4
Revisions (first published to current) to GDP growth



The average revisions and absolute average revisions published in First Releases (from M3 to the published value three years later) have been plotted in **Figure 2** and **Figure 3**. As a result, these are moving averages taken over 20 successive quarters. Note that the data published in First Releases are always one month in arrears. The household saving ratio (see Figure 3) was first included in First Releases from 2004Q4 and is published every quarter (with data corresponding to the previous quarter).

The results show that average revisions to GDP growth over the period have ranged from 0.09 to 0.13 percentage points. Notably, GDP growth is revised up on average but, since 2006Q1, revisions have been falling both in terms of the average and the absolute average. However, this may be a consequence of not taking on benchmarked data.

The average revision to the household saving ratio over the period ranged from 0.18 to 0.44 percentage points and was therefore also revised up on average. Recently, the average revision has sharply fallen and the average absolute revision has risen due to large downward revisions to the saving ratio in recent quarters.

More detailed information on revisions can also be obtained from revisions triangles available on the ONS website. These spreadsheets show the evolution of a time series over time and also include an analysis of whether revisions are significant. Revisions triangles are available for GDP and key components at www.statistics.gov.uk/statbase/product.asp?vlnk=13560

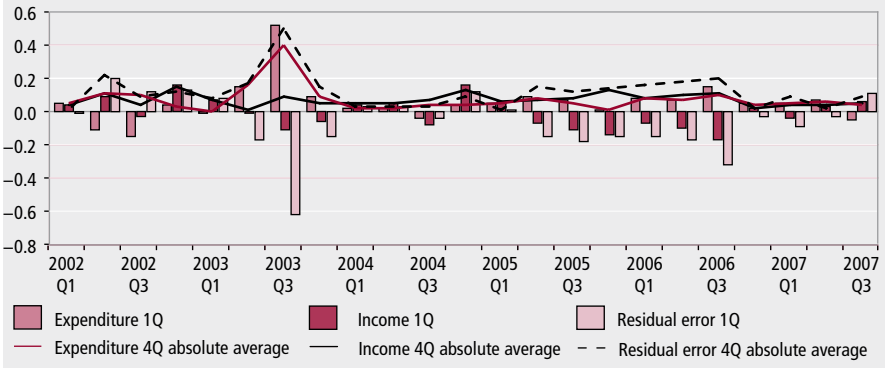
Figure 4 shows revisions to GDP growth for each quarter, from the preliminary estimate first published in month one to the latest published figure for that quarter (taken from the Quarterly National Accounts, published in December 2007). This uses information contained in the revisions triangle for GDP. The start date used here is 1999, although published revisions triangles are available back to 1992 for the aggregate series.

Although the average revision is upward, driven by the 20 upward revisions since 1999, downward revisions are also possible for any given quarter. The 2000Q1 estimate has been revised up by 0.7 percentage points since it was first published, while both the 2002Q2 and 2005Q1 estimates have been revised down by 0.4 percentage points. There have been fewer revisions to figures first published in the last three years. This is because data had not been subject to at least two *Blue Books* and therefore future revisions are likely.

It is possible for the current estimate to show little revision compared with the initial estimate, when in fact there have been large offsetting revisions in intervening time periods. Therefore, the choice of the time period analysed becomes important. Broadly, revisions fall into three areas of interest:

- stability of early estimates – the preliminary estimate published at M1 is based on early source data and is subject to revision as later data become available. The revision from M1 to M3 therefore reflects the reliability of the early estimate
- impact of benchmarking – over time, more reliable data from annual sources become available and data are revised as the quarterly path is benchmarked to the annual totals. This occurs during *Blue Book* One (BB1) and to a lesser extent during *Blue Book* Two (BB2),

Figure 5
Size of statistical discrepancies and residual errors as a percentage of GDP in real time



Note:
Alignment adjustments are calculated at current prices.

and

- impact of methodological improvements – after BB2, the majority of revisions are due to methodological improvements, some of which can have a large effect, such as the introduction of annual chain-linking in 2003

The size and nature of revisions from one year to the next are routinely presented as part of the annual publication of the National Accounts. Specific details about these revisions were presented in the 2007 *Blue Book* (pages 28 to 31). For instance, Table B of the *Blue Book* details revisions made to GDP between 1998 and 2005, since the 2006 edition. The level of GDP was revised upwards by nearly £9.3 billion in 2005, due to a range of improvements. Revisions to previous years were slightly smaller and exclusively due to a better method of estimating own-account

Box 2
Achieving a coherent quarterly data set

In the process of producing early estimates, a balance is achieved for recent quarters by using three different mechanisms.

Statistical discrepancies

Prior to supply and use balancing, there are small discrepancies in the levels of the three measures of GDP. The expenditure 'statistical discrepancy' measures the extent to which the production measure exceeds the expenditure measure and the income statistical discrepancy corresponds likewise. The term 'residual error' is sometimes used to describe the extent to which income exceeds expenditure. Statistical discrepancies are published in Tables C and D of the Quarterly National Accounts.

Alignment adjustments

The first way of adjusting the data is solely mechanical and consequently there is only some degree of control over alignment adjustments. These are used to bring the quarterly path of expenditure and income into line with production (which is the most reliable estimate of GDP in the short term). Alignment adjustments only affect the quarterly path, because over the year they sum to zero.

Expenditure alignment adjustments are always incorporated into the changes in inventories (stocks) component. Similarly, on the income side, alignment adjustments are added to the gross operating surplus of non-financial corporations (company profits). These areas of the accounts have been chosen specifically because they are the most difficult to estimate and therefore the most unreliable. Nevertheless, the true discrepancy could be within other expenditure and income components.

Quarterly alignment adjustments are published in Table M of the Quarterly National Accounts and are explained further in Snowdon (1997).

Quarterly coherence adjustments

Coherence adjustments are unpublished adjustments, applied to different areas of the accounts on a more judgemental basis. They are added to the data for two reasons:

- adjustments are inserted at component level by data compilers when there are concerns that low-quality data are distorting a component of GDP. They can be thought of as predicting the value the component should take if the quality were satisfactory. They are commonly used to adjust a component when the response rate of a survey is lower than anticipated and consequently results are different from what were expected. If these adjustments are working well, they will gradually be taken out over time as the quality of the data increases and the adjustments are replaced by actual values
- other adjustments are agreed during balancing, in order to help align the three measures. Where alignment adjustments are a mechanical method of alignment, coherence adjustments require judgement. This is particularly necessary for deciding to which area of the accounts to apply adjustments. In practice, this is done through consultation with compilers and coherence adjustments are applied to areas where there is data uncertainty. The adjustments are based in part on the projection of adjustments constructed during the most recent annual *Blue Book* process. For instance, if the supply and use tables show expenditure data on household consumption of services weak relative to the production of household services, a positive adjustment to the consumption of services will be applied and projected forward

software.

Methods of coherence

There are three different ways of producing GDP estimates, through production, expenditure or income. In theory all three estimates are equal, but due to the complexities involved in producing estimates from surveys and other source data, and differences in measuring many aspects of economic activity, equality will never occur in practice. The UK National Accounts are based on a single measure of GDP, but adjustments are applied to each of the measures to achieve this coherence through the supply and use balancing process. As explained in **Box 2**, the following three mechanisms are used to produce a coherent data set for the most recent quarters:

- statistical discrepancies
- alignment adjustments, and
- quarterly coherence adjustments

They do this essentially by bringing the expenditure and income estimates in line with production.

By recording real-time movements in the statistical discrepancies, alignment adjustments and quarterly coherence adjustments, the output, expenditure and income measures looked at together can give a broad indication of coherence.

Statistical discrepancies

A small unallocated divergence between the three measures of GDP is published. On the face of it, it would seem sensible to simply plot the differences between the three measures, as a way of monitoring coherence. This is done through 'statistical discrepancies' and the 'residual error'.

They are plotted in real time in **Figure 5**, as a percentage of GDP. The bars represent values for the latest quarter, while the lines are an average of the last four quarters, within the publication shown.

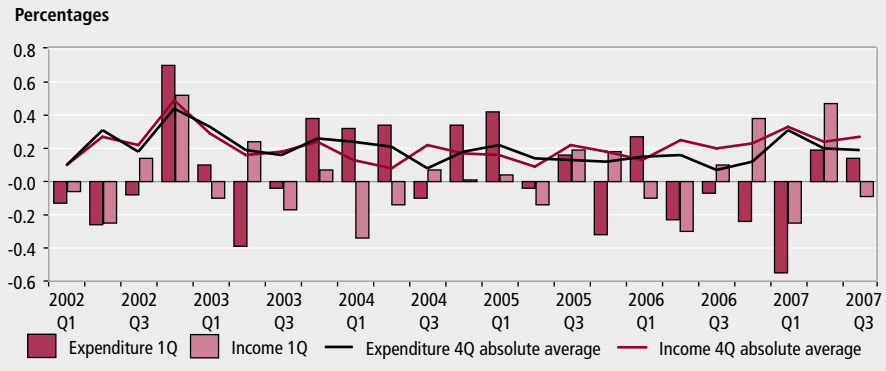
An exceptional discrepancy was published in 2003Q3. This was due to a one-off stripping out of internal buffers. In normal circumstances, an absolute residual error above 0.2 per cent of GDP is considered large and anything approaching this indicates possible difficulties in aligning the three measures for that quarter. In recent quarters, 2006Q3 shows a negative residual error of over 0.3 per cent, although subsequent quarters have delivered an improvement in this measure. Typically, the expenditure estimate comes in below the production measure and the discrepancy reflects this. Similarly, the income estimates have fairly regularly come in above production.

While in the longer term a full balance is reached through the input-output supply and use framework (where there are no discrepancies), in the shorter term, discrepancies exist, but are kept small by the use of other adjustments. Therefore, although discrepancies are helpful in adding to the picture of coherence, they are not enough on their own. Two methods of adjustments are used – alignment adjustments and quarterly coherence adjustments.

Alignment adjustments

Alignment adjustments only improve coherence by adjusting quarters within the year and do not alter the annual totals. Expenditure and income alignment adjustments are plotted in real time in **Figure 6**, as a percentage of GDP. Like the statistical discrepancy, bars represent

Figure 6
Size of alignment adjustments and residual errors as a percentage of GDP in real time



Note:
Alignment adjustments are calculated at current prices

Table 1
Annual current price coherence adjustments

£ million

	2003	2004
Financial corporations' profits	1,380	950
Private non-financial corporations' profits	1,884	–1,686
Compensation of employees	2,992	2,361
Rental income	–	–
Self-employment income	2,682	1,910
Total income	**8,938**	**3,535**
Households final consumption (HHFCE)	1,409	5,711
NPISH	520	802
Central government	–	–
Local government	–	–
Gross fixed capital formation	505	3,535
Changes in inventories	–	–
Exports of services	3,010	3,265
Imports of services	2,740	2,055
Total expenditure	**8,184**	**15,368**
Agriculture, forestry and fishing	35	0
Mining and quarrying	2,815	1,570
Manufacturing	179	–1,385
Electricity, gas and water supply	660	413
Construction	–366	240
Distribution and hotels	–1,857	–3,356
Transport and communication	–1,339	–685
Finance and business services	–4,194	–4,248
Public administration and defence	–	–
Education, health and social work	181	114
Other services	–794	–224
Total production	**–4,680**	**–7,561**

Source: United Kingdom Input-Output Analyses (2006 Edition)

values for the latest quarter, and lines are an average of the last four quarters, within the publication shown.

Alignment adjustments are considered large when their absolute value approaches 0.4 per cent of GDP. In 2002Q4, both the income and alignment adjustment were above this level. Recent quarters contain large, but not unprecedented, alignment adjustments, on the expenditure side in 2007Q1 and on the income side in 2007Q2, although there were relatively small alignment adjustments in the latest quarter.

Quarterly coherence adjustments

The third mechanism achieves a balance in the accounts by the use of coherence adjustments. These are applied to components of expenditure and income, as described in Box 2.

Annual coherence adjustments, shown in **Table 1**, are routinely published in Table B5 of the *United Kingdom Input-Output Analyses*. A full explanation of these adjustments is given in Mahajan and Penneck (1999).

The table shows that annual adjustments reduce the production measure, while raising the expenditure and income levels. In 2004, £15 billion (about 1.3 per cent of GDP) was added to the expenditure measure, over one-third of which was to the household final consumption expenditure (HHFCE) component. On the income side, compensation of employees is the largest and most dominant component. In 2004, the total income adjustment was offset by a downwards adjustment to private non-financial corporations' profits. Two production components (finance and business services, and distribution and hotels) are responsible for much of the negative adjustment to production in 2003 and 2004. While these annual coherence adjustments are applied to current price data in order to balance the input-output supply and use tables, they are also projected forward to assist with balancing of quarterly data in subsequent years. The size of the annual adjustments in 2004 and 2005 were by no means unusual. Adjustments of this order are always needed to balance the accounts.

These quarterly coherence adjustments are added and subtracted to low-level GDP component series of quarterly expenditure and income. In the same way as their annual counterparts, they help to achieve a balance but, as explained in Box 2, help align expenditure and income as well. Over the year, the quarterly adjustments diverge from the annual adjustments, until annual balancing takes place again. With the suspension of annual supply and use balancing in 2007, annual coherence adjustments were last calculated in 2006, which means that quarterly adjustments have continued to be projected forward from the last balanced year (2004). Until annual balancing is again carried out, it is impossible to know whether these adjustments are correctly anticipating levels of GDP components.

While it is possible to identify annual adjustments, quarterly adjustments are harder to analyse and interpret. A real-time analysis is currently carried out within ONS, although it is not easy to separate quality from coherence adjustments (the latter being more useful for judging coherence, see Box 2). The time series produced is also short, due to the lack of an available and reliable back series.

Although Table 1 gives adjustments made to the annual levels of GDP components, growth rates interest users more in quarterly publications. While quarterly coherence adjustments are increasing in terms of the level, they have no impact on the headline GDP growth rate which, as always, is still being driven by the more reliable short-term output measure.

Only a broad indication of the impact of quarterly coherence adjustments is possible. In growth terms, there is typically a need to add to the growth of the expenditure measure, in order for coherence with the production measure. Methods for doing this can vary. For instance, there were large inventories adjustments through 2006. However, following a downward revision to imports due to a reassessment of the impact of VAT Missing Trader Intra-Community (MTIC) fraud, inventories adjustments were lowered.

It should be emphasised that no adjustment, or even combination of adjustments, can give a complete picture of coherence. It should be looked at through discrepancies, alignment adjustments and coherence adjustments, because these are the tools available to National Accounts, and can be utilised to achieve a coherent data set. It is similarly the case in the sector accounts, where the identity between net lending/borrowing on the income and capital account and on the financial account is ensured through a (published) statistical discrepancy and (unpublished) adjustments to component series. It should also be noted that even a perfectly coherent data set is not necessarily an accurate one.

New quarterly quality/coherence assessment

The National Accounts process to achieve a single balanced and therefore fully coherent measure of GDP is complex. As above, there are various mechanisms that play distinct roles, and some adjustments are published, but it is not possible to combine all adjustments into a single indication of coherence. However, it is possible to make a qualitative judgement and assessment about the overall coherence of the data. Starting in March 2008, a coherence assessment will be included as part of the quality discussion in the background notes of the Quarterly National Accounts.

To illustrate the nature of this assessment, an example has been produced retrospectively for the 2007Q3 data set, published in December.

At present, the coherence between the three measures is broadly in line with historical experience. As is common, output growth is higher than both expenditure and income growth, according to the underlying information. The upward adjustment to expenditure growth has mainly been applied to HHFCE. The upward adjustment to the income measure has been allocated between the gross operating surplus of corporations and mixed income. Other adjustments to balance the accounts, the published statistical discrepancies and alignment adjustments, are also in line with historical experience.

Wider coherence

In addition to coherence within the National Accounts, the relationship between various official measures of economic activity (in particular labour market) is closely monitored by users. There is also some interest in the relationship with other official sources of information.

Coherence with labour market employment estimates

One measure of this sort is the relationship between GDP and either the Labour Force Survey (LFS) estimate of employment or workforce jobs.

Figure 7 plots the path of the four-quarterly growth rates for these three measures. Four-quarterly growth rates have been chosen because they are more stable than their quarterly counterparts. When comparing measures in this way, it is important to look at the movements in the series and check for divergence. Particular points of interest or concern are when one series moves in the opposite direction to another for a given period. For instance,

Figure 7
Four-quarterly growth rates of GDP, LFS (employment) and workforce jobs

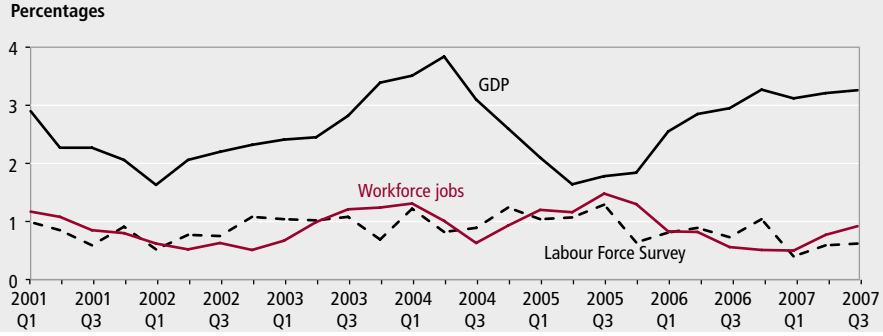
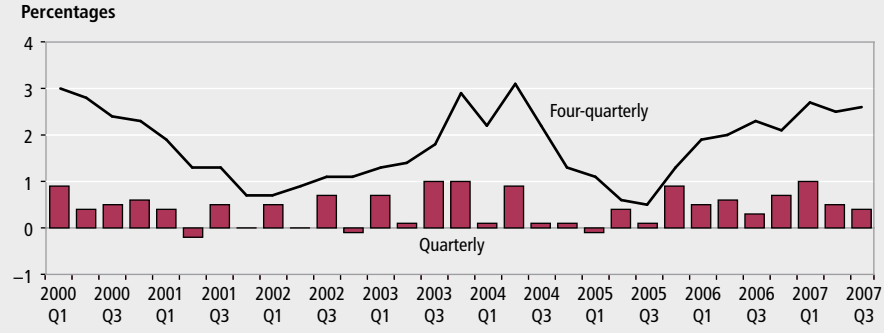


Figure 8
Productivity of the whole economy



between 2004Q2 and 2005Q2, GDP growth halved, but the growth in workforce jobs and LFS stayed fairly constant. Over the next few quarters, GDP increased, while LFS and workforce jobs fell slightly. One possible explanation is labour hoarding. In the short term, firms keep on staff and so there is a lag effect. Since growth in GDP fell and then grew over a relatively short period of time, this had little effect on labour market statistics.

Output and employment estimates are also encapsulated in estimates of labour productivity. However, the relationship between employment and output is not very well determined, and these coherence tests are very loose ones. They can only be suggestive, perhaps indicating the need for future analysis of the quality. Moreover, they could be pointing to quality issues with labour market estimates as much as issues surrounding the quality of the National Accounts.

Productivity is shown in **Figure 8** and in this context it is defined as output per worker. Divergence between GDP and labour market figures will be reflected as weak or strong estimates of productivity. Between 2004Q2 and 2005Q3, productivity growth slowed abruptly, as a consequence of GDP growth slowing and employment growth increasing. Similarly, the opposite effect has been evident since 2005Q3. Productivity growth is now just above the long-run average and not pointing to any immediate concerns.

Coherence with external sources

Although ONS is the official supplier of data on the UK economy, a number of other organisations and trade associations conduct surveys of economic activity. These tend to be more qualitative and based on smaller samples, but are still regarded by many as useful indicators. The most prominent and widely used is Purchasing Managers' Index (PMI) data. These are surveys of the UK private sector manufacturing, construction and services industries administered by NTC Economics on behalf of the Chartered Institute of Purchasing and Supply (CIPS). Further details of PMI data can be found at www.ntceconomics.com

External sources are not used to compile the National Accounts, but are a useful additional coherence check when finalising the estimates. ONS has developed a measure to assess the coherence of measures by calculating the degree of correlation between the CIPS estimate and the ONS estimate. This process is described in the Appendix to this article.

Sources

The discussion until now has been concentrated on outputs, but it is also worth considering the quality of the source and input data. GDP uses a wide range of source data. Surveys by ONS can be carried out over different periods and play an important role. Examples include the Monthly Inquiry into Distribution Services Sector, the Quarterly Stocks Inquiry or the ABI. These surveys are used alongside other survey or administrative data delivered by other government departments or external bodies.

Standard errors

The most obvious way of assessing quality is through the use of standard error statistics. The estimate produced from a sample survey will rarely be identical to the population value, but statistical theory allows us to estimate the precision associated with any survey result. Standard errors are an estimate of the sampling error which arises because an estimate is based on a survey rather than a population census. It is a measure of the precision of the estimate. A low standard error therefore indicates a precise estimate.

However, the prospect of producing a standard error for a measure such as GDP is fraught with problems, given the complexity of calculating estimates from multiple data sources. Instead, standard errors are produced for some component survey sources. **Table 2** gives a list of the most important surveys and sources that contribute to GDP.

The most common way of presenting standard errors is through confidence intervals. In most circumstances, a confidence interval can be instructed by taking the estimate plus or minus two standard errors – then the statement can be made that the true value lies within this range with 95 per cent confidence. For example, International Trade in Services 2005 estimates 2005 total exports at £51,710 million, with a standard error of £777 million. This can be interpreted as saying there is a probability of approximately 95 per cent that the true value lies between £50,156 and £53,264.

For comparing standard errors, a better measure is the coefficient of variation (sometimes also known as the relative standard error), which calculates the standard error as a percentage of the estimate. In the above example, the coefficient of variation is 1.5 per cent. However, for the purposes of assessing the quality of National Accounts outputs, time

Table 2
Main surveys and sources feeding into GDP

Surveys	National Accounts area	Coefficient of variaton (%)
Monthly Inquiry into Distribution Services Sector (MIDSS)	Production	0.4
Monthly Production Inquiry (MPI)	Production	0.5
Annual Business Inquiry (ABI)[1]	Production	n/a
Expenditure and Food Survey (EFS)	Household expenditure	1.3
Retail Sales	Household expenditure and production	0.6
International Passenger Survey (IPS)	Household expenditure and trade in services	1.6 (earnings); 1.0 expenditure
Capital Expenditure Survey (CAPEX)	Gross fixed capital formation	1.0
Quarterly Stocks Inquiry	Inventories	0.8
International Trade in Services (ITIS)	Trade in services	1.5 (exports); 1.7 (imports)
Workforce Jobs	Compensation of employees	1.0
Quarterly Profits Inquiry[2]	Profits of private non-financial corporations	n/a
Labour Force Survey (LFS)	Mixed Income	0.3 (employees)

Notes:

1 ABI standard errors are comprehensively available at component level, but are not available at aggregate level. These are published at www.statistics.gov.uk/abi/quality_measures.asp
2 Standard errors are being developed for the Quarterly Profits Inquiry.

Table 3
Other data sources of GDP

Other data sources	National Accounts area
BERR (construction)[1]	Production and gross fixed capital formation
DEFRA (agriculture)	Production and inventories
HMRC (alcohol, tobacco and betting)	Household expenditure
Treasury (Combined Online Information System – COINS)	Government expenditure
HMRC (customs data and intrastat survey)	Trade in goods
Bank of England (financial activities)	Trade in services and profits of financial corporations
Chamber of shipping	Trade in services
HMRC (wages and salaries)	Compensation of employees
Treasury (pensions)	Compensation of employees
HMRC (corporation tax profits)	Profits of private non-financial corporations
Communities and Local government and devolved administrations (including trading services)	Compensation of employees, government expenditure, gross fixed capital formation, taxes less subsidies and public corporations

Note:

1 In March 2008, construction statistics transfer from BERR to ONS.

series are necessary. The figures displayed in Table 2 are primarily intended as a baseline for future comparisons, but these are within magnitudes that can be expected from these kinds of surveys. Future articles will update Table 2, so that progress over time can be monitored.

External sources

ONS surveys only form part of the information used to build a picture of the economy. Surveys and administrative sources from external bodies are also used during the compilation of GDP. The most important of these are given in **Table 3**.

Conclusions

The absence of benchmarking and balancing in the 2007 *Blue Book* inevitably means that there is additional uncertainty about the path of the economy for recent years. This article brings together a number of quality measures concentrating on reliability (revisions) and coherence. While it is difficult to construct unambiguous measures of coherence because individual measures are noisy and cannot be combined into a single indicator, the article has looked to the publication of a qualitative assessment.

There is no obvious change in quality from the measures studied. Nevertheless it is likely that revisions will be larger than usual when balancing is reintroduced. While there is therefore no way of quantifying at this stage the degree of extra uncertainty, the material above should help inform users about aspects of quality in the National Accounts.

ACKNOWLEDGEMENTS

The authors would like to thank ONS colleagues for assistance with this article, in particular Martin Brand, Graeme Chamberlin, Sarah Green, Simon Humphries, Fenella Maitland-Smith, Colin Mowl, Steve Penneck and Robin Youll.

CONTACT

elmr@ons.gsi.gov.uk

REFERENCES

Akritidis L (2007) 'Improving the measurement of banking services in the UK National Accounts', *Economic & Labour Market Review* 1(5), pp 29–37 and at www.statistics.gov.uk/cci/article.asp?id=1761

Barklem A (2000) 'Revisions analysis of initial estimates of key economics indicators and GDP components', *Economic Trends* 556, pp 31–52 and at www.statistics.gov.uk/cci/article.asp?id=75

Beadle J (2007) 'Modernising the UK's National Accounts', *Economic & Labour Market Review* 1(4), pp 32–8 and at www.statistics.gov.uk/cci/article.asp?id=1737

Butler J (2005) 'GDP doubts. What evidence?' HSBC Global Research.

Jenkinson G and Stuttard N (2004) 'Revisions information in ONS First Releases', *Economic Trends* 604, pp 70–2 and at www.statistics.gov.uk/article.asp?id=793

Jenkinson G (2005) 'Publishing Quality Information for National Accounts Outputs' at www.statistics.gov.uk/article.asp?id=1141

Mahajan S and Penneck S (1999) 'Annual Coherence Adjustments in the National Accounts' *Economic Trends* 551, pp 27–32 and at www.statistics.gov.uk/article.asp?id=51

Meader R (2007) 'Revisions to quarterly GDP growth and its components', *Economic & Labour Market Review* 1(10), pp 36–43 and at www.statistics.gov.uk/article.asp?id=1888

Office for National Statistics (2005) *International Trade in Services* at www.statistics.gov.uk/statbase/product.asp?vlnk=14407

Office for National Statistics (2007) *United Kingdom National Accounts: The Blue Book 2007* at www.statistics.gov.uk/statbase/product.asp?vlnk=1143

Robinson H (2005) *Summary Quality Report for Gross Domestic Product* (GDP) data releases at www.statistics.gov.uk/article.asp?id=1180

Snowdon T (1997) 'Quarterly alignment adjustments in the UK National Accounts', *Economic Trends* 528, pp 23–7 and at www.statistics.gov.uk/statbase/product.asp?vlnk=1341

APPENDIX

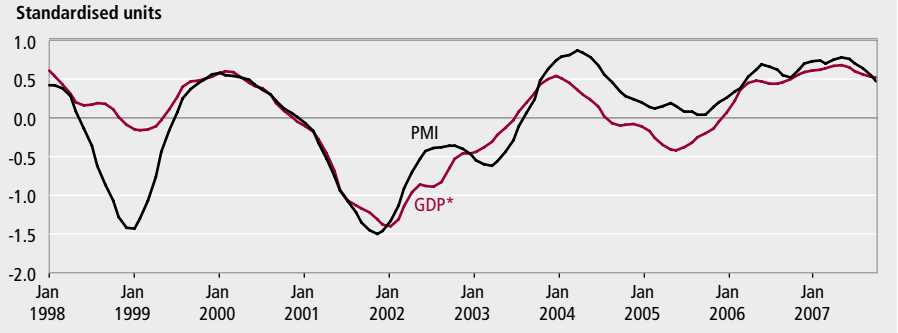
Coherence of ONS and PMI data

Monitoring the coherence between ONS and PMI data is a three-part problem:

- adjust ONS data so that its coverage is the same as the sectors covered in the PMI. Butler (2005) describes this as GDP*, noting that the PMI does not include the distribution and public sectors, and neither does it make an adjustment for the intermediate consumption of financial services
- standardise the data so it is expressed in a common metric, and
- extract and compare the signals from the standardised data using a Kalman filter

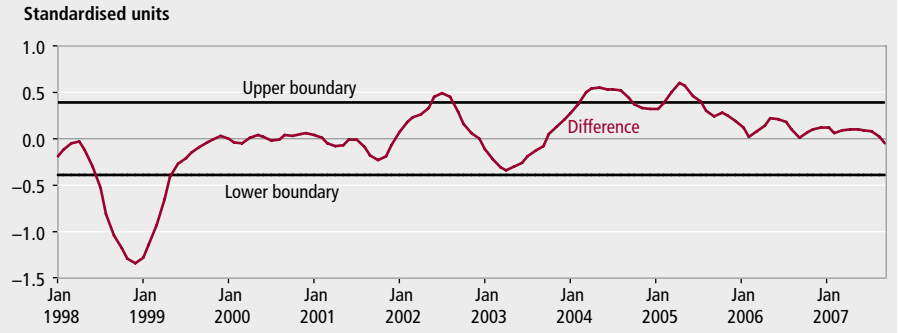
The outcome of these three steps for the latest available monthly is plotted in **Figure A1.**

Figure A1
Signal extracted views



A final step is to test when these signal extracted views have moved apart in a statistically significant way. This can be achieved by conducting a simple t-test on the differenced time series. Periods of significant divergence are shown in **Figure A2**, where the data move outside a 95 per cent confidence interval.

Figure A2
PMI – GDP*



FEATURE

Sumit Dey-Chowdhury
Office for National Statistics

International comparisons of productivity: an update to understanding revisions

SUMMARY

The UK's relative productivity performance has been revised (compared with the previous set of published results,) following the update to the benchmarking exercise of prices across all Organisation for Economic Co-operation and Development countries in November 2007.

Revisions in the international comparisons of productivity (ICP) estimates released in February 2008 predominantly reflect these new estimates of purchasing power parities (PPPs). This article provides an overview of the methodology used by the Office for National Statistics in constructing estimates of ICP and gives more detail to help users understand why the PPP data were revised and the impact this had on the latest published set of ICP estimates.

The Office for National Statistics (ONS) has been publishing estimates of international comparisons of productivity (ICP) since October 2001. These show the UK's relative productivity performance, as measured by gross domestic product (GDP) per worker and per hour worked, against all other G7 countries (Canada, France, Germany, Italy, Japan and the United States). Using the current purchasing power parity (PPP) approach, this allows cross-sectional comparisons of productivity to be made.

These current PPP-based ICP estimates should only be used to compare the relative productivity of the UK at a particular point in time; comparisons of growth should be avoided. In October 2007, ONS published its first estimates of ICP based on the constant PPP approach that allows users to make international comparisons of productivity growth (see Dey-Chowdhury (2007) for details).

The ICP First Release is a biannual release reflecting the publication cycles of the component data, which are published by the Organisation for Economic Co-operation and Development (OECD). In September, the series is extended by a further year reflecting the first time data are available for the four component data series (as well as incorporating revisions to these data for past years). The subsequent February release is an update of these initial estimates, which incorporate revised GDP and PPP data.

In every release, a table of revisions is published that shows how the estimates have changed relative to the previous publication (in terms of percentage points). When there is a methodology-based change in estimating one of the four component data series for a particular country, there is potential for these revisions to be significant. This makes the revisions country-specific and can affect all the estimates back to 1990. For example, French hours worked data were heavily revised in the October 2006 release, reflecting an improved methodology to estimating overtime hours and hours worked in second jobs, which caused downward revisions to French ICP estimates for 1990 to 2004. If such a change affects the UK, then this will be reflected in revisions for all other G7 countries. Because ICP estimates based on the current PPP approach are indexed such that the UK is always equal to 100, then revisions will feed into the relative productivity of the other countries. This was seen in October 2007, when the UK National Accounts incorporated improved estimates of own-account software investment that caused large upward revisions to UK GDP.

The revisions published in February 2008, however, were relatively large and broad-based. While the ranking of countries (in other words, the relative productivity comparisons) on both productivity measures has largely been unaffected, there are still quite large absolute changes in these

estimates. This affects how the productivity gap of the UK with the other G7 countries is interpreted. Of most significance is the gap with the US which, for 2006, on the GDP per worker measure is now 28 per cent, an upward revision of five percentage points from the previously published estimate in October 2007.

The revisions that are presented in this article can be shown to be predominantly driven by revisions to the PPP data, reflecting the publication of 2005 benchmarked PPPs in November 2007. There is also the effect of revisions to the US implied GDP deflator, as well as Eurostat revising their PPPs back to 1995. This article is an update to Lau and Wallis (2005), which outlined details of the previous benchmarking exercise in 2002 and explains why these latest PPP data have been revised.

Sources of revisions

The ICP estimates that are produced by ONS are based on underlying data obtained from the OECD, which improves the comparability of these data. Each of the component series is country and year specific.

$$\text{GDP per worker}_i = \frac{\text{GDP}_i / \text{PPP}_i}{\text{Employment}_i}$$

$$\text{GDP per hour worked}_i = \frac{\text{GDP}_i / \text{PPP}_i}{\text{Employment}_i \times \text{Hours}_i}$$

These data are obtained from the following sources:

- GDP from the OECD Main Economic Indicators, published monthly
- PPP from the OECD PPP website at www.oecd.org/std/ppp, which is updated on a continual basis
- employment from the OECD Annual Labour Force Statistics, available annually, usually from August
- hours from the OECD Employment Outlook, published annually in July

The timing of the publication dates of these four component series explains why ONS publishes estimates of ICP in September and February. Country-specific revisions to any of these underlying sources will automatically feed into the ICP estimates published for that country.

There are two types of revisions: information-based and methodology-based. Information-based revisions refer to those that result as more data become available to estimate that particular component series. These are a feature of any data series as there is a trade-off between timeliness and accuracy of publishing data. In terms of ICP, information-based revisions predominantly affect the estimates published in the September release, but revised GDP and/or PPP data, if there are any, will also cause estimates published in February to be revised.

However, methodology-based revisions have the potential to cause significant revisions to ICP dating back to 1990. These can occur for a number of reasons, principally efforts made by National Statistics Institutes (NSIs) to make these data more consistent with international guidelines such as the 1993 System of National Accounts (SNA 93). It should be noted that, although these initially cause one-off revisions that can be large in magnitude, they do improve the comparability of the data. This means that the estimates of ICP give a better indication of relative productivity as opposed to reflecting measurement type issues.

Whereas methodology-based revisions are less frequent, their impact on the published ICP estimates tend to be of a far more significant nature. Although such methodological changes do improve the comparability of these data, they can initially cause one-off sizeable revisions that require an explanation. **Table 1** is an update from Lau and Wallis (2005), outlining all the methodological changes that have occurred since the publication of the September 2005 ICP estimates.

Decomposition of latest set of revisions

The ICP estimates published in February 2008 were largely revised due to the latest OECD-Eurostat PPP triennial benchmarking programme, as well as revisions to the US implied GDP deflator and revisions carried out by Eurostat. The set of revisions is shown for both GDP per worker and GDP per hour worked in **Box 1**.

Figure 1 shows the revisions to GDP per worker for 2006 for all G7 countries (since ICP estimates are always indexed to 100 for the UK, revisions to the UK will always be zero). The revision refers to what was published for 2006 in February 2008 compared with what was previously published in October 2007. For the purposes of this analysis, revisions have been presented to one decimal place.

It can be seen from Figure 1 that the revisions to the latest GDP per worker estimates are being driven by revisions to the PPP data. In fact, these revisions would have been larger in absolute size had it not been for an upward revision to UK GDP data in 2006, caused by the inclusion of a number of annual sources, in particular insurance information, the annual benchmark of the international trade in services inquiries and the international film and TV survey. Since all ICP estimates are indexed to 100 for the UK, an upward revision to UK GDP causes downward revisions to all other countries' estimates of GDP per worker (assuming there are no additional source data revisions).

The latest benchmarked PPP data imply that the purchasing power of the pound has fallen, which has resulted in estimates of GDP per worker for the other G7 countries being revised upwards and so the relative productivity performance of the UK is lower than previously published. This is also a feature of all the estimates dating back to 2002 (with the exception of France in 2004). The recently benchmarked PPP data

Table 1
Sources of methodology-based revisions

ICP release	Sources of revisions
September 2005	None
February 2006	Back series of downward revisions to Japanese GDP data
October 2006	Upward revisions to French hours worked data to take account of overtime hours and hours worked in second or higher jobs, causing downward revisions to the French ICP GDP per hour worked estimates
	Upward revisions to Italian hours worked as a result of a change in source used by OECD
February 2007	Minor past revisions to Japan GDP and PPP data, the latter being revised because of changes in the implicit price deflators used to estimate PPPs for non-benchmarked years
October 2007	Incorporation of new improved methodology in estimating own-account software investment in the UK National Accounts. This led to upward revisions to UK GDP, causing downward revisions to ICP estimates for all other countries
February 2008	Significant revisions to PPPs caused by the 2005 benchmark results, affecting estimates of ICP for all countries

Box 1

Revisions in the ICP February 2008 release

Table 2 and **Table 3** below show the latest revisions to ICP, measured by GDP per worker and GDP per hour worked, respectively. These are largely the result of revisions to PPPs caused by the 2005 PPP triennial benchmark results. There were largely no revisions to GDP data since the last publication of ICP in October 2007, the exception being for Japan in 2004 and 2005 and for the UK in 2006.

The latest set of benchmarked PPP data led to upward revisions to UK PPPs, implying that the relative purchasing power of the pound had fallen. PPPs are the rates of currency conversion that eliminate price level differences between countries. The upward revisions mean that essentially more pounds are needed to buy a representative basket of goods and services consumed in the US. This means that when UK GDP is converted into dollars using PPPs, that output is worth relatively less compared with the previous set of estimates. This explains the fall in relative UK productivity since 2002.

Table 2

Revisions to GDP per worker – current PPPs

Year	Canada	France	Germany	Italy	Japan	UK	USA	G7	G7 excluding UK
1990	3	–1	n/a	1	3	0	3	n/a	n/a
1991	3	–2	5	1	3	0	3	3	3
1992	3	–2	6	1	3	0	3	3	3
1993	3	–1	5	1	3	0	3	3	3
1994	3	–1	5	1	3	0	3	3	3
1995	3	–1	5	1	3	0	3	3	3
1996	2	–2	4	0	2	0	3	2	2
1997	2	–3	4	1	2	0	2	2	2
1998	2	–3	4	1	2	0	3	2	2
1999	1	–2	5	0	1	0	2	1	2
2000	1	–2	2	–1	1	0	1	1	1
2001	1	–2	3	2	1	0	1	1	1
2002	3	3	5	0	2	0	3	3	3
2003	4	2	1	2	2	0	3	2	2
2004	3	0	2	1	1	0	3	2	2
2005	7	2	4	3	3	0	6	4	5
2006	6	1	4	3	4	0	5	4	4

Note:

Revisions refer to the difference in index points between the data released on 19 February 2008 and the data released on 1 October 2007.

Source: Office for National Statistics

Table 3

Revisions to GDP per hour worked – current PPPs

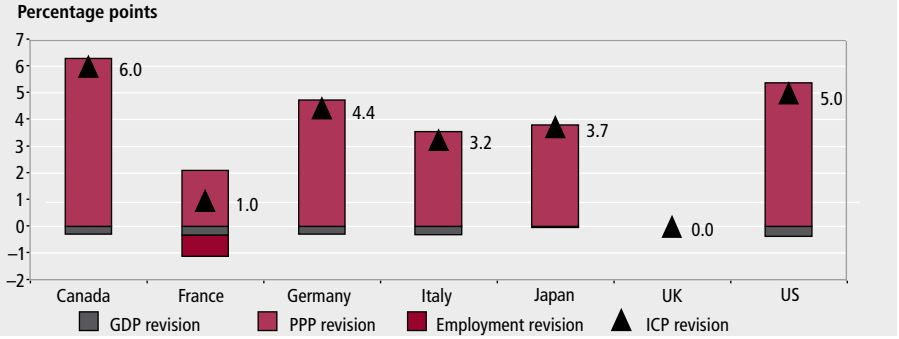
Year	Canada	France	Germany	Italy	Japan	UK	USA	G7	G7 excluding UK
1990	3	–1	n/a	1	3	0	3	n/a	n/a
1991	3	–2	6	1	3	0	3	3	3
1992	3	–2	6	1	3	0	3	3	3
1993	3	–1	6	1	3	0	3	3	3
1994	3	–1	6	1	2	0	3	3	3
1995	3	–1	6	1	3	0	3	3	3
1996	2	–2	5	0	2	0	2	2	2
1997	2	–3	4	1	2	0	2	2	2
1998	2	–3	4	1	2	0	2	2	2
1999	1	–3	5	0	1	0	2	1	1
2000	1	–3	2	–1	1	0	1	0	1
2001	1	–2	3	2	1	0	1	1	1
2002	3	3	5	0	2	0	3	3	3
2003	4	2	2	2	1	0	3	2	2
2004	3	0	2	1	1	0	2	2	2
2005	7	2	4	3	3	0	6	4	5
2006	6	1	5	3	4	0	5	4	4

Note:

Revisions refer to the difference in index points between the data released on 19 February 2008 and the data released on 1 October 2007.

Source: Office for National Statistics

Figure 1
Decomposition of revisions to GDP per worker, 2006



imply that the relative purchasing power of the pound has fallen, which explains these revisions (see Box 1).

As an aside, ICP revisions published in February usually only reflect revised GDP and/or PPP data. This is because both the employment and the hours worked series are only updated once a year, meaning that the same denominator series are used as in the previous autumn's release. However, the February 2008 release also incorporated revisions to French employment data. The reason for this was that these data were not available in time for the October 2007 release. ONS decided to extrapolate an employment estimate for 2006, applying the previous annual growth rate to the 2005 estimates. The actual data were available in time for the February 2008 release and were incorporated into this set of estimates. The latest French employment data also included revisions to data for 2002 to 2005, inclusive. The upward revision to French employment data would have had the effect of lowering productivity estimates. However, this was more than offset by the effect of the French PPP revisions.

PPP revisions

There are essentially three main factors explaining revisions to PPPs:

- OECD-Eurostat triennial benchmarking
- revisions to the implicit GDP deflator for the US
- revisions made by Eurostat

OECD-Eurostat triennial benchmarking

PPPs are jointly provided by the Eurostat and OECD. For 2005, this covered 45 countries, 31 being produced by Eurostat and the remaining 14 by OECD. Summarising the programme, Eurostat produces annual benchmarked estimates whereas OECD produces benchmarked data every three years. Estimates for intervening years for OECD-supervised countries are based on a method of extrapolation.

Eurostat implements a rolling benchmark approach, which can be summarised in three broad steps (see OECD PPP Methodological Manual, 2005 for details):

- for year t, prices for a group of similarly defined goods and services are collected. Price data for each country relating to the reference year t are collected for each of these 'basic headings'. This forms the basis of the relative prices that are used to construct PPPs
- for year t+1, about a third of these are replaced by new PPPs calculated using prices collected during t+1. The remainder of these data are extrapolated, meaning that all the basic headings now refer to year t+1
- these relative prices are then aggregated using expenditure weights for t+1; the basic headings provide the basis for these weights. This means that the PPPs refer to the reference year of t+1

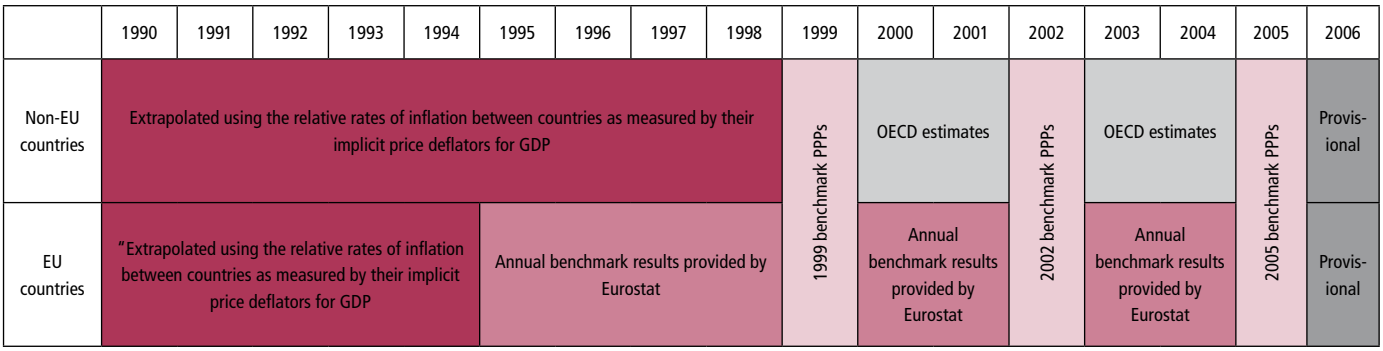
This continual process of replacing prices for the basic headings, extrapolation and re-aggregation forms the three-year rolling benchmark process, enabling Eurostat to provide annual estimates of PPPs for the 31 countries that it currently coordinates. This covers the PPP estimates for France, Germany, Italy and the UK. Estimates for these countries are subject to a three-year rolling revisions policy. In the latest set of estimates published in November 2007, preliminary PPP estimates for 2006 were published, along with revised PPPs for 2005 and final PPPs for 2004. This three-year rolling revisions policy, which reflects revised prices and expenditure data, are in line with SNA 93 deliveries. This explains the revisions to the PPPs published for France, Germany, Italy and the UK. The source of the PPP revisions for these countries reflected revised input data.

OECD publishes estimates every three years, with estimates for the interim years being based on a method of extrapolation. The extrapolation is based on relative rates of inflation for each country, as measured by the implicit GDP deflator. The reason that estimates are produced every three years is because of some of the difficulties associated with the rolling benchmark when dealing with certain basic headings. For example, it is costly to extrapolate the prices of capital goods, so OECD decided that it would publish estimates every three years rather than on an annual basis. (Incidentally, Eurostat price capital goods every two years and estimate the PPPs for the interim year based on interpolation.) In terms of the G7 countries, these triennial estimates cover Canada, Japan and the US.

Prior to the latest set of benchmarked PPP data, estimates for 2003 to 2005 inclusive were based on extrapolation from the previous benchmark year, which was 2002. However, the recently benchmarked data for 2005 would have an impact in terms of these data. This is because the method of estimation for PPPs in these years would have changed. Instead, benchmarked estimates, actually based on price and expenditure data, replaced the previous extrapolated 2005 results. For 2003 and 2004, the data would have been revised, because they are now interpolated between 2002 and 2005 rather than extrapolated from 2002. The PPP estimates are then smoothed between these two benchmarks, which would have led to potentially significant revisions. There is greater scope for PPP revisions for these countries as they reflected the use of actual input data for 2005 as well as the effects these had on extrapolating estimates for 2003 and 2004.

OECD integrates the annual benchmark results provided by Eurostat for the European countries into their programme, meaning that benchmarked results for all 45 countries are available every three years. The latest of these were published in November 2007, with results being benchmarked for 2005. It should be noted that the 2006 estimates for countries supervised by OECD are still provisional and are subject to revisions in the short term. This is illustrated in **Figure 2**.

Figure 2
The OECD-Eurostat PPP programme



For non-EU countries, PPPs before 1999 are calculated using extrapolation. For EU countries, extrapolation is used to calculate PPPs before 1995. Extrapolation is described in more detail below. As changes in PPPs depend directly on relative rates of inflation in different countries, this method produces robust estimates provided they are not too remote from the base year and there have been no significant changes in price or expenditure structures within countries. For the extrapolation, the base year for non-EU countries is 1999 while for EU countries it is 1995.

From 1995 onwards, PPPs for EU countries are annual benchmark results provided by Eurostat. In 2002, Eurostat undertook a thorough revision of its PPPs. The revisions concerned PPPs for the years 1995 to 2000 and corrected the inconsistencies arising from countries moving towards the European System of Accounts 1995 at different points in time. The results were published in November 2003.

For non-EU countries, the PPPs for 2000 and 2001 are the geometric averages of the interpolated results using the 1999 and 2002 benchmarks as the base years. Similarly, the PPPs for 2003 and 2004 use the 2002 and 2005 benchmarks as the base years.

PPPs for all countries are triennial benchmark results calculated jointly by the OECD and Eurostat.

For EU countries these are preliminary annual benchmark results provided by Eurostat. PPPs for non-EU countries are OECD estimates based on extrapolation. These estimates and preliminary results should be interpreted with caution as they are subject to revision.

Extrapolation: when estimating PPPs using extrapolation, the PPPs for the base year are carried forward (or backwards) by the relative rates of inflation in different countries as measured by implicit price deflators for GDP. Specifically, a country's PPP for year t+n (or t-n) is obtained by multiplying its PPP for the base year t by its implicit price deflator for GDP for year t+n (or t-n) and then dividing by the implicit GDP deflator for year t+n (or t-n) for the reference country. The choice of reference country does not influence the final result and in practice the OECD uses the United States. Note also that PPPs that have been extrapolated backwards are sometimes referred to as backdated PPPs.

Revisions to the implicit GDP deflator for the US

There are additional sources of revisions to PPPs that go back to 1990. The 14 countries for which OECD produces PPPs will be affected if there are country specific revisions to their implicit GDP deflator. This is because, as shown in Figure 2, PPPs for an OECD country are interpolated or extrapolated for non-benchmark years based on movements in that country's implicit GDP deflator. However, the implicit GDP deflator for the US has been revised, which has caused PPPs for all countries to be revised. This is because PPPs are constructed as a relative to the US. This explains why PPP revisions (and ICP revisions) date back to 1990.

Revisions made by Eurostat

In addition, Eurostat have also revised the PPP series back to 1995 for the 31 countries that it coordinates. PPPs are subject to continual revisions, which partly reflect NSIs incorporating changes to their National Accounts in line with the SNA 93. This can result in the inclusion of new methodologies that provide better, more comparable estimates of economic activity in that country. For example, in 2007, improved estimates of own-account software were incorporated into the UK National Accounts. The impact of this methodological change was to increase UK GDP and these were reflected in the October 2007 ICP release. However, these were not then reflected in the expenditure weights used to aggregate PPPs, but the latest set of revised PPPs has been updated to take this into account. Also, most countries have introduced estimates of Financial Intermediation Services Indirectly Measured (FISIM) into their National Accounts. Conceptually, FISIM can be thought of as having a level effect on the output measure of GDP, that is, the output of the banking services, but it will also have an impact on the expenditure side. This is because financial intermediaries provide these services to consumers, businesses, governments and the rest of world.

Constant PPP approach

In October 2007, ONS published their first estimates of ICP using the constant PPP approach (Dey-Chowdhury 2007). Estimates based on the current PPP approach give the best indication of international comparisons at a particular point in time. This is because the PPPs, which are country and year specific, give the best estimation of that country's price structure in that particular year. While these are suitable for cross-sectional analyses, it is not recommended that users infer productivity growth from these estimates. This is because the use of current PPPs means it is not possible to separately identify the price and volume effect in output growth. For productivity growth analyses, it is only changes in volume that matter.

The constant PPP approach, in line with OECD recommendations, fixes PPPs to a base year and uses growth in volume of each country's GDP to extrapolate both backwards and forwards. The advantage of this approach is that it enables the relative movements of volume growth to be captured, allowing comparisons of productivity growth.

Revisions to the constant PPP-based ICP estimates are almost non-existent, which is consistent with the source of revisions in the February 2008 release. In this approach, PPPs are fixed to a base year which, incidentally, has been updated to 2005 to reflect the latest benchmarked PPP data. Whereas the latest set of benchmarked results will affect the underlying productivity ratio, this will not be as directly observed once volume growth rates have been used to extrapolate from the base year and once all the data have been indexed to 100 for the reference year (1991). Significant revisions to these set of

ICP estimates will only occur if there have been revisions to volume measures of GDP; revisions to PPPs have minimal effects. This is a characteristic of any methodology that makes use of a fixed-base approach; a chain-linked approach would have incorporated these PPP revisions.

Conclusions

This article has provided an overview of why revisions to ICP estimates occur in general, and explains why these revisions have been observed in the February 2008 release. These have been predominantly driven by the publication of 2005 benchmarked PPP data, in accordance with the OECD-Eurostat triennial benchmarking exercise programme, which has led to large revisions to the PPP data. These have also been caused by the recent revisions to the implicit GDP deflator for the US, which has caused a back series of PPP revisions for all countries. It has also been shown why revisions to PPPs do not visibly feed thorough to the constant PPP-based ICP estimates that are now published by ONS.

ICP will always be susceptible to one-off revisions, reflecting changes that may occur to the component data series. In particular, PPPs are susceptible to continual revisions, reflecting both changes in price data and changes in National Accounts data. Depending on the nature of the change, these may cause country-specific changes or wider changes. Due to the continual cycle of source data revisions, users may wish to focus more on relative changes in productivity than just on absolute productivity levels, which are more susceptible to revisions. It should be stressed though that the long-run implication is that these revisions will improve the comparability of the data, enhancing the quality of productivity comparisons.

ACKNOWLEDGEMENTS

The author is grateful for the contributions made by David Baran (ONS) and Gavin Wallis (HM Treasury) in preparing this article.

CONTACT

elmr@ons.gsi.gov.uk

REFERENCES

Dey-Chowdhury S (2006) 'Methodological Note: International comparison of economic activity', *Economic Trends* 633, pp 23–8 and at www.statistics.gov.uk/cci/article.asp?id=1614

Dey-Chowdhury S (2007) 'International comparisons of productivity: recommended used of the current and constant PPP approach' *Economic & Labour Market Review* 1(8), pp 33–9 and at www.statistics.gov.uk/cci/article.asp?id=1844

Lau E and Wallis G (2005) 'International comparisons of productivity: a technical note on revisions and interpretation', *Economic Trends* 617, pp 42–56 and at www.statistics.gov.uk/cci/article.asp?id=1120

Organisation for Economic Co-operation and Development (2005) *PPP Methodological Manual* at www.oecd.org/std/ppp/manual

Office for National Statistics International Comparisons of Productivity First Release, February 2008 at www.statistics.gov.uk/statbase/product.asp?vlnk=9671

FEATURE

Revisions to workforce jobs: December 2007

Nick Barford
Office for National Statistics

SUMMARY

This article was first published on the National Statistics website on 12 December 2007, to coincide with the Labour Market Statistics First Release and the planned revisions made to the workforce jobs (WFJ) series. The revisions are mainly due to benchmarking the short-term employee jobs series to the latest estimates from the Annual Business Inquiry (ABI/1). The article describes the changes the Office for National Statistics has made to ABI/1 methods in the transition to the new Business Register and Employment Survey, and the discontinuities these changes have caused between December 2005 and September 2006. Estimates of change across this period are now unreliable, but the new methods have improved the levels and changes moving forward. Revisions to other sources that feed into WFJ are also explained.

The Office for National Statistics (ONS) released revisions to the workforce jobs (WFJ) series on 12 December 2007. WFJ is a quarterly measure of the number of jobs in the UK and is the preferred measure of jobs by industry. It is the sum of employee jobs measured by surveys of employers, self-employment jobs from the Labour Force Survey (LFS) and government-supported trainees and HM Forces from administrative sources.

The revisions are mainly due to benchmarking the short-term employee jobs series for Great Britain (GB) to the latest estimates from the Annual Business Inquiry (ABI/1). Revisions to other sources that feed into WFJ have also been incorporated, for GB public sector employment, GB self-employment jobs and Northern Ireland jobs.

Table 1 to **Table 4** show the revisions to UK WFJ back to 1996. The level has been revised downwards by 196,000 (0.6 per cent) in December 2006. The annual change to December 2006 has been revised downwards by 172,000, of which 130,000 is due to the benchmarking process. Methodological changes to ABI/1 have caused a discontinuity between December 2005 and September 2006 and estimates of change across this period are now unreliable. It is estimated that the annual change to December 2006 is 150,000 to 350,000 higher than published. Despite the discontinuity, the new methods are an improvement to both the levels and changes moving forward, and the annual change to September 2007 is on a continuous basis.

Public sector employment revisions account for the majority of the remaining 42,000 of the total 172,000 downward revision to the annual change to December 2006. This is not part of the discontinuity.

Annual benchmarking

Each year, the GB short-term employee jobs series are aligned to successive benchmarks from ABI/1 estimates (also released in December). In order to maintain the short-term path, the revisions are interpolated back over preceding months or quarters to the previous benchmark. There are some series that are not benchmarked because the source data are believed to be a better estimate than the ABI/1. The public sector components within public administration and defence, education, health and social work (sections L, M and N), post and telecommunications (division 64) and recreation, cultural and sporting activities (division 92) are not benchmarked. The agriculture series (section A), from the LFS, is also not benchmarked.

The revised benchmark for December 2005 and the new benchmark for September 2006 have been applied, revising WFJ back to the start of 2005. This alone has caused a downward revision of 160,000 to the level in December 2006 and 130,000 to the annual change. Benchmarking usually revises the annual change in the short-term series upwards by around 100,000 (a range of 32,000 to 214,000 over the last seven years), because the short-term estimator tends to underestimate the change in employment. The downward revisions this year are due

Table 1
Workforce jobs:[1] revisions to levels

United Kingdom — Thousands, seasonally adjusted

	Workforce jobs	Employee jobs	Self-employment jobs	HM Forces	Government-supported trainees
Mar 96	–4	–4	0	0	0
Jun 96	9	–4	14	0	0
Sep 96	9	–5	14	0	0
Dec 96	9	–5	14	0	0
Mar 97	9	–4	14	0	0
Jun 97	7	–4	11	0	0
Sep 97	7	–5	11	0	0
Dec 97	6	–5	11	0	0
Mar 98	7	–4	11	0	0
Jun 98	3	–4	7	0	0
Sep 98	3	–4	7	0	0
Dec 98	2	–5	7	0	0
Mar 99	3	–5	7	0	0
Jun 99	6	–4	10	0	0
Sep 99	6	–4	10	0	0
Dec 99	4	–6	10	0	0
Mar 00	5	–5	10	0	0
Jun 00	2	–5	6	0	0
Sep 00	2	–4	6	0	0
Dec 00	–3	–9	6	0	0
Mar 01	0	–7	6	0	0
Jun 01	4	–6	11	0	0
Sep 01	5	–6	11	0	0
Dec 01	0	–11	11	0	0
Mar 02	5	–6	11	0	0
Jun 02	7	–6	12	0	0
Sep 02	8	–5	12	0	0
Dec 02	–1	–14	12	0	0
Mar 03	7	–6	12	0	0
Jun 03	9	–3	12	0	0
Sep 03	8	–3	12	0	0
Dec 03	–6	–18	12	0	0
Mar 04	13	1	12	0	0
Jun 04	–6	–6	0	0	0
Sep 04	–4	–5	0	0	0
Dec 04	–16	–20	4	0	0
Mar 05	11	6	5	0	0
Jun 05	–2	–8	6	0	0
Sep 05	–4	–11	7	0	0
Dec 05	–24	–31	7	0	0
Mar 06	–46	–54	8	0	0
Jun 06	–115	–115	0	0	0
Sep 06	–182	–183	0	0	0
Dec 06	–196	–206	10	0	0
Mar 07	–171	–174	2	0	0
Jun 07	–153	–160	7	0	0

Note:

1 Workforce jobs figures are a measure of jobs rather than people. For example, if a person holds two jobs, each job will be counted in the workforce jobs total. For this reason, self-employment jobs (which come from LFS) will not equal the figures for self-employed persons from the LFS. Workforce jobs figures come from a variety of sources, and where possible, from the employer rather than the individual. Employee jobs (which is much the largest component of workforce jobs) come from quarterly surveys of employers carried out by ONS, and administrative sources.

to methodological changes to the ABI/1, which have caused a large discontinuity between December 2005 and September 2006.

Developments to the Annual Business Inquiry (ABI/1)

ONS has changed the way in which it constructs annual employment estimates from the ABI/1, as part of the first phase in the transition to the Business Register and Employment Survey (BRES). BRES will replace the ABI/1 and the Business Register Survey (BRS) for the 2009 survey period. In preparation, three major changes have been introduced this year that affect ABI/1 estimates. These are:

- a change in the reference period from December in 2005 to September in 2006, in line with the BRS reference period. This implements a recommendation from the Employment and Jobs Quality Review (see ONS 2006)
- the use of individual BRS returns from businesses for the first time, which is now the primary source for ABI/1 estimates. This means a switch in the data sources, for large units at least. Previously, ABI/1 used individual returns collected by the Short-Term Employment Surveys (STES). The switch to BRS data improves the quality of industry and regional employment estimates, because it enables the direct use of the detailed, local unit information the BRS collects. This change also reduces compliance costs, and
- an improvement to the minimum domains method. Minimum domains group together certain industries and geographical areas in order to proportion regional estimates at a more detailed, local unit level. This only affects estimates at a detailed industry and geographical level, and not the whole economy series

The first two changes have combined to cause a large discontinuity. The STES and BRS questionnaires ask for employment on the same date (mid-September) but, in practice, businesses tend to return employment for STES based on a later date. This incongruence is because STES is dispatched after BRS. Also, STES collects turnover information (used for the short-term output indicators), and so businesses tend to wait until the turnover information is available before completing the employment section. This timing difference can lead to sizeable differences in the returned employment from the same businesses between the two surveys. The effect is exacerbated by the change in reference period to September, especially for highly seasonal industries such as retail, where employment increases through September ahead of Christmas. Therefore, ABI/1 estimates for September 2006 are lower for using BRS responses than if STES responses had been used.

This discontinuity in the annual aggregate estimates is transmitted to the short-period estimates via the benchmarking process. This year's downward revision, plus the

Table 2
Workforce jobs:[1] revisions to annual changes

United Kingdom — Thousands, seasonally adjusted

	Workforce jobs	Employee jobs	Self-employment jobs	HM Forces	Government-supported trainees
Dec 97	–3	0	–2	0	0
Dec 98	–4	0	–4	0	0
Dec 99	2	–1	3	0	0
Dec 00	–7	–3	–4	0	0
Dec 01	3	–2	4	0	0
Dec 02	–1	–3	2	0	0
Dec 03	–5	–4	–1	0	0
Dec 04	–10	–2	–8	0	0
Dec 05	–8	–12	3	0	0
Mar 06	–57	–60	3	0	0
Jun 06	–113	–107	–6	0	0
Sep 06	–178	–172	–7	0	0
Dec 06	–172	–175	2	0	0
Mar 07	–125	–120	–5	0	0
Jun 07	–38	–46	8	0	1

Note:
1 See note 1 to Table 1.

usual upward revision, would suggest the discontinuity is in the range of 150,000 to 350,000 for the annual change to December 2006. Ideally, the discontinuity would be removed, at least for WFJ, which should be a continuous time series. However, there is insufficient information to do this, particularly for detailed breakdowns by industry and region. Users should note that estimates of change across December 2005 to September 2006 are now unreliable. Despite the discontinuity, the new methods are an improvement to both the levels and changes moving forward, and the annual change to September 2007 is on a continuous basis.

Revisions to other WFJ sources

ONS has incorporated revisions to other sources that feed into WFJ, in line with the revisions policy. Revisions previously made to the Public Sector Employment First Release (ONS 2007c) have now been taken on within WFJ. This has caused a downward revision of 47,000 to the level in December 2006, and 40,000 to the annual change. This is mainly due to revisions to NHS estimates. There are also revisions caused by the annual re-referencing of the local authority series for England and Wales, to bring the historical time series in line with the latest survey levels. This causes a small revision of 7,000 to the level, back to the start of the WFJ series in 1959.

Revisions to Northern Ireland employee and self-employment jobs have been incorporated back to June 1996. GB self-employment estimates from the LFS have also been revised back to September 2000, following revisions to population estimates.

The comparison of WFJ and LFS estimates of jobs, located in Annex 1 of the Labour Market Overview (ONS 2007a) that accompanies the First Release (ONS 2007b), has been updated to reflect revisions to both measures.

CONTACT

elmr@ons.gsi.gov.uk

Table 3
Workforce jobs[1] by industry: revisions to annual changes

United Kingdom — Thousands, seasonally adjusted

	All jobs	Agriculture and fishing	Production	Construction	Distribution, hotels and Catering	Transport and communications	Finance, real estate, renting and business activities	Public administration, education and health[2]	Other services
SIC 2003 sections	A–O	A,B	C–E	F	G,H	I	J, K	L–N	O
Dec 97	–3	0	1	1	–1	0	–1	–1	–1
Dec 98	–4	0	–1	–3	0	0	0	0	0
Dec 99	2	0	1	2	0	0	0	0	0
Dec 00	–7	–2	–1	0	0	0	–2	–3	0
Dec 01	3	2	0	–1	1	0	–1	0	0
Dec 02	–1	0	1	2	0	0	–3	–1	0
Dec 03	–5	–1	0	1	–1	–1	0	–2	–1
Dec 04	–10	2	–2	–6	–1	–1	–1	–1	–1
Dec 05	–8	0	8	0	0	–2	–10	–4	1
Mar 06	–57	1	–9	–6	–18	–11	7	–18	–5
Jun 06	–113	–1	–27	–12	–41	–19	25	–27	–12
Sep 06	–178	0	–44	–20	–58	–29	37	–44	–20
Dec 06	–172	4	–49	–20	–61	–27	45	–44	–21
Mar 07	–125	–5	–34	–13	–41	–20	21	–17	–16
Jun 07	–38	0	–13	–5	–11	–10	17	–9	–7

Notes:
1 See note 1 to Table 1.
2 Includes both public and private sectors.

Table 4
Workforce jobs[1] by industry: revisions to levels

United Kingdom — Thousands, seasonally adjusted

	All jobs	Agriculture and fishing	Production	Construction	Distribution, hotels and Catering	Transport and communications	Finance, real estate, renting and business activities	Public administration, education and health[2]	Other services
SIC 2003 sections	A–O	A,B	C–E	F	G,H	I	J, K	L–N	O
Mar 96	–4	0	0	0	0	0	0	–4	0
Jun 96	9	–2	2	4	3	1	2	–3	2
Sep 96	9	–2	2	5	3	1	2	–3	2
Dec 96	9	–1	2	4	3	1	2	–3	2
Mar 97	9	–2	2	5	2	1	2	–3	2
Jun 97	7	–2	3	6	2	0	1	–4	1
Sep 97	7	–2	2	6	1	0	1	–4	1
Dec 97	6	–1	3	6	1	0	1	–4	1
Mar 98	7	–2	3	6	1	0	1	–4	1
Jun 98	3	–2	2	3	2	0	1	–3	1
Sep 98	3	–2	1	3	1	0	2	–4	1
Dec 98	2	–2	1	3	1	0	1	–4	1
Mar 99	3	–2	1	4	1	0	1	–4	1
Jun 99	6	–2	2	4	2	0	2	–4	1
Sep 99	6	–2	2	5	1	0	2	–4	1
Dec 99	4	–2	2	4	1	1	1	–4	1
Mar 00	5	–2	2	6	1	0	1	–4	1
Jun 00	2	–4	2	4	1	0	1	–4	1
Sep 00	2	–3	2	4	1	0	2	–4	1
Dec 00	–3	–3	1	4	1	1	-1	–7	0
Mar 01	0	–3	2	6	0	0	1	–7	1
Jun 01	4	–2	2	4	2	1	3	–6	1
Sep 01	5	–1	1	5	2	0	3	–6	1
Dec 01	0	–1	2	4	2	1	-2	–7	1
Mar 02	5	–1	2	6	0	0	3	–7	2
Jun 02	7	–2	2	5	3	1	3	–6	1
Sep 02	8	–1	1	7	1	0	4	–5	1
Dec 02	–1	–1	3	6	2	1	-5	–7	0
Mar 03	7	–1	3	7	–1	0	4	–7	2
Jun 03	9	–3	2	6	3	1	3	–5	1
Sep 03	8	–2	1	8	1	0	5	–5	0
Dec 03	–6	–3	3	7	1	0	–5	–9	0
Mar 04	13	–1	4	9	2	0	6	–8	2
Jun 04	–6	–1	-1	0	–1	1	2	–6	0
Sep 04	–4	1	-1	–1	0	0	–1	–2	0
Dec 04	–16	–1	1	1	0	0	–6	–10	–1
Mar 05	11	2	4	2	2	-1	3	–3	2
Jun 05	–2	–1	3	0	–2	-1	–1	–1	1
Sep 05	–4	2	4	–2	0	0	–12	5	0
Dec 05	–24	–1	8	1	0	–2	–16	–14	-1
Mar 06	–46	2	–5	-4	–16	–11	11	–21	–3
Jun 06	–115	–2	–24	–12	–42	–19	24	–28	–11
Sep 06	–182	1	–41	–22	–57	–29	24	–39	–20
Dec 06	–196	3	–41	–19	–-61	–29	29	–58	–21
Mar 07	–171	–3	–38	–17	–57	–32	32	–38	–18
Jun 07	–153	–2	–37	–17	–53	–29	40	–36	–18

Notes:

1 See note 1 to Table 1.

2 Includes both public and private sectors.

REFERENCES

Office for National Statistics (2006) 'National Statistics Quality Review of Employment and Jobs Statistics' at www.statistics.gov.uk/about/data/methodology/quality/reviews/labour.asp

Office for National Statistics (2007a) 'Comparison of LFS and WFJ statistics on jobs' at www.statistics.gov.uk/statbase/product.asp?vlnk=1944

Office for National Statistics (2007b) 'Labour Market Statistics First Release', December 2007 at www.statistics.gov.uk/statbase/product.asp?vlnk=1944

Office for National Statistics (2007c) 'Public Sector Employment First Releases', Q1 to Q3 2007 at www.statistics.gov.uk/statbase/product.asp?vlnk=13615

FEATURE

Regional gross value added

Eddie Holmes
Office for National Statistics

SUMMARY

This article presents estimates for regional gross value added (GVA) at current basic prices, published in December 2007. These data are published using the European Union Nomenclature of Units for Territorial Statistics (NUTS) regions. Data are published at the NUTS1 level for the time period 1989 to 2006 and at the NUTS2 and NUTS3 level for the time period 1995 to 2005. This is followed with an overview of the methodology used in the calculation of regional GVA and the article concludes with the Office for National Statistics' future plans for regional economic data.

NUTS1 gross value added (GVA) data were looked at in the February 2008 *Economic & Labour Market Review* article Regional economic indicators with a focus on regional productivity (Dey-Chowdhury *et al* 2008) and the NUTS1 GVA data were used in the calculation of the GVA productivity data analysed in that article. This article focuses on regional GVA data at the different NUTS levels.

NUTS1 data

Total GVA has been increasing in all NUTS1 regions (**Table 1**). At current prices, the regions that experienced the highest growth in total GVA between 2005 and 2006 were London (5.7 per cent), Northern Ireland (5.6 per cent) and the North East (5.5 per cent). Most regions experienced a growth rate similar to the UK average of 5.1 per cent. Growth in the North West was the lowest (4.5 per cent).

GVA per head of population for the UK as a whole, excluding Extra-regio, was £18,631 in 2006. London had the highest GVA per head (£26,192). The South East and East of England were also above the UK average at £21,514 and £19,599, respectively.

Table 1
NUTS1 regional GVA,[1,2] 2006[3]

Region	Total (£bn)	Share of UK (%)	Growth on 2005 (%)	Per head (£)	Per head index (UK=100)
United Kingdom[4]	1,128.8	*100.0*	5.1	18,631	100
North East	38.8	*3.4*	5.5	15,177	81
North West	111.3	*9.9*	4.5	16,234	87
Yorkshire and The Humber	82.1	*7.3*	4.6	15,968	86
East Midlands	74.1	*6.6*	5.0	16,982	91
West Midlands	89.0	*7.9*	5.0	16,583	89
East of England	109.9	*9.7*	4.7	19,599	105
London	196.8	*17.4*	5.7	26,192	141
South East	177.2	*15.7*	5.1	21,514	115
South West	89.5	*7.9*	5.4	17,467	94
England	968.6	*85.8*	5.1	19,082	102
Wales	42.7	*3.8*	4.9	14,396	77
Scotland	91.0	*8.1*	5.4	17,789	95
Northern Ireland	26.4	*2.3*	5.6	15,175	81

Notes:

1 GVA at current basic prices on residence basis.
2 Figures may not sum due to rounding in totals; per head (£) figures are rounded to the nearest pound.
3 2005 and 2006 estimates are provisional.
4 Excluding statistical discrepancy and Extra-regio (offshore contribution to GVA that cannot be assigned to any region).

Box 1

Regional gross value added methodology

Gross value added is the difference between the value of goods and services produced (output) and the cost of raw materials and other input which are used in production (intermediate consumption); that is, the value added by any unit engaged in production. This is calculated gross of any deductions for depreciation or consumption of fixed capital.

Regional gross value added (GVA) is estimated at current basic prices and comprises gross domestic product (GDP) less taxes (plus subsidies) on products. Taxes on products are taxes that are payable per unit of some good or service produced or transacted. Examples include value-added tax and excise duties. Subsidies are payments made to producers by the government or institutions of the European Union to influence production.

The headline estimates presented in this article are produced using a five-period moving average. These adjusted series remove some year-to-year volatility in the unadjusted series. The unadjusted data are also published on the Office for National Statistics (ONS) website.

NUTS1 GVA data are calculated on both a residence (GVA allocated to where someone lives) and workplace (GVA allocated to the location of production) basis. It is currently assumed that net commuting only has a significant impact in London, the East of England and the South East so these are the only regions which have different estimates for residence-based and workplace-based GVA. NUTS2 and NUTS3 data are only calculated on a workplace basis, in line with European standards.

All regional GVA data are at current prices, in other words, the effects of price inflation and regional price variation are not removed from these data.

Regional GVA data are calculated using the UK National Accounts as control totals and then prorated to the regions on a top-down basis. Regional information in the form of a wide range of indicator data sets is used to allocate the national GVA, initially to the NUTS1 regions. The NUTS1 totals are then allocated to the constituent NUTS2 and NUTS3 regions. These data are published in line with the ESA 95 requirement to produce NUTS2 and NUTS3 data and associated industrial breakdowns, within two years of the reference period. Additionally, ONS publishes provisional data at NUTS1 within one year of the reference period.

Regional GVA data referred to in this article are calculated using an income approach. This involves adding up all the income earned by the resident individuals or corporations in the production of goods and services.

There are several components of GVA. The largest are compensation of employees (CoE) (payment in cash or kind payable by an enterprise to an employee in return for work done), taxes on production, gross operating surplus (which includes profits and rental income) and income from self employment (mixed income) (GOS/MI).

Data sources

The data are allocated to the regional level using the most appropriate indicators available and are drawn from a wide variety of survey and administrative sources. The main data sets used are HM Revenue and Customs (HMRC) pay-as-you-earn and self-assessment tax data, as well as ONS surveys: the Annual Business Inquiry (ABI) (Parts 1 and 2), the Short-Term Employment Survey (STES) and the Annual Survey of Hours and Earnings (ASHE) earnings data.

All the input data are subject to a rigorous quality assurance process to determine that they are the best indicators available.

Box 2

Regional classification

The Nomenclature of Units for Territorial Statistics (NUTS) provides a single uniform breakdown for the production of regional statistics for the European Union. Regional GVA are produced at three levels of NUTS in the UK. These are:

- NUTS1: the devolved administrations of Scotland, Wales and Northern Ireland and the Government Office Regions of England
- NUTS2: 37 areas – sometimes referred to as subregions
- NUTS3: 133 areas – generally groups of unitary authorities or districts, also known as local areas
- Extra-regio GVA is that which cannot be assigned to regions, such as the GVA of embassies and UK armed forces stationed overseas, along with the elements relating to activities on the continental shelf

Figure 1
Regional share of UK residence-based GVA, 2006

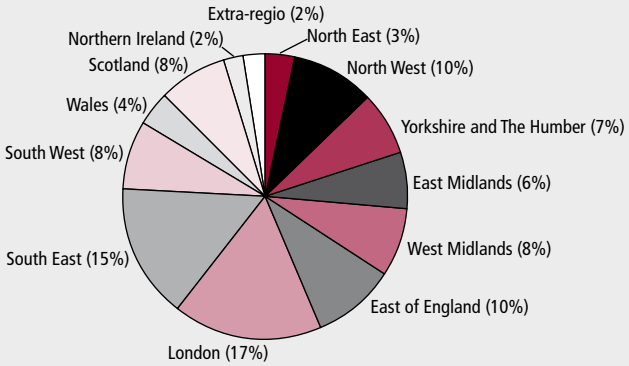


Figure 2
Regional share of UK workplace-based GVA, 2006

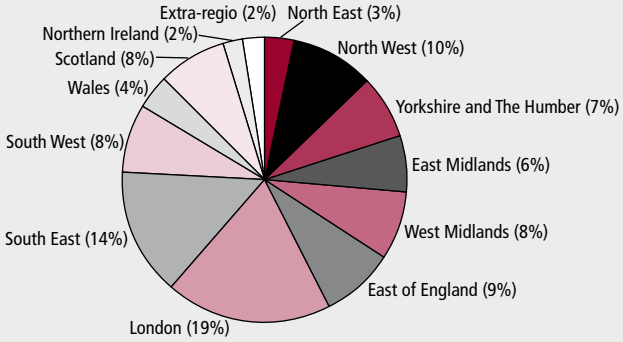


Figure 3
GVA per head: by NUTS1 region

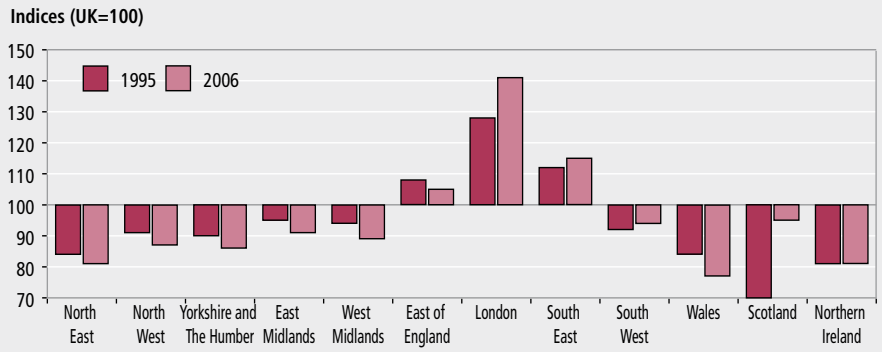
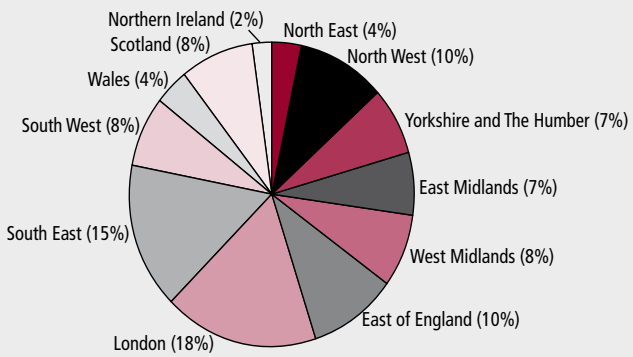


Figure 4
Regional share of total compensation of employees, 2006



All other regions had a GVA per head value below the UK average. Wales had the lowest (£14,396) followed by Northern Ireland (£15,175) and the North East (£15,177) (see **Map 1**).

London (17.4 per cent) and the South East (15.7 per cent) had the largest share of total GVA in 2006, while Northern Ireland (2.3 per cent) and the North East (3.4 per cent) had the smallest share. London's and the South East's share of GVA have increased since 1995 when they accounted for 15.3 per cent and 14.9 per cent, respectively. **Figure 1** and **Figure 2** show the proportions including Extra-regio.

When calculated on a workplace basis, London has a share of 18.8 per cent of UK GVA. In the calculation of NUTS1 GVA, net commuting is only considered to be significant for London, the East of England and the South East.

London had the highest regional per head of population index in 2006 (141, where UK=100), more than a third greater than the UK average and 13 points above the 1995 average (128) as calculated on a residence basis (**Figure 3**). Wales had the lowest index (77), 23 index points below the UK average.

GVA NUTS1 component analysis

Compensation of employees (CoE) and gross operation surplus/mixed income (GOS/MI) are the two largest components of GVA. **Table 3** shows the levels of CoE and GOS/MI and the proportion of GVA from CoE and GOS/MI for 1995 and 2006 (see **Box 1** for definitions).

In 2006, the North East, Wales and Scotland had the joint largest CoE as a proportion of GVA, at 65 per cent, while Northern Ireland with 59 per cent had the smallest proportion. CoE as a proportion of GVA has risen, while the proportion of GVA due to GOS/MI has fallen in all regions except Northern Ireland, which has remained constant. The largest change was seen in Wales, whose CoE as a proportion of GVA rose from 59 per cent in 1995 to 65 per cent in 2006.

London has the highest CoE and GOS/MI per head in 2006 (£16,847 and £9,345 respectively) (**Table 4**). Northern Ireland has the lowest CoE per head in 2006 (£8,975) and Wales the lowest GOS/MI per head (£5,110).

London had the highest proportion of CoE (18 per cent) and GOS/MI (16 per cent) (**Figure 4** and **Figure 5**). Northern Ireland had the smallest share of CoE and GOS/MI (both 2 per cent). Less than 1 per cent of CoE, but 6 per cent of GOS/MI is allocated to Extra-regio.

Box 3

Diversity of the NUTS1 regions

Scotland, Wales, Northern Ireland and the regions of England are all different in character, industrial structure and economic performance. **Table 2** shows some of the differences.

Table 2
Key regional statistics

Percentages

Region	Area 2006 (% of total)	Population[1] 2006 (% of total)	Total economically active[2] 2006 (% of total)	Gross value added[3] 2006 (% of total)	Total gross disposable household income[4] 2005 (% of total)
North East	*3.5*	*4.2*	*4.1*	*3.4*	*3.6*
North West	*5.8*	*11.3*	*11*	*9.9*	*10.4*
Yorkshire and The Humber	*6.3*	*8.5*	*8.3*	*7.3*	*7.7*
East Midlands	*6.4*	*7.2*	*7.3*	*6.6*	*6.7*
West Midlands	*5.3*	*8.9*	*8.8*	*7.9*	*8.1*
East of England	*7.8*	*9.3*	*9.4*	*8.8*	*9.8*
London	*0.7*	*12.4*	*13*	*19.3*	*14.9*
South East	*7.8*	*13.6*	*14.1*	*14.8*	*15.3*
South West	*9.8*	*8.5*	*8.4*	*7.9*	*8.4*
England	*53.4*	*83.8*	*84.3*	*85.8*	*85.1*
Wales	*8.5*	*4.9*	*4.6*	*3.8*	*4.4*
Scotland	*32.3*	*8.4*	*8.5*	*8.1*	*8.0*
Northern Ireland	*5.8*	*2.9*	*2.6*	*2.3*	*2.5*
United Kingdom (=100%)	244,167 sq km	60.6m	30.6m	£1,128.8bn	£799.5bn

Notes:

1 Mid-year population estimates.
2 Labour Market Statistics 2006 (average of four quarters, seasonally adjusted).
3 Excluding Extra-regio and statistical discrepancy.
4 Regional household income estimates as published by ONS on 27 March 2007, UK less Extra-regio.

Scotland has the largest area but a small population. London has by far the smallest area, but the second largest population, over 12 per cent of the UK total. The South East has the largest share of the UK population, nearly 14 per cent. At the other extreme, Northern Ireland has the smallest population, 2.9 per cent of the UK total. These variations are reflected in the size of regional GVA and incomes.

The wide variation in the size of the regions makes it difficult to compare their economic performance using cash totals. Comparisons are therefore usually expressed in terms of the amounts per head of the population. However, it is important to note that the growth in totals may be quite different from the growth per head in regions where the population has increased or decreased. Furthermore, the level per head is determined both by the average amount of cash of the working population and by the proportion of dependants. Households in Northern Ireland have a high proportion of children (23 per cent of the population were aged under 16 in 2006 compared with 19 to 21 per cent in other regions). This will tend to depress amounts per head. Ideally, the age structure of the population should be taken into account when comparing figures on a per head basis.

Table 3

Compensation of employees and gross operating surplus/mixed income and as a proportion of GVA:[1] by NUTS1 region

	Compensation of employees		CoE as a proportion of GVA (%)		Gross operating surplus/mixed income		GOS/MI as a proportion of GVA (%)	
Region	**1995**	**2006**	**1995**	**2006**	**1995**	**2006**	**1995**	**2006**
United Kingdom	386,035	721,287	*60*	*62*	257,714	434,225	*40*	*38*
North East	15,191	25,339	*65*	*65*	8,341	13,449	*35*	*35*
North West	41,507	71,172	*61*	*64*	26,029	40,079	*39*	*36*
Yorkshire and The Humber	30,075	52,707	*62*	*64*	18,324	29,409	*38*	*36*
East Midlands	25,595	47,469	*61*	*64*	16,539	26,643	*39*	*36*
West Midlands	33,258	56,573	*62*	*64*	20,205	32,425	*38*	*36*
East of England	37,760	70,313	*62*	*64*	23,476	39,572	*38*	*36*
London	58,134	126,558	*60*	*64*	38,141	70,206	*40*	*36*
South East	57,056	111,230	*61*	*63*	37,049	65,994	*39*	*37*
South West	27,868	54,577	*58*	*61*	20,011	34,924	*42*	*39*
England	326,443	615,937	*61*	*64*	208,115	352,701	*39*	*36*
Wales	15,668	27,542	*59*	*65*	10,719	15,156	*41*	*35*
Scotland	33,800	59,420	*61*	*65*	21,508	31,605	*39*	*35*
Northern Ireland	8,489	15,631	*59*	*59*	5,954	10,798	*41*	*41*
Extra-regio	1,635	2,757	*13*	*10*	11,418	23,965	*87*	*90*

Note:

1 Headline GVA at current basic prices on a residence basis.

Table 4

Compensation of employees and gross operating surplus/mixed income per head

	Compensation of employees per head		Gross operating surplus/mixed income per head	
Region	**1995**	**2006**	**1995**	**2006**
United Kingdom	6,653	11,905	4,441	7,167
North East	5,882	9,915	3,230	5,262
North West	6,079	10,385	3,812	5,848
Yorkshire and The Humber	6,063	10,250	3,694	5,719
East Midlands	6,255	10,877	4,042	6,105
West Midlands	6,327	10,541	3,844	6,042
East of England	7,254	12,541	4,510	7,058
London	8,409	16,847	5,517	9,345
South East	7,350	13,502	4,773	8,011
South West	5,828	10,651	4,185	6,816
England	6,747	12,134	4,301	6,948
Wales	5,424	9,286	3,711	5,110
Scotland	6,623	11,612	4,214	6,177
Northern Ireland	5,148	8,975	3,610	6,200

Figure 5

Regional share of total gross operating surplus/mixed income, 2006

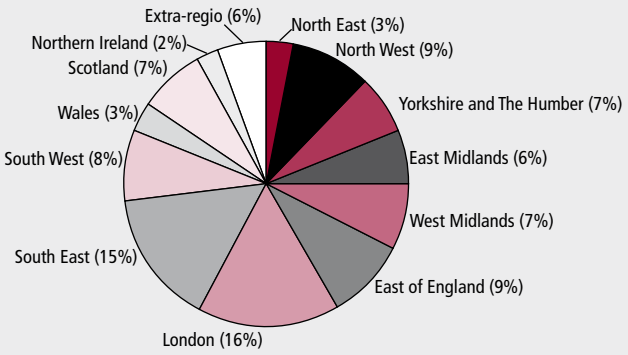
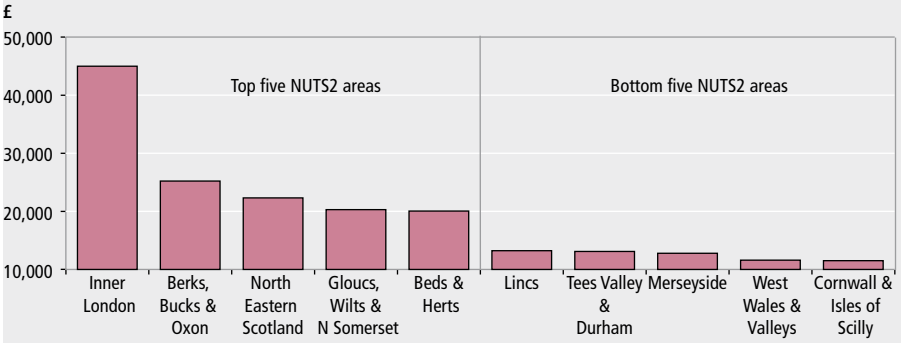


Table 5
Top five and bottom five GVA[1,2] per head: by NUTS2 region, 2005[3]

Region	Share of UK (%)	Growth on 2004 (%)	Per head (£)[4]	Per head index (UK=100)
United Kingdom	*100.0*	4.1	17,827	100
Top five GVA per head				
Inner London	*12.3*	5.5	44,982	252
Berkshire, Buckinghamshire & Oxfordshire	*5.0*	4.3	25,213	141
North Eastern Scotland	*1.0*	3.6	22,315	125
Gloucestershire, Wiltshire & North Somerset	*4.2*	3.9	20,295	114
Bedfordshire & Hertfordshire	*3.1*	3.7	20,051	112
Bottom five GVA per head				
Lincolnshire	*0.8*	2.3	13,227	74
Tees Valley & Durham	*1.4*	5.1	13,097	73
Merseyside	*1.6*	2.7	12,784	72
West Wales & Valleys	*2.0*	3.7	11,598	65
Cornwall & Isles of Scilly	*0.6*	3.6	11,510	65

Notes:
1 GVA at current basic prices on workplace basis.
2 Excluding Extra-regio.
3 2005 estimates are provisional.
4 Per head figures are rounded to the nearest pound.

Figure 6
NUTS2 areas with the highest and lowest GVA[1,2] per head of population, 2005[3]



NUTS2 GVA data

Total GVA increased in all NUTS2 regions in 2005. Within NUTS2 areas, growth in total GVA between 2004 and 2005 was highest in Inner London (5.5 per cent) and Tees Valley and Durham (5.1 per cent) (**Table 5**). The NUTS2 region with the lowest growth rate between 2004 and 2005 was Lincolnshire (2.3 per cent).

The NUTS2 regions with the highest GVA per head of population in 2005 were Inner London (£44,982), Berkshire, Buckinghamshire and Oxfordshire (£25,213) and North Eastern Scotland (£22,315) (**Figure 6**). The areas with the lowest GVA per head were Cornwall and Isles of Scilly (£11,510), West Wales and the Valleys (£11,598), Merseyside (£12,784) and Tees Valley and Durham (£13,097) (see **Map 2**).

Box 4
European Union Structural Funds

Under the European System of Accounts 95 (ESA 95) and the current transmission requirements, ONS provides GVA plus the CoE component with a 17-way industrial split at NUTS2 and GVA with a three-way industrial split at NUTS3 to Eurostat. The industrial breakdown uses the Standard Industrial Classification 2003 (SIC 03). Eurostat requires the unadjusted data rather than the five-period data presented in this article. In 2007, ONS only provided the regional GVA totals because of the reduced scope of the 2007 National Accounts *Blue Book*.

Eurostat takes the NUTS2 GVA estimates and allocates the difference between national GVA and GDP on a pro rata basis and then applies purchasing power parities to produce estimates that are comparable across the EU. Funding criteria are set to these estimates.

The Structural Funds account for approximately one-third of the EU budget and are used to support regional development and employment, particularly in poorer regions and Member States. The funds can be used to finance a wide range of activities including supporting innovation, enterprise and business development, protecting and enhancing the environment, supporting specific sectors of regional economies, delivering active labour market policies and improving skills.

Table 6
Top five and bottom five GVA per head: by NUTS3 region, 2005

Region	Share of UK (%)	Growth on 2004 (%)	Per head (£)[3]	Per head index (UK=100)
United Kingdom	*100.0*	4.1	17,827	100
Top five GVA per head				
Inner London West	*7.9*	5.4	78,285	439
Berkshire	*2.2*	4.3	29,235	164
Edinburgh, City of	*1.2*	4.7	28,432	159
Swindon	*0.5*	4.0	27,354	153
Milton Keynes	*0.6*	4.3	26,934	151
Bottom five GVA per head				
South West Wales	*0.4*	4.7	10,859	61
East & West Dunbartonshire	*0.2*	2.4	10,819	61
Gwent Valleys	*0.3*	3.8	10,298	58
Wirral	*0.3*	2.2	10,115	57
Isle of Anglesey	*0.1*	4.3	9,392	53

Notes:
1 GVA at current basic prices on workplace basis.
2 Excluding Extra-regio.
3 2005 estimates are provisional.
4 Per head figures are rounded to the nearest pound.

Figure 7
Highest and lowest NUTS3 GVA per head in each NUTS1 region, 2005

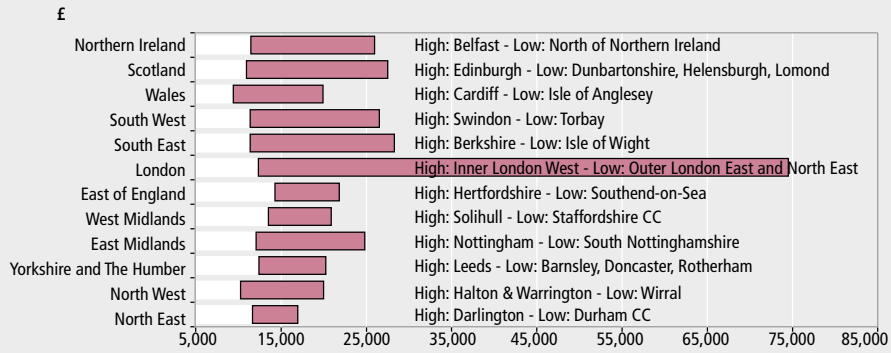
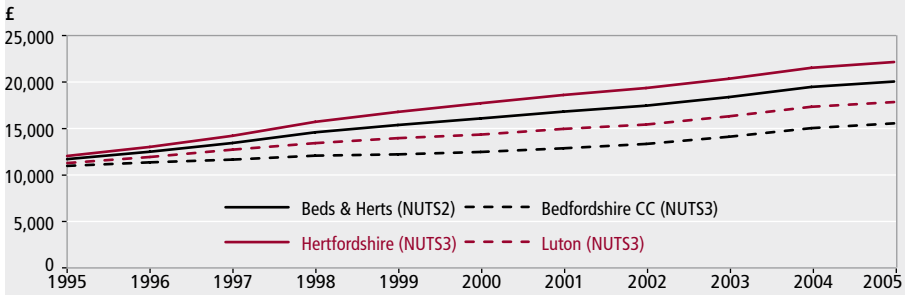


Figure 8
GVA per head, NUTS3 areas within Bedfordshire and Hertfordshire



NUTS3 GVA data

GVA grew in all NUTS3 regions in 2005. The NUTS3 regions with the highest GVA per head in 2005 were Inner London West (£78,285), Berkshire (£29,235) and Edinburgh (£28,432) (**Table 6**). These estimates compare with the UK average GVA per head of £17,827. The Isle of Anglesey (£9,392), Wirral (£10,115) and Gwent Valleys (£10,298) were the NUTS3 areas with the lowest GVA per head in 2005 (see **Map 3**).

In 2005, Inner London West had the highest GVA per head index of 439, over four times the UK average; in contrast, the Isle of Anglesey had the lowest GVA per head index of 53, which was a little over half the UK average.

Figure 7 shows the variation within NUTS regions. The graph represents the constituent NUTS3 region with the highest and lowest GVA per head in each NUTS1 region in 2005. London shows the biggest contrast, with Inner London West having the highest GVA per head (£78,285) and Outer London East and North East the lowest (£12,210). The region with the least variation was the North East, with Darlington having the highest GVA per head (£17,199) and Durham CC the lowest (£11,554).

Bedfordshire and Hertfordshire provide an example of a divergence in economic activity between regions in the same NUTS area (in this case the NUTS2 region of Bedfordshire and Hertfordshire) (**Figure 8**). In 1995, all the NUTS3 areas had a similar GVA per head: £11,282 in Luton, £10,977 in Bedfordshire CC and £12,045 in Hertfordshire. By 2005, the spread of GVA per head had changed substantially, with Luton (£17,844) 11 per cent below (£20,051), Bedfordshire (£15,554) 22 per cent below and Hertfordshire (£22,153) 11 per cent higher than the NUTS2 value.

2007 National Accounts *Blue Book*

The 2007 UK National Accounts *Blue Book* was reduced in scope in order to free resources as part of the ongoing re-engineering project, part of the ONS programme of modernisation. A summary of the changes which have an effect on regional GVA is given below:

- the latest annual benchmark data were not fully incorporated
- no preliminary balance based on these data was struck for 2005 and the preliminary balance for 2004 was not updated

Effects on this regional GVA release were:

- no industrial breakdowns of regional data were published in the December 2007 publication. The existing industrial breakdowns, consistent with the December 2006 release, will remain available on the National Statistics website, but these will not sum to the new regional GVA totals
- the two most recent years (2005 and 2006) are both marked provisional in the December 2007 publication

Revisions

Revisions in the December 2007 GVA estimates cover the period 1989 to 2005.

Estimates at lower geographical levels are being revised for the period 1995 to 2004, with the starting point of the NUTS2 and NUTS3 time series being 1995.

The main revisions are:

- revisions to the UK National Accounts (*Blue Book* 2007): the only change to the national controls for 2004 and earlier is due to the incorporation of an improved method for estimating investment on own-account software, amounting to total increases of £7.8 billion in 2004 and a decreasing amount to previous years
- revised data from HMRC for use in the calculation of mixed income (sole traders), partnerships' income and compensation of employees became available. There were also minor revisions to STES, ASHE and the ABI data used in the calculation of GVA

Future work plans

It is planned to publish regional gross disposable household income estimates at the NUTS1, 2 and 3 levels from 1995 to 2006 (consistent with the National Accounts *Blue Book* 2007) in May 2008.

It is also planned to publish regional GVA for 1989 to 2007 at the NUTS1 level and 1995 to 2006 for NUTS2 and NUTS3 in December 2008. These will be consistent with the National Accounts *Blue Book* 2008. A full industrial breakdown will be restored when the supply and use tables have been published at the national level.

The GVA estimates presented in this article are calculated using an income approach. It is planned to publish experimental estimates of GVA using a production approach, at the NUTS1 level, in December 2009. This will present constant prices estimates consistent with the National Accounts *Blue Book* 2009.

Notes

1 The full Regional Accounts gross value added publication can be accessed on the ONS website at www.statistics.gov.uk/statbase/product.asp?vlnk=14650

CONTACT

elmr@ons.gsi.gov.uk

REFERENCES

Beadle J 'Modernising the UK's National Accounts', *Economic & Labour Market Review* 1(4), pp 32–8.

Chamberlin G, Clayton T and Farooqui S 'New measures of UK private sector software investment', *Economic & Labour Market Review* 1(5), pp17–28.

Dey-Chowdhury S, Penny D, Wosnitza B and Walker M 'Regional economic indicators, February 2008, with a focus on regional productivity', *Economic & Labour Market Review* 2(2) pp 48–61.

Office for National Statistics (1998) *Introducing the European System of Accounts 1995*, The Stationery Office: London.

Office for National Statistics (1998) *National Accounts Concepts Sources and Methods*, The Stationery Office: London.

Office for National Statistics (2002) *UK Standard Industrial Classification of Economic Activities 2003*, The Stationery Office: London.

Office for National Statistics (2007) *UK National Accounts Blue Book*.

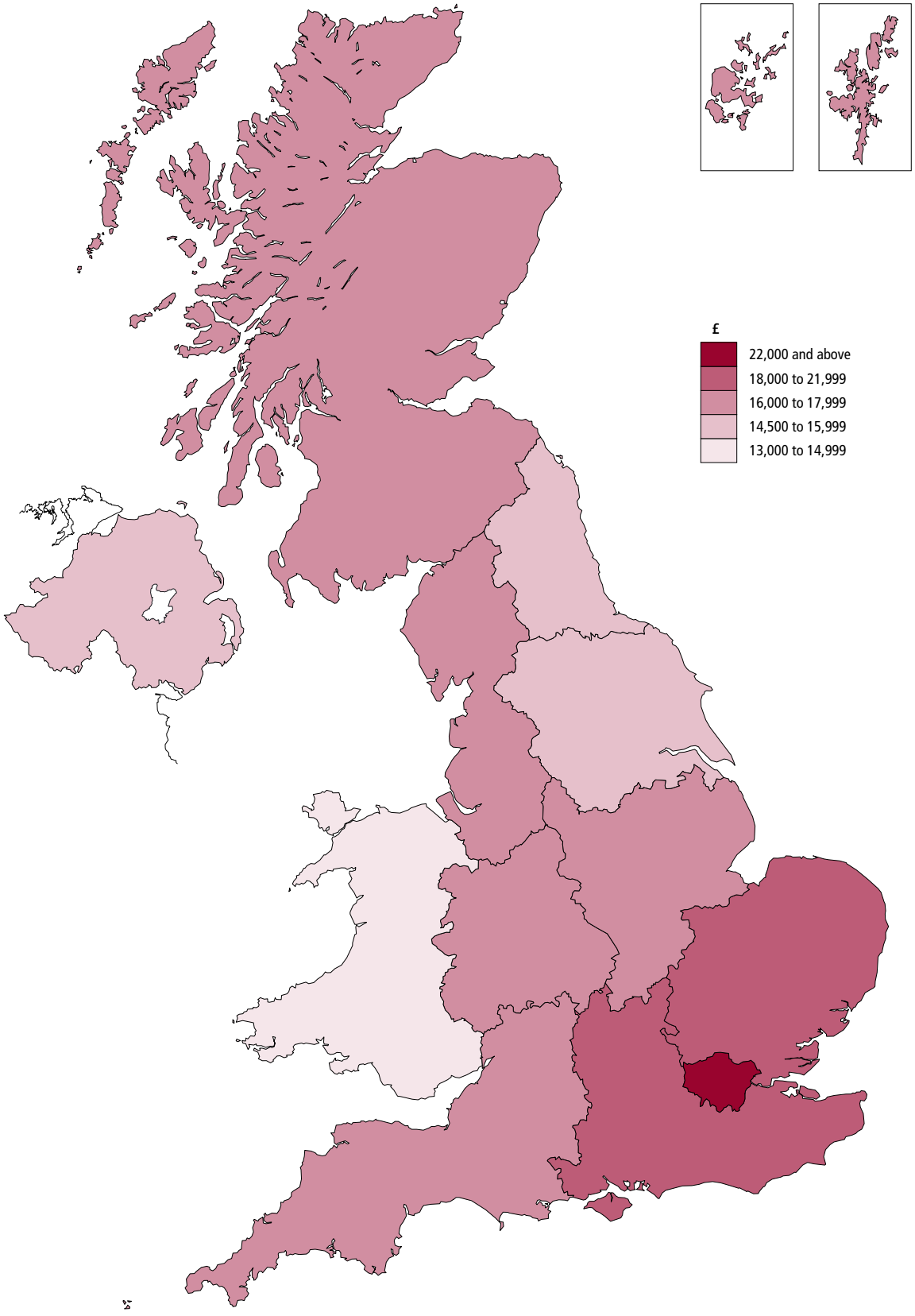
Office for the Official Publications of the European Communities (1996) *European System of Accounts 1995*, Eurostat (1996).

Regional GDP per inhabitant in the EU27, Eurostat (February 2008).

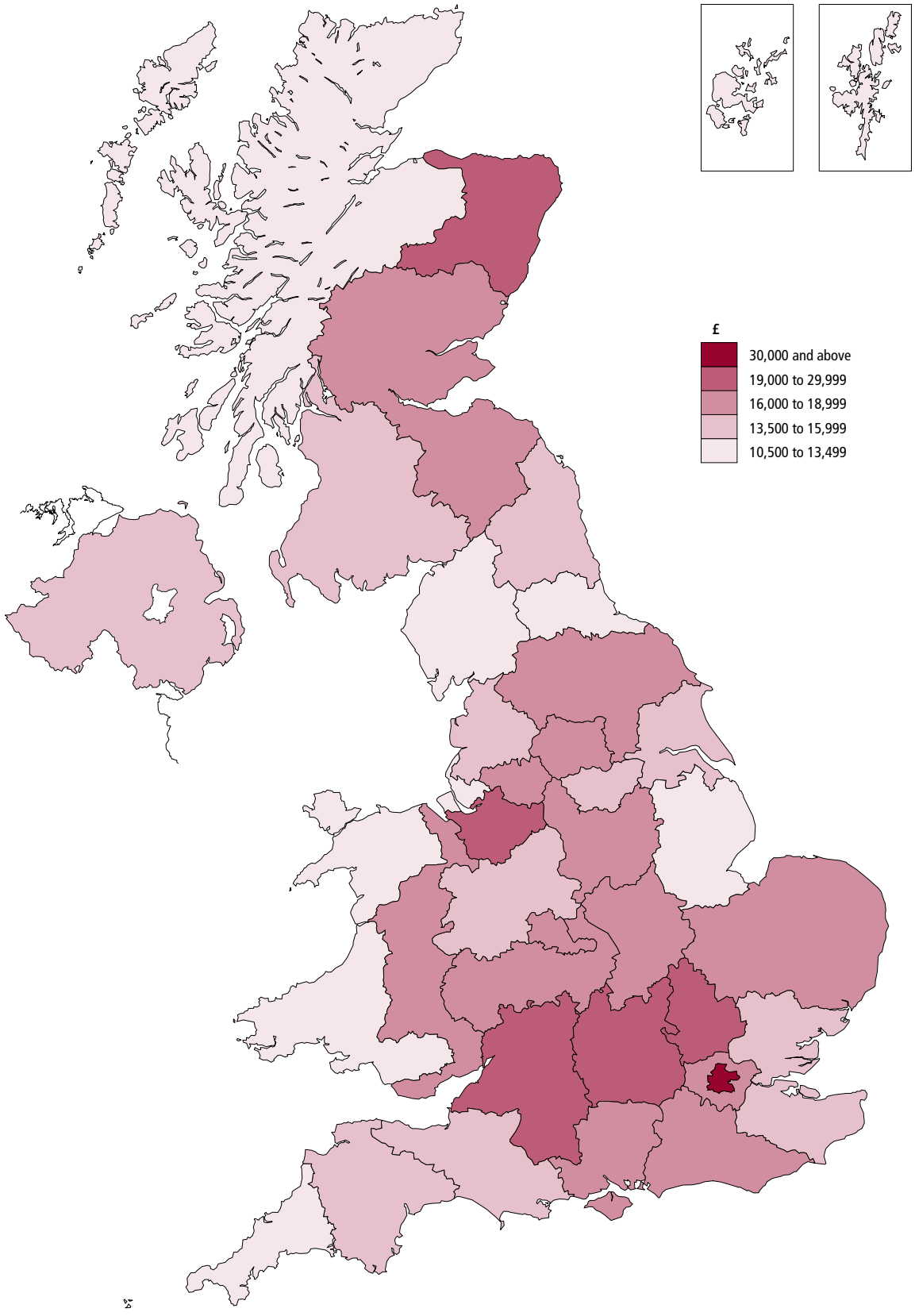
APPENDIX

Map 1

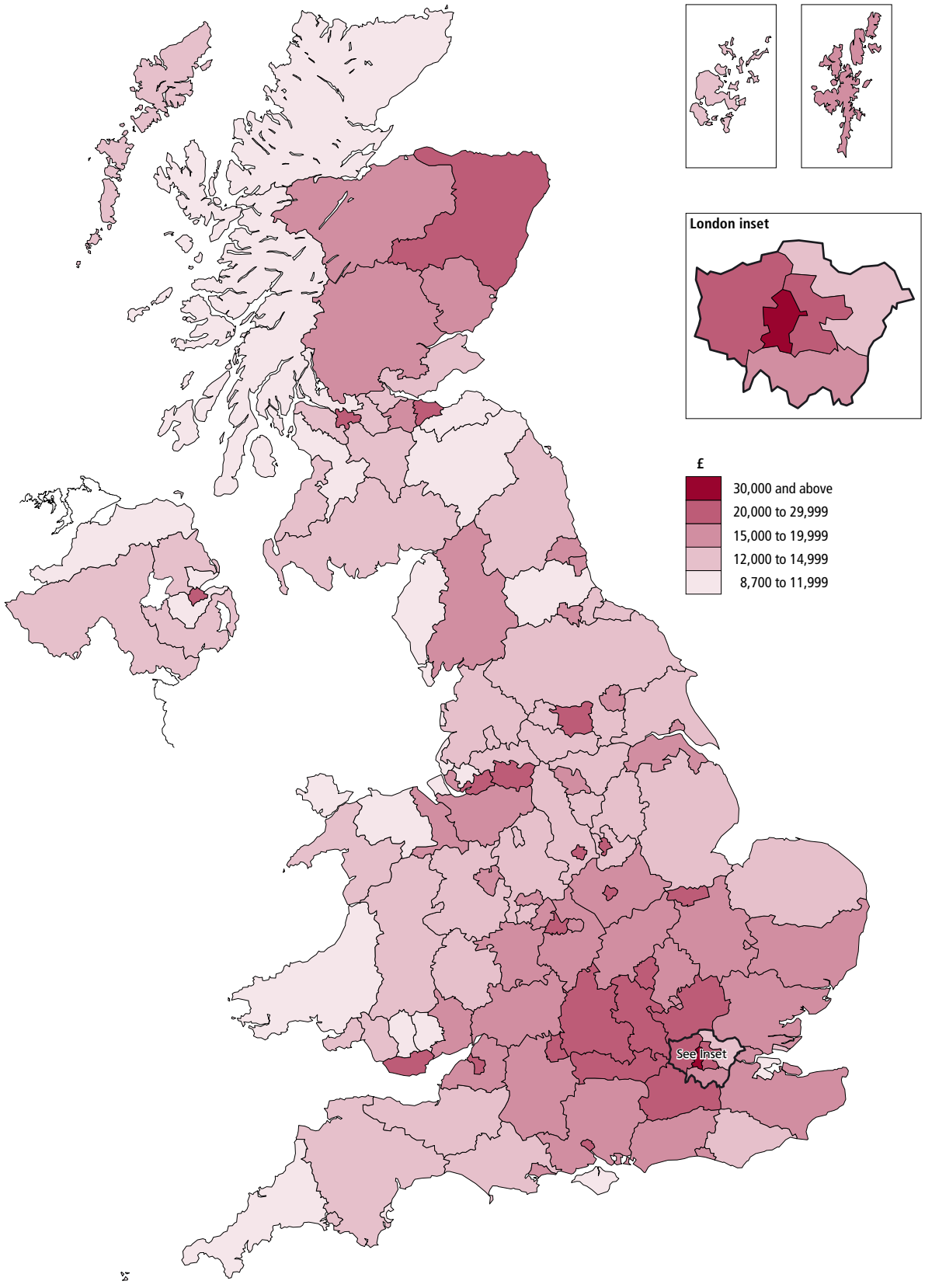
Gross value added per head, 2006, by NUTS1 area



Map 2
Gross value added per head, 2005, by NUTS2 area



Map 3
Gross value added per head, 2005, by NUTS3 area



Methods explained

Methods explained is a quarterly series of short articles explaining statistical issues and methodologies relevant to ONS and other data. As well as defining the topic areas, the notes explain why and how these methodologies are used. Where relevant, the reader is also pointed to further sources of information.

Household saving ratio

Graeme Chamberlin and Sumit Dey-Chowdhury
Office for National Statistics

SUMMARY

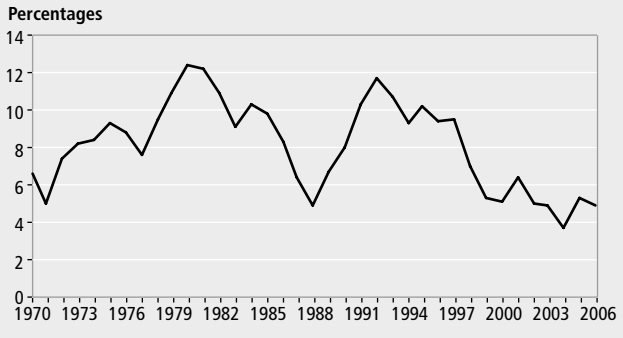
The household saving ratio is published quarterly as part of the UK National Accounts. This article outlines why users may be interested in this macroeconomic statistic and describes how this measure is calculated. There are a number of well-known controversies and measurement issues in defining saving, so alternative measures of the household saving ratio are also presented. Finally, possible reasons accounting for the downward trend in the UK household saving ratio since 1997 are offered.

The purpose of saving is to increase future resources available for consumption and to protect against unexpected changes in income. Typically, savings are channelled into investments which increase the capital stock and future potential output. Since the 1990s, the UK household saving ratio has fallen to historically low levels, raising concerns of an imbalance between consumption today and consumption tomorrow (**Figure 1**).

As the population ages, pay-as-you-go pension and health insurance schemes are likely to face a huge rise in liabilities, putting upward pressure on future tax burdens as the dependency ratio rises. Increasing savings may offset this by providing greater capital stock per worker and hence greater productivity. Is the present low saving ratio evidence that UK households are failing to make adequate provisions for their future?

However, a sudden reversal of recent saving trends may not be good news either. Keeping everything else equal, consumption would have to fall by 3.4 per cent for the saving ratio to recover to the long-term average of 8 per cent. Such retrenchment in spending may harm short-term economic growth. Macroeconomic interest in the saving ratio arises from its potential use in forecasting consumer expenditure, which is a significant component of GDP, although the empirical evidence is mixed (see Nakamura and Stark 2005).

Figure 1
UK household saving ratio



The purpose of this article is to first describe how this key economic statistic is calculated and relates to the National Accounts. The second focus is to discuss some of the controversies in defining saving and what impact these have on the ratio. Is the recently observed fall really that alarming if measurement issues may lead to a reassessment of trends? Finally, some conclusions are made relating trends in the saving ratio to economic theory.

Calculating the saving ratio

Saving is essentially the difference between household (and also non-profit institutions serving households) disposable resources and consumption on goods and services. The saving ratio simply relates the level of saving to the level of disposable household resources in nominal terms. This statistic and the detailed components that make up the formation of household disposable income can be found in the income and capital accounts (Tables A37, A38 and A40) which are published quarterly in the *United Kingdom Economic Accounts* (UKEA). A summary of the calculations for 2006 is presented in **Table 1**.

Calculating household disposable income is a two-step process. The balance of gross primary incomes shows the gross income received by households where the compensation of employees (wages, salaries and employers' social contributions) is the largest component. Gross operating surplus and mixed income essentially measures the rental income from buildings (including imputed rents of owner-occupied housing) and the earnings of the self-employed. Net property income is mainly the difference between payments received from, and payment to, other sectors of the economy with respect to the ownership of financial assets and non-produced assets such as land.

The secondary distribution of income account shows how the balance of primary incomes is modified by payments of current taxes, payments of social contributions and the receipts of benefits, to form gross household disposable income.

Total available household resources requires an adjustment to gross disposable income for the change in net equity of households in pension funds reserves (see the section 'Defined benefit pension schemes' for a fuller account of this item). Gross saving is simply the

Table 1
Calculating the household saving ratio, 2006

£ million and percentages

	£ million
Primary income account (A37)	
Gross operating surplus including gross mixed income	161,015
Compensation of employees	722,408
Net property income	75,412
Balance of gross primary incomes	958,835
Secondary income account (A38)	
Balance of gross primary incomes	958,835
Current taxes	–169,845
Net social contributions/benefits and other current transfers	45,528
Gross disposable income	834,518
Use of disposable income account (A40)	
Gross disposable income	834,518
Adjustment for change in net-equity of pension funds	35,043
Total household resources	869,561
Final consumption expenditure	828,008
Gross saving	41,533
Saving ratio: (41,533/869,561) * 100 =	4.8%

Table 2
Capital accumulation accounts, 2006

	£ million
Change in household net worth	
Gross saving	41,533
Net capital transfers	3,112
Total	44,665
Change in assets	
Investment (GFCF)	74,189
Acquisitions less disposals of non-financial non-produced assets	–358
Net lending/borrowing	–29,907
Total	44,665

Table 3
Household financial account (A53), 2006

	£ million
Total net acquisition of financial assets	140,739
Total net acquisition of financial assets	168,968
Statistical adjustment	–1,678
Net lending/borrowing	–29,907

difference between this measure and final consumption expenditure, with the saving ratio defined to be saving as a percentage of the total available household resources.

Savings and the capital and financial accounts

The capital account shows how saving, along with capital transfers (investment grants and taxes) are used to finance the acquisition of non-financial assets (see Table A41 in UKEA). A brief description is given in **Table 2**.

Gross fixed capital formation (GFCF) refers to expenditure in tangible and intangible fixed assets, inventories and valuables (stores of value such as antiques). The small component 'acquisitions less disposals of non-financial non-produced assets' covers transactions in land and transferable contracts such as patents and leases. Net lending/borrowing balances the capital account, relating to the change in household financial assets and liabilities required to fund the acquisition of non-financial assets. In this case, the household sector is a net borrower, increasing its financial liabilities to fund the excess of investment over saving.

Net lending/borrowing should therefore be consistent (aided by a statistical adjustment) with the household sector's financial account (Table A53 in UKEA). This records the accumulation of household financial assets and liabilities and is summarised in **Table 3**.

The relationship between gross saving and the accumulation of wealth (net worth) described by the income and capital accounts can be written in terms of a simple household budget constraint:

$$\Delta W_t = W_t - W_{t-1} = (1-\tau) r_t W_{t-1} + (1-\tau) L_t - C_t \qquad (1)$$

where W_t is wealth, r_t the rate of return on wealth, L_t is labour income, τ the tax rate and C_t is consumption expenditure. Therefore there are two ways of calculating gross saving. The right-hand side of (1) is the conventional National Accounts approach, where gross saving is disposable income from labour and property/wealth minus consumption. Alternatively, gross saving could be calculated from the left-hand side as the change in household net worth between the current and previous period. In the US National Accounts, these two measures are known as the NIPA (national income product account) and flow of funds measures respectively.

Controversies in the measurement and interpretation of the saving ratio

Statisticians have debated for many years over what should be constituted as saving in the National Accounts. The low, and briefly negative, saving ratio observed in the US has rekindled interest in this issue. A number of recent papers have investigated the effect of different definitions of saving and disposable income on the ratio. These include, Garner (2006), Reinsdorf (2007), Whittaker (2007), Perozek and Reinsdorf (2002), Doss (2003), Steindel (2007), Moulton (2001), Guidolin and Jeunesse (2007) and Sentence (2007). In this section, these different definitions are applied to the UK and the impact on the saving ratio analysed.

Revisions

Income and expenditure are calculated from different data sources. Because household income and household expenditure are large aggregates, small changes to either are capable of producing a large change in gross saving, which is the relatively small difference between two large numbers. For example, using the figures from Table 1, a 2 per cent downward revision to consumption would generate a 40 per cent increase in gross saving, leading the saving ratio to increase from 4.8 per cent to 6.7 per cent.

In the US, past revisions have been significantly upwards, which reduces some of the current concern given the low (negative) prevailing saving rate. Audits of the underground economy have tended to revise income upwards relative to consumption, hence the saving ratio rises.

The UK experience is different (**Figure 2**); comparing the latest estimate with the first estimate shows no discernable tendency to revise upwards over time. History therefore does not provide any precedent for the current saving trends to be significantly revised.

Figure 2
Revisions to the UK household saving ratio

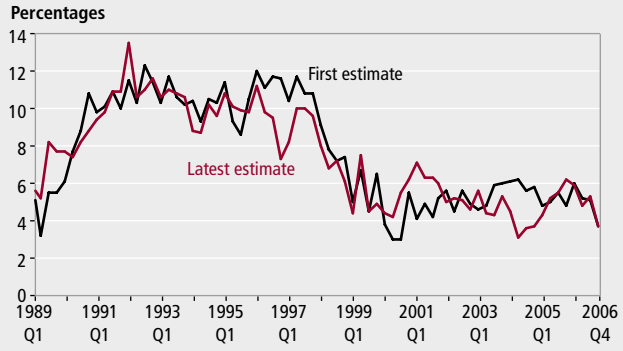


Figure 3
Household multiples of wealth to disposable income

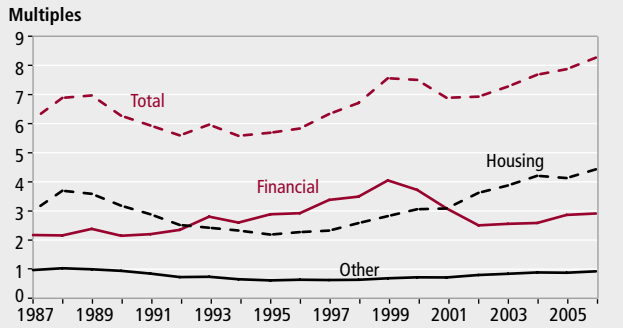


Figure 4
Capital gains and the saving ratio

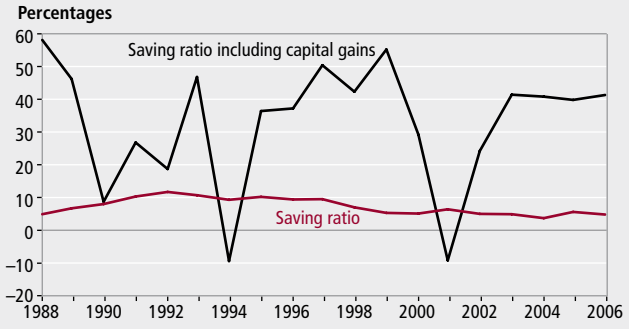
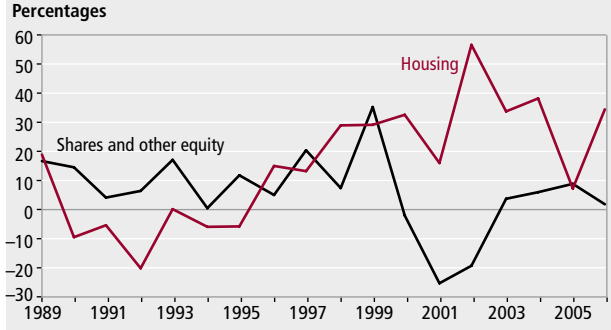


Figure 5
Ratio of capital gains to disposable income



Capital gains

Equation (2) postulates a simple relationship between saving and wealth accumulation. In essence, the change in wealth is actually equal to both the accumulation of new assets and the revaluation of existing ones.

$$\Delta W_t = W_t - W_{t-1} = \pi_t W_{t-1} + (1-\tau) r_t W_{t-1} + (1-\tau) L_t - C_t \qquad (2)$$

where $\pi_t W_{t-1}$ reflects the change in value of existing wealth holdings. Household non-financial balance sheets are published annually in the *Blue Book* showing the market value of non-financial assets (Table 10.10 for households). Financial balance sheets are published in UKEA (Table A64) giving the net value of holdings of financial assets and liabilities and, taken together, a measure of net worth or wealth of households can be calculated. While consumption may be high relative to disposable income, it certainly is not relative to wealth, where recent increases have been driven by strong wealth gains in housing (**Figure 3**).

The revaluation effect in (2) is relatively large and tends to dominate wealth movements. Debate has raged as to whether these capital gains or losses should be included in measures of saving. Hicks (1965) refers to income as the maximum amount that can be consumed while keeping net wealth constant. In this case, capital gains and losses, reflecting changes in household resources that can support consumption, should be included in the calculation of saving. Including capital gains has a large effect on the measured saving ratio in the UK (**Figure 4**).

The value of capital gains in housing and equity (excluding assets held in pension funds) wealth as a proportion of household available resources are shown in **Figure 5**. These are calculated as the difference between the change in values of wealth holdings and the accumulation of the asset. Here it can be seen that the low UK saving ratio has occurred at the same time as strong capital gains in housing.

Current practice is to exclude capital gains from the National Accounts for a number of reasons:

- the National Accounts concept of saving is to measure the funds that are taken out of current income to be made available for new capital investment. Capital gains result from revaluation of existing assets, not necessarily the production of new ones. The source of capital gains is therefore most important. If rising asset prices reflect an improvement in the productivity of capital or labour, then asset valuations are indicative of greater long-run resources. But asset prices may rise for other reasons unconnected with the productive potential of the economy, for example, a reduction of the risk premium, changes in preference or falling long-run interest rates

- gains have to be realised before they are available to support consumption. However, the act of realising gains may actually reduce their size, particularly if the asset is not liquid or the asset price has been affected by a bubble

- empirical evidence suggests that, in making consumption decisions, households respond differently to capital gains than to income. This is partly because asset prices are

volatile, so gains and losses are viewed as transitory and do not justify a large consumption response, and partly because much household wealth is not liquid nor easily supportive of consumption (for example, pension funds). As the propensity to consume out of capital gains is very low, the volatility in asset prices will then feed directly into the measured saving ratio

Capital gains taxes

National Accounts are inconsistent in excluding capital gains from disposable income, but at the same time treating capital gains taxes (CGT) as taxes on income. Therefore, the saving ratio is likely to fall during periods of strong asset prices as higher tax receipts are deducted from disposable income. Given that CGT has many similar characteristics to capital taxes (for example, inheritance and gift taxes) perhaps they should be given a parallel treatment to capital gains and excluded from the measurement of the saving ratio (**Figure 6**)? Consistent with this approach is the widely held belief that capital gains taxes are generally viewed as a subtraction from realised capital gains rather than income.

Capital gains and the distribution of corporate profits

The treatment of capital gains may become more relevant if companies increasingly use share repurchases as a way of distributing profits to shareholders. Instead of paying a dividend, a company may elect to buy its own equity at a premium and reward its shareholders with a capital gain. There is a clear tax incentive to do so as, for most shareholders, the rate of capital gains tax is lower than their marginal income tax rate.

Such a shift would exert a downward bias to the saving ratio.

Figure 6
The saving ratio and capital gains taxes

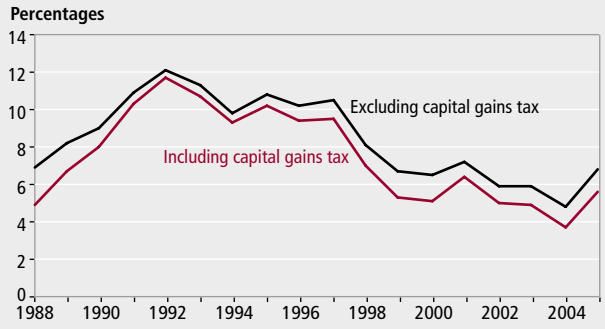
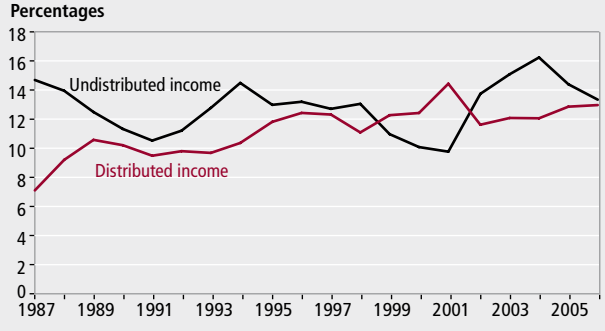


Figure 7
Distributed and undistributed income of UK private sector companies



Dividend payments are included as property income in the calculation of available household resources, but capital gains are excluded. This is considered a big issue in the US and an important driver of the recent decline in the saving ratio.

National Accounts tend to view share repurchases as a return of capital (so not part of household income), whereas a dividend payment is viewed as payment out of ongoing corporate income and is included. However, the difference can be arbitrary: for example, the special $35 billion dividend paid by Microsoft in 2004 was widely perceived as a return of capital. A further confusion is that not all share repurchases may be a substitute for dividend payments. For example, share repurchases could be funded by an increase in debt as part of corporate balance sheet restructuring.

In the UK, the undistributed income of private sector firms has been as large as distributed income. This can be viewed as the gross disposable income of firms, that is, the resources available to fund investment, or to fund share repurchases (**Figure 7**). There is little evidence that UK households have received large amounts of cash from corporations that have not been included in income. Given the apparent ease for firms to substitute between distributed and undistributed income and recent trends in the US, however, it may suggest a broader view of the saving ratio is appropriate where corporate undistributed income is added to household saving (see the section 'National saving').

Durable goods

Durable goods are typically defined as those having a lifespan of at least three years. Purchasing a durable good can thus be seen as a form of saving because at least part of the expenditure is an investment decision designed to yield a flow of future consumption services.

Durables could be considered as a form of private gross investment and treated in the National Accounts in a similar way to housing. The treatment of homeowners is designed to make GDP invariant to changes in the proportion of owner-occupied housing. Homeowners are treated as landlords in the business sector who produce housing services that they consume in the personal sector. Imputed rents are recorded in consumption expenditure and net rental income is included in personal income. Using the methodology described in Herman *et al* (2003) and applying the depreciation rates calculated in Fraumeni (1997), capital stocks of durable goods and the annual flow of consumption services consumed by households can be calculated.

The current National Accounts approach sees household available resources (R_t) divided between durable consumption (D_t) , non-durable consumption (including services) (ND_t) and saving (S_t).

$$R_t = D_t + ND_t + S_t$$

Hence the saving ratio is S_t / R_t. Capitalising durable goods means that the consumption of durable services (DS_t) enters both sides of the use of disposable income account.

$$R_t + DS_t = D_t + ND_t + S_t + DS_t$$

Now household resources are augmented by the flow of services from the stock of durables it holds, and are divided between consumption (the purchases of non-durables and services, and durable services)

and total saving which now also includes investments in durable goods. Hence the new (gross) saving rate is $(S_t + D_t)/(R_t + DS_t)$. Although spending on durables and the consumption of durable services would be expected to be similar, the saving ratio will likely rise as the numerator rises by a higher proportion than the denominator. Because the share of durables in total consumer expenditure has been fairly constant over the last two decades and no change in depreciation rates is assumed, the overall effect on the saving ratio is on levels rather than trends (**Figure 8**).

The present exclusion of durables in saving is tied to the National Accounts production boundary. It is argued that counting a flow of capital services from the accumulated stock of durables into the household production of consumption services would leave this boundary misaligned with respect to other inputs, notably labour. After all, the services of an oven cannot be considered without the services of a cook. As a result, this treatment of services would require a full set of household accounts measuring own-account production. Moulton (2001), however, makes an interesting suggestion, drawing on the analogous treatment of valuables in the National Accounts, that durables could be treated as assets included in saving and wealth even though not primarily used for production. Instead, consumer durables are consumed over time as if they were from an inventory; no production is required.

Defined benefit pensions schemes

It is assumed in the National Accounts that the reserves of privately funded pension schemes are owned by the household sector which has a claim on the funds. In the secondary distribution of income, the pension contributions to, and pension benefits paid by, the private funded schemes are included as transfers. Therefore the balance of contributions less receipts would be included as part of the disposable income of pension schemes in the financial corporations sector, rather than the household sector. Thus, in order to ensure that saving is correctly attributed to households, it is necessary to make an adjustment to include the balance as a resource in the household income account. This is the 'adjustment for change in net equity of pension funds' referred to earlier.

While this treatment may be consistent for defined contribution (DC) schemes, it is less clearly appropriate for defined benefit (DB) schemes. Under DC schemes, the pension benefits are accrued from employee and employer contributions to a fund and investment returns on that fund. Therefore, employees own the assets and bear the investment risks. In DB schemes, employees are not entitled to all the funds in the scheme, but simply benefits calculated according to some rule based on a function of salary and years of service. Employers make the investment decisions and bear the risks. Households do not have complete command over the resources of the fund, but contributions and investment income are nonetheless included as personal income.

Falling asset returns and longer life expectancy assumptions have combined to move many DB pension schemes into deficit, where the assets of the fund are insufficient to cover the actuarially calculated value of future liabilities. New regulations on pension funding do not allow these deficits to persist, forcing employer sponsors of DB schemes to take action. This has resulted in a wave of closures to new and, increasingly, existing membership to DB schemes, but has also required greater firm contributions to funds. This is clearly seen in **Figure 9,** where employer contributions as a proportion of household resources have been rising sharply since 2001. Given that these contributions form part of household available resources, they have acted to underpin the saving ratio at a time when it was already low.

Although there are some questions about whether households can lay claim to the resources in DB schemes, there are also strong reasons why fund assets should be seen as the property of the household sector. Regulations prevent companies from accessing the resources of DB schemes for their own use, and are designed to keep assets close to the actuarially calculated estimates of liabilities (that is, discourage positions of large surpluses or deficits in schemes which might create ownership conflicts between the household and corporate sectors).

Inflation

Should the saving ratio equation be defined in real or nominal terms? Saving rates are calculated in nominal terms and, to the extent that inflation scales up both income and expenditure, it has a limited effect on the measure. However, because nominal interest rates tend to be adjusted for inflation (so as to protect a real rate of interest), the interest income and outlays that constitute part of the net property income of households will be affected.

If the value of interest-bearing assets exceeds the value of liabilities in the household sector, an increase in nominal interest rates will raise measured saving, even though purchasing power of households is left unchanged. Therefore, periods of high inflation would be associated with an upward shift in the saving rate holding everything else equal.

Figure 8
Saving ratio treating expenditure on durables as investment/saving

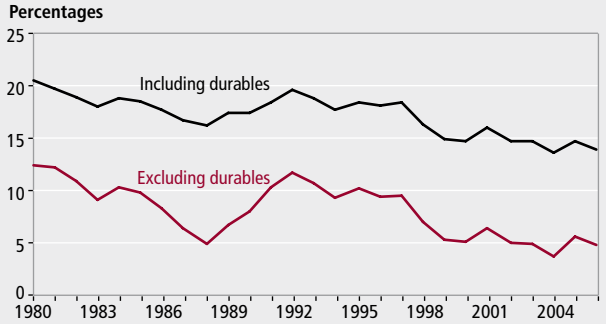


Figure 9
The impact of employer contributions to pension schemes

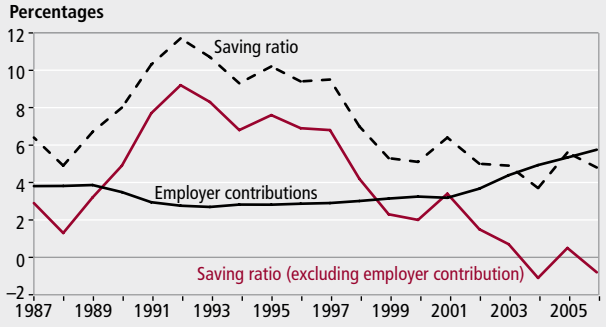


Figure 10
Saving ratio and the effect of inflation

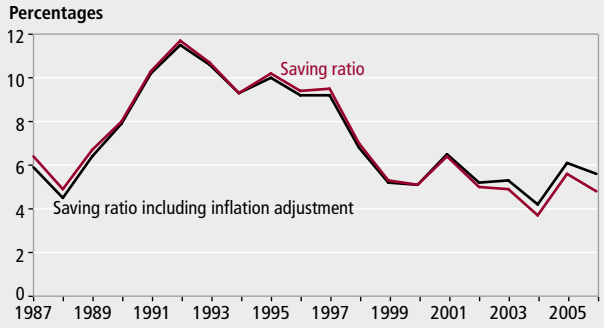
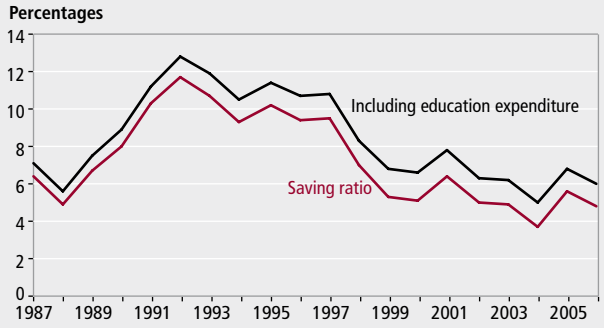


Figure 11
Treating household spending on education as investment in human capital



Conversely, if the household sector was a net borrower of interest-bearing financial assets, periods of high inflation would be associated with greater net interest outlays, falling net property income and a lower saving rate.

The inflation effect can be estimated by multiplying inflation by the average net holdings of interest-bearing financial assets, including those held on behalf of households by pension and insurance funds. The impact on the UK saving ratio is fairly minimal, largely because net holdings of interest-bearing financial assets and liabilities are small and inflation rates have been modest over much of the period (**Figure 10**). However, it is noticeable that inflation is exerting a downward influence on the measured saving ratio in recent years. This is largely because the household sector has become an increasing net borrower of interest-bearing assets, a trend driven by house price inflation which subsequently requires larger mortgages to fund house purchases.

Education

Household spending on education is treated as current expenditure even though it arguably increases the stock of human capital, so could be viewed as investment. Recategorising education in this way would raise the saving ratio (**Figure 11**). More discussion on intangibles investment can be found in the next section.

National saving

There are two reasons why the national, rather than the household, saving rate might be a more appropriate measure of saving trends in the economy. First, the boundary between household, government and business saving can be difficult to ascertain. This has been seen with the treatment of pension fund contributions and undistributed corporate profits. Second, in some sense, both corporations and government belong to households, so their saving may be analogous to the household doing the saving themselves. Saving by sector and the national saving ratio are plotted in **Figure 12** and **Figure 13**, respectively.

If the UK Government is committed to its fiscal rules and balancing the current budget over the economic cycle, it suggests that, in the medium to long term, its impact on saving will be neutral. Therefore, the private sector will have to live with its own saving decisions. It is evident in recent years that low household saving has been offset by high corporate saving. Therefore the national saving rate does not exhibit the same downward trend as the household saving rate.

It is also a consideration that current saving levels of private corporations may be underestimated in the National Accounts. Work by Giorgio Marrano *et al* (2007) argues that firm investment is increasing in intangible assets such as software, research and development, training, marketing and organisational capital but, despite these having asset properties, the System of National Accounts continues to treat most of them as current rather than capital expenditure (though not software). Reclassifying spending on intangibles as investment would raise corporate profits and saving, and accordingly the national saving ratio.

Concluding comments: explaining trends in the UK saving ratio

In this final section, some of the economic arguments accounting for the fall in the household saving ratio after 1997 are briefly mentioned.

Permanent income hypothesis

Simple maths implies that the saving ratio has declined because consumption growth has outstripped growth in disposable income. According to the permanent income hypothesis, where consumption plans are based on a longer-term view of income, this is an optimal response if households have stronger expectations about future disposable income and asset returns or view them as being less uncertain/risky. Macroeconomic stability has improved, which has enhanced the confidence households have in calculating future income.

Wealth effects

Household net worth has grown strongly in recent years, and adapting the saving ratio to include capital gains gives a very different picture. Most econometric studies find the propensity to consume out of wealth is low, so it is not apparent that growing wealth is being used to support consumption. However, the wealth effects generated, mainly by house price inflation, may act to reduce precautionary saving by raising the ratio of non-human to human wealth. Gains in housing wealth may also be viewed as more permanent than those stemming from equities.

Demographics

According to the life cycle hypothesis, a lower savings rate is a natural symptom of an ageing population, that is, old people dissave to fund retirement. Arguably though, ageing happens too slowly to fully account for the recent downward swing in the saving ratio.

Figure 12
Saving by sector

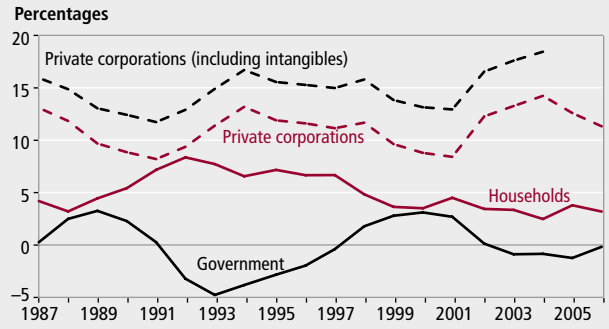


Figure 13
Household and national saving ratios

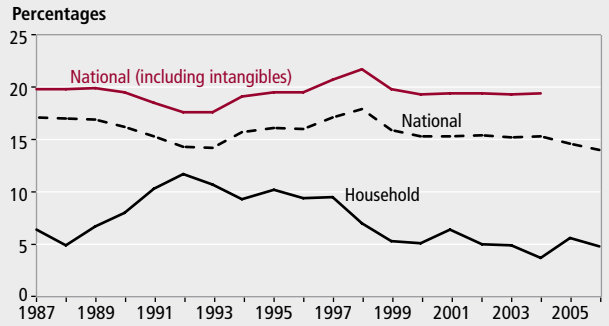
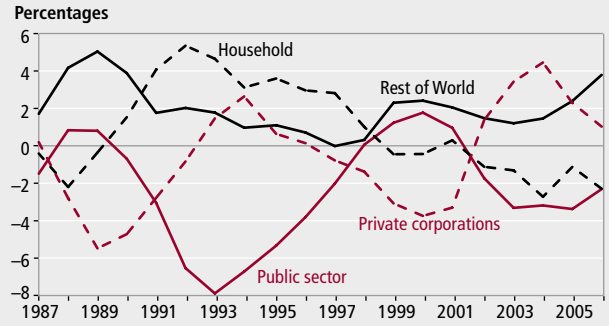


Figure 14
Net lending/borrowing by sector



Ricardian equivalence

Economic theory argues that forward-looking households adjust saving behaviour to cover their expected liabilities from the public finances. The implementation of the golden rule states that the Government intends to run a balanced budget over the economic cycle, reversing years of average deficits. As a result, expected future taxes would be lower and hence the need to save would fall.

Windfall payments

Nearly £37 billion was paid out by demutualising building societies and insurance companies to around 15 million households in 1997. These, under National Accounts conventions, increased measured wealth but no measured saving. Sales of shares, though, are likely to have supported funds for household consumption and driven the saving ratio down in 1997 and 1998.

Global saving

Figure 14 plots net lending/borrowing for each sector in the UK and from the rest of the world (RoW). These flows should add up to zero by definition. Here, it is clear that the net borrowing positions of the household and public sectors are offset by net lending from private corporations and increasingly from RoW.

This suggests that maintaining the low UK saving ratio will require greater dependence on borrowing from the rest of the world by running continued current account deficits. If the current account deficit becomes unsustainable, it would require a retrenchment in domestic spending, most likely in consumption. However, due to a global glut in saving from oil-producing countries, and emerging markets where high saving rates combined with poorly developed financial institutions mean that savings are exported, current account deficits have been fairly easy to sustain. A reversal of these large global capital flows, though, could inevitably put upward pressure on the UK saving ratio.

CONTACT

elmr@ons.gsi.gov.uk

REFERENCES

Doss T (2003) 'Alternative measures of income and saving', Australian Bureau of Statistics mimeo.

Fraumeni B (1997) 'The measurement of depreciation in the U.S. National Income and Product Accounts', Bureau of Economic Analysis, Survey of Current Business, July.

Garner C (2006) 'Should the decline in the personal saving rate be a cause fro concern?', Federal Reserve Bank of Kansas City, Economic Review, Q2.

Giorgio Marrano M, Haskel J, and Wallis G (2007) 'What happened to the knowledge economy? ICT, intangible investment and Britain's productivity record revisited', Department of Economics working paper series no. 603, Queen Mary University of London.

Guidolin M and Jeunesse E (2007) 'The decline in the U.S. personal saving rate: Is it real and is it a puzzle?', Federal Reserve Bank of St. Louis Review, November/December.

Herman S, Katz A, Loebach L and McCulla S (2003) 'Fixed assets and consumer durable goods in the United States, 1925-97', Bureau of Economic Analysis mimeo.

Hicks J (1965) 'Capital and Growth', Oxford.

Moulton B (2001) 'Issues in measuring household net saving and wealth', OECD meeting of National Accounts experts, 9–12 October, Paris.

Nakamura L and Stark T (2005) 'Benchmark revisions and the U.S. personal savings rate', Federal Reserve Bank of Philadelphia working paper No. 05–6, April.

Perozek M and Reinsdorf M (2002) 'Alternative measures of personal saving', Bureau of Economic Analysis, Survey of Current Business, April.

Reinsdorf M (2007) 'Alternative measures of personal saving', Bureau of Economic Analysis, Survey of Current Business, February.

Sentence A (2007) 'The changing pattern of savings: implications for growth and inflation', Royal Bank of Scotland/Scottish Economics Society Lecture, 15 March.

Steindel C (2007) 'How worrisome is a negative saving rate?', Federal Reserve Bank of New York, Volume 13, No. 4, May.

Whitaker S (2007) 'National saving', Bank of England Quarterly Bulletin, spring.

Key time series

National accounts aggregates

Last updated: 27/02/08

Seasonally adjusted

	£ million		Indices (2003 = 100)						
	At current prices		Value indices at current prices		Chained volume indices			Implied deflators[3]	
	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[2]	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
2002	1,055,793	937,323	94.4	94.3	97.1	97.3	97.3	97.0	97.0
2003	1,118,245	993,507	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2004	1,184,296	1,051,934	105.9	105.9	103.4	103.3	103.3	102.6	102.5
2005	1,233,976	1,096,629	110.3	110.4	104.2	105.2	105.2	104.9	104.9
2006	1,303,573	1,158,871	116.6	116.6	105.8	108.2	108.3	107.7	107.7
2007	1,385,122	1,231,778	123.9	124.0		111.6	111.7	111.0	111.0
2002 Q1	259,054	229,737	92.7	92.5	95.9	96.4	96.5	96.1	95.9
2002 Q2	262,774	233,372	94.0	94.0	96.2	97.0	96.9	96.9	97.0
2002 Q3	265,836	236,103	95.1	95.1	98.3	97.7	97.6	97.4	97.4
2002 Q4	268,129	238,111	95.9	95.9	98.2	98.2	98.1	97.7	97.7
2003 Q1	272,953	242,612	97.6	97.7	99.4	98.8	98.8	98.9	98.9
2003 Q2	277,119	246,427	99.1	99.2	98.9	99.3	99.3	99.8	99.9
2003 Q3	281,996	250,492	100.9	100.9	100.0	100.4	100.4	100.4	100.5
2003 Q4	286,177	253,976	102.4	102.3	101.7	101.5	101.6	100.9	100.7
2004 Q1	288,912	256,106	103.3	103.1	101.9	102.2	102.2	101.1	100.9
2004 Q2	295,066	262,094	105.5	105.5	103.2	103.1	103.2	102.3	102.3
2004 Q3	297,941	264,732	106.6	106.6	103.0	103.5	103.5	102.9	103.0
2004 Q4	302,377	269,002	108.2	108.3	105.4	104.1	104.2	103.9	104.0
2005 Q1	303,996	270,082	108.7	108.7	104.2	104.4	104.4	104.2	104.1
2005 Q2	307,306	273,158	109.9	110.0	105.3	104.8	104.9	104.9	104.8
2005 Q3	308,515	273,676	110.4	110.2	103.4	105.4	105.4	104.7	104.5
2005 Q4	314,159	279,713	112.4	112.6	104.1	106.1	106.2	106.0	106.1
2006 Q1	318,656	283,557	114.0	114.2	104.7	107.0	107.2	106.5	106.5
2006 Q2	322,143	286,232	115.2	115.2	105.9	107.8	108.0	106.9	106.7
2006 Q3	329,052	292,438	117.7	117.7	106.1	108.5	108.6	108.5	108.4
2006 Q4	333,722	296,644	119.4	119.4	106.3	109.5	109.6	109.0	109.0
2007 Q1	337,893	299,850	120.9	120.7	106.8	110.4	110.5	109.5	109.3
2007 Q2	344,683	306,496	123.3	123.4	108.5	111.2	111.3	110.8	110.8
2007 Q3	349,685	311,212	125.1	125.3	108.1	112.1	112.1	111.6	111.8
2007 Q4	352,861	314,220	126.2	126.5		112.7	112.7	112.0	112.2
Percentage change, quarter on corresponding quarter of previous year[4]									
2002 Q1	*4.5*	*4.6*	*4.5*	*4.6*	*3.0*	*1.6*	*1.3*	*2.8*	*3.5*
2002 Q2	*5.3*	*5.6*	*5.3*	*5.7*	*3.0*	*2.1*	*1.7*	*3.1*	*4.0*
2002 Q3	*5.9*	*6.1*	*5.9*	*6.1*	*4.1*	*2.2*	*1.9*	*3.6*	*4.1*
2002 Q4	*5.2*	*5.3*	*5.3*	*5.4*	*4.4*	*2.4*	*2.2*	*2.8*	*3.0*
2003 Q1	*5.4*	*5.6*	*5.3*	*5.6*	*3.6*	*2.5*	*2.4*	*2.9*	*3.1*
2003 Q2	*5.5*	*5.6*	*5.4*	*5.5*	*2.8*	*2.4*	*2.5*	*3.0*	*3.0*
2003 Q3	*6.1*	*6.1*	*6.1*	*6.1*	*1.7*	*2.8*	*2.9*	*3.1*	*3.2*
2003 Q4	*6.7*	*6.7*	*6.8*	*6.7*	*3.6*	*3.4*	*3.6*	*3.3*	*3.1*
2004 Q1	*5.8*	*5.6*	*5.8*	*5.5*	*2.5*	*3.4*	*3.4*	*2.2*	*2.0*
2004 Q2	*6.5*	*6.4*	*6.5*	*6.4*	*4.3*	*3.8*	*3.9*	*2.5*	*2.4*
2004 Q3	*5.7*	*5.7*	*5.6*	*5.6*	*3.0*	*3.1*	*3.1*	*2.5*	*2.5*
2004 Q4	*5.7*	*5.9*	*5.7*	*5.9*	*3.6*	*2.6*	*2.6*	*3.0*	*3.3*
2005 Q1	*5.2*	*5.5*	*5.2*	*5.4*	*2.3*	*2.2*	*2.2*	*3.1*	*3.2*
2005 Q2	*4.1*	*4.2*	*4.2*	*4.3*	*2.0*	*1.6*	*1.6*	*2.5*	*2.4*
2005 Q3	*3.5*	*3.4*	*3.6*	*3.4*	*0.4*	*1.8*	*1.8*	*1.7*	*1.5*
2005 Q4	*3.9*	*4.0*	*3.9*	*4.0*	*–1.2*	*1.9*	*1.9*	*2.0*	*2.0*
2006 Q1	*4.8*	*5.0*	*4.9*	*5.1*	*0.5*	*2.5*	*2.7*	*2.2*	*2.3*
2006 Q2	*4.8*	*4.8*	*4.8*	*4.7*	*0.6*	*2.9*	*3.0*	*1.9*	*1.8*
2006 Q3	*6.7*	*6.9*	*6.6*	*6.8*	*2.6*	*2.9*	*3.0*	*3.6*	*3.7*
2006 Q4	*6.2*	*6.1*	*6.2*	*6.0*	*2.1*	*3.2*	*3.2*	*2.8*	*2.7*
2007 Q1	*6.0*	*5.7*	*6.1*	*5.7*	*2.0*	*3.2*	*3.1*	*2.8*	*2.6*
2007 Q2	*7.0*	*7.1*	*7.0*	*7.1*	*2.5*	*3.2*	*3.1*	*3.6*	*3.8*
2007 Q3	*6.3*	*6.4*	*6.3*	*6.5*	*1.9*	*3.3*	*3.2*	*2.9*	*3.1*
2007 Q4	*5.7*	*5.9*	*5.7*	*5.9*		*2.9*	*2.8*	*2.8*	*2.9*

Notes:

Source: Office for National Statistics

1 "Money GDP".
2 This series is only updated once a quarter, in line with the full quarterly national accounts data set.
3 Based on chained volume measures and current price estimates of expenditure components of GDP.
4 For index number series, these are derived from the rounded figures shown in the table.

Gross domestic product: by category of expenditure

Last updated: 27/02/08

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

	Domestic expenditure on goods and services at 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
2002	676,833	27,130	224,868	184,701	2,289	183	1,116,239	280,593	1,396,862	308,706	0	1,088,108
2003	697,160	27,185	232,699	186,700	3,983	–37	1,147,690	285,397	1,433,087	314,842	0	1,118,245
2004	721,434	27,327	240,129	197,655	4,597	-42	1,191,099	299,289	1,490,388	335,703	0	1,154,685
2005	732,005	28,167	246,527	200,654	3,611	–354	1,210,610	323,749	1,534,359	359,626	1,183	1,175,916
2006	746,097	29,868	251,134	216,465	1,236	290	1,245,090	359,413	1,604,503	395,626	1,246	1,210,122
2007	769,383	30,976	255,848	227,352	6,492	525	1,290,580	339,849	1,630,429	382,900	345	1,247,874
2002 Q1	167,588	6,762	55,756	44,562	1,059	66	275,814	69,440	345,256	75,709	0	269,595
2002 Q2	168,803	6,756	56,288	45,610	409	48	277,926	71,533	349,504	78,367	0	271,044
2002 Q3	169,715	6,793	56,429	46,422	520	62	280,004	71,056	351,089	78,006	0	273,034
2002 Q4	170,727	6,819	56,395	48,107	301	7	282,495	68,564	351,013	76,624	0	274,435
2003 Q1	171,828	6,843	57,099	46,805	–477	–8	282,249	72,662	354,921	78,836	0	276,082
2003 Q2	174,146	6,779	57,684	46,131	–635	94	284,342	70,610	354,945	77,283	0	277,686
2003 Q3	175,140	6,790	58,445	45,964	2,223	–68	288,498	70,334	358,825	78,089	0	280,743
2003 Q4	176,046	6,773	59,471	47,800	2,872	–55	292,601	71,791	364,396	80,634	0	283,734
2004 Q1	178,197	6,830	59,969	49,353	–439	112	294,023	73,389	367,412	81,648	0	285,764
2004 Q2	180,362	6,805	59,530	49,159	1,042	–90	296,808	74,861	371,670	83,313	0	288,357
2004 Q3	181,032	6,826	60,002	49,832	1,047	–96	298,644	75,097	373,741	84,300	0	289,441
2004 Q4	181,843	6,866	60,628	49,311	2,947	32	301,624	75,942	377,565	86,442	0	291,123
2005 Q1	182,466	7,005	60,858	49,393	1,894	–158	301,458	75,952	377,410	85,898	253	291,764
2005 Q2	182,306	6,987	61,613	49,334	797	86	301,122	79,576	380,698	87,920	300	293,078
2005 Q3	183,174	7,042	61,885	50,642	853	–201	303,394	82,357	385,751	91,483	320	294,588
2005 Q4	184,059	7,133	62,171	51,285	67	–81	304,636	85,864	390,500	94,325	310	296,486
2006 Q1	184,076	7,355	62,842	52,200	483	101	307,056	93,877	400,933	102,099	377	299,211
2006 Q2	186,465	7,436	62,502	53,184	76	229	309,892	96,051	405,943	104,855	351	301,439
2006 Q3	186,828	7,509	62,718	54,636	1,037	–28	312,700	84,680	397,379	94,387	298	303,290
2006 Q4	188,728	7,568	63,072	56,445	–360	–12	315,442	84,805	400,248	94,285	220	306,182
2007 Q1	190,349	7,635	63,691	56,880	–9	67	318,613	84,288	402,901	94,513	136	308,524
2007 Q2	191,715	7,712	63,733	56,293	651	321	320,425	84,534	404,960	94,067	94	310,987
2007 Q3	193,491	7,774	63,938	57,244	2,737	48	325,232	85,733	410,966	97,730	65	313,301
2007 Q4	193,828	7,855	64,486	56,935	3,116	89	326,310	85,294	411,602	96,590	50	315,062
Percentage change, quarter on corresponding quarter of previous year												
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*	*1.6*			*2.9*	*3.2*	*3.0*	*6.0*		*2.1*
2002 Q3	*3.3*	*0.5*	*3.3*	*3.1*			*2.8*	*4.6*	*3.2*	*6.4*		*2.2*
2002 Q4	*3.1*	*1.3*	*2.1*	*9.0*			*3.8*	*–0.8*	*2.8*	*4.5*		*2.3*
2003 Q1	*2.5*	*1.2*	*2.4*	*5.0*			*2.3*	*4.6*	*2.8*	*4.1*		*2.4*
2003 Q2	*3.2*	*0.3*	*2.5*	*1.1*			*2.3*	*–1.3*	*1.6*	*–1.4*		*2.5*
2003 Q3	*3.2*	*0.0*	*3.6*	*–1.0*			*3.0*	*–1.0*	*2.2*	*0.1*		*2.8*
2003 Q4	*3.1*	*–0.7*	*5.5*	*–0.6*			*3.6*	*4.7*	*3.8*	*5.2*		*3.4*
2004 Q1	*3.7*	*–0.2*	*5.0*	*5.4*			*4.2*	*1.0*	*3.5*	*3.6*		*3.5*
2004 Q2	*3.6*	*0.4*	*3.2*	*6.6*			*4.4*	*6.0*	*4.7*	*7.8*		*3.8*
2004 Q3	*3.4*	*0.5*	*2.7*	*8.4*			*3.5*	*6.8*	*4.2*	*8.0*		*3.1*
2004 Q4	*3.3*	*1.4*	*1.9*	*3.2*			*3.1*	*5.8*	*3.6*	*7.2*		*2.6*
2005 Q1	*2.4*	*2.6*	*1.5*	*0.1*			*2.5*	*3.5*	*2.7*	*5.2*		*2.1*
2005 Q2	*1.1*	*2.7*	*3.5*	*0.4*			*1.5*	*6.3*	*2.4*	*5.5*		*1.6*
2005 Q3	*1.2*	*3.2*	*3.1*	*1.6*			*1.6*	*9.7*	*3.2*	*8.5*		*1.8*
2005 Q4	*1.2*	*3.9*	*2.5*	*4.0*			*1.0*	*13.1*	*3.4*	*9.1*		*1.8*
2006 Q1	*0.9*	*5.0*	*3.3*	*5.7*			*1.9*	*23.6*	*6.2*	*18.9*		*2.6*
2006 Q2	*2.3*	*6.4*	*1.4*	*7.8*			*2.9*	*20.7*	*6.6*	*19.3*		*2.9*
2006 Q3	*2.0*	*6.6*	*1.3*	*7.9*			*3.1*	*2.8*	*3.0*	*3.2*		*3.0*
2006 Q4	*2.5*	*6.1*	*1.4*	*10.1*			*3.5*	*–1.2*	*2.5*	*0.0*		*3.3*
2007 Q1	*3.4*	*3.8*	*1.4*	*9.0*			*3.8*	*–10.2*	*0.5*	*–7.4*		*3.1*
2007 Q2	*2.8*	*3.7*	*2.0*	*5.8*			*3.4*	*–12.0*	*–0.2*	*–10.3*		*3.2*
2007 Q3	*3.6*	*3.5*	*1.9*	*4.8*			*4.0*	*1.2*	*3.4*	*3.5*		*3.3*
2007 Q4	*2.7*	*3.8*	*2.2*	*0.9*			*3.4*	*0.6*	*2.8*	*2.4*		*2.9*

Notes:

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

Source: Office for National Statistics

Labour market summary

Last updated: 13/02/08

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
Oct–Dec 2005	47,990	30,359	28,803	1,557	17,630	*63.3*	*60.0*	*5.1*	*36.7*
Oct–Dec 2006	48,386	30,793	29,102	1,692	17,593	*63.6*	*60.1*	*5.5*	*36.4*
Jan–Mar 2007	48,488	30,759	29,053	1,705	17,729	*63.4*	*59.9*	*5.5*	*36.6*
Apr–Jun 2007	48,590	30,814	29,153	1,661	17,776	*63.4*	*60.0*	*5.4*	*36.6*
Jul–Sep 2007	48,694	30,890	29,223	1,667	17,804	*63.4*	*60.0*	*5.4*	*36.6*
Oct–Dec 2007	48,803	31,004	29,398	1,606	17,799	*63.5*	*60.2*	*5.2*	*36.5*
Male	MGSM	MGSG	MGSA	MGSD	MGSJ	MGWH	MGSS	MGSY	YBTD
Oct–Dec 2005	23,281	16,467	15,549	918	6,814	*70.7*	*66.8*	*5.6*	*29.3*
Oct–Dec 2006	23,504	16,675	15,708	967	6,829	*70.9*	*66.8*	*5.8*	*29.1*
Jan–Mar 2007	23,561	16,692	15,716	976	6,870	*70.8*	*66.7*	*5.8*	*29.2*
Apr–Jun 2007	23,618	16,735	15,785	951	6,883	*70.9*	*66.8*	*5.7*	*29.1*
Jul–Sep 2007	23,676	16,753	15,803	950	6,924	*70.8*	*66.7*	*5.7*	*29.2*
Oct–Dec 2007	23,735	16,787	15,875	912	6,948	*70.7*	*66.9*	*5.4*	*29.3*
Female	MGSN	MGSH	MGSB	MGSE	MGSK	MGWI	MGST	MGSZ	YBTE
Oct–Dec 2005	24,709	13,892	13,254	639	10,817	*56.2*	*53.6*	*4.6*	*43.8*
Oct–Dec 2006	24,882	14,118	13,394	724	10,764	*56.7*	*53.8*	*5.1*	*43.3*
Jan–Mar 2007	24,927	14,067	13,337	730	10,860	*56.4*	*53.5*	*5.2*	*43.6*
Apr–Jun 2007	24,972	14,079	13,369	710	10,893	*56.4*	*53.5*	*5.0*	*43.6*
Jul–Sep 2007	25,018	14,137	13,420	717	10,881	*56.5*	*53.6*	*5.1*	*43.5*
Oct–Dec 2007	25,068	14,216	13,523	694	10,851	*56.7*	*53.9*	*4.9*	*43.3*

	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
Oct–Dec 2005	37,177	29,221	27,686	1,535	7,955	*78.6*	*74.5*	*5.3*	*21.4*
Oct–Dec 2006	37,436	29,568	27,899	1,670	7,867	*79.0*	*74.5*	*5.6*	*21.0*
Jan–Mar 2007	37,488	29,533	27,851	1,681	7,955	*78.8*	*74.3*	*5.7*	*21.2*
Apr–Jun 2007	37,540	29,574	27,942	1,632	7,965	*78.8*	*74.4*	*5.5*	*21.2*
Jul–Sep 2007	37,591	29,618	27,976	1,642	7,973	*78.8*	*74.4*	*5.5*	*21.2*
Oct–Dec 2007	37,641	29,722	28,134	1,588	7,919	*79.0*	*74.7*	*5.3*	*21.0*
Male	YBTG	YBSL	YBSF	YBSI	YBSO	MGSP	MGSV	YBTJ	YBTM
Oct–Dec 2005	19,252	16,076	15,168	907	3,176	*83.5*	*78.8*	*5.6*	*16.5*
Oct–Dec 2006	19,432	16,269	15,308	961	3,163	*83.7*	*78.8*	*5.9*	*16.3*
Jan–Mar 2007	19,476	16,282	15,316	966	3,194	*83.6*	*78.6*	*5.9*	*16.4*
Apr–Jun 2007	19,520	16,319	15,381	937	3,201	*83.6*	*78.8*	*5.7*	*16.4*
Jul–Sep 2007	19,561	16,320	15,379	941	3,241	*83.4*	*78.6*	*5.8*	*16.6*
Oct–Dec 2007	19,596	16,367	15,461	906	3,229	*83.5*	*78.9*	*5.5*	*16.5*
Female	YBTH	YBSM	YBSG	YBSJ	YBSP	MGSQ	MGSW	YBTK	YBTN
Oct–Dec 2005	17,925	13,146	12,518	628	4,779	*73.3*	*69.8*	*4.8*	*26.7*
Oct–Dec 2006	18,004	13,300	12,591	709	4,704	*73.9*	*69.9*	*5.3*	*26.1*
Jan–Mar 2007	18,012	13,251	12,535	716	4,761	*73.6*	*69.6*	*5.4*	*26.4*
Apr–Jun 2007	18,020	13,256	12,561	695	4,764	*73.6*	*69.7*	*5.2*	*26.4*
Jul–Sep 2007	18,030	13,298	12,597	701	4,732	*73.8*	*69.9*	*5.3*	*26.2*
Oct–Dec 2007	18,045	13,355	12,674	681	4,690	*74.0*	*70.2*	*5.1*	*26.0*

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.

Source: Labour Force Survey, Office for National Statistics
Labour Market Statistics Helpline: 01633 456901

Prices

Last updated: 12/02/08

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]
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	–0.8	–0.4
2004 Mar	1.1	1.1	1.0	2.6	2.1	1.7	1.4	1.5	0.8	–0.1
2004 Apr	1.1	1.1	1.0	2.5	2.0	1.8	1.8	1.3	2.9	–0.1
2004 May	1.5	1.4	1.3	2.8	2.3	2.2	2.5	1.4	5.6	0.6
2004 Jun	1.6	1.5	1.4	3.0	2.3	2.3	2.6	1.4	3.8	1.3
2004 Jul	1.4	1.4	1.2	3.0	2.2	2.0	2.6	1.7	3.9	1.8
2004 Aug	1.3	1.3	1.1	3.2	2.2	2.0	2.8	2.2	4.6	2.4
2004 Sep	1.1	1.0	0.9	3.1	1.9	1.7	3.1	2.3	8.1	3.6
2004 Oct	1.2	1.2	1.1	3.3	2.1	2.0	3.5	2.9	9.0	4.6
2004 Nov	1.5	1.4	1.4	3.4	2.2	2.2	3.5	3.0	6.4	4.5
2004 Dec	1.7	1.7	1.6	3.5	2.5	2.5	2.9	2.5	4.0	4.0
2005 Jan	1.6	1.7	1.5	3.2	2.1	2.0	2.6	2.6	9.7	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	10.1	7.0
2005 May	1.9	2.0	1.8	2.9	2.1	2.2	2.7	2.5	7.6	6.7
2005 Jun	2.0	2.2	1.9	2.9	2.2	2.2	2.5	2.2	11.8	7.4
2005 Jul	2.3	2.5	2.3	2.9	2.4	2.5	3.1	2.2	14.1	8.7
2005 Aug	2.4	2.6	2.3	2.8	2.3	2.3	3.0	1.9	13.0	7.6
2005 Sep	2.5	2.6	2.4	2.7	2.5	2.5	3.3	2.1	10.6	5.6
2005 Oct	2.3	2.5	2.3	2.5	2.4	2.3	2.6	1.4	8.8	7.0
2005 Nov	2.1	2.3	2.1	2.4	2.3	2.3	2.3	1.3	13.5	9.6
2005 Dec	1.9	2.1	1.8	2.2	2.0	2.0	2.4	1.8	17.9	12.0
2006 Jan	1.9	2.1	1.9	2.4	2.3	2.3	2.9	1.7	15.8	10.2
2006 Feb	2.0	2.1	2.0	2.4	2.3	2.3	2.9	1.7	15.0	10.6
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	2.2	15.3	10.0
2006 May	2.2	2.3	2.2	3.0	2.9	2.8	3.1	2.4	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	10.6	8.3
2006 Aug	2.5	2.6	2.4	3.4	3.3	3.4	2.7	2.3	8.0	7.9
2006 Sep	2.4	2.6	2.3	3.6	3.2	3.3	1.9	2.2	5.4	7.4
2006 Oct	2.4	2.7	2.3	3.7	3.2	3.3	1.6	2.6	4.6	6.3
2006 Nov	2.7	3.0	2.6	3.9	3.4	3.6	1.8	2.5	3.4	4.9
2006 Dec	3.0	3.2	2.9	4.4	3.8	3.9	2.2	2.4	2.1	3.0
2007 Jan	2.7	2.9	2.6	4.2	3.5	3.7	2.2	2.5	–2.8	1.5
2007 Feb	2.8	2.9	2.6	4.6	3.7	3.9	2.3	2.7	–1.1	1.4
2007 Mar	3.1	3.1	2.9	4.8	3.9	4.0	2.7	2.8	0.7	2.4
2007 Apr	2.8	2.9	2.6	4.5	3.6	3.7	2.4	2.4	–0.9	1.9
2007 May	2.5	2.6	2.3	4.3	3.3	3.4	2.4	2.2	1.2	3.6
2007 Jun	2.4	2.5	2.2	4.4	3.3	3.3	2.5	2.1	2.4	3.3
2007 Jul	1.9	2.0	1.7	3.8	2.7	2.6	2.5	2.2	0.6	1.5
2007 Aug	1.8	1.9	1.6	4.1	2.7	2.6	2.4	2.4	1.1	2.1
2007 Sep	1.8	1.7	1.6	3.9	2.8	2.8	2.9	2.3	7.5	3.7
2007 Oct	2.1	1.9	1.8	4.2	3.1	3.0	4.0	2.4	9.7	3.1
2007 Nov	2.1	1.9	1.8	4.3	3.2	3.0	4.7	2.4	11.3	2.5
2007 Dec	2.1	2.0	1.9	4.0	3.1	3.1	5.0	2.7	12.7	4.2
2008 Jan	2.2	2.1	2.0	4.1	3.4	3.3	5.7	3.2	18.9	7.1

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.

NOTES TO TABLES

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

The tables listed below are available as Excel spreadsheets via weblinks accessible from the main *Economic & Labour Market Review* (ELMR) page of the National Statistics website. Tables in sections 1, 3, 4 and 5 replace equivalent ones formerly published in *Economic Trends*, although there are one or two new tables here; others have been expanded to include, as appropriate, both unadjusted/seasonally adjusted, and current price/chained volume measure variants. Tables in sections 2 and 6 were formerly in *Labour Market Trends*. The opportunity has also been taken to extend the range of dates shown in many cases, as the online tables are not constrained by page size.

In the online tables, the four-character identification codes at the top of each data column correspond to the ONS reference for that series on our time series database. The latest data sets for the old *Economic Trends* tables and the Labour Market Statistics First Release tables are still available on this database via the 'Time Series Data' link on the National Statistics main web page. These data sets can also be accessed from links at the bottom of each section's table listings via the 'Data tables' link in the individual ELMR edition pages on the website.

Weblink: www.statistics.gov.uk/elmr/03_08/data_page.asp

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	.
1.18 Index of services	M	✔
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	✔

Weblink: www.statistics.gov.uk/elmr/03_08/data_page.asp

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	✔

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 (THIS TABLE IS NO LONGER BEING UPDATED)	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	M	✔
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	✔

Weblink: www.statistics.gov.uk/elmr/03_08/data_page.asp

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	✔
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
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
01633 456961
rpi@ons.gsi.gov.uk

Labour Market Statistics Helpline
01633 456901
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

Department for Children, Schools and Families Public Enquiry Unit
0870 000 2288

For statistical information on

Average Earnings Index (monthly)
01633 819024

Claimant count
01633 456901

Consumer Prices Index
01633 456900
cpi@ons.gsi.gov.uk

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
01633 456901
labour.market@ons.gsi.gov.uk

Economic activity and inactivity
01633 456901

Employment
Labour Force Survey
01633 456901
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
01633 456901
labour.market@ons.gsi.gov.uk

Labour Force Survey Data Service
01633 455732
lfs.dataservice@ons.gsi.gov.uk

New Deal
0114 209 8228

Productivity and unit wage costs
01633 812766

Public sector employment
General enquiries
01633 455889

Source and methodology enquiries
01633 812865

Qualifications (Department for Children, Schools and Families)
0870 000 2288

Redundancy statistics
01633 456901

Retail Prices Index
01633 456900
rpi@ons.gsi.gov.uk

Skills (Department for Innovation, Universities & Skills)
0870 001 0336
Skill needs surveys and research into skill shortages
0870 001 0336

Small firms (BERR)
Enterprise Directorate
0114 279 4439

Subregional estimates
01633 812038

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

Annual Population Survey, local area statistics
01633 455070

Trade unions (BERR)
Employment relations
020 7215 5934

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

Employer-provided training (Department for Innovation, Universities & Skills)
0870 001 0336

Travel-to-Work Areas
Composition and review
01329 813054

Unemployment
01633 456901

Vacancies
Vacancy Survey: total stocks of vacancies
01633 455070

ONS economic and labour market publications

ANNUAL

Financial Statistics Explanatory Handbook

2008 edition. Palgrave Macmillan, ISBN 0-230-52583-2. Price £47.50.

www.statistics.gov.uk/products/p4861.asp

Foreign Direct Investment (MA4)

2006 edition

www.statistics.gov.uk/products/p9614.asp

Input-Output analyses for the United Kingdom

2006 edition

www.statistics.gov.uk/products/p7640.asp

Research and development in UK businesses (MA14)

2006 edition

www.statistics.gov.uk/statbase/product.asp?vlnk=165

Share Ownership

2006 edition

www.statistics.gov.uk/products/p930.asp

United Kingdom Balance of Payments (Pink Book)

2007 edition. Palgrave Macmillan, ISBN 978-1-4039-9397-7. Price £49.50.

www.statistics.gov.uk/products/p1140.asp

United Kingdom National Accounts (Blue Book)

2007 edition. Palgrave Macmillan, ISBN 978-1-4039-9398-4. Price £49.50.

www.statistics.gov.uk/products/p1143.asp

First releases

- Annual survey of hours and earnings
- Foreign direct investment
- Gross domestic expenditure on research and development
- Low pay estimates
- Regional gross value added
- Share ownership
- UK Business enterprise research and development
- Work and worklessness among households

QUARTERLY

Consumer Trends

2007 quarter 3

www.statistics.gov.uk/products/p242.asp

United Kingdom Economic Accounts

2007 quarter 3. Palgrave Macmillan, ISBN 978-0-230-20565-9. Price £35.

www.statistics.gov.uk/products/p1904.asp

UK trade in goods analysed in terms of industry (MQ10)

2007 quarter 3

www.statistics.gov.uk/products/p731.asp

First releases

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

MONTHLY

Financial Statistics

March 2008. Palgrave Macmillan, ISBN 978-0-230-20569-1. Price £47.50.

www.statistics.gov.uk/products/p376.asp

Focus on Consumer Price Indices

January 2008

www.statistics.gov.uk/products/p867.asp

Monthly review of external trade statistics (MM24)

January 2008

www.statistics.gov.uk/products/p613.asp

Producer Price Indices (MM22)

January 2008

www.statistics.gov.uk/products/p2208.asp

First releases

- Consumer price Indices
- Index of production
- Index of services
- Labour market statistics
- Labour market statistics: regional
- Producer prices
- Public sector finances
- Retail sales
- UK trade

OTHER

The ONS Productivity Handbook: a statistical overview and guide

Palgrave Macmillan, ISBN 978-0-230-57301-7. Price £55.

www.statistics.gov.uk/about/data/guides/productivity/default.asp

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

SEPTEMBER 2007

Globalisation: what are the main statistical challenges?
Karen Dunnell, Fernando Galindo-Rueda and Richard Laux

New labour productivity measures from the ABI – 1998 to 2005
Peter Goodridge

Indicators to measure trade union membership, strikes and lockouts in the UK
Derek Bird

A preliminary analysis of the difference between AWE and the AEI
Harry Duff

Mapping trends in the care workforce using SOC 1990 and SOC 2000
Antonia Simon and Charlie Owen

Methods explained: data reduction and model selection techniques
Graeme Chamberlin

OCTOBER 2007

Using administrative data for statistical purposes
Stephen Penneck

The treatment of pensions in the National Accounts
Sumit Rahman

Measuring the quality of the producer price index
John Morris and Tegwen Green

GDP(O) revisions analysis system: overview and indicative results
Hilary Mainwaring and Hugh Skipper

The effects of bonuses on earnings growth in 2007
Harry Duff

Measuring societal wellbeing
Paul Allin

Services producer price index (experimental) – second quarter 2007
Ian Richardson

NOVEMBER 2007

UK environmental accounts: air emissions and energy use
Ian Gazley

Revisions to quarterly GDP growth and its components
Ross Meader

Civil Service employment statistics 2006
Donna Livesey, Craig Taylor and Pete Jones

Using the FRS to examine employment trends of couples
Antonia Simon and Elizabeth Whiting

Regional economic indicators, November 2007, with a focus on rural and urban differences in the English regions
Claire Swadkin, Barbara Louca and Dev Virdee

DECEMBER 2007

Developing an R&D satellite account for the UK: a preliminary analysis
Fernando Galindo-Rueda

New LFS questions on economic inactivity
Katherine Kent

Volume of capital services: estimates for 1950 to 2006
Gavin Wallis and Sumit Dey-Chowdhury

Quality-adjusted labour input: estimates for 1996 to 2006
Sumit Dey-Chowdhury and Peter Goodridge

Methods explained: forecasting
John Wood and Duncan Elliot

JANUARY 2008

Developments in measuring the UK service industries, 1990 to 2006
Keith Brook

Planned methodological changes to the Index of Production
Andrew Walton, Robin Youll and Chris Hunt

The Occupational Pension Schemes Survey 2006
Sarah Levy and David Miller

Multi-factor productivity: estimates for 1997 to 2006
Peter Goodridge

Labour Force Survey: interim reweighting 2007
Nicholas Palmer and Matthew Hughes

Services producer price index (experimental) – third quarter 2007
Ian Richardson

FEBRUARY 2008

Improvements to the measurement of government output in the National Accounts
Mark Pont

Patterns of pay: results of the Annual Survey of Hours and Earnings, 1997 to 2007
Hywel Daniels

The International Comparison Programme: 2005 results and supporting the programme
Ben Whitestone

Linking the Annual Survey of Hours and Earnings to the Census: a feasibility study
Jamie Jenkins

The revision of the 1993 System of National Accounts – what does it change?
Charles Aspden

Regional economic indicators, February 2008, with a focus on regional productivity
Sumit Dey-Chowdhury, David Penny, Birgit Wosnitza and Martin Walker

Future articles

List is provisional and subject to change.

APRIL 2008

The gender pay gap in the UK

International comparisons of labour disputes in 2006

Reconstructing the financial assets time series in the UK

CPI and RPI: the 2008 basket of goods and services

First findings from the UK Innovation Survey 2007