

Economic & Labour Market Review

August 2007 | Volume 1 | Number 8

Contents

REGULARS

In brief	3
Quality is the key to measuring public service productivity; Labour Force Survey methodology workshop in Vienna; Third international conference on Establishment Surveys; Royal Statistical Society conference 2007	
Updates and forthcoming releases	5
Economic review	6
Independent forecasts	15
Key indicators	16

FEATURES

Forecasting GDP using external data sources	18
<i>Graeme Chamberlin</i>	
Describes how principal components analysis can be used to construct an alternative estimate of GDP	
Measures of accuracy for the Index of Production	24
<i>Robin Youll, Neil Parkin and Chris Hunt</i>	
Sets out the results of recent work on the accuracy of IoP estimates, based on an analysis of sampling error	
Introduction of automatic occupation coding in ASHE	29
<i>James Scruton</i>	
Describes the adoption of automatic coding by text recognition into ASHE and the significant benefits that will ensue	
International comparisons of productivity: the current and constant PPP approach	33
<i>Sumit Dey-Chowdhury</i>	
Explains the differences between the two above approaches, outlining the context in which they should be used	
Measuring government output: issues for Children's Social Care Services	40
<i>Jean Soper, Lisa Holmes and Enliz D'souza</i>	
Presents research commissioned by the former DfES into finding direct output indicators for the above for the National Accounts	
Regional economic indicators, August 2007, with a focus on differences in sub-regional economic performance	47
<i>Claire Swadkin and David Hastings</i>	
Compiles information covering the nine English Government Office Regions, Northern Ireland, Scotland and Wales for the above	

DATA AND SUPPORT

Key time series	59
National accounts aggregates; Gross domestic product: by category of expenditure; Labour market summary; Prices	
Notes to tables; Concepts and definitions	
Directory of online tables	64
Contact points	67
ONS economic and labour market publications	68
Recent and future articles	69

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page 67.

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

In brief

Quality is the key to measuring public service productivity

On 3 July 2007, the Office for National Statistics UK Centre for the Measurement of Government Activity (ONS UKCeMGA) published a strategy for measuring quality as part of public service output.

This follows up the Atkinson Report (ONS, 2005) on measurement of public service output for the National Accounts, and ONS consultation on principles and techniques for including quality in output measures.

Measuring Quality as Part of Public Service Output – Strategy Following Consultation proposes a conceptual framework for measuring quality of public services, based on the extent to which the service:

- succeeds in delivering intended outcomes
- responds to user needs – the human factor in service delivery

The balance between these two should depend on evidence or assumptions that are clear to all.

The strategy for measuring quality-adjusted education output is to:

- refine the use of GCSE results
- work on approaches using Key Stage results to measure progress within school years
- work to take account of diplomas and A levels
- use research to measure quality of pre-school education
- measure how far education delivers outcomes in the Government programme 'Every Child Matters'

The strategy for measuring quality-adjusted healthcare output is:

- more weight on health gain than patient experience
- more work on measurement of health prevention as part of healthcare output
- need for systematic information on health gain from treatment

- more work to estimate the relative benefit to health from different treatments, although productivity articles will be based on the cost of treatments, not a mixture of costs and benefits, in line with the consultation

The strategy also proposes new work to measure welfare gained from public spending, including benefits for the market sector. This replaces the 'rise in earnings' adjustments in previously published education and healthcare productivity articles.

More information

www.statistics.gov.uk/cci/article.asp?id=1831

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Labour Force Survey methodology workshop in Vienna

The second Labour Force Survey (LFS) methodology workshop was held on 10–11 May 2007 and hosted by Statistics Austria in Vienna. The focus of the workshop was on data collection in the LFS, following the focus on survey design at the first LFS methodology workshop which was hosted by Statistics Netherlands in Heerlen in 2006. The workshops follow the statistical value chain in terms of their content, and the third workshop to be held in 2008 is to focus on LFS processing and associated issues. The workshops provide an opportunity for researchers, statisticians and methodologists working on the LFS to meet to discuss common problems, share best practice, and develop links, enabling dialogue to continue on LFS methodology issues between workshops.

Statistics Austria proved to be excellent hosts, providing a well-organised workshop in their impressive new building in Vienna, which was attended by 60 delegates from 30 countries and by Eurostat. The workshop contained plenary and parallel sessions, which covered topics such as strategies to improve response rates, best practice

in questionnaire design, cognitive testing and piloting, the use of mixed modes, proxy response effects and interviewer training. ONS, which is represented on the organising committee for the workshop series, sent three delegates, who delivered well-received presentations based on developments, evidence and experience from the LFS.

There was considerable interest in the cognitive testing and piloting which is carried out in the UK LFS, including the objectives of these processes, their strengths and limitations, and the way they complement each other to provide, together with post-implementation evaluation of new variables, an effective question-testing strategy. Also of considerable interest were the strategies used to improve or maintain response rates, which in some countries include up to 12 attempts at contact by interviewers, letters from the head of the national statistical institution to refusals to encourage refusal conversion, the use of weekly indicators of interviewer performance, and short postal surveys to non-responders to collect key labour market data. In summary, the workshop provided a valuable learning experience and work is already underway to organise the third workshop in the series which is to take place in spring 2008.

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Third international conference on Establishment Surveys

This major, international conference took place in Montreal, Canada on 18–21 June 2007. It followed on from the success of its predecessors in 1993 and 2000 and provided a rare opportunity for government statisticians from around the world to share experiences on the collection and analysis of data from businesses, farms, educational institutions, local and regional governments and other 'establishments'. Although the location of the conference meant that most of the 400 or so delegates

came from Canada and the US, participants also included delegates from many other countries worldwide, including the UK, with 11 delegates from ONS.

Main themes of the conference were:

- handling non-response
- data collection
- use of administrative data
- estimation methods
- integration of surveys and systems

The most dominant themes were the problems of non-response and data collection. Presentations on non-response addressed the questions of how this affects the results of surveys, how to improve response rates and how best to chase up non-respondents, which is an expensive process, to obtain effective responses. Presentations on data collection addressed problems of good questionnaire design and of electronic data collection, including collection over the internet.

The conference also included software demonstrations and a variety of introductory overview lectures, in which renowned experts presented best practice and recent developments in their respective fields of expertise. Prior to the conference, delegates also had the opportunity to attend short courses on various aspects of survey methods.

A common, cross-cutting theme raised in many sessions was the pressure, felt worldwide, to reduce costs, including the burden on respondents. This pressure had an important influence on the nature and content of the presentations. Indeed, the main themes of the conference were largely driven by the need to reduce survey costs and respondent burden. A particular example of this was the large number of presentations discussing the strengths and limitations of using administrative data, such as from taxation authorities, as a means of reducing the need for separate surveys. The use of administrative data for statistical purposes is a growing trend in many countries.

Participants agreed that the conference was very worthwhile, providing a valuable opportunity to learn from other countries' experiences, to disseminate their own findings and, most importantly, to discuss current challenges face to face with colleagues from statistical offices around the world. A feeling generally expressed was that seven years is too long to wait for the next conference. ONS statisticians have already

produced a long list of ideas and methods worth investigating for use in the UK.

More information

www.amstat.org/meetings/ices/2007

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Royal Statistical Society conference 2007

The annual conference of the Royal Statistical Society (RSS) took place from 16–20 July 2007 at the University of York. The title of the conference was Statistics and Public Policy-Making, and it was attended by about 350 delegates from around the world, representing statistical institutions, government departments and academia.

Denise Lievesley, president-elect of the International Statistical Institute, gave the opening address of the conference. In her presentation she talked about values in official statistics and the need to build trust. In his plenary session address to the conference, Jack Straw MP, Secretary of State for Justice, talked of his hopes for the new statistical system. This was particularly relevant as, in the week of the conference, the new statistics bill was in the final stages before receiving royal assent. The implications of independence for official statistics were also discussed in parallel sessions by representatives from ONS, other public bodies, users of official data and the media.

Many of the sessions at the conference covered the themes of health, education, and crime. Other aspects of official statistics were also explored in presentations and posters prepared by representatives of the Government Statistical Service. Two short courses were run prior to the conference covering disease modelling and randomised trials.

The organised social events were to the usual high standard of RSS conferences, and provided a great opportunity to network, meet others and discuss the latest hot topics. The final evening saw the traditional conference dinner held at York racecourse, with a short after-dinner address by Tim Holt, the current president of the RSS, and prizes given for the poster presentations.

The conference closed with an address by Professor Adrian Smith of Queen Mary College, who had recently chaired a

group leading an independent review of crime statistics. He talked about the role of statistical evidence in public policy, and suggested that a shift in emphasis from national to local statistics would be beneficial, together with overhauling the scope of National Statistics. Once again, the conference had been very successful and a thoroughly enjoyable to attend. Next year's conference is a general one, and will take place at the University of Nottingham from 1–5 September.

Enquiries about RSS conferences should be directed to conference@rss.org.uk

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UPDATES

Updates to statistics on www.statistics.gov.uk

6 July

Index of production

Manufacturing: 0.3% three-monthly rise to May

www.statistics.gov.uk/cci/nugget.asp?id=198

9 July

Producer prices

Factory gate inflation unchanged at 2.4% in April

www.statistics.gov.uk/cci/nugget.asp?id=248

10 July

UK trade

Deficit narrowed to £3.5 billion in May 2007

www.statistics.gov.uk/cci/nugget.asp?id=199

17 July

Inflation

June: CPI down to 2.4%; RPI at 4.4%

www.statistics.gov.uk/cci/nugget.asp?id=19

18 July

Average earnings

Underlying pay growth steady for May 2007

www.statistics.gov.uk/cci/nugget.asp?id=10

Employment

Rate rises to 74.5% in three months to May 2007

www.statistics.gov.uk/cci/nugget.asp?id=12

19 July

Public sector

June: £5.8 billion current budget deficit

www.statistics.gov.uk/cci/nugget.asp?id=206

Retail sales

Underlying growth remains firm

www.statistics.gov.uk/cci/nugget.asp?id=256

20 July

GDP growth

UK economy rose by 0.8% in Q2 2007

www.statistics.gov.uk/cci/nugget.asp?id=192

Index of services

0.9% three-monthly rise into May

www.statistics.gov.uk/cci/nugget.asp?id=558

23 July

UK net worth

£6.5 trillion at end-2006, an increase of £326 billion on previous year

www.statistics.gov.uk/cci/nugget.asp?id=479

25 July

Motor vehicles

Car production rises in the three months to June

www.statistics.gov.uk/cci/nugget.asp?id=376

31 July

Local employment

Highest rate of 90.1% in South Northants

www.statistics.gov.uk/cci/nugget.asp?id=252

Local inactivity

Lowest rate of 6.4% in Surrey Heath

www.statistics.gov.uk/cci/nugget.asp?id=1013

Local unemployment

Lowest rate of 2.1% in Eden, Cumbria

www.statistics.gov.uk/cci/nugget.asp?id=1606

FORTHCOMING RELEASES

Future statistical releases on www.statistics.gov.uk

6 August

Index of production – June 2007

7 August

Mergers and acquisitions involving UK companies – Q2 2007

9 August

UK trade – June 2007

13 August

Producer prices – July 2007

14 August

Consumer price indices – July 2007**Digest of engineering turnover and orders – June 2007****MM24: Monthly review of external trade statistics – June 2007**

15 August

Labour market statistics – August 2007**MM19: Aerospace and electronic cost indices – May 2007**

16 August

Public and private sector breakdown of labour disputes**Retail sales – July 2007****SDM28: Retail sales – July 2007**

20 August

Focus on consumer price indices – July 2007**Public sector finances – July 2007**

21 August

MM22: Producer prices – July 2007

22 August

Average weekly earnings – June 2007**Index of labour costs per hour – Q2 2007**

23 August

Business investment provisional results – Q2 2007**Internet connectivity – Q2 2007****Motor vehicle production – July 2007****Public sector finances: supplementary (quarterly) data**

24 August

Experimental market sector gross value added (GVA) – Q2 2007**Index of services – June 2007****UK output, income and expenditure – Q2 2007**

28 August

Monthly digest of statistics – August 2007

29 August

Work and worklessness among households

31 August

Distributive and service trades – June 2007**PM34.10: Motor vehicle production business monitor – July 2007**

Economic review

August 2007

Anis Chowdhury

Office for National Statistics

SUMMARY

GDP continued to grow robustly in 2007 quarter two, driven mainly by the services sector, supported by an upturn in manufacturing output. On the expenditure side in 2007 quarter one, business investment and household spending weakened. The current account deficit narrowed in 2007 quarter one. As a reflection of the UK's dynamic domestic demand profile and unfavourable exchange rate position, the trade deficit widened in 2007 quarter one. In May 2007, the trade deficit narrowed. The labour market remains buoyant but average earnings remains subdued. The public sector finances deteriorated in June 2007. Consumer price inflation fell and Producer price output inflation was unchanged in June 2007.

GROSS DOMESTIC PRODUCT

Second quarter growth of 0.8 per cent

The preliminary GDP growth figure for the second quarter of 2007 is now available, which showed a slight acceleration from the previous quarter and a continued robust rate of growth. GDP grew by 0.8 per cent in 2007 quarter two, up from 0.7 per cent growth in the previous quarter. The initial rate for the annual rate

of growth rose by 3.1 per cent, a similar rate to 2007 quarter one. It should be noted that these estimates are based on the output side. The headline figure will be firmed up later as more data becomes available (Figure 1).

The growth rate in the UK economy in 2007 quarter two continued to be led by strong growth in services sector output. The pick up in growth in the latest quarter was entirely due to strengthening in production output, driven by strong manufacturing and mining and quarrying output. Construction

output also contributed to growth by sustaining the strong rate of growth from the previous quarter.

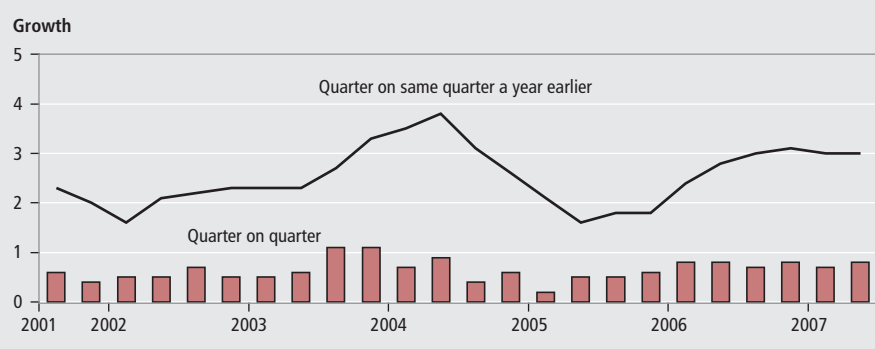
OTHER MAJOR ECONOMIES

Global growth moderates

Data for 2007 quarter two for the other major OECD countries were not yet available at the time of writing this article. Data for 2007 quarter one for the other major OECD countries showed a slowing picture of the world economy. US GDP data for the first quarter of 2007 showed a weakening. Growth was a subdued 0.2 per cent compared to 0.6 per cent in 2006 quarter four. The lower rate of growth was mainly due a decline in residential investment, continuing the trend from the previous quarter and in line with the weak housing market. The slowdown was also led by a lesser extent due to a weak net export picture with exports falling and imports rising. This was partially offset by a continued robustness in household consumption expenditure, which was underpinned by a fairly buoyant labour market together with a fall in energy prices. Government spending growth also made a positive contribution to GDP growth. Japan's GDP growth also moderated. GDP growth in 2007 quarter one was 0.8 per cent, down from 1.3 per cent in the previous quarter. The slowdown was mainly due to a contraction in private and non-private residential investment as well as business investment. This was partially offset by buoyant household consumption expenditure and partly due to a positive net trade picture with exports rising strongly on the quarter and exceeding imports.

Growth in the three biggest mainland EU economies – Germany, France and Italy – also exhibited signs of weakening but still showed a robust rate of growth. According to Eurostat, euro area GDP grew by 0.7 per cent in 2007 quarter one. This is a deceleration compared to growth of 0.9 per cent growth in the previous quarter. German GDP growth according to the initial estimate was a modest 0.5 percent. This follows fairly strong growth of 1.0 per cent in 2006 quarter four. A weaker net trade position together with a slowdown in household spending contributed towards the modest GDP growth. This was offset by fairly strong growth in industrial output and investment growth. French GDP growth

Figure 1
Gross Domestic Product



also grew moderately, at 0.5 per cent, similar to the rate in the previous quarter. This reflected a slowdown in manufacturing investment together with household consumption. This was offset by a pick up in household investment and a stronger net trade position. The Italian economy showed a marked deceleration in growth. GDP growth according to the preliminary estimate was just 0.3 per cent in 2007 quarter one, compared to growth of 1.1 per cent in the previous quarter. Early indications suggest that this may mainly have been driven by a fall in industrial production.

FINANCIAL MARKETS

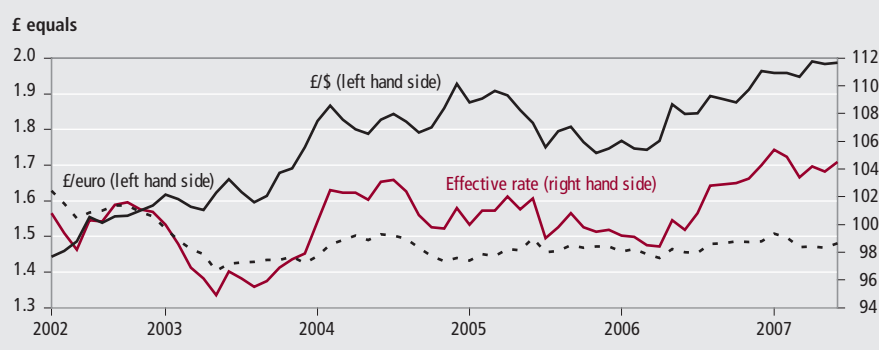
Share prices moderate and pound weakens

Equity performance after exhibiting a strong bounce-back in 2007 quarter one, showed a slowdown in the latest quarter, but still evident of fairly buoyant growth. The FTSE All-Share index rose by around 4.0 per cent in 2007 quarter two after growing by around 11.0 per cent in the previous quarter. The slower rate of equity growth may mainly be attributed to higher interest rates and its possible impact, in terms of lower GDP growth and reduced company profitability.

As for currency markets, 2007 quarter two saw sterling's average value broadly weakening compared to the previous quarter. The pound appreciated against the dollar by around 1.7 per cent in 2007 quarter two, a lower rate of appreciation compared to around 2.0 per cent in 2007 quarter one. Against the euro, sterling's value depreciated by around 1.0 per cent after appreciating by around 0.5 per cent in the previous quarter. Overall, the quarterly effective exchange rate depreciated by around 0.5 per cent following appreciation of around 1.0 per cent in 2007 quarter one (Figure 2).

The recent movements in the exchange rate might be linked to a number of factors. Firstly, exchange rate movements can be related to the perceptions of the relative strengths of the US, the Euro and UK economy. The appreciation of the pound against the dollar in 2007 quarter two may be partly linked to perceptions of stronger UK economic growth, leading to greater inflationary pressures and therefore the prospects of higher interest rates in the UK. The potential for future rate rises may have been a factor in sterling's recent appreciation. In fact, interest rates were increased by a further 0.25 percentage

Figure 2
Exchange rates



point in June 2007, this follows the 0.25 percentage point interest increase in May 2007 and leaves interest rates currently standing at 5.75 per cent.

In contrast, there have been particular concerns in recent months regarding the relative weakness of US GDP growth. Furthermore, inflationary pressures have been relatively subdued in the US. This may have lessened the likelihood of further interest rate rises in the US, which currently stand at 5.25 per cent.

In the euro-area, the depreciation of the pound against the euro in the second quarter of 2007 may have come in response to further monetary tightening, with the European Central Bank (ECB) raising interest rates by 0.25 percentage points in March 2007. The prospects for future interest rate rises may have weighed as a factor; in fact, interest rates were increased by a further 0.25 percentage points in June to leave interest rates currently standing at 4.0 per cent. The rise in the euro has been further underpinned by relatively robust growth in the euro-zone. However, compared to US and UK rates, euro-zone interest rates still remain fairly moderate and accommodative.

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

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

purposes) thereby further undermining the value of the dollar.

OUTPUT

Services sector drives economic growth

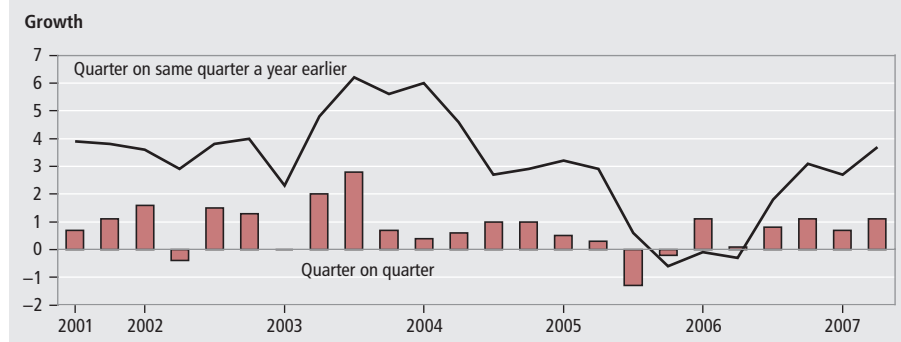
GDP growth in 2007 quarter two was estimated at 0.8 per cent, up from 0.7 per cent in the previous quarter. On an annual basis it was 3.1 per cent, unchanged from the previous quarter.

Construction activity is estimated to have grown strongly in the second quarter of 2007. Construction output grew by 1.1 per cent in 2007 quarter two, an acceleration from growth of 0.7 per cent in the previous quarter. Comparing the quarter on the quarter a year ago, construction output rose by 3.7 per cent following growth of 2.7 per cent in the previous quarter (Figure 3).

As for external surveys of construction, the CIPS survey signalled strengthening activity in 2007 quarter two with the average headline index at 59.3, up from 58.0 in the previous quarter. Stronger activity was driven by a rise in commercial activity. The RICS in its 2007 quarter two construction survey reported that growth in construction workloads slowed markedly in the second quarter, although remaining firm. The balance was 16, down from 28 in 2007 quarter one.

Total output from the production industries rose by 0.6 per cent in 2007 quarter two after falling by 0.1 per cent in the previous quarter. On an annual basis it also rose by 0.5 per cent compared to virtually flat growth in the previous quarter. The main contributions to the pick up in the latest quarter came from a turnaround in manufacturing output. Manufacturing output grew by 0.6 per cent, after contracting by 0.4 per cent in the previous quarter. On an annual basis, manufacturing output grew by a robust 1.0 per cent,

Figure 3
Construction output



down marginally from growth of 1.1 per cent in the previous quarter (**Figure 4**). The contribution to GDP growth was also provided by the strengthening in the output of the mining and quarrying industries (including oil & gas) which grew by 1.1 per cent in 2007 quarter two, up from 1.0 per cent in the previous quarter. On an annual basis, output contracted by 2.3 per cent, a lower rate of contraction compared to a decrease of 7.2 per cent in 2007 quarter one. This was offset by a weakening in the output of the electricity, gas and water supply industries where growth fell by 0.4 per cent following an increase of 1.5 per cent in 2007 quarter one. On an annual basis, output fell by 1.1 per cent compared to a fall of 3.2 per cent in the previous quarter.

Production growth has generally been weak 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. However, there was a weakening in manufacturing output in the last two quarters. In the latest quarter, the picture has somewhat reversed with a revival in total production output, driven mainly by a strengthening in manufacturing output. The output of the agriculture, forestry and fishing industries weakened in the latest quarter with growth of just 0.1 per cent, down from strong growth of 0.8 per cent in the previous quarter.

External surveys of manufacturing for 2007 quarter two showed a mixed picture (**Figure 5**). It is not unusual for the path of business indicators and official data to diverge over the short term. These differences happen partly because the series are not measuring exactly the same thing. External surveys measure the direction rather than the magnitude of a change in output and often inquire into expectations rather than actual activity.

The CIPS average headline index for manufacturing indicated a stable but robust picture in the latest quarter. The headline index was 54.3, similar to the index in the previous quarter. Growth was led by both increases in output. The CBI in its 2007 quarter two Industrial Trends survey reported a slowdown in manufacturing activity with the total orders index at minus 6 from plus two in the previous quarter. The BCC in its 2007 quarter two survey reported an improvement in manufacturing activity. The net balance for home sales rose to plus 31 from plus 26 in quarter one.

Overall the service sector, by far the largest part of the UK economy, continues to be the main driver of UK growth. Growth was 0.8 per cent in 2007 quarter two, down from 0.9 per cent in the previous quarter (**Figure 6**). On an annual basis, growth was 3.6 per cent, down from 3.8 per cent in the previous quarter. Growth was recorded across most sectors. The main contribution to the growth rate continues to be driven by business services and finance output which grew by 1.3 per cent in the latest quarter, an acceleration from 1.0 per cent growth in the previous quarter. Transport, storage and communication also grew strongly at 1.4 per cent, but down from 1.6 per cent growth in the previous quarter. The output of the distribution, hotels and catering sector grew modestly, by 0.4 per cent, a deceleration from growth of 1.0 per cent in the previous quarter. The output of government and other services in contrast was virtually flat after modest growth of 0.5 per cent in the previous quarter.

The external surveys on services continued to show a fairly robust picture in line with the official picture. The CIPS average headline index in 2007 quarter two was 57.4, although down from 58.1 in the

Figure 4
Manufacturing output

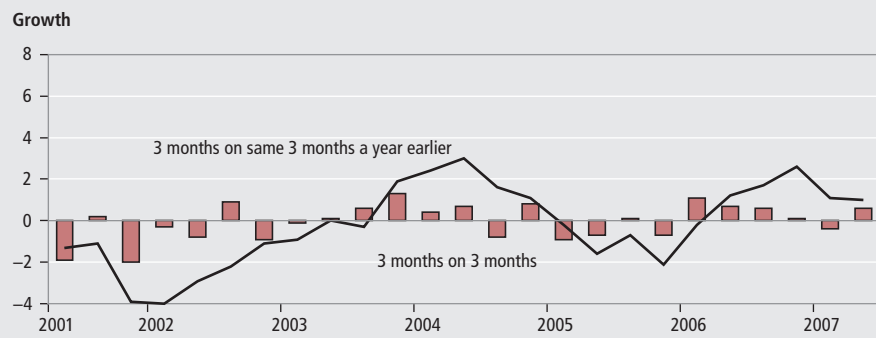


Figure 5
External manufacturing indicators

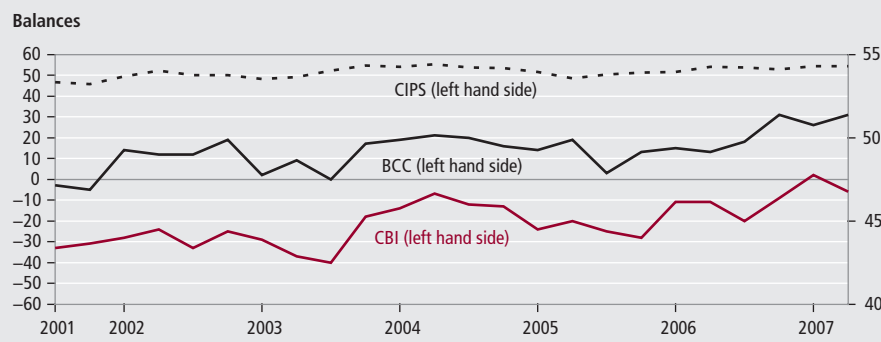
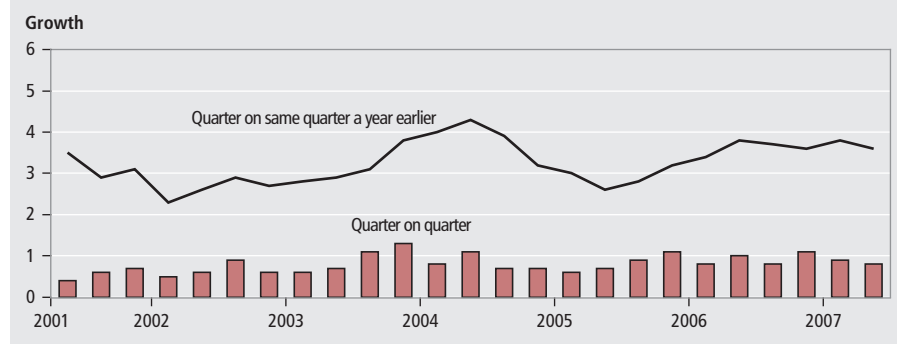


Figure 6
Services output



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

The CBI and BCC also report a fairly buoyant picture (Figure 7). The CBI in its latest services sector survey in May reported strong growth in business volumes for both consumer and business & professional services firms over the last three months. The consumer services volume balance was at plus 44 and for business & professional services, the balance was at plus 27. The BCC in its 2007 quarter two survey reported a mixed picture of service sector

activity. The net balance for home sales rose nine points to plus 36, and was the highest since 2004 quarter two. The net balance for home orders fell four points to plus 24, the lowest since 2006 quarter three.

EXPENDITURE

Consumers' spending weakens

Household consumption expenditure growth decelerated in 2007 quarter one. Growth was a fairly modest 0.5 per cent. This follows relatively strong growth of 1.1 per cent in the previous

quarter. Growth compared with the same quarter a year ago was 2.9 per cent, up from 2.5 per cent in the previous quarter (Figure 8). In terms of expenditure breakdown, the slowdown was led by virtually flat growth in semi-durable goods expenditure, compared to strong growth in the previous quarter. There was also a weakening in non-durable goods and services expenditure. This was offset by buoyant growth in expenditure on durable goods, although slowing from the previous quarter.

Indications of consumer demand for 2007 quarter two appear mixed. One key indicator of household expenditure is retail sales. Retail sales appear to have strengthened in 2007 quarter two. Retail sales grew by 1.1 per cent in the latest quarter, an acceleration from growth of 0.5 per cent in the previous quarter. The increase in retail sales may be partly attributed to heavy discounting in shops and early sales which can be reflected in the price deflator (that is, shop prices) which on average grew by just 0.5 per cent in the latest quarter.

Retail sales figures are published on a monthly basis and the latest available figures for June showed buoyant growth, similar to the previous month (Figure 9). This may suggest that going into the second quarter, interest rate rises don't seem to be having much of an impact on spending as it may have did in the first quarter. But it should be noted that retail sales account around 40 per cent of household expenditure. According to the latest figures, the volume of retail sales in the three months to June 2007 was 1.1 per cent higher than the previous three months. This followed growth of 1.1 per cent in the three months to May. On an annual basis, retail sales continued to grow strongly despite slowing. Retail sales on the latest three month on the same three months a year ago rose by 3.8 per cent, compared to 4.6 per cent in the three months to May compared to the same period a year ago.

At a disaggregated level, retail sales growth during the three months to the end of June was driven by an acceleration in growth in the 'Predominantly non-food stores' sector which grew by 1.9 per cent, up from 1.6 per cent growth in the previous month. Within this sector in the three months to June, growth was registered across all sectors and was led by the 'Other stores' sector which grew by 3.3 per cent. The 'Non-specialised stores' sector also

Figure 7
External services

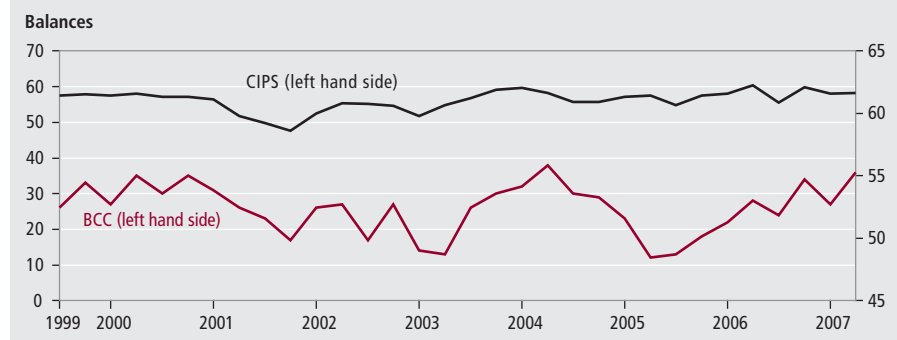


Figure 8
Household demand

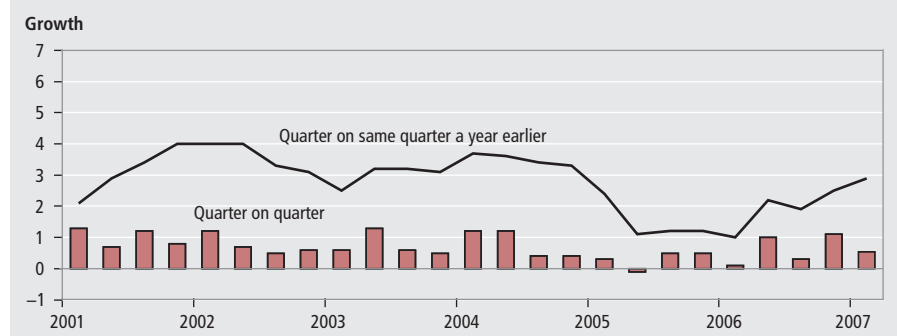
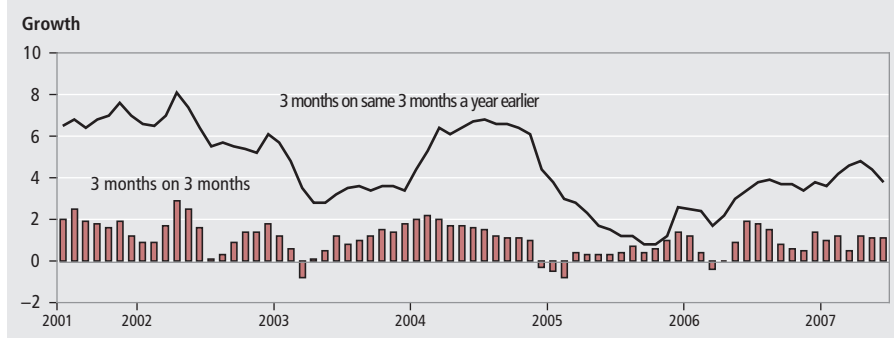


Figure 9
Retail sales



registered strong growth of 2.5 per cent, up from 0.6 per cent from the previous month. The 'Household goods stores' sector recorded a turnaround in growth of 0.5 per cent following contraction of 1.2 per cent in the previous month. In contrast, retail sales growth in the 'Predominantly food stores' sector showed a weakening, with growth falling by 0.1 per cent.

External surveys for retail showed a slowdown, but overall still a fairly robust picture. The CBI in its monthly Distributive Trades survey report that retail sales volumes grew in June with a balance of plus 17, although a slowdown from plus 31 in May. The BRC report that retail sales increased by 3.0 per cent on a like-for-like basis in June, up sharply from 1.8 per cent in the previous month. The BRC report that on a quarterly basis, growth averaged just 2.5 per cent compared to 3.5 per cent in the previous quarter (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, increases in interest rates increases debt servicing costs, discouraging borrowing and in the process may displace consumer expenditure on certain goods.

Bank of England figures show signs of slowdown in borrowing, suggesting that

recent interest rate rises might be starting to have an impact. The Bank of England reported that the increase in total net lending to individuals was £9.5 billion in May, higher than the increase of £9.2 billion in April. However the twelve-month growth rate fell by 0.2 percentage points to 10.2 per cent. Within the total, the increase in net lending secured on dwellings was £8.7 billion in May, down from £8.8 billion in April. The twelve-month growth rate fell 0.2 percentage points to 11.2 per cent. Consumer credit lending rose by £0.8 billion in May, up from £0.4

billion in April. Net credit card lending fell by £0.2 billion in May, weaker than the £0.1 billion increase in April. The annual growth rate of consumer credit fell by 0.2 percentage points to 5.2 per cent. Bank of England figures show M4 lending also slowing in June with lending of £5.1 billion (provisional) compared to £26.6 billion in May.

Household spending may be affected by a continued slowdown in real households' disposable income, going into 2007 quarter two (Figure 11). In 2007 quarter one, real household disposable income weakened with negative growth of 0.3 per cent, up from a 0.1 per cent decrease in the previous quarter. The fall in real households' disposable income could be partly attributable to a rise in taxes as a share of income in 2007 quarter one, which rose by 4.7 per cent on the quarter, reversing a fall of 0.6 per cent in the previous quarter (Figure 12).

Finally, although the labour market appears relatively healthy, wage growth has been weak in real terms recently and this may act to a certain extent as a constraint on expenditure.

Figure 10
External retailing indicators

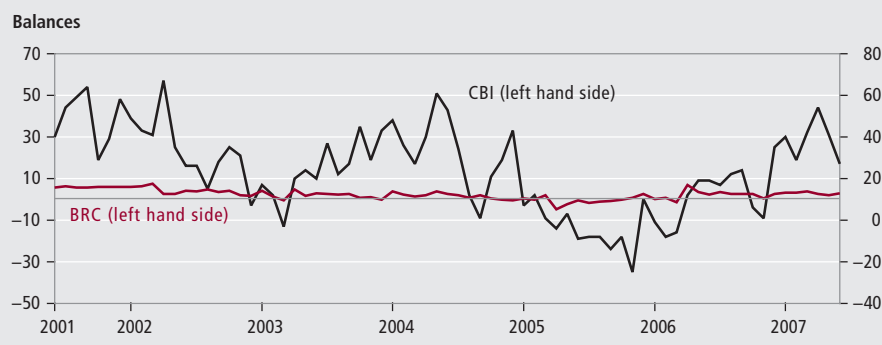


Figure 11
Real households' disposable income

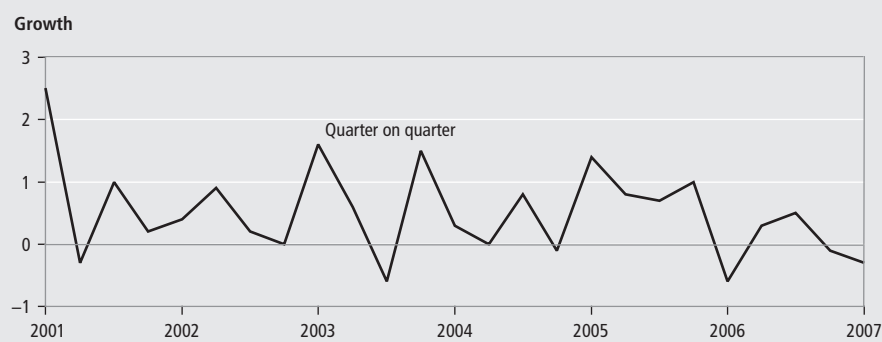
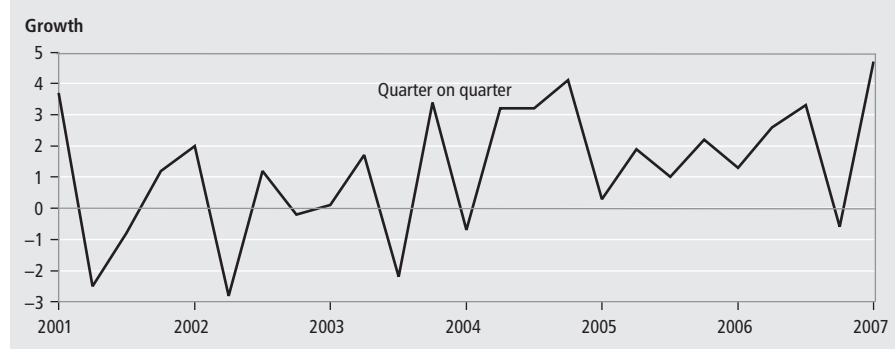


Figure 12

Taxation as a share of income**BUSINESS DEMAND****Business investment weakens**

Total investment slowed down in 2007 quarter one from the previous quarter but continues to show a fairly robust rate of growth. Growth was 1.1 per cent compared to 3.1 per cent in 2006 quarter four. On an annual basis it grew by 8.9 per cent compared to 9.8 per cent in the previous quarter. The weakening in total investment was primarily driven by a contraction in business investment.

Business investment grew relatively strongly throughout 2006. However, in the latest quarter, this previously benign position has somewhat turned around. Business investment in 2007 quarter one fell by 0.6 per cent, reversing the relatively strong growth of 4.1 per cent in the previous quarter. Business investment on an annual basis slowed but still continues to grow fairly robustly. Growth was 9.4 per cent, down from 12.8 per cent annual growth in the previous quarter (Figure 13). There could be a number of economic reasons explaining this downturn in business investment. Firstly, the continued strength of the pound and its further recent appreciation, particularly against the dollar may, aligned with a slowdown in the US economy have been a factor. Secondly, high real interest rates may have made investment in financial assets a much more favourable investment proposition than physical assets which may have been reflected in increased share buying and merger activity recently. However, it is worth noting that business investment has been volatile in the recent past.

Evidence on investment intentions from the latest BCC and CBI surveys showed a mixed picture. According to the quarterly BCC survey, the balance of manufacturing firms planning to increase investment in plant and machinery rose 10 points to plus 28 and in services firms fell by 1 point to

plus 19 in 2007 quarter two. The CBI in its 2007 quarter two Industrial Survey reported a subdued investment picture, with the investment balance of plant and machinery at minus six.

GOVERNMENT DEMAND**Government expenditure showed modest growth**

Government final consumption expenditure grew moderately in 2007 quarter one. Growth was 0.5 per cent, similar to the rate in the previous quarter. Growth quarter on quarter a year ago was a

fairly strong 1.1 per cent, but a deceleration of growth from 1.9 per cent in the previous quarter (Figure 14).

Public sector finances worsen

The latest figures on the public sector finances report in the current financial year to June 2007 and illustrated a relatively weak picture. It showed a higher current budget deficit together with 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 June 2007, the current budget was in deficit by £5.8 billion; this compares with a deficit of £5.2 billion in June of 2006. In the financial year April to June 2007/08, the deficit was £12.2 billion; this compares with a deficit of £11.1 billion in the financial year April to June 2006. Net borrowing was £7.4 billion in June 2007; this compares with £6.3 billion in June 2006. In the financial year April to June 2007/08, net borrowing was £16.8 billion; this compares with net borrowing of £15.5 billion in the financial year April to June 2006/07. The overall negative picture mainly reflected a

Figure 13

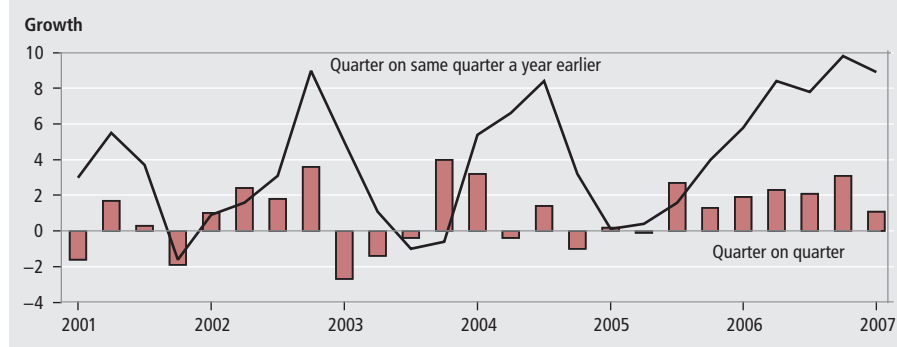
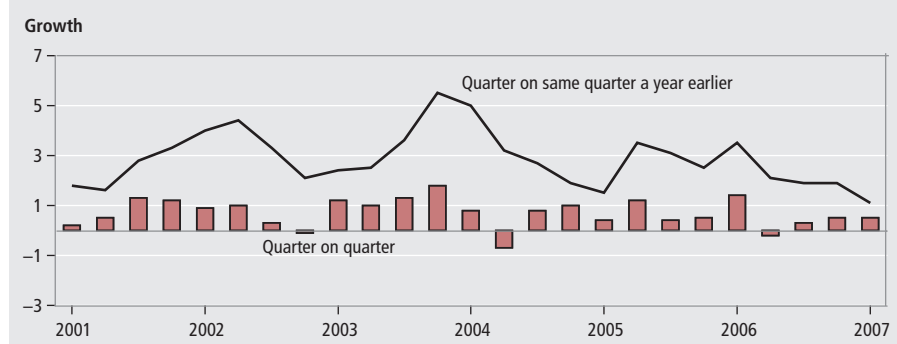
Total fixed investment

Figure 14

Government spending

lower growth in VAT receipts and National Insurance contributions together with increased Local government 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 June 2007 was 37.5 per cent of GDP, up from 37.2 per cent in May. This compares with 37.3 per cent of GDP in June 2006. In the financial year 2006/07, net debt as a percentage of GDP was 36.9 per cent.

TRADE AND THE BALANCE OF PAYMENTS

Current account deficit narrows; goods deficit widens

The publication of the latest quarterly Balance of Payments shows that the current account deficit narrowed in 2007 quarter one to £12.2 billion, from a deficit of £14.5 billion in the previous quarter (**Figure 15**). As a proportion of GDP, the deficit fell to 3.6 per cent of GDP from 4.3 per cent in 2006 quarter four. The narrowing in current account deficit in 2007 quarter one was due to a higher surplus on investment income and a higher surplus on trade in services, partially offset by a higher deficit in the trade in goods. The surplus in income rose to £3.4 billion from £1.4 billion, while the surplus in the trade in services rose to £8.5 billion from £7.9 billion. The increase in income was driven by a rise in earnings on other investment abroad and on portfolio investment, 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 one showed the UK continuing to have a large trade deficit in goods with levels of imports rising faster than exports. This has provided a negative contribution towards GDP growth in the first quarter. The deficit on trade in goods in 2007 quarter one was £20.8 billion, compared with a deficit of £20.0 billion in the previous quarter. In terms of growth, exports of goods fell by 2.5 per cent in 2007 quarter one whilst imports of goods fell by 0.9 per cent. Services

exports rose by 2.1 per cent whilst services imports were flat. Total exports fell by 0.8 per cent whilst total imports fell by 0.7 per cent.

According to the latest trade figures in May, the UK's deficit on trade in goods and services is estimated to have narrowed to £3.5 billion, from £4.2 billion in April. The trade in goods deficit was £6.3 billion, down from £6.9 billion in April. Total exports on a volume basis rose by 3.4 per cent and total imports fell by 0.6 per cent on the month. In the three months ended May, the deficit on trade in goods and services narrowed to £12.0 billion, from an £12.3 billion deficit in the previous three months.

However, these figures are distorted by volatility in VAT Missing Trader Intra-Community (MTIC) Fraud and therefore needs 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 have fallen to £0.1 billion in May and by £0.3 billion in the first quarter of 2007.

External surveys on exports showed a mixed picture. The BCC reported that the manufacturing sector's export balances improved markedly in 2007 quarter two. The balance rose by nine points to plus 30. The export orders balance rose six points to plus 26. In contrast, the CBI reported in its quarterly survey that the balance of export order volumes was at minus five.

LABOUR MARKET

Labour market activity buoyant

The Labour market in the latest reference period showed a relatively strong picture – continuing the trend of fairly high levels of employment and low levels of unemployment seen throughout 2006 and in 2007. The robust labour market

picture continues to be a reflection of fairly strong demand conditions in the UK economy.

The latest figure from the Labour Force Survey (LFS) pertains to the three-month period up to May 2007 and showed positive picture. The number of people in employment as well as the employment rate increased. The number of unemployed people and the unemployment rate fell. The claimant count decreased. The number of vacancies increased. Average earnings, excluding and including bonuses fell. Overall, average earnings remain subdued with weak real wage growth.

Looking at a detailed level, the increase in the employment level appears to be mainly driven by a rise in employees, particularly full time employees, offset by a decrease in the number of people in self-employment, reversing the trend somewhat of the previous months where employment was driven by self employment.

The current working age employment rate was 74.5 per cent, in the three months to May 2007, up 0.1 percentage points from the three months to February 2007 and down 0.1 percentage points from a year earlier. The number of people in employment rose by 93,000 over the quarter, and up 180,000 over the year, to leave the employment level standing at 29.08 million in the three months to May 2007. The unemployment rate was 5.4 per cent, in the three months to May 2007, down 0.1 percentage from the three months to February 2007 but unchanged from a year earlier (**Figure 16**). The number of unemployed people fell by 35,000, from the three months to February, but was up 2,000 from a year earlier, leaving the unemployment level currently standing at 1.66 million.

According to the LFS, in the period March to May 2007, the number of people

Figure 15
Balance of payments

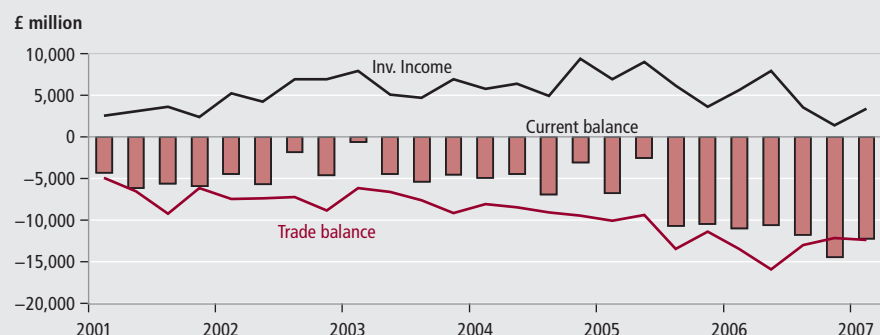
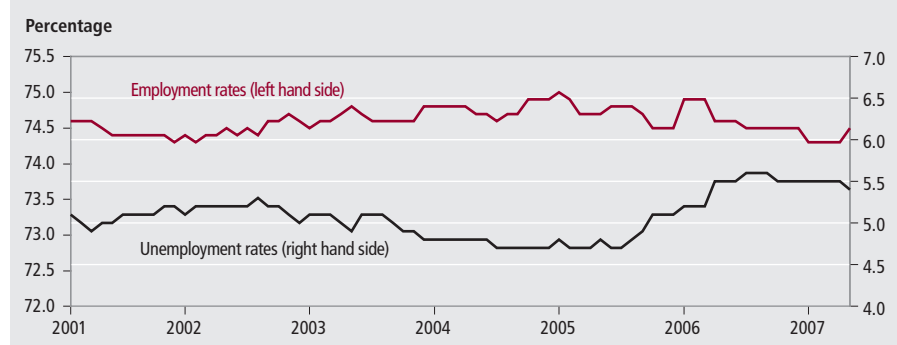


Figure 16
Employment and unemployment



in employment rose by 93,000. The increase was led by a rise in employees of 93,000, offset by a decrease in self-employment of 6,000. From another perspective, the number of people in full-time employment rose by 117,000, whilst people in part-time employment fell by 25,000.

Workforce jobs falls

According to employer surveys, there was a decrease of 22,000 jobs in the three months to March 2007. Most sectors showed decreases in jobs over the quarter. The largest quarterly contribution came from falls in agriculture, forestry & fishing (down 22,000), followed by transport & communication (down 21,000) and manufacturing (down 16,000). This was offset by increases in finance and business services (up 32,000) followed by distribution hotels & restaurants (up 11,000). Over the year, total workforce jobs increased by 265,000. Of the total, the largest contribution to the increase came from finance and business services (up 126,000) followed by construction (up 75,000) and education, health and public administration (up 63,000). The manufacturing sector in contrast lost the largest number of jobs on the year (down 43,000 jobs), followed by transport and communication (down 24,000).

Claimant count falls

The claimant count measures the number of people claiming the Jobseekers Allowance. The latest figures for June showed the claimant count level at 864,100 down 13,800 on the month and down 91,100 on a year earlier. The claimant count rate in June 2007 was 2.7 per cent, unchanged from the previous month but down 0.3 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 641,900 job vacancies in the three months to June 2007, up 5,100 from the previous three months and up 52,500 from the same period a year earlier.

Inactivity level falls slightly

The working age inactivity rate was 21.2 per cent in the three months to May 2007, unchanged from the three months to February 2007, but up 0.1 percentage points from a year earlier. In level terms, the number of economically inactive people of working age was down 1,000 over the quarter to leave the level standing at 7.93 million in the three months to May 2007. There were inactivity decreases amongst most categories over the quarter. The largest decrease in inactivity level occurred amongst those categorised as 'Long-term sick' (down 45,000), followed by those categorised as 'Temp sick' (down 7,000) and the 'Discouraged' (down 7,000). On an annual basis, inactivity rose by 85,000, with the largest rises being amongst those categorised as 'Student' (up 34,000), followed by the 'Looking after family/home' category (up 31,000) and 'Retired' (up 23,000).

Average earnings remain subdued

Average earnings growth showed a weakening picture in May 2007. Average earnings (including bonuses) decreased in the latest reference period. It fell by 0.6 percentage points from the previous month to 3.5 per cent. Average earnings growth (excluding bonuses) was

3.5 per cent, down 0.1 percentage point from the previous month. In terms of the public and private sector split, the gap in wages narrowed slightly. Average earnings (excluding bonuses) grew by 3.1 in the public sector, unchanged from the previous month, and grew by 3.6 per cent in the private sector, down 0.1 percentage points from the previous month.

Overall, the numbers still point to a fairly buoyant labour market, although it is still loose compared to previous years, with employment levels at relatively high levels and unemployment at a fairly 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 prices unchanged; input prices rise

Industrial input and output prices are an indication of inflationary pressures in the economy. In 2007 quarter two, output prices exhibited signs of further acceleration of growth from 2007 quarter one and therefore signs of greater inflationary pressures. Input prices also accelerated in the second quarter from the first quarter of 2007. This may suggest that firms to some extent have attempted to rebuild their profit margins by passing on the higher price of their products to customers, after facing profit squeeze of previous quarters.

Input prices on average rose by around 1.0 per cent in 2007 quarter two. This contrasts with 2007 quarter one where prices on average fell by 1.0 per cent. The core input price index, excluding food, beverages, tobacco and petroleum rose by around 2.8 per cent in 2007 quarter two compared to growth of 1.9 per cent in 2007 quarter one. The quicker growth in input prices was mainly driven by crude petroleum oil prices which rose by around 16 per cent, compared to a fall of around 4.0 per cent in 2007 quarter one; and to a lesser extent, metal prices which rose by around 7.0 per cent compared to growth of around 1.0 per cent in 2007 quarter one.

Output prices grew on average by 2.4 per cent in 2007 quarter two, a strengthening from growth of 2.2 per cent in the previous quarter, and as mentioned earlier may be an attempt by firms to re-build their profit

margins. The underlying picture suggested inflationary pressures may have moderated somewhat in the latest quarter. On the core measure which excludes food, beverages, tobacco and petroleum, producer output prices rose by 2.2 per cent in 2007 quarter two, down from 2.7 per cent growth in the previous quarter. The rise in output prices were partly driven by increases in base metal and petroleum products which rose around 5.0 per cent and 7.0 per cent respectively.

Consumer prices fall

Growth in the consumer price index (CPI) – the Government's target measure of inflation – fell in June to 2.4 per cent from 2.5 per cent in May and from the March peak of 3.1 per cent; but still continuing to exceed the Government's 2.0 per cent inflation target. The Retail Price Index (RPI) a broader measure of inflation however rose, to 4.4 per cent from 4.3 per cent in May. The Retail Price Index, excluding mortgage interest payments (RPIX) was 3.3 per cent, unchanged from June (Figure 17).

The main downward pressure on the CPI annual rate came from average gas and electricity bills which continued to fall this year but rose 12 months ago. There were

also large downward effects from cigarettes, where last year's price increases were not repeated this year, and from audio-visual equipment and related products, with prices falling by more than a year ago, particularly for digital cameras, hi-fi equipment, televisions and pre-recorded DVDs.

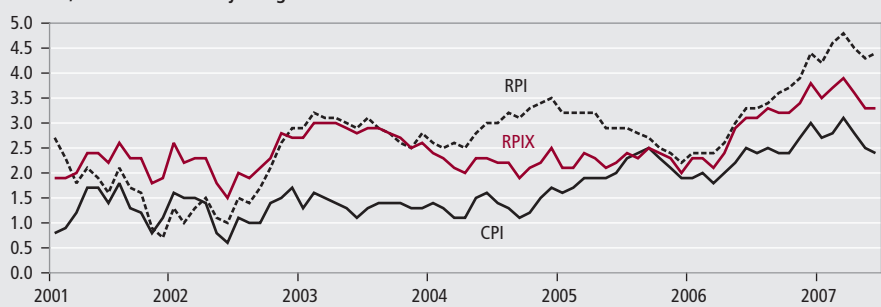
Small downward effects also came from a range of other products including personal care appliances and products; insurance premiums; and books, newspapers and stationery.

The largest upward effect on the CPI annual rate came from road fuels, where the average price recorded for petrol across June rose by around 1.2p per litre, compared with a fall of 0.9p per litre last year. There was also a large upward effect from furniture and furnishings, which rose by a record monthly rate for June in advance of the usual summer sales period.

RPI inflation rose to 4.4 per cent in June, up from 4.3 per cent in May. The main upward pressure came from mortgage interest payments – which are excluded from the CPI – with lenders passing on the remainder of this May's quarter point increase in the Bank Rate. Other factors impacting on the RPI were similar to those that affected the CPI.

Figure 17
Inflation

Growth, month on month a year ago



Independent forecasts

July 2007

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 2007 and 2008 and are extracted from HM Treasury's Forecasts for the UK Economy.

2007

	Average	Lowest	Highest
GDP growth (per cent)	2.8	2.3	3.1
Inflation rate (Q4, per cent)			
CPI	2.1	1.4	2.9
RPI	3.7	2.9	4.5
Claimant unemployment (Q4, million)	0.90	0.81	1.10
Current account (£ billion)	-44.1	-58.2	-29.0
Public Sector Net Borrowing (2007-08, £ billion)	34.5	25.3	41.5

2008

	Average	Lowest	Highest
GDP growth (per cent)	2.3	-0.3	3.0
Inflation rate (Q4, per cent)			
CPI	2.0	1.5	3.0
RPI	2.7	1.7	3.9
Claimant unemployment (Q4, million)	0.92	0.71	1.25
Current account (£ billion)	-45.5	-68.8	-25.4
Public Sector Net Borrowing (2008-09, £ billion)	33.4	19.4	46.3

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 (preliminary edition), published by OECD (Organisation for Economic Co-operation and Development).

2007

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	2.1	2.0	2.5	2.6
Consumer price (percentage change from previous year)	2.6	-0.3	2.0	2.3
Unemployment rate (per cent of the labour force)	4.7	3.7	6.9	5.6
Current account (as a percentage of GDP)	-6.1	4.8	0.4	-1.5
Fiscal balance (as a percentage of GDP)	-2.8	-2.7	-0.8	-1.8

2008

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	2.6	2.2	2.2	2.7
Consumer price (percentage change from previous year)	2.2	0.4	2.1	2.0
Unemployment rate (per cent of the labour force)	4.9	3.6	6.6	5.4
Current account (as a percentage of GDP)	-6.2	5.4	0.4	-1.5
Fiscal balance (as a percentage of GDP)	-2.8	-3.2	-0.7	-1.9

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	2005	2006	2006 Q4	2007 Q1	2007 Q2	2007 Apr	2007 May	2007 Jun
GDP growth - chained volume measures (CVM)									
Gross domestic product at market prices	ABMI	1.8	2.8	0.8	0.7	0.8	..	..	..
Output growth - chained volume measures (CVM)									
Gross value added (GVA) at basic prices	ABMM	1.9	2.9	0.8	0.7	0.8	..	..	..
Industrial production	CKYW	-2.0	0.0	-0.1	-0.1	0.5	0.3	0.6	..
Manufacturing	CKYY	-1.2	1.3	0.1	-0.4	0.7	0.4	0.3	..
Construction	GDQB	1.5	1.0	1.1	0.6	1.1	..	..	..
Services	GDQS	2.9	3.6	1.0	1.0	0.8	..	..	..
Oil and gas extraction	CKZO	-10.5	-8.9	-1.1	0.7	..	1.0	1.5	..
Electricity, gas and water supply	CKYZ	-0.4	-2.6	-2.0	1.5	-0.3	-1.0	2.1	..
Business services and finance	GDQN	4.4	5.2	1.0	1.0	1.3	..	..	..
Household demand									
Retail sales volume growth	EAPS	2.0	3.3	1.4	0.5	1.1	-0.1	0.4	0.1
Household final consumption expenditure growth (CVM)	ABJR	1.5	1.9	1.1	0.5	..	..	..	..
GB new registrations of cars (thousands) ¹	BCGT	2,444	2,340	446	678	..	168	185	..
Labour market^{2,3}									
Employment: 16 and over (thousands)	MGRZ	28,674	28,895	29,036	28,981	..	29,075	..	..
Employment rate: working age (%)	MGSU	74.7	74.6	74.5	74.3	..	74.5	..	..
Workforce jobs (thousands)	DYDC	31,042	31,409	31,608	31,587	..	..	..	..
Total actual weekly hours of work: all workers (millions)	YBUS	918.6	923.7	925.8	927.1	..	930.2	..	..
Unemployment: 16 and over (thousands)	MGSC	1,426	1,657	1,687	1,700	..	1,660	..	..
Unemployment rate: 16 and over (%)	MGSX	4.7	5.4	5.5	5.5	..	5.4	..	..
Claimant count (thousands)	BCJD	861.7	944.7	947.1	916.3	877.2	889.7	877.9	864.1
Economically active: 16 and over (thousands)	MGSF	30,100	30,552	30,723	30,681	..	30,735	..	..
Economic activity rate: working age (%)	MGSO	78.5	78.9	79.0	78.8	..	78.8	..	..
Economically inactive: working age (thousands)	YBSN	7,933	7,843	7,854	7,939	..	7,928	..	..
Economic inactivity rate: working age (%)	YBTL	21.5	21.1	21.0	21.2	..	21.2	..	..
Vacancies (thousands)	AP2Y	616.8	595.0	602.0	636.8	641.9	638.1	640.5	641.9
Redundancies (thousands)	BEAO	126	145	130	145	..	123	..	..
Productivity and earnings annual growth									
GB average earnings (including bonuses) ³	LNNC	..	..	4.0	4.5	..	4.1	3.5	..
GB average earnings (excluding bonuses) ³	JQDY	..	..	3.7	3.6	..	3.6	3.5	..
Whole economy productivity (output per worker)	A4YN	..	..	2.1	2.7	..	..	..	..
Manufacturing productivity (output per job)	LOUV	..	..	..	..	..	3.5	3.5	..
Unit wage costs: whole economy	LOJE	..	..	1.6	2.4	..	..	..	..
Unit wage costs: manufacturing	LOJF	..	..	..	..	..	-0.1	0.3	..
Business demand									
Business investment growth (CVM)	NPEL	15.7	-4.2	4.1	-0.6	..	..	..	..
Government demand									
Government final consumption expenditure growth	NMRY	2.7	2.4	0.5	0.5	..	..	..	..
Prices (12-monthly percentage change – except oil prices)									
Consumer prices index ¹	D7G7	2.1	2.3	2.7	2.9	2.6	2.8	2.5	2.4
Retail prices index ¹	CZBH	2.8	3.2	4.0	4.5	4.4	4.5	4.3	4.4
Retail prices index (excluding mortgage interest payments)	CDKQ	2.3	2.9	3.5	3.7	3.4	3.6	3.3	3.3
Producer output prices (excluding FBTP) ⁴	EUAA	2.1	2.3	2.6	2.6	2.2	2.4	2.2	2.1
Producer input prices	EUAB	11.7	9.5	3.4	-0.7	1.0	-0.6	1.3	2.1
Oil price: sterling (£ per barrel)	ETXR	30.358	35.929	31.637	29.946	34.052	34.019	32.639	35.497
Oil price: dollars (\$ per barrel)	ETXQ	55.046	66.107	60.633	58.527	67.640	67.646	64.760	70.514

	Source CDID	2005	2006	2006 Q4	2007 Q1	2007 Q2	2007 Apr	2007 May	2007 Jun
Financial markets									
Sterling ERI (January 2005=100)	BK67	100.5	101.0	103.5	104.6	104.2	104.2	103.8	104.5
Average exchange rate /US\$	AUSS	1.820	1.842	1.915	1.955	1.987	1.991	1.984	1.986
Average exchange rate /Euro	THAP	1.463	1.467	1.485	1.492	1.473	1.471	1.468	1.481
3-month inter-bank rate	HSAJ	4.57	5.26	5.26	5.56	5.93	5.66	5.76	5.93
Selected retail banks: base rate	ZCMG						5.25	5.50	5.50
3-month interest rate on US Treasury bills	LUST	3.92	4.89	4.89	4.91	4.64	4.79	4.60	4.64

Trade and the balance of payments

UK balance on trade in goods (£m)	BOKI	-68,789	-83,631	-20,040	-20,818	..	-6,933	-6,291	..
Exports of services (£m)	IKBB	115,182	124,586	31,596	32,340	..	10,871	10,819	..
Non-EU balance on trade in goods (£m)	LGDT	-31,912	-45,598	-12,567	-11,736	..	-3,856	-3,481	..
Non-EU exports of goods (excl oil & erratics) ⁵	SHDJ	119.8	118.0	112.5	115.2	..	109.6	113.0	..
Non-EU imports of goods (excl oil & erratics) ⁵	SHED	116.8	124.4	127.6	127.1	..	128.1	122.3	..
Non-EU import and price index (excl oil) ⁵	LKWQ	101.2	103.9	103.2	104.4	..	104.2	104.6	..
Non-EU export and price index (excl oil) ⁵	LKVX	100.1	101.5	100.2	101.9	..	101.9	102.1	..

Monetary conditions/government finances

M0 (year on year percentage growth)	VQMX	5.1	..	..	..	..	..	..	..
M4 (year on year percentage growth)	VQJW	11.3	13.3	12.8	12.9	..	13.3	13.9	..
Public sector net borrowing (£m)	-ANNX	40,510	31,473	12,302	-3,157	16,763	617	8,703	7,443
Net lending to consumers (£m)	RLMH	19,743	13,115	3,299	2,353	2,180	411	894	874

External indicators – non-ONS statistics

		2006 Dec	2007 Jan	2007 Feb	2007 Mar	2007 Apr	2007 May	2007 Jun	2007 Jul
Activity and expectations									
CBI output expectations balance	ETCU	11	12	28	21	18	18	25	10
CBI optimism balance	ETBV		-7			16			-2
CBI price expectations balance	ETDQ	8	11	16	19	14	26	18	17

Notes:

1 Not seasonally adjusted.

2 Annual data are for April except for workforce jobs (June), claimant count (average of the twelve months) and vacancies (average of the four quarters).

3 Monthly data for vacancies and average earnings are averages of the three months ending in the month shown. Monthly data for all other series except claimant count are averages of the three months centred on the month shown.

4 FBTP: food, beverages, tobacco and petroleum.

5 Volumes, 2003 = 100.

For further explanatory notes, see Notes to tables on page 63.

FEATURE

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Forecasting GDP using external data sources

SUMMARY

The Office for National Statistics (ONS) is the official provider of National Accounts data in the UK. However, business surveys and financial markets also provide a large number of other possible indicators of economic activity. This article outlines how ONS might use this 'external' data in compiling gross domestic product (GDP) estimates. A study of the literature suggests that these indicators may be useful predictors of economic activity, but their forecast performance in 'real time' is not proven. As a result ONS uses this data cautiously and only as an informal guide and a check on its own statistics. As there are a large number of potential indicators, this article describes how principal components analysis can be used to construct an alternative estimate of GDP which aims to summarise the external data 'view of the world' for comparison purposes.

In the UK, the Office for National Statistics (ONS) produces a succession of different vintages of quarterly gross domestic product (GDP). The first of these is the preliminary estimate which is an output-based measure and is published no more than 25 days after the end of the reference quarter. Due to the timeliness of the release, information for many of the components of GDP is incomplete, particularly for the final month of the quarter. Skipper (2005) estimates the data content of the preliminary estimate to be just 44 per cent, with the missing information at this stage replaced by forecasts and imputations.

Over time ONS publishes later vintages of the same data. Revisions reflect the arrival of new survey information, not only for the output measure of GDP but also for the income and expenditure measures. By the time the Quarterly National Accounts are published around 85 days after the end of the reference quarter, the data content of the GDP estimate increases to 80 per cent. Data-driven revisions can continue for up to two years as data from annual surveys and administrative sources such as HM Revenue & Customs (HMRC) become available. In the longer run, revisions can also result from methodological changes representing attempts to measure the evolving economy more accurately.

The presence of revisions is clear evidence of a 'timeliness versus accuracy' trade-off between different vintages of GDP. Although preliminary estimates are available almost immediately, being based

on low data content also means they are likely to be superseded by later vintages that more accurately measure the growth path of the economy. This trade-off is a prominent issue where policy is set in a pre-emptive fashion, such as the operation of monetary policy, because short-term forecasts may be affected by relatively immature and unrevised data. This issue is outlined by Croushore and Stark (2002), and Nelson and Nicolov (2003) discuss the implications of output gap mismeasurement for UK inflation during the 1970s and 1980s. The analysis of 'real time' data and their impact on (monetary) policy setting has been a hot topic in the recent economics literature.

Although mature ONS data are generally accepted as the best measure of GDP, given the low data content of the preliminary estimate, it is sensible to investigate the possibility of reducing the likelihood of subsequent revisions by using other timely data. There are two main sources of alternative data. Business surveys are conducted by trade associations and industry groups in the UK such as the Confederation of British Industry (CBI), the Chartered Institute of Purchasing and Supply (CIPS) and the British Chambers of Commerce (BCC). These data are more qualitative, but are available in a timely fashion and on a broad range of indicators. Financial market variables are available in 'real time' and may also have predictive power over the level of GDP.

A recent paper by Ashley *et al* (2005) describes how the Bank of England uses business surveys in an attempt to deal with

the 'data uncertainty' in early estimates of GDP. Although ONS does not use formal methods to incorporate business survey data into its estimates, it is not oblivious to the story being told by other data sources. Compilers of economic statistics in ONS pay attention not just to business survey and financial market data, but also to a large amount of specific industry data and use these in the process of quality assuring data from official sources. ONS also monitors the views reported by business surveys as a check on its own data, and attempts to account for any differences in the story being told.

This article has two main aims. The first is to review the recent literature on using business surveys and financial market data as indicators in forecasts of GDP. If found to have strong predictive content, then there is a rationale for using these data to guide early estimates. The conclusion of this article is that there are likely to be significant technical difficulties with the use of such indicators in this way, and that other considerations must also be taken into account, notably the independence of official estimates, and their grounding in international standards. Therefore an informal use of these data is the most appropriate and then simply as a guide and a check on official estimates. Second, the number of potential indicator variables is very large. Although some of these warrant more consideration than others, it is useful to extract common factors which may be interpreted as shared underlying trends in order to give a single 'external data' view of the economy. This can be done using principal components analysis which works as a data reduction technique. Using this approach, for each quarter, an alternative estimate of GDP is constructed for comparison purposes with the official estimate.

The rationale for using external data in official estimates

Both the ONS preliminary estimate of GDP and the alternative estimate constructed using external data sources can be viewed as nowcasts of GDP. That is, they are essentially forecasts of later vintages of the same data. Following Granger and Ramanathan (1984), there is an extensive literature on the potential benefits of reducing forecast errors by combining forecasts. Noting that forecast errors in this context refer to data revisions, it is worth exploring the potential scope for a combination of preliminary and alternative estimates to produce a better timeliness-accuracy trade-off for early GDP estimates.

Let the preliminary estimate of GDP

for period t be defined as y_t^p , and a mature estimate as y_t^m . If the preliminary estimate is simply a nowcast of the later estimate then:

$$y_t^m = y_t^p + \varepsilon_t \quad (1)$$

The error term ε_t is the associated forecast error. The revision from the preliminary to the mature estimate is simply $R_t = y_t^m - y_t^p$, so from (1) it is clear that revisions are just forecast errors between different vintages of the same data. Mincer and Zarnowitz (1969) argue that if the preliminary estimate is an efficient forecast then it must fully incorporate all the information available at the time of its compilation. Therefore, the forecast error or the revision should be unpredictable, implying that future revisions are driven solely by information that will only become available in the future. This statement forms what is known as the efficient forecast hypothesis (EFH).

A test of the EFH can be formed by estimating

$$R_t = a + by_t^p + \mathbf{X}_t' \boldsymbol{\phi} + \varepsilon_t \quad (2)$$

Where $\mathbf{X}_t = [x_{1t}, x_{2t}, \dots, x_{mt}]$ is the vector of m indicators and $\boldsymbol{\phi} = (\phi_1, \phi_2, \dots, \phi_m)$ an associated vector of coefficients. In this case the null hypothesis of accepting the EFH requires

$$a = b = \phi_1 = \phi_2 = \dots = \phi_m = 0 \quad (3)$$

Acceptance of this null would imply that revisions are unpredictable and that the EFH holds. However, a rejection of the null would infer the opposite, that the current forecast is inefficient and making use of the added information will on average reduce revisions.

The form of (2) is fairly easy to justify and gives an indication from where extra information might be found. If $a \neq 0$ then it implies that there is a systematic component or bias to the revisions. For example, if $a > 0$, it implies that revisions have a positive mean, suggesting that the preliminary estimate on average underestimates the latest estimate. This could be corrected by simply adding a bias adjustment of the size a to the preliminary estimate.

It might also be the case that $b \neq 0$ which suggests that the preliminary estimate itself is a predictor of future revisions. For example, if $b < 0$, revisions are inversely related to the preliminary estimate. This would mean that if the preliminary estimate is positive (perhaps overestimated) then the subsequent revision is likely to be downwards, whereas if the preliminary estimate is negative (perhaps

underestimated) then future revisions are likely to be upwards. Alternatively, if $b > 0$, then the implication is that preliminary estimates under-record the strength of a growing economy and the weakness of a shrinking economy.

When one or more components in the coefficient vector $\boldsymbol{\phi}$ are significantly different from zero, it means that the associated indicators have predictive power over revisions. In this case, the preliminary estimate can be improved if it is adjusted to incorporate the part of the revision that is predicted by the indicators.

The concept of forecast efficiency is very similar to the notion of combining forecasts outlined by Granger and Ramanathan (1984). The optimal forecast of GDP is its expected value given the full available information set (I_t) , $y_t^* = E[y_t/I_t]$. The preliminary estimate in turn is the expected value of GDP growth given the information available to ONS $y_t^p = E[y_t/I_t^p]$. Because these are based on surveys of samples rather than populations, the information set will only be a subset of the total $I_t^p \subset I_t$. Likewise, the alternative estimate is based on the information available to the forecaster from business survey and financial market data $y_t^A = E[y_t/I_t^A]$, which is again a subset of all the information available $I_t^A \subset I_t$. The combined forecast represents the estimate based on the union of the two information sets $y_t^C = E[y_t/I_t^p \cup I_t^A]$.

Combining information or data sets is difficult though, especially if they are large and not measured in the same units. For example, in the ONS survey, the response by a firm will represent a point estimate of quarterly output movements, whereas in an business survey they would simply reply 'up', 'down' or 'no change'. Quantitative and qualitative data cannot be easily combined. Therefore, combining forecasts provides an easy approximation to combining information sets $y_t^C = \lambda y_t^p + \omega y_t^A$. The optimal weights λ and ω can be identified as the estimated coefficients from the regression:

$$y_t^m = \lambda y_t^p + \omega y_t^A + \varepsilon_t \quad (4)$$

It is often the case that the weights are constrained to sum to one. There is no econometric rationale as to why the restriction $\omega = (1 - \lambda)$ in (4) needs to be applied; in fact, unrestricted estimation is likely to produce a better fitting equation. However, imposing the restriction makes it easier to judge the relative contribution of each forecast in the optimal combination.

There is a clear link between the concept of forecast efficiency and the motivation

underlying forecast combinations. The alternative estimate can be formed from a set of indicators using a two-stage process. First, estimate a relationship between a mature estimate of GDP and the set of m indicator variables:

$$y_t^M = \alpha + \mathbf{X}_t \boldsymbol{\theta} + \varepsilon_t \quad (5)$$

where $\boldsymbol{\theta} = (\theta_1, \theta_2, \dots, \theta_m)$ is a set of m coefficients. The alternative estimate can then be formed using the estimated parameters from (5). As all the elements in \mathbf{X} for time t are available before the preliminary estimate is published, the alternative GDP forecast can be constructed using the coefficients from (5) estimated at time $t-1$:

$$y_t^A = \hat{\alpha} + \mathbf{X}_t \hat{\boldsymbol{\theta}} + \varepsilon_t \quad (6)$$

Essentially the forecast efficiency (2) and forecast combination (4) models are just reparametrisations of each other, where $a = \omega \hat{a}$, $b = -\lambda$, $\boldsymbol{\varphi} = \omega \hat{\boldsymbol{\theta}}$ and \hat{a} and $\hat{\boldsymbol{\theta}}$ are the estimated coefficients in (6). The two models are therefore equivalent. If the preliminary estimate is an inefficient estimate of mature data, it implies that it fails to incorporate available and relevant information. If this information is reflected in an alternative estimate, then combining forecasts leads to a more efficient outcome (that is, lower forecast errors or revisions on average).

This forecast combination approach is advocated by the Bank of England in Ashley *et al* (2005). ONS has investigated the potential improvement to revisions performance but has stopped short of using formal combination methods for a number of reasons.

The success of forecast combination models, like any forecast models, is best assessed by testing out-of-sample performance. As will be seen in the next but one section, there is a substantial literature showing that indicators that work well in-sample can form poor forecasts when the sample is extended. The best-fitting equation is not necessarily the best forecasting model. This is partly because the relationship between indicators and official data is unstable over time. Certain indicators are found to work well but only in certain periods. The relationships are further complicated by ongoing improvements to National Statistics, such as the development work on measuring the service sector (see Tily (2006)). All in all, a relationship that worked well in the past will not necessarily perform so well in the future.

Tests should also be conducted using 'real time' data. These are the unrevised data available at the time the forecast was produced. Failure to do so gives the forecaster an informational advantage that he would not enjoy in actuality. It is much easier to select the relevant variables if you have some knowledge of where the data being forecast will gravitate towards in the future. As yet there is little published evidence that external indicator variables have performed well in out-of-sample tests on real time data. These points are generally accepted in Ashley *et al* (2005).

As a National Statistics institution, ONS has an obligation to meet international standards on the formulation of National Accounts, and produce estimates in a transparent way so that users can be confident that quality benchmarks are being maintained. Combining official estimates with indicators would certainly compromise this. Many business surveys are based on very small samples compared with those used by ONS, and purport to measure something other than a point estimate of GDP. A difficulty in separating out the different data sources might also hamper users who could just as well combine the data themselves if considered necessary.

ONS recognises that external data sources are potentially useful in helping to interpret and validate its data but, based on the above considerations, it is better to use indicator data in a strictly informal way rather than incorporating them into official estimates using combination models.

Indicators of GDP

There are two main sources of information on which an alternative estimate of GDP can be based.

Business and consumer surveys

There are many industry groups and trade associations that administer surveys on certain sectors of the economy. These business surveys are based on smaller samples than those conducted by ONS and tend to be more qualitative. For example, the ONS survey would seek to measure how output changed in a certain industry over the quarter. The external surveys on the other hand would simply ask firms to respond as to whether their output went 'up', 'down' or was 'unchanged', with the results published as a balance statistic between the total number of 'ups' and 'downs'.

There are a large number of these types of surveys in the UK recording a rich variety of firm and consumer behaviours, experiences and expectations. These do

not just apply to recent output, but factors that are otherwise difficult for National Statistics institutions to collect such as expected future output, capacity constraints, confidence, cost and availability of finance, skill and labour shortages, order books and uncertainty of demand.

The three main business surveys are conducted by CIPS and the BCC, which cover the manufacturing and service sectors of the economy, and the CBI who survey the manufacturing and distribution sectors. Other important sources include the PricewaterhouseCoopers financial services survey, the British Retail Consortium survey of high street consumer spending, and consumer confidence indicators provided by MORI and GfK.

Monetary and financial data

Data from financial markets are generally available in 'real time' so there is only a very small delay between the end of the reference quarter and the availability of relevant data. Monetary and financial data consist of variables such as exchange rates, interest rates, yield curves, stock market indices, money supply and commodity prices. There are two ways in which these data are expected to be an indicator of GDP.

First, there is a direct economic association between financial data and the main aggregates of GDP. Movements in exchange rates affect imports and exports. Interest rates and stock market prices have an impact on both consumption and investment. Although conventional wisdom argues that monetary variables have no long run effects on real variables such as real GDP growth, the presence of nominal rigidities implies that they can have significant short-run effects.

Second, the prices of financial assets are largely governed by expectations about the future including GDP growth. If the economy is anticipated to grow strongly, then expectations of higher future profits will boost current stock market prices and perhaps the gradient of the yield curve would increase. The price of financial assets generally incorporates investors' expectations of the future; hence movements in asset prices might be an indicator of future economic growth.

Recent literature on the use of indicator variables

A large literature has grown up on how these indicators might be used to forecast GDP and its components.

Business surveys

Blake *et al* (2000) look at the short-term forecasting of EU industrial production using three business surveys and short-term interest rates as an indicator. The models are estimated recursively and out-of-sample performance is tested. The findings suggest that models with indicators generally do worse than simple autoregressive models. Naive models where output growth is equal to previous output growth are found to perform well so there is little role for indicator variables, particularly in quieter periods. They also report that the best-fitting model is not always the best forecasting model, and that performance was sensitive to the choice of starting date for the forecast evaluation stage.

However, Sedillot and Pain (2003) find that indicators such as business surveys and financial variables can outperform autoregressive time series models when forecasting GDP for a range of OECD countries. For most countries, the difference in forecasting errors is statistically significant, but different indicators tend to perform differently in different countries. Although their results are based on recursive testing, the underlying data are not 'real time' but the most recently published data set. Similar results were found by Mouougagne and Roma (2002) who investigate the use of confidence indicators for forecasting real GDP growth rates in a range of selected euro area countries. The results are based on a limited number of observations for out-of-sample assessments and found to be a useful improvement over ARIMA models. In addition, Garcia-Ferrer and Bujosa-Brun (2000) find that using qualitative survey data improves the detection of turning points in the economy for six OECD countries.

Consumer confidence

A number of researchers have investigated whether consumer confidence indicators can forecast consumer spending or GDP, but with very limited success. Howrey (2001) finds that measures of consumer sentiment sharpen predictions of recessions, but as a measure of quantitative GDP they only do marginally better than a distributive lag model. Furthermore, these results were not tested out-of-sample and the lead times between movements in confidence indicators and GDP are variable.

Bram and Ludvigson (1998), in forecasting consumer expenditure in the USA, show that adding extra information on consumer confidence reduced forecast

errors but not by a statistically significant amount. They also note that models tend to fit better in-sample rather than out-of-sample and in 'real time'. This finding is supported by Croushore (2005), whose main conclusion is that, in 'real time', indexes of consumer confidence are not of significant value in forecasting consumer spending. In fact, in some cases they make forecasts significantly worse.

Financial variables

The significance of financial variables in forecasting GDP is also mixed. Forni *et al* (2003) state that financial variables are not significant leading indicators of industrial production. Estrella and Mishkin (1998), though, find that the yield curve spread holds some power in predicting recessions based on out-of-sample forecasting models. Finally, Stock and Watson (2001) investigate the use of financial variables in predicting output growth using out-of-sample estimation. They find that financial variables predict output movements for some countries in some periods, but overall it is difficult to predict what variables will work where and when.

Factor analysis and data reduction techniques

A useful technique for forecasting output movements when there are a large number of potential indicators was pioneered by Stock and Watson (1989). The underlying hypothesis is that the collection of indicators is driven by a common unobservable variable which might be interpreted as the state of the economy. This can be extracted using a dynamic factor model and used to forecast GDP. This approach was extended by Camba-Mendez *et al* (2001) who develop an automatic leading indicator (ALI) model of GDP. This is a two-stage process where latent variables are first extracted from a set of indicators which are then used to forecast GDP using vector autoregressive models. The ALI model has been used in several instances to generate flash estimates of GDP and industrial production in the euro area (see Buffeteau and Mora (2000) and Bruno and Lupi (2003)).

Principal components analysis works in a similar way to factor analysis, aiming to select a small number of principal components which account for most of the variance in the larger original set of indicators. This approach is adopted by Klein and Park (1995) and Klein and Ozmurur (2001) who find that many indicators are helpful in improving

statistical performance for forecasting but no single indicator can do the job by itself. The results from surveys covering consumers and producers are generally useful in forecasting major macroeconomic variables such as industrial production and retail sales, and qualitative data can be very responsive to changing economic conditions. Principal components are used to find common factors from a range of surveys which are subsequently used to forecast the components of GDP. Encouraging results were found in one-step-ahead forecasts using this method.

Neither of these models, though, is immune to general forecasting problems. Stock and Watson (1992) highlighted many of the difficulties in using indicators to forecast GDP: for example they failed to predict the 1991 US recession. Indicator selection can be difficult, as certain indicators can work well in some samples but not in others. Emerson and Hendry (1996) share the scepticism in using indicator (ALI) based models for forecasting. Different indicators tend to perform well at different times, which make out-of-sample testing crucial, as model stability may be otherwise taken for granted.

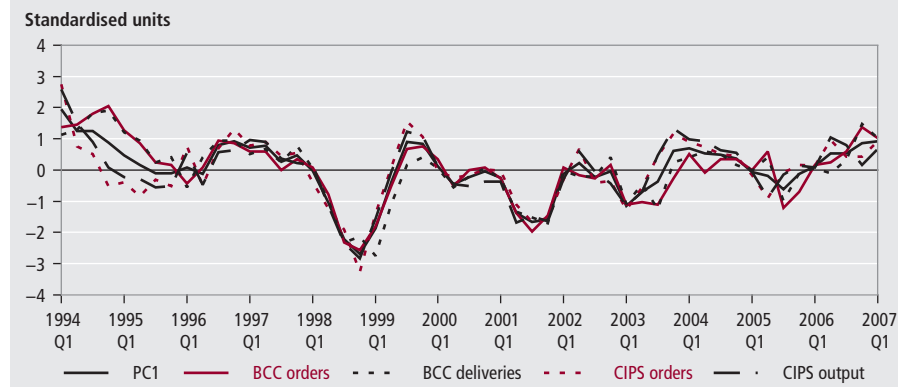
The general view from the literature is that indicator variables may offer some value in interpreting the economy, but whether they can make accurate forecasts of GDP on a consistent basis is unproved. ONS is therefore justified in taking a cautious approach in the use of external data sources.

An alternative estimate of GDP using principal components analysis

Equations (5) and (6) describe a two-stage process where an alternative estimate of GDP can be based on a set of indicator variables. This can then be used as a check against official measures. However, problems arise in estimating (5) because the potential set of external information is large relative to the sample size (T). The number m of available indicator variables amounts to several hundred, so because $T < m$, there is a major degrees of freedom problem and estimation of (5) is not possible. A further problem arises due to the high degree of correlation between many of the indicators. Estimation of (5) will then be subject to multicollinearity, and because it is then difficult to interpret the significance of the parameters in θ , model selection is hampered.

A solution to both these problems exists in using principal components analysis.

Figure 1
Four surveys of manufacturing activity and the first principal component



This essentially identifies the common factors in a set of data and, because the number of significant common factors is substantially below m , it works as a useful factor reduction technique. In addition, because principal components are designed to be orthogonal to each other, the collinearity problem that otherwise befits estimation of (5) is reduced. A full description of the principal components methodology can be found in Mitchell and Weale (2001).

For example, **Figure 1** plots four survey measures of activity in the UK manufacturing sector along with the first principal component of this data set. In **Table 1**, the relative variance accounted by each of the four principal components is displayed. The weights for the first principal component are designed so that the component accounts for the maximum variance of the four variables. The second principal component, in turn, accounts for the largest amount of variance not

Table 1
Variance proportions of the four principal components relating to the four manufacturing surveys in Figure 1

	Percentages			
	PC1	PC2	PC3	PC4
Variance proportion	83	15	1.1	0.9
Cumulative variance	83	98	99.1	100

accounted for the first, and so on. It can be seen that, in this case, 83 per cent of the variance in the four manufacturing surveys can be accounted for by one principal component.

Figure 2 illustrates how principal components analysis can be useful as a factor reduction technique when the set of available indicators is very large. In forming an alternative GDP estimate for 2007 Q1, there are a total of 415 available indicators, so there will also be 415 corresponding principal components. However, the first five principal components account for 62 per cent of the total variation, whereas the first ten account for 75 per cent of the cumulative variance. Therefore, a relatively large number of indicators may be represented by a fairly small number of principal components. In fact, once the eighth principal component is exceeded, no individual principal component accounts for more than 2 per cent of the total variance.

The estimation of (5) now becomes feasible. Instead of using the set of m indicators, the vector \mathbf{X} can be replaced with a vector \mathbf{Z} of $n < m$ principal components. The only remaining consideration is the choice of mature data y_t^M onto which the principal components will be mapped. A mature vintage, such as data that have passed through at least two Blue Books, would have advantages, as the alternative estimate might then reflect where the preliminary estimate could end up. However, the Quarterly National Accounts (month 3) estimate is chosen for two reasons. First, this is the most mature data vintage that is available with a one-quarter lag, so the alternative estimate only requires a one-step ahead forecast. Second, given a reported bias between preliminary and post-Blue Book 2 data, alternative forecasts constructed using later data vintages are unlikely to be informative about the scale and trends in the preliminary estimate, and hence of little comparative value.

Figure 2
Cumulative share of total variance accounted for by each principal component, 2007 Q1

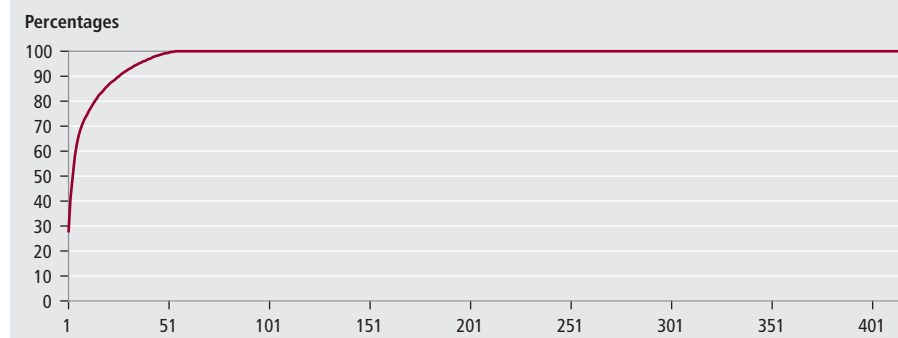
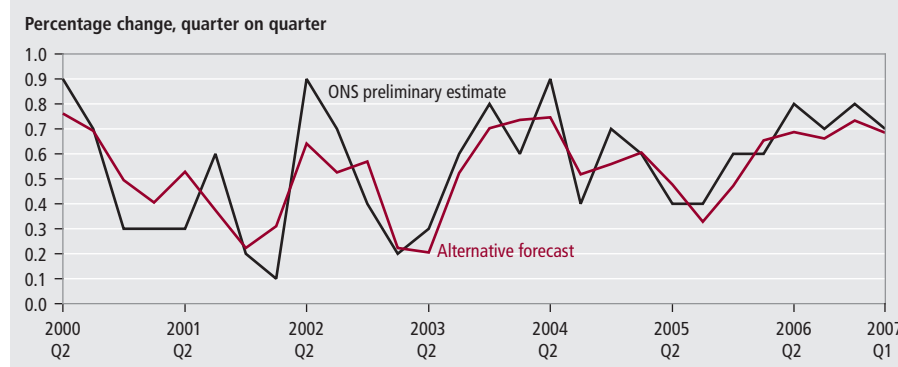


Figure 3
Preliminary and alternative early estimates of GDP



The alternative forecast of GDP is plotted in **Figure 3** along with the ONS preliminary estimate. Note that each of these forecasts has been generated out-of-sample using 'real time' data.

Conclusion

ONS takes a conservative approach to using external data sources in compiling its statistics. This is primarily due to the forecast reliability of indicators being unproven in 'real time', and that external data sources might not reach the same quality benchmarks required by the National Statistics label. However, there are a large number of available indicators from business surveys and financial markets which may help compilers in better understanding the current state of the economy and in interpreting their data. ONS is also taking steps to analyse and measure the coherence of official and external data.

This article introduces a simple approach to producing an early estimate of GDP using data collected from non-official sources. Principal components analysis is used to derive the common factors from a large number of available indicators, which is then used to form an alternative forecast/measure of GDP. This measure can help provide an informal check or guide when compiling official estimates.

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REFERENCES

Ashley J, Driver R, Hayes S and Jeffrey C (2005) 'Dealing with Data Uncertainty', *Bank of England Quarterly Bulletin* (Spring 2005).

Blake A, Kapetanios G and Weale M R (2000) 'Nowcasting EU Industrial Production and Manufacturing Output', National Institute of Economic and Social Research.

Bram J and Ludvigson S (1998) 'Does Consumer Confidence Forecast Household Expenditure? A Sentiment Index Horse Race', FRBNY Economic Policy Review, June.

Bruno G and Lupi C (2003) 'Forecasting euro-area industrial production using (mostly) business surveys data', ISAE, March 2003.

Buffeteau S and Mora V (2000) 'Predicting the national accounts of the euro zone using business surveys', mimeo, Division Synthese conjuncturelle, INSEE.

Camba-Mendez G, Kapetanios G, Smith R J and Weale M R (2001) 'An automatic leading indicator of economic activity: forecasting GDP growth for European countries', *Econometrics journal*, 4, s56-s90.

Croushore D (2005) 'Do consumer confidence indexes help forecast consumer spending in real time?', University of Richmond.

Croushore D and Stark T (2002) 'Forecasting with a Real-Time Data Set for Macroeconomists', *Journal of Macroeconomics* 24(4), pp 507-31.

Emerson R A and Hendry D F (1996) 'An Evaluation of Forecasting using Leading Indicators', *Journal of Forecasting*, 15, pp 271-91.

Estrella A and Mishkin F S (1998) 'The Yield Curve as a Predictor of U.S. Recessions', *Current Issues in Economics and Finance, Federal Reserve Bank of New York*, vol 2. no.7.

Forni M, Hallin M, Lippi M and Reichlin L (2003) 'Do financial variables help forecasting inflation and real activity in the Euro area?', *Journal of Monetary Economics*, 50(6), pp 1243-55.

Garcia-Ferrer A and Bujosa-Brun M (2000) 'Forecasting OECD industrial turning points using unobserved components models with business survey data', *International Journal of Forecasting*, 16, pp 207-27.

Granger C W J and Ramanathan R (1984) 'Improved Methods of Combining Forecasts', *Journal of Forecasting* 3, pp 197-204.

Howrey E P (2001) 'The Predictive Power of the Index of Consumer Sentiment', Brookings papers on economic activity.

Klein L R and Park J Y (1995) 'The University of Pennsylvania Model for High-Frequency Economic Forecasting' Economic and Financial Modelling, Autumn.

Klein L R and Ozmucur S (2001) 'The predictive power of survey results in macroeconomic analysis', MACROMODELS 2001, Krag, Poland.

Mincer J and Zarnowitz V (1969) 'The Evaluation of Economic Forecasts', in Economic Forecasts and Expectations, ed. J. Mincer, National Bureau of Economic Research, New York.

Mitchell J and Weale M R (2001) 'A review of statistical procedures for FLASH estimates of GDP and its components', National Institute of Economic and Social Research, mimeo.

Mouougane A and Roma M (2002) 'Can confidence indicators be useful to predict short term real GDP growth?', ECB working paper no. 133.

Nelson E and Nicolov K (2003) 'UK Inflation in the 1970s and 1980s: The Role of Output Gap Mismeasurement', *Journal of Economics and Business* 55(4), pp 353-70.

Sedillot F and Pain N (2003) 'Indicator models of real GDP growth in selected OECD countries', OECD Economics department working paper no. 364.

Skipper H (2005) 'Early Estimates of GDP: Information Content and Forecasting Methods', *Economic Trends* 617, pp 26-35.

Stock J H and Watson M W (1989) 'New indexes of leading and coincident economic indicators', NBER Macroeconomics annual, pp 351-94.

Stock J H and Watson M W (1992) 'A procedure for predicting recessions with leading indicators: econometric issues and recent experience', NBER 4014.

Stock J H and Watson M W (2001) 'Forecasting output and inflation, the role of asset prices', NBER 8180.

Tily G (2006) 'Improvements to timely measures of service sector output', *Economic Trends* 630, pp 29-42.

FEATURE

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Measures of accuracy for the Index of Production

SUMMARY

In recent times the key measure of quality used for the Index of Production (IoP) has been the revisions performance of key aggregates. This is published as a set of revisions triangles alongside the monthly IoP release on the National Statistics website. Additionally, the IoP homepage on the website has a link to a Summary Quality Report which describes other aspects of quality of the series, for example, their timeliness, punctuality and relevance. This article sets out the results of recent further work on another dimension of the quality of these series: the accuracy of the estimates, based on an analysis of their sampling error. Additionally the article introduces an approach to defining quality bands for each series, to allow users to compare the relative quality of different IoP components.

The Index of Production (IoP) measures the volume of production of the manufacturing, mining and quarrying, and energy supply industries, which covered 18.6 per cent of the United Kingdom (UK) economy in 2003. The IoP is a monthly time series with annual and quarterly data also available.

The Index of Manufacturing (IoM) covers the 14 sub-sectors of manufacturing and these are aggregated to form the resulting monthly manufacturing output time series. The IoM is widely used as a short-term economic indicator in its own right, and the manufacturing industries made up 79.2 per cent of the total IoP in 2003.

The IoP has three primary uses:

- as a short-term economic indicator in its own right. The Government, HM Treasury and the Bank of England, among others, monitor the IoP as an important indicator of industrial activity. The IoP is usually published 26 working days after the end of the month – the earliest official indicator on the performance of UK industry
- as a component of the production or output measure of gross domestic product (GDP). GDP measures the sum of the value added created through the production of goods and services within the economy, and
- as a requirement for the Statistical Offices of the European Community (Eurostat). Information on production and current price sales are provided to Eurostat. These are used with data from

other countries to construct EC indices, published on a monthly basis

Ideally, the IoP would measure changes in value added of the production industries each month. On a short-term basis it is difficult to measure all the outputs and inputs in an industry, so the IoP measures changes in gross output. This is deflated turnover plus the change in inventories for work in progress and finished goods.

The IoP is published as a First Release. The Release disaggregates the manufacturing sector into seven industrial sectors as well as showing the main industrial groupings and the oil and gas extraction industry. The Release focuses on the standard three-month on previous three-month percentage movements. The IoP is a monthly series and news agencies and media generally focus on the monthly percentage change in the level of the index. However, monthly movements can be volatile, and the Office for National Statistics (ONS) gives prominence to three-month on previous three-month movements.

A link to the methodology for the IoP can be found in the References section.

New measures of quality for the Index of Production

In recent times, ONS has published information of the revisions performance of the IoP as a measure of its quality. Revisions performance is useful, but is somewhat limited as a quality measure, since it tells us nothing about the accuracy

of the estimates themselves. In response to this shortcoming, ONS has now developed an additional measure of the quality of the published series. This is the standard error of the annual growth rate of each series. It provides a guide to how well series meet users' purposes, although different users have different requirements. Before looking at the standard errors themselves, it is helpful to be clear what they say about the quality of the series (see **Box 1**).

Method of estimation

The estimation of standard errors for official statistics has long been recognised as being very difficult. Standard errors exist for few composite measures due to the complexity of calculating estimates from multiple data sources. For the IoP, ONS has used a technique that simplifies the method of estimation. The calculation of the standard errors of the IoP required first the calculation of the variance of each individual component series. This section describes how this was carried out and how it was used as the basis for the calculation of the variance of each aggregate series, including the total IoP itself.

There are four main data sources used to compile the majority of the IoP:

- Monthly Production Inquiry (MPI)
- Quarterly Stocks Inquiry (QSI)
- Producer Price Indices (PPI), and
- Export Price Indices (EPI)

In essence, the IoP is constructed as a combination of sales growth from the MPI, deflated by the PPI and EPI, with changes in stocks from the QSI deflated by stocks deflators, which are also derived from PPIs. The main source of variance estimates for the IoP is turnover data from the MPI.

A new technique has been developed to estimate variances for the IoP. The approach used is to partition the total variance of the growth rate for a given industry domain into contributions from the following additive components:

- total sales
- inventory changes
- the differential movement of domestic and export sales
- export price indices
- producer price indices
- the effect of lagging deflators for inventory changes

Each of these components is a sum of variances, each multiplied by the appropriate squared weight. For sales and inventories, summation is across industries. For EPIs and PPIs, summation is across products. This approach simplifies the computations considerably because there is no need to consider explicitly the covariances between industry deflators that use the same price deflators. It has the added advantage of allowing the user to see easily the contributions made by the different data sources. A demonstration of this can be seen in the Appendix.

Exploratory work using the new method demonstrated that nearly 95 per cent of the total variance of the main industry IoP is attributable to the variance of the MPI data. For this work, therefore, ONS has computed estimates of variance for the IoP using only sales data from the MPI. Using this approximation meant that complicated problems matching data between the MPI and deflators were avoided, and so estimates of variances could be computed for much larger time periods. The longer series of variance estimates ensures more

reliable quality measures. However, not all of the production industries are sourced to the MPI. The industries not covered are all volume series and their data are collected from different sources by various other government departments and trade associations. In these cases, the methodology used means that it would be very difficult to produce standard errors and therefore there is no standard error estimate calculated for the non-MPI industries.

Quality bands for the Index of Production

To provide users with a sense of the relative quality of each IoP series, ONS has established four quality bands into which each series has been allocated. After examination of the possibility of using composite quality measures based on a range of different indicators weighted together, it was felt that a simpler method using just the standard errors and growth rates of the series could be more easily motivated. The rationale for this approach is similar to that used for the average earnings index (Youll, 2002).

The four quality bands are denoted A, B, C and D and define the relative quality of the series, but say nothing about quality in absolute terms. Nor are labels attached to the bands (for example, A = excellent, B = good and so on). Such labels are likely to be unhelpful, since they will mean different things to different people. The quality bands simply indicate that those in band A are of higher quality (have greater accuracy) than those in band B, and so on.

The choice of where to draw the lines between adjacent bands is guided by the need to provide a reasonably equal number of series in each band. This makes

Box 1

What is a standard error?

The difference between an estimate and its true value is known as the sampling error. The actual sampling error for any estimate is unknown, but a representative error can be estimated from the sample and this is known as the standard error. This provides a means of assessing the accuracy of the estimate of growth: the lower the standard error, the closer the estimate of production growth is likely to be to its true value. In fact, the degree of confidence can be expressed more precisely. If estimates of the true production growth rate were obtained from many different samples, then approximately two-thirds of these estimates would be less than one standard error away from the true value and approximately 95 per cent

of them would be less than two standard errors away from the true value. Standard errors are often presented in terms of confidence intervals around an estimate.

For example, if the standard error for an estimated growth rate of 4.0 per cent is 0.4 percentage points, then the estimate of 4.0 per cent has a 95 per cent confidence interval of 3.2 per cent to 4.8 per cent (that is, 4.0 per cent ± 2 standard errors). One further way to express the standard error is as a percentage of the estimate itself. This is referred to as the coefficient of variation (CV) of the estimate. In the example above, the estimated growth rate of 4.0 per cent has a CV of 10 per cent (that is, 0.4/4.0 expressed as a percentage).

maximum use of distinction between bands. If this approach were not used then, at an extreme, if bands B, C and D were chosen such that there were no series in these bands (that is, all series were defined as band A), the power of the banded approach would be lost. To achieve a reasonable allocation of series to each quality band, the following criteria were used:

- the average standard error of the annual growth rates
- the sample size
- the achieved sampling fraction (after taking into account non-response)
- the smoothness of the series (as a measure of the signal to noise ratio)

Results

Based on the criteria for defining each quality band described above, **Figure 1** shows where each of the detailed component series which make up the total IoP (there are 224 of them) fall on a scatter diagram, plotting the 2005 median growth rates against the median standard errors.

Aggregate series based on these detailed component series have also been allocated into quality bands, using the same criteria.

Table 1, **Table 3** and **Table 4** show the 2005 median growth rates, standard errors and quality bands for the total IoP, IoM, main industrial groupings and sub-sector series level. The 2005 median growth rate

denotes the median of the annual growth rates for each month in 2005. The 2005 median standard error denotes the median of the standard errors of the annual growth rates for each month in 2005. **Table 2** shows the annual growth rates, standard errors and quality bands for each month in 2005 for the total IoP. The IoP weights in each figure do not sum to 1,000 due to the non-MPI-sourced industries having no standard error calculated.

Further developments

The figures in the previous section provide a snapshot of the quality of the IoP and its component series, based on the average standard errors in 2005. In that sense, the measure is static, and it is not intended to update this each time the index is published. The standard errors over the period considered in the forgoing analysis were reasonably stable for each series and so provide a robust indication of the current quality of the published IoP and component series. However, there are a number of developments to the IoP in the coming months which are likely to lead to significant changes in the quality and relative quality of the IoP and published components. In particular:

- a reduction in the sample sizes of the two main surveys used to produce the IoP, namely the Producer Prices Survey (used to produce PPIs) and the MPI. The PPI survey was reduced by 25 per cent at the start of 2007, and a 17 per cent reduction in the sample size for the MPI is planned for later in 2007
- a revised sample allocation for the MPI is also planned at the same time as the reduction in the sample size. The combined effect of sample cuts and revision should be to reduce the standard error of the IoP
- the variable used to calculate population estimates from sample values will be changed from employment to turnover when the MPI sample is reduced. Turnover for the population as a whole more closely correlates with the sampled estimate of turnover than does employment, and so this change will lead to a further reduction in the standard error of the IoP
- finally, in early 2008, it is planned to carry out a more thoroughgoing update of the MPI sample, including redrawing the stratification of the sample. Again, this will reduce the standard error of the series

Figure 1

Quality bands based on the median growth rate against the median standard error for each four-digit production industry, 2005

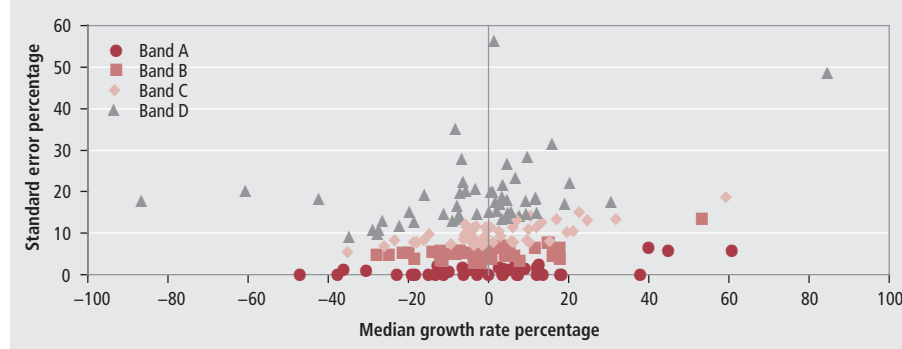


Table 1

Quality band measures for the IoP and IoM, 2005

Industry	Median growth rate (per cent)	Median standard error (per cent)	Quality band
Production	0.1	0.8	A
Manufacturing	-0.1	1.0	A

Source: Office for National Statistics

Table 2

Quality band measures for the IoP, January to December 2005

Production industries	Growth rate (per cent)	Standard error (per cent)	Quality band
January	0.5	0.8	A
February	1.7	0.8	A
March	-1.5	0.7	A
April	0.3	0.8	A
May	4.2	0.8	A
June	1.0	0.8	A
July	-2.2	1.1	A
August	4.0	0.9	A
September	-0.1	0.8	A
October	-1.3	0.8	A
November	-0.9	0.8	A
December	-0.2	0.8	A

Source: Office for National Statistics

Table 3

Quality band measures for the IoP main industrial groupings, 2005

Main industrial grouping	Median growth rate (per cent)	Median standard error (per cent)	Quality band	IoP weight (parts per thousand)
Consumer durables	-2.4	3.2	B	36.1
Capital goods	-0.8	1.9	A	189.5
Consumer non-durables	-0.7	1.6	A	249.4
Intermediate goods	2.7	1.9	A	253.2

Source: Office for National Statistics

Table 4

Quality band measures for the IoP sub-sector industry level, 2005

Sub-sector industry level	Median growth rate (per cent)	Median standard error (per cent)	Quality band	IoP weight (parts per thousand)
Mining and quarrying except energy-producing materials (CA)	14.2	3.4	A	8.3
Manufacture of food products, beverages and tobacco (DA)	2.1	1.1	A	88.0
Manufacture of textiles and textile products (DB)	-7.2	5.5	B	23.6
Manufacture of leather and leather products (DC)	-11.3	8.0	C	2.5
Manufacture of wood and wood products (DD)	0.1	10.4	C	14.7
Manufacture of pulp, paper and paper products; publishing and printing (DE)	-3.3	3.4	B	107.7
Manufacture of chemicals, chemical products and man-made fibres (DG)	0.8	1.4	A	87.4
Manufacture of rubber and plastic products (DH)	3.2	5.8	B	41.4
Manufacture of other non-metallic mineral products (DI)	3.4	2.7	A	29.8
Manufacture of basic metals and fabricated metal products (DJ)	12.7	5.1	B	75.9
Manufacture of machinery and equipment not elsewhere classified (DK)	1.9	2.9	A	66.0
Manufacture of electrical and optical equipment (DL)	-10.8	3.3	B	84.9
Manufacture of transport equipment (DM)	1.1	2.2	A	62.6
Manufacturing not elsewhere classified (DN)	-2.8	6.5	B	35.2

Source: Office for National Statistics

Taken together, it is not yet clear how these changes will affect the quality of individual IoP component series. However, research in ONS indicates that higher level aggregates (roughly division or two-digit Standard Industrial Classification components) will be improved by these changes, that is, their standard errors will be reduced.

An update of the results presented in this article will be published once the above changes have been implemented and 12 months of data are available to produce a stable average of the standard errors.

CONTACT✉ elmr@ons.gsi.gov.uk**REFERENCES**

- Bucknall R, Parkin N, Sova M and Wood J (2006) 'Estimation of Standard Errors for the UK Index of Production', *Survey Methodology Bulletin* 59, pp 1–10 and at www.statistics.gov.uk/events/gss2006/downloads/C1Parkin.doc
- Full S and Lewis D (2001) 'Estimating sampling errors for movements in the UK index of production', *Proceedings of the Statistics Canada Symposium*, 2001 at www.statcan.ca/english/freepub/11-522-XIE/2001001/session15/s15d.pdf
- Kocic P N (1998) 'Estimating the sampling variance of the UK Index of Production', *Journal of Official Statistics*, 14, pp 163–79 and at www.jos.nu/Articles/abstract.asp?article=142163

Rees M (2007) 'Summary Quality Report for the Index of Production' at www.statistics.gov.uk/statbase/product.asp?vlink=6230

Walton A (2005) 'Methodology for the Index of Production'. Non-journal article at www.statistics.gov.uk/articles/nojournal/IOPMethodology.pdf

Youll R (2002) 'Quality of the estimates of earnings growth from the Average Earnings Index', *Labour Market Trends* 110(4), pp 207–13 and at www.statistics.gov.uk/articles/labour_market_trends/AEI_estimates_apr2002.pdf

APPENDIX

Demonstration of decomposition of standard errors into data sources

The main contribution to the estimated variance of growth in the all-industry IoP from September 2003 to September 2004 comes from MPI data. **Table A1** demonstrates this, showing the estimated standard error (in percentage points), the corresponding variance (in percentage points squared) and the proportion of that variance attributable to each of the four main data sources:

- Monthly Production Inquiry (MPI)
- Quarterly Stocks Inquiry (QSI)
- Producer Price Indices (PPI)
- Export Price Indices (EPI)

Clearly, at the all-industry level, the dominant contribution is from MPI, which accounts for almost 95 per cent of the total IoP variance. This dominance remains, with a few exceptions, at all levels of aggregation. At main industrial groupings (MIG) level, MPI consistently dominates as the main source of variance, as illustrated in **Table A2** and **Figure A1**.

The main source of variance for IoP is turnover data from the MPI. Nearly 95 per cent of the total variance is attributable to the MPI. **Figure A1** illustrates the dominance of the MPI. The contribution of each MIG to the total IoP variance is shown as a percentage (y-axis), subdivided according to the contribution of the different sources within each MIG (different colours).

Table A1

Estimated variance for the IoP, September 2003 to September 2004

Weighted variance (percentage of total)	Weight	Standard error (percentage points)	Variance (percentage points squared)	Percentage of all industries variance			
				Monthly Production Inquiry	Quarterly Stocks Inquiry	Producer Price Indices	Export Price Indices
100.0	100.0	0.79	0.63	93.8	3.3	1.4	1.4

Source: Office for National Statistics

Table A2

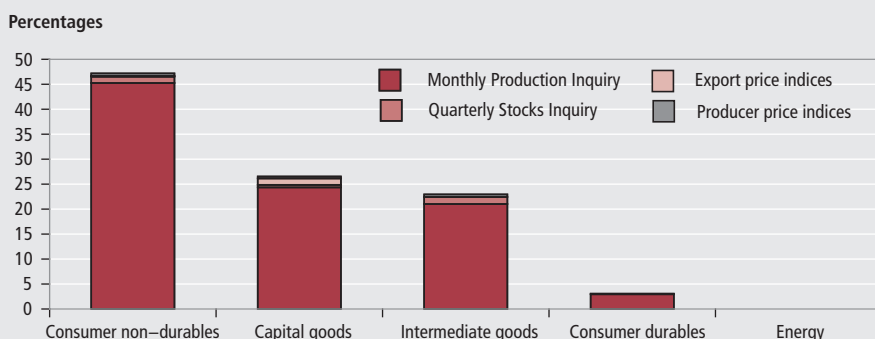
Estimated variance for the Index of Production at MIG level, September 2003 to September 2004

Main industrial groupings	Weighted variance (percentage of total)	Weight	Standard error (percentage points)	Variance (percentage points squared)	Percentage of all industries variance			
					Monthly Production Inquiry	Quarterly Stocks Inquiry	Producer Price Indices	Export Price Indices
Capital goods	26.62	22.05	1.82	3.32	91.8	2.0	1.5	4.7
Consumer durables	3.17	3.66	3.79	14.34	92.5	5.2	1.3	1.0
Consumer non-durables	47.23	25.81	2.07	4.30	95.9	2.8	1.1	0.2
Energy	0.00	21.74	0.00	0.00	0.0	0.0	0.0	0.0
Intermediate goods	22.98	26.73	1.40	1.95	91.5	5.9	2.2	0.4

Source: Office for National Statistics

Figure A1

Weighted variance of IoP growth at MIG level as a percentage of total weighted variance, September 2003 to September 2004



FEATURE

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Introduction of automatic occupation coding in ASHE

SUMMARY

The automatic coding tool, automatic coding by text recognition (ACTR), is being introduced for the Annual Survey of Hours and Earnings (ASHE). ACTR has been shown to improve the quality of occupation coding. However, it also brings a moderate discontinuity in the ASHE results. The improvement in the quality of the coding, and the savings obtained from using ACTR, mean that the benefits of its adoption are significant. For continuity, a revised 2006 data set will also be created on an ACTR-coded basis.

Historically, Standard Occupational Classification (SOC) codes were allocated to records on the Annual Survey of Hours and Earnings (ASHE) in two different ways. Firstly, SOC codes were carried forward for employees who were in the same job as the previous year. These codes may have been carried forward for a number of years without any reassessment of the employee's occupation. Secondly, for employees who were either not included in ASHE for the previous year, or employees who had changed jobs, the SOC codes were manually allocated by a team of coders through examining the job titles and descriptions supplied on the ASHE questionnaire and selecting the most suitable code.

Automatic coding by text recognition (ACTR) is a tool supplied by Canada's national statistical agency Statistics Canada and is approved by the Office for National Statistics (ONS) for assigning classification codes to text descriptions. The use of ACTR for coding GB occupations on ASHE was desirable as it had been shown to increase the quality of the SOC codes while reducing the burden on the coders within ONS. There was, however, the potential that moving from manual to ACTR coding would cause a discontinuity in the ASHE results, and this article assesses the discontinuity caused by coding all records (where possible) using ACTR on 2006 ASHE.

Quality of ACTR coding

A representative sample of 2,998 records was drawn from the 2006 ASHE survey, and ACTR was able to give an exact code to 1,358 (45.3 per cent) of these records. An expert coder (somebody who had an excellent knowledge of SOC 2000, and was able to match a job title to the most suitable occupation code) then assigned occupation codes manually to the 1,358 records, which allowed comparison of ACTR, existing ASHE coding as taken from the 2006 survey, and expertly coded records to assess the quality of ACTR's coding. All three methods for coding agreed on a code for 1,019 (75.0 per cent) of the records; however, the correspondence between ACTR and the expert coder was 98.5 per cent, while the correspondence between the ASHE codes and the expert coder was only 76.1 per cent. This gave a clear indication that ACTR was significantly improving the coding of occupations on ASHE.

Coding occupations using ACTR

ACTR works by reading the job title taken from the ASHE questionnaire, and where possible allocating the most suitable SOC code. In an exercise undertaken on the full 2006 ASHE data set, specific codes were allocated to around 45 per cent of records, an 'interactive' method was used to identify around 35 per cent of records, while the remaining 20 per cent were not allocated a code. This could be for reasons such as

poor-quality input data, or new records where the knowledge bases underpinning ACTR need to be updated to accommodate the new job titles. Interactive coding is used where the job title contains insufficient information to assign a SOC 2000 code, and so ACTR presents the coders with a number of options from which they can pick the most suitable based on the additional job information supplied on the respondent's questionnaire. For example, consider the job title 'teacher'. The level at which the person teaches is not known from this title, so for quality purposes it is unwise to let ACTR make an assumption. The records not coded directly by ACTR or through the 'interactive' method would need to be manually coded as in previous years if they were new, or have their SOC codes carried forward if they featured in ASHE on the previous year's survey. ASHE data relating to Northern Ireland employees are collected by the Department of Enterprise, Trade and Investment (Northern Ireland), which has no immediate plans to implement ACTR.

Positives and negatives of implementing ACTR on ASHE

Positive features arising from implementing ACTR on ASHE include:

- there is an improvement in the quality and consistency of ASHE results
- out-of-date codes will be updated annually
- fewer resources are required for coding within ONS and this will reduce costs
- ACTR gives ONS the opportunity to implement a standard tool for classifying occupations

Negative aspects include:

- introducing ACTR will cause a discontinuity in ASHE results
- automatic coding is based purely on job title, with no reference to additional information about the job supplied on the questionnaire. However, additional information may be used for interactive coding

- information management costs involved in setting up ACTR

Discontinuity in gross weekly pay

Analysis was performed on the 2006 ASHE results by coding as many records as possible using ACTR and comparing the results with the data set used to publish 2006 results. The new data set was reweighted and re-imputed as these operations depend on the one-digit occupation group of the employee (see Table 1).

The largest revisions to median gross weekly pay were generally in the higher-paid occupation groups where using ACTR coding on all records where possible led to a decrease in gross weekly pay. Although occupation groups 32 – health and social welfare associate professionals, 41 – administrative occupations, and 42 – secretarial and related occupations all had large movements in the number of jobs either going in or out of these groups,

Table 1

Difference in gross weekly pay¹ through using ACTR coding on all records where possible

Two-digit occupation	Median gross weekly pay					
	Manual (£)	ACTR (£)	Difference (£)	Difference (per cent)	CV (manual) (per cent)	CV (ACTR) (per cent)
11 – Corporate managers	688.1	677.2	-10.9	-1.58	0.4	0.6
12 – Managers and proprietors in agriculture and services	508.5	494.0	-14.5	-2.85	1.8	1.8
21 – Science and technology professionals	662.3	651.6	-10.7	-1.62	0.8	1.0
22 – Health professionals	1,038.4	1,037.7	-0.7	-0.07	3.0	2.8
23 – Teaching and research professionals	625.3	625.3	0.0	0.00	0.5	0.5
24 – Business and public service professionals	643.9	632.4	-11.5	-1.79	1.2	1.2
31 – Science and technology associate professionals	479.1	475.8	-3.3	-0.69	1.1	1.0
32 – Health and social welfare associate professionals	485.9	484.1	-1.8	-0.37	0.7	0.7
33 – Protective service occupations	607.6	603.2	-4.4	-0.72	0.9	1.0
34 – Culture, media and sports occupations	488.7	485.4	-3.3	-0.68	1.7	1.9
35 – Business and public service associative professionals	505.7	498.0	-7.7	-1.52	0.9	0.7
41 – Administrative occupations	337.0	335.2	-1.8	-0.53	0.4	0.4
42 – Secretarial and related occupations	340.2	339.5	-0.7	-0.21	1.0	1.0
51 – Skilled agricultural trades	321.7	319.1	-2.6	-0.81	2.0	2.3
52 – Skilled metal and electrical trades	460.0	460.2	0.2	0.04	0.7	0.7
53 – Skilled construction and building trades	416.8	413.2	-3.6	-0.86	1.3	1.4
54 – Textiles, printing and other skilled trades	320.0	320.2	0.2	0.06	1.7	1.6
61 – Caring personal service occupations	288.3	288.0	-0.3	-0.10	0.7	0.7
62 – Leisure and other personal service occupations	306.6	309.3	2.7	0.88	1.6	1.7
71 – Sales occupations	258.7	255.6	-3.1	-1.20	0.9	0.8
72 – Customer service occupations	293.2	294.0	0.8	0.27	1.0	1.1
81 – Process, plant and machine operatives	376.7	377.9	1.2	0.32	0.9	1.0
82 – Transport and mobile machine drivers and operatives	394.4	394.7	0.3	0.08	0.8	0.8
91 – Elementary trades, plant and storage related occupations	308.2	308.5	0.3	0.10	0.7	0.7
92 – Elementary administration and service occupations	286.4	286.0	-0.4	-0.14	1.1	1.0
UK	447.1	444.1	-3.0	-0.67	0.2	0.2

Notes:

1 Full-time employees on adult rates of pay whose earnings have not been affected by absence.

The quality of an estimate is measured by its coefficient of variation (CV), which is the ratio of the standard error of an estimate to the estimate.

there was little change in their median gross weekly pay. This indicated that, where jobs were moving into or out of these groups, they had a similar level of gross weekly pay to the records already in the group.

The majority of revisions to the coefficient of variation were small at either 0.0 or 0.1 percentage points. The largest increase in the coefficient of variation was 0.3 percentage points, as seen in occupation group 51 – skilled agricultural trades, while the largest decreases, of 0.2 percentage points, were in 22 – health professionals and 35 – business and public service associative professionals.

Movement of occupations

Under ACTR, a large number of jobs that were manually coded as being part of occupation group 41 – administrative occupations, moved into occupation groups that, on average, had a higher level of gross weekly pay. The biggest movements were into occupations groups 11 – corporate managers (48,000) and 35 – business and public service associative professionals (73,000). Although 41 – administrative occupations had little change in median gross weekly pay as a result of this movement, there was a significant reduction in both occupation groups 11 and 35. A similar pattern occurred in other occupation groups and, when coupled with jobs leaving these high earning groups and moving into slightly less well-paid groups, there was a reduction in median gross weekly pay that particularly affected the groups with the highest earners. The lower-paid occupation groups also saw a decrease in median gross weekly pay (albeit to a lesser extent), as they lost some of their best-paid jobs to groups with higher median gross weekly pay.

The main reason for the large number of jobs moving into occupation group 11 – corporate managers, was that the coding tool better handled the inclusion of the word ‘manager’ in the job title than those who were manually coding occupation. Reasons for other movements between occupation groups appeared to be logical when the job titles were examined, although it is unclear if these discrepancies were due to miscoding or a failure to update out-of-date codes.

Changes in ASHE weighting

ASHE weights are produced by looking at the proportion of records falling into each of 108 weighting groups, and calibrating these to the proportions represented among the same 108 groups on the Labour Force Survey. Weighted estimates are higher than unweighted ones. This may seem like a strange result, as the main exclusions are those employees below the PAYE threshold. However, high earners have a poor response rate, and have been under-represented in the unweighted sample. The weighting therefore corrects for this. One of the variables used in the weighting process is one-digit occupation, and so the move from manual to ACTR coding alters the weights assigned to each group. When coding with ACTR, the median weights generally decrease for the higher paid one-digit occupation groups (particularly 1 – managers and senior officials, 2 – professional and 3 – associate professional and technical) and generally increase for the lower-paid occupation groups. This implies that some of the bias caused by the poor response of high earners has now been addressed by coding with ACTR. What is now seen is a levelling out of the weights across the occupation groups and an overall decrease in estimates of UK earnings.

Impact on the main ASHE outputs

Gender pay gap

ASHE is used to measure the gender pay gap, which shows the difference in average earnings of men and women. This measure is based on hourly earnings, excluding overtime, for full-time employees on adult rates of pay whose earnings have not been

affected by absence. Here, full time is taken as anyone working more than 30 paid hours in a week or, in the case of teachers, 25 or more paid hours in a week. This analysis has been carried out using mean hourly earnings (see **Figure 1**).

Using all ACTR coding (where possible) on the 2006 ASHE results slightly increased the UK gender pay gap by 0.1 percentage points to 17.3 per cent. The largest increase across one-digit occupation groups was 1 percentage point for 1 – managers and senior officials, raising it to 27.2 per cent. The largest reduction was 0.8 percentage points in 2 – professional occupations, where the gender pay gap narrowed to 9.4 per cent.

Revisions to the gender pay gap figures are seen to be relatively small.

Low pay estimates

ASHE is also used to measure the number of employees paid below the National Minimum Wage (NMW). In 2006 the NMW was £3.00 for 16- to 17-year olds, £4.25 for 18- to 21-year olds and £5.05 for those aged 22 and over. **Table 2** shows the weighted counts by one-digit occupation. Compared with using manual coding, there were 335,000 jobs falling below the NMW in the UK using ACTR coding, a drop of 1,000. The largest percentage change was found to be in occupation group 2 – professional, where the number paid below the NMW decreased by 1,000. However, this group contains relatively few jobs paid below NMW and so the large percentage difference is not so significant. The figures show that there is no significant impact on the estimates of numbers paid below the NMW in the move to using ACTR.

Figure 1

Gender pay gap: by one-digit occupation

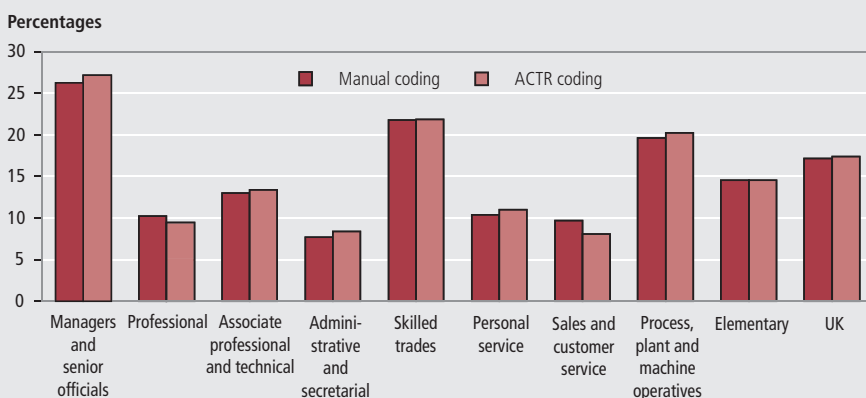


Table 2
Number of jobs falling below National Minimum Wage

One-digit occupation	Thousands	
	Number of jobs falling below NMW	
	Manual coding	ACTR coding
1 – Managers and senior officials	14	14
2 – Professional	5	4
3 – Associate professional and technical	14	15
4 – Administrative and secretarial	25	25
5 – Skilled trades	46	47
6 – Personal service	43	44
7 – Sales and customer service	67	66
8 – Process, plant and machine operatives	17	17
9 – Elementary	106	104
UK	336	335

Other options for implementation

An alternative option for implementation was to use ACTR to code only those records which did not appear in the ASHE data set in the previous year. There are no additional savings in resources for using this option. However, it would cause less of a discontinuity with the previous year's results. If it had been possible to add a marker to these records, then they could also have been identified and recoded in subsequent years and so, over time, those

records that in the past would have had their occupation codes carried forward, would now get an updated code. This option is not desirable, however, as the result would be to acquire an artificial change over time as ACTR codes an increasingly larger percentage of occupations. For this reason, it was felt best to incorporate the ACTR change in as full a way as possible, namely to code all the records in the data set which could be coded by the tool, and to quantify the discontinuity as accurately as possible.

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FEATURE

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International comparisons of productivity: the current and constant PPP approach

SUMMARY

The purpose of this article is to explain the differences between the current and constant purchasing power parity (PPP) approaches to producing estimates of international comparisons of productivity. This aims to outline and explain the context in which the respective approaches should be used. The Office for National Statistics (ONS) recommends that, for assessing differences in productivity levels, the current PPP approach should be used. For comparing differences in productivity growth across countries, the constant PPP approach should be used. This article marks the first time that ONS has produced volume growth rates for these productivity data using the constant PPP approach. These are presented towards the end of this article.

The Office for National Statistics (ONS) produces biannual estimates of international comparisons of productivity (ICP), usually in September and February of every year. The September release extends the ICP time series by one year (as well as including revisions to previously published data) whereas the February release is a revised version of the previous September's data. These revisions occur to the gross domestic product (GDP) and/or purchasing power parity (PPP) component data series. Presently, ICP data are produced using the current PPP approach. The release presents 'snapshots' of the G7 countries' international performances relative to the UK. These ICP data should be interpreted as a series of cross-sections, not as a time series. The technical reasons for this are explained in more depth in this article.

The article also publishes for the first time ONS estimates of ICP using the constant PPP approach that enable international comparisons of productivity growth. The reasons for using the constant PPP approach for time series analyses are discussed. These complementing ICP data are scheduled for incorporation into the September 2007 ICP release and are to become a permanent fixture of this release.

Current PPPs

The role of PPPs in calculating estimates of ICP is to serve as a 'currency converter'. They enable the GDP data of each G7 country, which are expressed in that country's currency, to be converted into a common currency. Without PPPs, it would not be possible to compare the output of these countries which would otherwise be expressed in the different countries' currencies. Current PPPs are used in the ICP estimates produced by ONS because they are the best indication of the most recent and relevant price structure. The role of PPPs is to eliminate the differences in price levels between countries' GDP data to produce a comparable measure of real output that can then be used for international comparisons.

However, the way in which PPPs are constructed for use in the ICP calculations means that they should only be regarded as currency converters for a given point in time. Inter-temporal comparisons of the ICP data produced by ONS should be avoided. This is why previous ICP First Releases have highlighted that users should not infer relative rates of volume growth from the published data. It is also the principal reason why the Organisation for Economic Co-operation and Development

(OECD) focuses on the latest annual data in their productivity levels publication.

Table 1 shows the ICP estimates from the February 2007 ICP First Release, the latest available at the time of writing. In this particular release, the data represented revised data for all years for which ICP data are published (1990 to 2005). However, these data should not be seen as a time series but rather a series of individual 'snapshot' comparisons. Although this difference in interpretation may not seem obvious, it is an important distinction that needs to be made. Users who infer a time series or volume growth from these data are incorrectly interpreting the ICP estimates that are published because of the way in which PPPs are constructed. Analyses of productivity growth require volume measures of output and if current PPPs are used, then changes in output over time are also capturing price changes. This is because PPPs are the best indication of each year's relevant price structure and hence change on an annual basis. Inferring productivity growth rates from these current PPP-based ICP data would also incorporate changes in price structures, and not just volume changes to output.

Whereas the ICP data produced using current PPPs can be used as indicators of how relative productivity levels have evolved over time, provided year-on-year changes are significant, it is advised not to use these data to infer comparisons of productivity growth. Considering the methodological features of the two approaches, the constant PPP approach is recommended for assessing changes over time.

Why current PPPs should not be used for time series analysis

The reason for this caution when interpreting the ICP data is the role of current PPPs as a currency converter. Current PPPs are constructed on an annual basis. The final stage of producing PPPs at the whole economy level involves weighting and averaging the price ratios for individual product groups. This depends on GDP expenditure shares for that particular year. Since new price data are collected on an annual basis, prices and price structures are allowed to vary over time, meaning that international comparisons can be made of labour productivity measures of countries for a given year. This is because for a given year, applying current PPPs to GDP measured at current prices (which are expressed in that country's respective

Table 1

Current PPP-based ICP estimates

GDP per worker (UK=100)

	Canada	France	Germany	Italy	Japan	UK	US	G7	G7 exc. UK
1990	118	131		133	107	100	137		
1991	116	131	113	132	107	100	136	123	125
1992	115	130	115	131	104	100	136	122	124
1993	113	126	111	132	100	100	133	119	121
1994	112	124	111	132	97	100	131	118	119
1995	111	123	111	134	97	100	130	117	119
1996	109	122	109	132	97	100	129	117	118
1997	107	121	107	129	94	100	128	115	116
1998	106	121	105	129	91	100	128	114	115
1999	109	119	105	127	91	100	131	115	117
2000	106	118	104	125	91	100	128	114	115
2001	104	116	102	121	89	100	125	111	112
2002	98	112	99	115	87	100	122	108	109
2003	97	109	104	111	88	100	123	109	110
2004	95	108	101	106	87	100	123	108	109
2005	96	109	99	104	88	100	125	109	110

GDP per hour worked (UK=100)

	Canada	France	Germany	Italy	Japan	UK	US	G7	G7 exc. UK
1990	117	136		123	93	100	132		
1991	115	136	129	122	94	100	132	119	121
1992	113	133	127	119	92	100	129	117	118
1993	110	129	123	120	91	100	125	115	116
1994	109	128	124	122	89	100	123	114	115
1995	109	130	126	124	90	100	122	114	115
1996	106	128	126	122	89	100	122	113	114
1997	106	128	124	119	88	100	120	112	113
1998	104	128	121	118	85	100	120	111	112
1999	106	126	122	116	86	100	121	112	113
2000	103	126	121	115	85	100	119	110	111
2001	101	126	120	112	84	100	118	109	110
2002	95	123	116	106	82	100	113	105	106
2003	94	119	122	103	81	100	114	106	106
2004	91	117	118	98	81	100	113	104	105
2005	93	119	115	97	83	100	116	106	106

Note:

Data for all years and all countries have been subject to revision in this release.

Source: Office for National Statistics

national currency) produces comparable measures of output in volume terms. For a given year, these volume measures are measured with the same price structure (that is, the PPPs for that year).

However, using current PPPs means that inferring productivity growth rates should be avoided. This is because this approach incorporates a combination of the following effects:

- relative volume changes
- changes in relative prices between countries
- changes in methodologies and definitions

Since current PPPs are constructed using current GDP expenditure data, making inter-temporal analyses of ICP data means that volume measures for different years are not measured using the same price structure. As the relative price structures of countries vary from one year to the next, the use of current PPPs explains why growth rates from ONS ICP estimates should not be calculated (see also **Box 1**).

The 'snapshot' approach

If inferences are to be made on whether the productivity gap of the UK relative to its key competitors has narrowed over time using the current PPP approach, the 'snapshot'

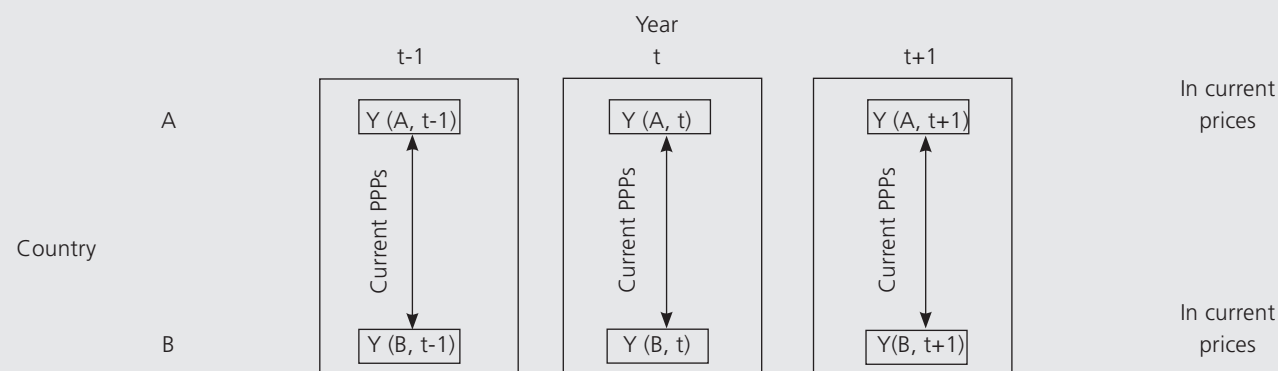
Box 1

Interpreting current and constant PPP-based ICP data

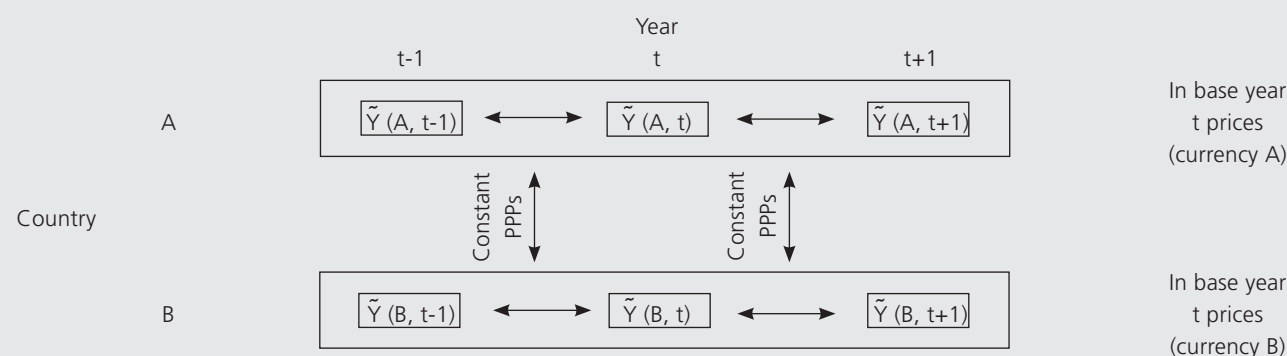
The diagram below illustrates how the data produced from the two different approaches to producing ICP should be interpreted. When using current PPPs, the data should be seen as a series of

snapshots which show the relative levels of productivity for different years. When using the constant PPP approach, the ICP data should be seen as a time series that allows relative rates of productivity growth to be analysed.

Comparing levels of productivity across countries at different points in time



Comparing growth rates of productivity across countries



approach can be used. This compares two snapshots of productivity levels in two different time periods (for example, 1995 and 2005). In this example, the relative performances of countries in 2005 can be compared with what was happening in 1995 in terms of how differences in productivity levels with the UK have changed over time (provided there is a significant change in levels). There is a subtle difference between this approach and inferring comparable measures of growth. The use of current PPPs means that year-on-year growth rates should not be made.

The reason for caution relates to the fact that differences of a few percentage points are not seen as significant when comparing differences in productivity levels for any given year. This is because of the difficulties in calculating PPPs, which means that it is not possible to say that there is significant difference in productivity levels of two countries if their ICP estimates only differ by a few percentage points. A difference

of a few percentage points could be caused by this measurement error rather than capturing differences in countries' productivity performance, which is why ONS takes this approach.

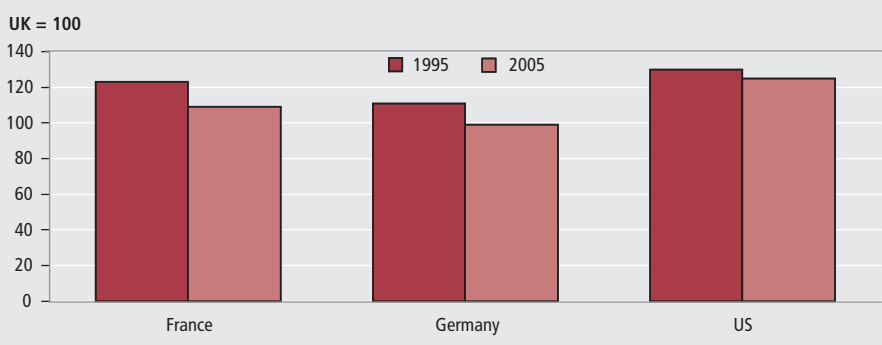
This reasoning also holds when using the snapshot approach which compares differences in productivity levels over two time periods. This approach should only be used if there has been a significant change in productivity levels between these two time periods, as defined by the change in percentage points. Analysis of current PPP-based ICP data shows that such differences do not occur on a year-on-year basis, which is why the snapshot approach should be used when using two time periods that are spaced out by several years and not for consecutive years. However, it is not possible to recommend a fixed time period because the change in percentage points in terms of productivity levels varies from country to country. For some countries it may be possible to use the

snapshot approach over a three-year period; for other countries it may be much longer.

The snapshot approach, while not allowing a precise quantitative-based analysis to be made as to how much the productivity gap has narrowed (or widened), does allow a qualitative assessment of the direction of change in the productivity gap. However, this cannot be used for comparing real rates of productivity growth.

Figure 1 presents ICP data published in the February 2007 ICP release for France, Germany and the US, the countries that are listed in the joint HMT/BERR Public Service Agreement target. Figure 1 shows that, between 1995 and 2005, the productivity gap between the UK and each of these countries on a GDP per worker measure did narrow, although a precise estimate on how much this gap has narrowed should not be inferred. Instead, this change can only be approximated, although caution should still be used.

Figure 1

The snapshot approach – GDP per worker**Constant PPPs**

Constant PPP-based ICP data should be used if comparisons of productivity growth are required. ONS has not yet published ICP estimates with calculated constant PPPs, although these are scheduled for inclusion in the September 2007 ICP First Release. These constant PPP-based ICP data will be suitable for comparing the UK's productivity growth with its key competitors over time.

Comparable measures of output for each G7 country (that is, GDP data adjusted by PPPs) are fixed to a base year. These are then extrapolated backwards and forwards from the base year by applying the annual volume growth rates in GDP in the respective countries, which produces comparable measures of output for the other years in the time series being investigated. This approach allows inter-

temporal analyses to be made because the price structure of constant PPPs does not vary over time. Only the PPPs for the base year are used in these calculations. This means that these ICP data are only capturing volume changes.

Box 2 shows in detail the methodology used for calculating ICP estimates based on constant PPPs. It should be apparent from step 2 that the underlying ICP data (that is, before indexing) for the base year should be the same whether the current or constant PPP-based approach is used since the two sets of calculations are identical. The difference occurs for the other years in the time series as the constant PPP approach only uses PPP data for the base year.

When the constant PPP approach is used, the subsequent volume measures of output replicate the relative movements of volume GDP growth. Using constant PPPs instead

of current PPPs means that only volume changes to output are captured, and this does not capture changes to relative prices. The only price structure that is taken into account is that in the base year, which is treated as constant, since only PPP data for the base year are used in the calculation.

Another feature of using this constant PPP-based approach is that it avoids difficult interpretations of breaks in the data series as well as avoiding dealing with any methodological changes that may have occurred over this period of time. If current PPPs are to be used when making time series analysis, methodological homogeneity has to be assumed, which is often a strong assumption to make.

Indexing

Current PPP-based ICP data are indexed in such a way that the UK data are equal to 100 for every year. This allows the productivity gap to be measured for any given year, which is in line with the recommended uses of these data. Constant PPP-based ICP data have been indexed in such a way that the data for every country are equal to 100 in the reference period. The reference period that has been chosen is 1991 because this allows the clearest comparisons of productivity growth for the whole time series for which ICP data are published. It is not possible to use 1990 as there are no German GDP data for that year (due to unification) meaning it is not

Box 2**Producing constant PPPs based ICP estimates**

Comparable output measures are calculated by applying the growth rate in GDP volume to the base year GDP estimate that has been adjusted by the PPP, and then extrapolating accordingly. The steps required to calculate the output measure for each country (denoted with the subscript i) is shown below. The remainder of the methodology to produce constant PPP-based ICP estimates is the same as the current approach, namely dividing these output measures by the respective measure of employment.

Step 1: Calculate annual growth rates in constant price GDP

$$g_t = \left(\frac{GDP_i(KP)_t}{GDP_i(KP)_{t-1}} \right) - 1$$

where KP denotes constant price

Step 2: Calculate the comparable output measure for the base year of PPPs

$$\frac{GDP_{i, 2002}}{PPP_{i, 2002}}$$

Step 3: Extrapolate the base year (2002) GDP KP using these growth rates in constant price GDP

(i) Extrapolate forwards for post-2002 time periods:

$$\left(\frac{GDP_i}{PPP_i} \right)_{t+1} = \left(\frac{GDP_i}{PPP_i} \right)_t \times (1 + g_{t+1})$$

(ii) Extrapolate backwards for pre-2002 time periods:

$$\left(\frac{GDP_i}{PPP_i} \right)_{t-1} = \frac{\left(\frac{GDP_i}{PPP_i} \right)_t}{(1 + g_t)}$$

Note that in step 3 the measure of output is calculated using the constant PPP approach

possible to extrapolate using GDP volume growth.

Issues

Although the use of constant PPPs is more appropriate for producing inter-temporal analyses of ICP data, there is one significant limitation to using constant PPPs. There is the implicit assumption that the price structures do not change over time. The calculation uses the PPP data in the base year, which reflects the price structure of countries in that one year (2002 in this analysis). However, in practice, relative prices do change over time, meaning that any volume measures of output produced using constant PPPs need to be treated with care, especially if a large time series is being looked at. If such changes are ignored over long time periods, it is possible for these ICP data to be biased. This is a feature of all indices that are fixed to a base period.

One other issue to consider is that using a fixed base year approach means that the results are dependent on this year. The choice of the base year is important as it can affect the degree of bias that can be introduced as a result of assuming that price changes do not change over time. The decision has been taken to initially use 2002 as the base year because of the triennial benchmarking exercise undertaken within the Eurostat-OECD PPP Programme. The last benchmark year for this exercise was 2002. Although Eurostat provides annual PPP data for the countries that it co-ordinates, these are not available for OECD countries that are not co-ordinated by OECD. The quality of price data in benchmark years is of a more reliable nature, as in non-benchmark years PPPs are extrapolated between benchmarks, meaning that using a benchmark year minimises the risk that the choice of base year has on the ICP data that are produced. PPP data are due to be benchmarked for 2005 by the end of 2007 so the choice of base year for the February 2008 ICP First Release will reflect this.

Sensitivity analyses

Although not presented here, sensitivity analyses were carried out to assess the effects of using different base years to produce estimates of productivity growth rates. Although in theory this could introduce bias, the results that were produced suggested that this was not the case. The differences that did occur were insignificant, which implies that the choice of base year was not a big issue. This may

be because even though the Eurostat-OECD PPP Programme involves a triennial benchmarking exercise, annual benchmark results are available for EU countries reducing the scope for the introduction of bias. ONS produces ICP estimates for the G7 countries, for four of which Eurostat produces annual benchmarked PPP data, which could potentially explain the results that were observed. Despite these results, ONS still recommends that the latest year of this triennial benchmarking exercise is still used as the fixed base year for calculating constant PPP-based ICP data.

Comparisons of productivity growth

Figure 2 and Figure 3 present a time series from 1990 to 2005 showing each of the G7 countries' relative productivity growth. These are measured by GDP per worker and GDP per hour worked, respectively, and are consistent with the current PPP-based ICP data published in the February 2007 ICP First Release.

These data have been calculated by indexing the constant PPP-based ICP data to 100 for all countries in 1991, which allows a direct comparison of productivity growth rates across these countries. This also deals with the potentially problematic

issue of revisions analysis. If the format presently used for current PPP-based ICP estimates were used (always indexing the data to 100 for the UK), revisions would always occur when a new base year were chosen, reflecting the Eurostat-OECD PPP Programme benchmarking process. These revisions would be misleading when comparing new productivity growth rates with previous data.

From these data, it can be seen that the UK has experienced similar levels of productivity growth to the US since 1990, as measured by GDP per worker, and has experienced faster productivity growth than both France and Germany over the same period of time.

However, there are certain differences between these relative productivity growth rates and those measured on a per hour worked basis. The slowdown in productivity growth as measured by GDP per worker for France is not seen when using the per hour worked productivity measure. This reflects that while there has been positive growth in the number of French workers since 1994, there has been predominantly negative growth in the number of hours worked. Figure 3 shows that the negative growth in hours worked has more than offset the positive growth in the number of workers.

Figure 2
Productivity growth – GDP per worker

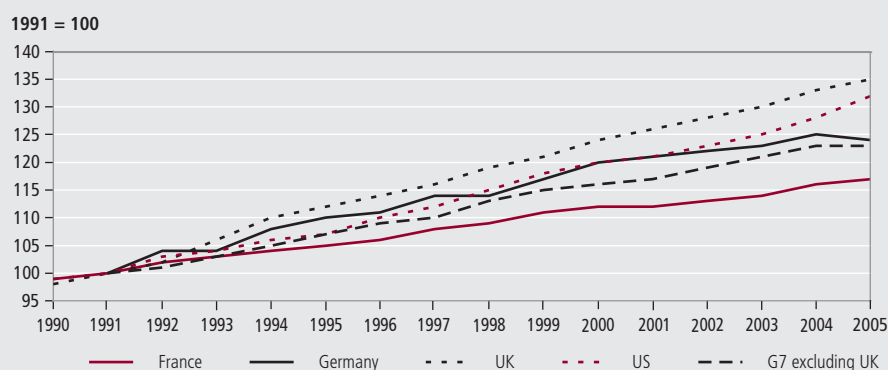
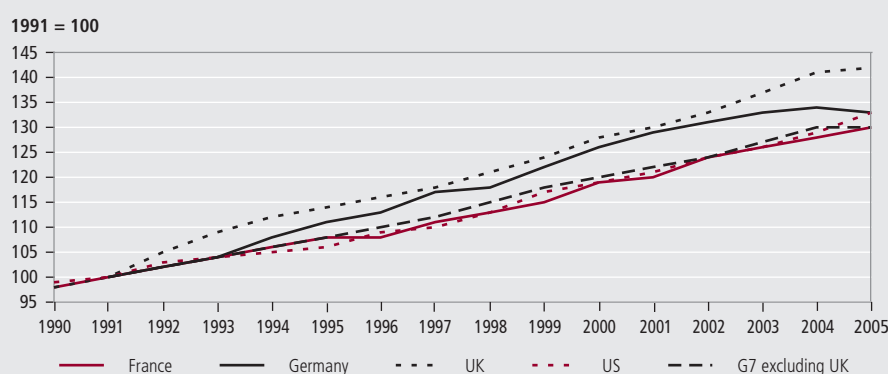


Figure 3
Productivity growth – GDP per hour worked



Another feature is that the productivity growth in the UK and the US have been at similar rates as measured by GDP per worker, but not in terms of GDP per hour worked, where UK productivity has grown at a faster rate.

Proposed structure of the new ICP First Release

The plan is for the September 2007 ICP First Release to include both current and constant PPP-based ICP data. The outline below is a proposal on how these data will be presented in the First Release:

- current PPP-based ICP data will continue to be produced in their current format; the existing series (1990 to latest year) of snapshots for both GDP per worker and GDP per hour worked will continue to be updated and revised in line with the cycle of ICP publications. This will involve the ICP data for the UK being indexed to 100 for each year
- the current graphs that are produced showing the latest snapshot of ICP data will continue to be produced for both measures of productivity: GDP per worker and GDP per hour worked

- the new addition is that the First Release will now contain a chart that illustrates the growth rate in relative productivity using the constant PPP approach. To make the interpretation clearer, it is proposed that the graph will only show comparisons in growth for France, Germany, the UK and the US. The graph will also include figures for the G7 countries excluding the UK to encapsulate the other data used. The reference period will be 1991
- all the ICP data for 1990 to the latest year will be made available on the ONS ICP homepage, using both the current and constant PPP approach, as well as supplementary tables at the back of the First Release. This will include the productivity growth figures for the other G7 countries so users can produce their own graphs if necessary the revisions policy will remain unchanged

Box 3 summarises the advantages and disadvantages of the two approaches to producing ICP estimates. What this table illustrates is when it is appropriate to use the respective approaches, which have formed the basis of the recommendations outlined in this article.

Conclusions

This article has explained in depth why inter-temporal analyses should not be made with the ICP estimates that are presently produced by ONS, which are based on current PPPs. From September 2007, ONS is planning to additionally publish ICP estimates that are based on constant PPPs. These figures are more appropriate for productivity growth analyses for the reasons that have been outlined.

The following summarises the recommended approaches to international comparisons of productivity:

- **productivity levels:** cross-sectional comparisons for any given point in time are best based on current PPPs as they reflect the most recent and most relevant price structure. If users want to assess the difference in productivity levels for any particular year, it is the current PPP-based ICP data that should be used. These have always been published in previous ICP First Releases and will continue to be published
- **productivity growth:** for pure volume comparisons over time, the constant PPP approach to producing ICP data is the recommended option.

Box 3

Advantages and disadvantages of the current and constant PPP approach

	Advantages	Disadvantages
Current PPP approach	<p>Makes use of current price GDP which removes the need for using national GDP deflators, which are often calculated in different ways across the G7 countries.</p> <p>Best method for measuring the productivity gap at a point in time. PPPs are designed specifically to generate comparable volume measures of output between countries.</p>	<p>Relies on the availability of annual PPPs, which can be subject to large revisions. The estimate of the productivity gap (as well as the ranking of countries) is very sensitive to PPP revisions.</p> <p>ICP estimates from the current PPP approach should not be viewed as a time series for the purposes of assessing productivity growth.</p>
Constant PPP approach	<p>Provides timely evidence on UK productivity growth relative to the other G7 countries.</p> <p>Does not rely on a time series of PPPs. Only need PPPs for the base year, which can be taken as one of the benchmark years (the latest available at the time of writing is 2002).</p> <p>The results are generally more comparable and consistent with UK and other countries' national productivity estimates.</p>	<p>The constant PPP approach relies on national deflators to remove the effect of price changes over time.</p> <p>Differences in the way GDP is deflated across national statistical offices may distort some of the identified movements in productivity through their effect on the extrapolated PPPs.</p>

This approach allows inter-temporal analyses to be made because the price structure of constant PPPs does not vary over time as only PPPs for the base year are used in these calculations. This means that these constant-based ICP data should be used for comparing differences in productivity growth rates. This approach minimises the need to interpret data discontinuities arising from methodological changes

Users are advised not to apply growth rates inferred from the constant PPP-based ICP data to productivity levels measured from the current PPP approach as the

resultant productivity data will not be correct.

The recommendations that have been outlined in this article are consistent with OECD guidance. The presentation of both these sets of ICP data should be of assistance to users of the ICP First Release.

ACKNOWLEDGEMENTS

The author would like to thank Fernando Galindo-Rueda and Gavin Wallis (HM Treasury) for their advice.

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REFERENCES

- Dey-Chowdhury S (2006) 'International comparisons of economic activity', *Economic Trends* 633, pp 23–8.
- HM Treasury (2004) *Productivity in the UK 5: Benchmarking UK Productivity Performance*, March 2004.
- Lau E and Wallis G (2005) 'International comparisons of productivity: revisions and interpretation', *Economic Trends* 617, pp 42–56.
- Schreyer P and Koechlin F (2002) 'Purchasing Power Parities – Measurement and Uses', *OECD Statistics Brief*, March 2002.
- ONS International Comparisons of Productivity First Release, February 2007.
- Organisation for Economic Co-operation and Development (2005) *PPP Methodological Manual*.

FEATURE

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Measuring government output: issues for Children's Social Care Services

SUMMARY

In the case of Children's Social Care Services (CSCS), there are particular challenges in finding direct output indicators for use in the National Accounts. Since services for vulnerable children are often delivered by multi-agency teams and are intended to have a continuing benefit throughout the children's lives, it is difficult to measure the specific outcomes of CSCS interventions. Methodological and practical issues arise because the decision to supply services is made by local authorities, there is no suitable comparator group who do not receive services, there is no infrastructure for collecting outcomes information, and even collecting activity information for some services is difficult. This article presents research commissioned by the former Department for Education and Skills. It analyses the issues and suggests possible ways forward.

Government services such as Children's Social Care Services (CSCS) (see **Box 1**) are very important both to the people who use them and in terms of the total expenditure laid out on them. Since there are no market prices to indicate the value of public services, measuring their output requires a different approach from that used for private sector goods and services. In its Final Report, the independent Atkinson Review (2005) made recommendations to improve the measurement of public services output. The UK Centre for the Measurement of Government Activity is taking forward this work, and has hosted several recent events focusing on the question of which measurement methodology is best (ONS, 2007).

Previous convention assumed public sector output to be measured by the real monetary value of inputs, but in recent years there has been a move towards the use of direct output indicators. This approach was advocated by the Atkinson Review. The general principles which it set out concluded that the measurement of non-market output should, as far as possible, follow a procedure parallel to that adopted for market output; and that the output of the government sector should be measured in a way that is adjusted for quality. It recommended using a set of indicators that capture the range of public services provided, and said that ideally the indicators should measure the incremental impact of the services on client outcomes.

There are particular challenges in applying this approach to CSCS. Interventions to assist vulnerable children are often delivered by multi-agency teams where social workers work alongside professionals from education, health and youth justice. The services have an immediate effect on the lives of the children who are assisted, but their overall impact is much greater than this. Improvements in children's health, education and emotional wellbeing affect their careers, their achievements and their ability to develop relationships with others and so continue throughout their whole lives. Linking specific interventions to outcomes is therefore problematic. Some CSCS services are preventative, and for these it is very difficult to make comparisons with what would have occurred if the service had not been provided.

Difficulties in valuing the output of CSCS arise not only because of the absence of market prices, but also because the various stakeholders have different opinions about appropriate levels of service, and different levels may be provided in different local authorities. Ideally the impact of CSCS interventions on outcomes would be isolated using individual child-level data. As these are unavailable, a simpler approach must be taken, using aggregate activity volume measures adjusted by aggregate quality.

A map of the services provided by CSCS and their intended outcomes has been developed. This forms a framework for immediately broadening the coverage of services for which output is measured directly, and also for defining improved measures in the future.

Box 1**Children's Social Care Services**

Under the Children Act 1989, local authorities have a duty to provide social care services to safeguard and promote the welfare of children within their area who are in need. In terms of the meaning of the Act, a 'child' is any person under the age of 18 years. Children are defined by the Act to be in need if:

- they are unlikely to achieve or maintain a reasonable standard of health or development without the provision for them of services by a local authority

- their health or development is likely to be significantly impaired without the provision for them of such services, or
- they are disabled

Services to meet these children's needs are provided by CSCS, whose principal aim is to support vulnerable children, help them fulfil their potential and enable them to live independent adult lives. Under the Government's Every Child Matters: Change For Children programme, CSCS now form part of children's services, together with education services.

Government initiatives integrating CSCS with education services have led to new approaches to commissioning services being developed. New data collection initiatives and new approaches to processing data are also being planned. What are needed are joined-up annual data collections that collect information on activity, outcomes and expenditure items under a common framework. In future, some comparisons with children who do not receive CSCS interventions will be available, and it might be possible to measure CSCS output using outcomes indicators that reflect both the quantity and quality of services provided to individuals.

The underlying research used in this article was commissioned by the former Department for Education and Skills (DfES)¹ following the Atkinson Review.² Further details of the mapping, literature analysis and references are set out in the interim report (Soper *et al*, 2006) while data issues and recommendations for changes to the index are presented in the final report (Soper *et al*, 2007).

Current measure of CSCS output

CSCS deliver services to children in need in two different ways. They may support the children in their families or independently by visits from a social worker and/or through children's centres where, for example, children might attend a structured playgroup, or their parents might attend classes in parenting skills. Alternatively, where there are concerns for children's wellbeing, CSCS have authority to remove such children from their families and look after them away from home, placing them with foster carers or in residential placements. Of the 386,000 children recorded in September 2005 as being in need (DfES, 2005a), 80 per cent were supported in their families or helped to live independently. However, while looked after children represented only 20 per cent of children in need, they accounted for around

60 per cent of total CSCS expenditure (Soper *et al*, 2007).

The direct output measures used in the CSCS output index at present are activity measures for looked after children. Before the Atkinson Review, the sole activity indicator was the number of looked after children on a particular date. The cost-weighted index used since 2005, however, includes four activity indicators, each measured for the year under consideration:

- number of child-days in children's homes (including residential schools)
- number of child-days in secure accommodation for welfare purposes
- number of child-days in foster placements, and
- number of child-days in other placements

For the remainder of CSCS activities, output is measured indirectly using the inputs measure of real total expenditure on them. The current index is preferable to the one used previously because looked after children are now separated into broad categories of placements, and changes in the length of time spent in placements are captured. Each indicator measures two aspects of the volume of activity: the number of children, and the number of days that each spends being looked after.

Recommended changes to the CSCS index

An index that captured the full breadth of CSCS activities would include separate indicators for each of the different services delivered, since these are provided in different circumstances, meet different needs, incur different costs and are subject to different forces for change. Ideally, the indicators would measure the value-added impact of the various services on client outcomes. The study, however, identified challenges that prevent such indicators being used at present. Instead it recommended continuing to use the current

indicators together with four additional measures of the volume of activity carried out, namely:

- number of children adopted
- number of care leavers
- hours of service provided to children supported in their families or independently, and
- number of core assessments completed

The four current activity indicators, the four new ones and an inputs measure for all other CSCS interventions are listed with their 2004/05 values in the first two columns of **Table 1**. The third column shows the rate of change for each from 2003/04. The cost-weighted activity index is constructed as described by ONS (2005). It is an annually chained, base-year-weighted (Laspeyres) index. The percentages of expenditure on the various activities, shown in column 4, are used as weights. The aggregate index is formed by multiplying each 'rate of change in activity' value by the corresponding weight to obtain the 'contribution to growth' of each activity, and then summing these values as shown in the fifth column of the table. The overall index for 2004/05 shows an annual rate of growth of 4.98 per cent from 2003/04. (Calculations from the numbers shown in the table may not match the stated values exactly due to rounding.)

The new index with eight direct activity measures improves on the existing index by capturing 60 per cent of the value of CSCS output, compared with 44 per cent currently. The new indicators measure facets of CSCS activities that are not at present captured in the index, so there is no double counting in including them. Core assessments provide structured, in-depth assessments of children's needs and are used to develop individual children's plans. Both the third and fourth new indicators therefore represent some aspects of services provided to children supported in their families and independently.

Table 1
New index for CSCS output, 2004/05

	Activity indicators	Rate of change in activity from 2003/04 (per cent)	Expenditure weights (per cent)	Contribution to growth (percentage points)
Children's homes (child-days, thousands)	2,494	-3.41	20.76	-0.73
Secure accommodation (welfare) (child-days, thousands)	94	11.90	0.66	0.06
Foster placements (child-days, thousands) (including adoptive placements)	16,408	-0.02	19.92	0.00
Other placements for looked after children (child-days, thousands)	3,242	0.78	2.23	0.02
Number of children adopted	3,800	0.00	3.58	0.00
Number of children aged 16 and over who ceased to be looked after during the year ending 31 March	7,500	10.29	4.32	0.48
Total hours of service provided to children supported in their families or independently	394,767	0.48	7.01	0.04
Number of core assessments completed	74,100	16.51	1.63	0.25
Deflated expenditure: total other children services (£ thousand)	1,525,584	11.92	39.89	4.61
Total (per cent)			100.00	4.98

Quality adjustment

Quality adjustment takes account of changes in the value of output that are attributable, not to a change in the volume of service provided (captured by the activity indicators above), but to the quality of those services. Ideally, each of the different measures of CSCS activity would be individually adjusted for quality. Given data limitations, however, the study recommended that only services provided to looked after children should be quality-adjusted, using indicators of quality improvement for looked after children relating to:

- school attendance
- educational attainment
- participation in education, training or employment at age 19
- criminal convictions
- stability of placement, and
- speed of adoption placement

This study breaks new ground in quality-adjusting CSCS output. While there is limited data available at present, it is anticipated that the approach provides a way forward for the future.

Data used in the new index are at present available only for the years 2001/02 to 2004/05. **Table 2** shows the values of the current index, new index and new index with quality adjustment for these years. Growth in the new index is somewhat slower than that of the existing index unless the quality adjustment is included, in which case it grows at a fairly similar rate. Government policy is that wherever possible

children should be supported within their families or, as young adults, independently; if this is not possible in the long term, then they should be placed for adoption rather than continuing to be looked after. It is therefore unsurprising that the four indicators of placement days for looked after children sometimes have negative growth rates. The seventh and eighth indicators in Table 1 use the only available data on the services provided to children supported in their families and independently, but still only provide a partial representation of the volume of these activities. Since it is services for these children that are generally growing in volume, it is very important that they should be adequately represented in the index. The limited data available to the study suggested that hours of service

Table 2
Values of the current CSCS index, new index and new index with quality adjustment

	2001/02	2002/03	2003/04	2004/05
Current index	100.0	105.5	112.3	117.8
New index	100.0	105.3	109.6	114.7
New index with quality adjustment	100.0	106.0	112.0	118.7

Box 2

The Every Child Matters outcomes

The Every Child Matters policy initiative (DfES, 2004) defines five outcome areas that are most important to children and young people:

- be healthy
- stay safe

to children supported in their families and independently are growing slightly faster than deflated expenditure on them. Since 2001 there has been strong growth, in real terms, in CSCS expenditure, and hence the deflated expenditure indicators in both the current and the new indices exhibit strong growth over the period.

Mapping of services delivered by CSCS

As a basis for identifying appropriate output indicators, the various services that CSCS deliver were identified and linked with the Every Child Matters outcome they are expected to achieve (see **Box 2**). For this mapping exercise, the researchers used the Department of Health Core Information Requirements Process Model, information from local authority policy and procedure documents, a selection of children and young people's plans, information from children's services websites and the guidance notes for the annual expenditure return to DfES, identifying 33 different services provided by CSCS. **Table 3** summarises this mapping, which is shown in full in the interim report of the study (Soper *et al.*, 2006).

The first column of Table 3 sets out the four categories of services delivered by CSCS. These represent four key service domains for which output should be measured. The first service domain is open access services for vulnerable children which are available without the need for referral. The second and third domains correspond to the two core categories of intervention for children in need: services for children supported in their families or independently and services for looked after children. As well as these core services, children in need also receive

- enjoy and achieve
- make a positive contribution, and
- achieve economic wellbeing

The five outcome areas, which are interdependent, comprise universal ambitions for every child and young person, whatever their background or circumstances.

Table 3
Services provided by CSCS

Service domain	Service	Number of services	Delivered by	Intended Every Child Matters outcome
Open access services for vulnerable children	Strategic management	1	CSCS	All outcomes
	Parenting support	2	CSCS/multi-agency	All outcomes
	Child/young person health support	4	Multi-agency/bought in	Be healthy/stay safe
	Supervised family contact	1	CSCS/bought in	Stay safe
	School and career support services	4	Multi-agency/bought in	Enjoy and achieve/ economic wellbeing
Services for children supported in their families or independently (CSFI) – core interventions	Assessment and family-based support*	1	CSCS	All outcomes
	Direct payments	1	CSCS	All outcomes
	Safeguarding services	2	CSCS/bought in	Stay safe
Services for looked after children (LAC) – core interventions	Child, placement and care leaver support*	7	CSCS/bought in	All outcomes
	Adoption*	1	CSCS/bought in	All outcomes
Additional needs support services	Education support for LAC and CSFI, including SEN	2	CSCS/bought in/multi-agency	Enjoy and achieve
	Disabilities support, including special schools	2	CSCS/bought in/multi-agency	Enjoy and achieve/all outcomes
	Health and mental health needs (LAC and CSFI)	3	CSCS/bought in/multi-agency	Be healthy
	Offending (LAC and CSFI)	2	CSCS/multi-agency	Positive contribution
	All services	33		

additional support services as appropriate to counter the impact of inadequate parenting on health and education, and to address intrinsic needs such as disabilities, emotional and behavioural difficulties or offending behaviour. These comprise the fourth service domain. The second column of the table outlines for each domain the types of services provided, while the third column shows the numbers of different services of each type that are distinguished in the interim report. The extent to which CSCS are involved in delivering the various services is set out in the fourth column. The core interventions in the second and third service domains are largely delivered by CSCS, with some being bought in from agencies or voluntary organisations. Services in the other two domains, however, are usually delivered by a multi-agency team and CSCS may not take the lead role.

The last column of Table 3 shows the Every Child Matters outcomes that the different services are intended to achieve. There is no direct one-to-one link between activities and outcomes. Many core CSCS activities focus on helping disadvantaged children with all aspects of their development, implying that they relate to all five of the Every Child Matters outcome areas. In contrast, most of the additional needs support services and open access services do focus on particular Every

Child Matters outcome areas. However, several services may contribute to the same outcome, and indeed children often receive a package of services.

The eight activity indicators recommended for inclusion in the new index all relate to services in the starred rows of Table 3. Although these represent only a small subset of CSCS activities, they do comprise core interventions that account for the major part of CSCS expenditure. The study found that no suitable activity indicators are available at this point in time for other CSCS services.

Measurement of value added

The concept of added value is fundamental to National Accounts methodology. It implies measuring the growth in output that occurs as a direct result of CSCS activity. Ideally it is the size of the improvement in clients' outcomes resulting from CSCS interventions that should be recorded since it is the ultimate outcomes that are government objectives. Optimally one would like baseline measures for categories related to each child's physical, mental and emotional state and level of educational attainment on first receiving CSCS support, and similarly on an annual basis until case closure. The use of baseline data is particularly important since those children who receive support from CSCS have a

wide range of different needs and the use of standard outcome indicators is therefore inappropriate. For example, GCSE results may not be an appropriate indicator of education or academic achievement for some children with disabilities.

Measuring CSCS outcomes

An outcome is the result of a physical, intellectual or emotional activity or programme of activities, which in the CSCS context implies the difference between the condition or situation of a family that has received a service, compared with their situation had they not received it. The counterfactual here is unknowable, since the same family cannot both receive and not receive a service. There are ethical problems associated with the alternative approach of making comparisons with a control group who do not receive the service, since this implies withholding the service from some children who are in need. Outcomes for safeguarding services and for many open access services are intrinsically difficult to measure since these interventions are preventative and there is no way of measuring what has not occurred as a result of the intervention. These factors make it difficult to obtain empirical proof of the outcomes of CSCS interventions.

It can also be unclear whether an observed change in an outcome should

be interpreted as an improvement or as a worsening of the situation, and this often involves making subjective judgements. For example, services for looked after children have often been deemed successful if the children return home, but some studies have found that returning to live at home 'on trial' can be an unstable and even harmful placement. A further problem in using children living at home as an outcome is that this is the event which would have occurred if CSCS had not been involved in the first place.

Extensive work has been undertaken in the UK to devise a methodology for assessing outcomes when children are looked after by local authorities (see Parker *et al*, 1991; Ward, 1995; Department of Health, 1995). The Looking After Children project provided a series of age-related assessment and action records which asked practitioners to assess children's development across seven dimensions and relate progress to the quality of parenting they received while in the care of the authority.

Interventions by CSCS have an immediate effect on the lives of the children and young people who are assisted, but their overall impact is much greater than this. Poor socio-economic circumstances have been shown by many researchers to have a wide impact on children's development and their future careers. Assisting vulnerable children generates improvements in their health, education and emotional wellbeing. These changes affect their careers, their achievements and their ability to develop relationships with others and so continue throughout their whole lives. The outcomes to which CSCS interventions contribute are therefore widely dispersed in time. They are also affected by teachers and other professionals who work with the same disadvantaged children. The timescale over which service users' outcomes are measured would ideally be a very long one. For practical purposes a cut-off is necessary, but ideally outcomes would continue to be measured for some years after a child has left care, for example.

Attributing outcomes of CSCS interventions

Another issue arises in attributing changes in outcomes. Factors other than CSCS-provided services also contribute to observed outcomes for vulnerable children, since a package of multi-agency interventions is often provided, and most child care is provided by families themselves. There is evidence that recent

policy initiatives to promote the use of integrated services and multi-disciplinary teams have generated benefits for the children served, especially with respect to supporting additional needs. Local authorities are therefore extending multi-agency working. They are developing children and young people's strategic partnerships and setting up commissioning strategies that bring together all the funding streams and resources within new Children's Services Directorates and partner agencies. However, the multi-agency approach introduces further complexity for national income accounting where there are international guidelines on how to measure the volume and growth in output (Pritchard, 2004). When social workers work alongside education workers, health visitors and youth justice workers, it is difficult to separate out the contribution made by CSCS *per se*. Given that the trend to multi-agency working is likely to continue, clear guidelines are needed for allocating expenditure and attributing outcomes.

Valuing CSCS output as compared with market output

For services which are bought in a market (such as beauty treatments and car servicing), consumers choose whether or not to purchase them. Economic analysis shows that the principle of consumer sovereignty therefore ensures that the price of a service reflects its value to the marginal service user. Seeking to measure the value attributable to CSCS interventions by identifying their impact on outcomes is in fact an attempt to capture more complete information than market prices provide. If all contributions to outcomes for each individual could be measured, the total value of the benefits would be captured, including consumer surplus. Market prices, however, measure marginal utility.

While consumers make choices in markets, the arbiter of whether CSCS services are provided is the local authority, although under the Children Act 1989 the wishes and feelings of children are taken into account. Young children are dependent on adults, usually their parents, to make decisions for them. When CSCS intervene to provide safeguarding services, often the parents would prefer that the child did not receive them. The services, therefore, have negative utility to the parents although there are positive benefits to the children themselves and to society of safeguarding children. Safeguarding services, then, are an example of what economists term a

'merit good', since the Government provides more of them than people would buy for themselves.

Economic theory also shows that when CSCS professionals make a decision on behalf of a vulnerable and dependent child, a principal/agent problem may arise. While the judgement is very likely to be in the child's best interests, even if it is not, the child has no choice but to accept it. The agent (CSCS) has control over the outcome gained by the principal (the child). It is theoretically possible, for example, that the social worker could choose to handle a situation in the way that is easiest for them, rather than doing what is best for the child. Such an event is described as the occurrence of X-inefficiency. The risk of such principal/agent problems occurring is minimised by the use of incentives or monitoring, such as that carried out by Ofsted in the case of CSCS.

Decisions about whether to provide CSCS interventions are made by local authorities. Since different authorities operate different policies and interpret the legislation in different ways, there are variations between authorities in the thresholds at which children access services. The marginal valuations of service users are therefore likely to differ between local authorities, whereas in a market they would be equalised by price (subject to transport costs). If thresholds in different local authorities were equalised by expanding CSCS provision in the authorities where marginal returns are highest, it seems likely that the additional children helped would have lower additional needs than the children typically helped at present. If so, there would be diminishing marginal returns to extending CSCS activities.

While it is very difficult to value the benefit of providing CSCS interventions, there are many costs of withholding them. Childhood disadvantages and mental health problems have been shown to lead to poor health, poor employment prospects and a lifetime of social exclusion. Many CSCS activities are aimed at promoting children's wellbeing by trying to deflect them from these disadvantageous life pathways, largely by removing the various risk factors. Failure to provide such interventions is expensive in the long term, since when these children grow up they may require various publicly-funded services throughout their adult lives. One indicator of the value of social services might therefore be compiled by examining the costs of not intervening.

Availability of outcomes data

Of the four service domains listed in Table 3, the only one for which outcomes data are available at present relates to services for looked after children. The data depict certain aspects of children's development but do not capture overall changes in wellbeing and cannot be linked to specific interventions. At present, therefore, the available outcomes indicators do not provide direct measures of the impact of services on client outcomes, but instead they can be used for quality adjustment.

One approach to gathering outcomes information is to ask a sample of clients to complete a questionnaire. Instruments are available to assess health and wellbeing, for example, the Strengths and Difficulties Questionnaire. Although children's views on the quality of the care services provided for them are now recognised as important, various difficulties have been reported with the quality of data obtained by interviewing children in care. The overall conclusion is that the questionnaire or interview type approach will not at present generate sufficiently robust data for National Accounts purposes. Ongoing work on developing outcomes-based contracts with providers of social work services may lead to improvements in data quality, including client satisfaction measures.

If data on child development could be gathered at regular intervals, they might be sufficiently robust for National Accounts purposes. There is no suitable collection infrastructure in the UK at present, although there is some experience of such systems in the US. Local authorities, however, are currently working towards implementing an electronic record keeping system called the Integrated Children's System. It includes assessment and progress records that give indicators of current status and change across seven developmental dimensions, and in future these may provide some outcomes data.

Data collections

To further progress the measurement of CSCS output, improvements to data collections are needed. The activity data recommended for inclusion in the index are collected in the following data sets: the SSDA 903 (DfES, 2006); Child Protection and Referrals, CPR3 (DfES, 2005b); and also by the no-longer-operational CiN Census (DfES, 2005a) (see **Box 3**). The study sought corresponding expenditure data for use as weights in constructing a cost-weighted activity index, but found that the headings used in the PSS EX1 expenditure data collection (DH, 2005) do not always match those for the activity data. The study recommended that joined-up annual data collections are needed that collect information on activity, outcomes and expenditure items under a common framework.

The previous CiN Census is no longer appropriate due to changes in local authority funding structure and the need for a broader Children's Services perspective. A replacement data collection is therefore being planned. The study recommended it should ask for the submission of data that are already held electronically and be developed in consultation with local authorities to ensure its demands are least burdensome.

The recent White Paper entitled *Strong and Prosperous Communities* (DCLG, 2006) proposes a substantial reduction in the number of indicators on which local authorities have to report, with the indicators being outcome-focused wherever possible and including some user satisfaction measures. Although outcomes indicators which simultaneously reflect volume would theoretically be preferred for National Accounts purposes, the evidence of this study is that sufficiently robust measures are very difficult to obtain. Activity indicators are therefore needed to measure the volume of output, with outcomes measures used where available

to adjust for change in quality. If suitable measures are not collected along these lines, the only recourse is to use input measures to represent the value of CSCS output in the National Accounts.

Future possibilities for measuring outcomes

A plethora of initiatives are under way trialling different measuring instruments for evaluating outcomes. In addition to the new central data collection systems being planned, these include initiatives by local authorities such as outcomes-based contracts for externally commissioned placements and services.

The vision of the study is that, in future, the recommended joined-up approach to data collection will generate activity, outcome and expenditure indicators for each of the service types shown in Table 3, and ideally for separate activities at least within the core interventions. The ultimate aim is to have outcomes data at the individual child level for all children in need, linked to specific interventions for which duration and cost data are available, with information on the contributions of different agencies to service delivery. The study's final recommendation then, is that the CSCS output index should be reviewed again once the significant data collections that are coming on stream become available.

Notes

- 1 DfES is now the Department for Children, Schools and Families.
- 2 The study which provides the basis for this article was commissioned by DfES. The work included:

- a mapping of services provided by CSCS
- an extensive literature analysis of methodological issues and empirical evidence relevant to measuring the output of CSCS

Box 3

National data collections for CSCS

SSDA 903 – aims to collect information about children who are looked after by local authorities during a financial year, and for those that have recently left care. The information relates to their placement, legal status and educational achievements.

Child Protection and Referrals (CPR3) – consists of two parts: Part A collects information about the referral of children to children's social care and the subsequent assessment procedure; Part B

collects further information about those children who enter the child protection system.

Children in Need (CiN) Census – a now obsolete data collection of activity and expenditure on all children in need who received a service from a social services department during a survey week.
PSS EX1 – collects detailed expenditure and unit cost data for personal social services (both children's and adults services).

- consultation with three local authorities
- a review of data sources for potential indicators of CSCS activity, expenditure and quality, and
- trialling and analysis of new indices of output

The issues discussed in this article are presented in more detail in the interim report of the study (Soper *et al*, 2006). They form the basis of the nine principles and 31 specific recommendations for the future measurement of CSCS output that are set out in the final report (Soper *et al*, 2007).

ACKNOWLEDGEMENTS

The authors wish to thank DfES, ONS, members of the project Steering Group, together with local authority managers and data officers for all the helpful advice and information they provided throughout the study.

The views expressed in this article are the authors' and do not necessarily reflect those of DfES.

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REFERENCES

- Atkinson Review: Final Report (2005) *Measurement of Government Output and Productivity for the National Accounts*. Palgrave Macmillan: Basingstoke.
- Children Act (1989) HMSO: London.
- Department for Communities and Local Government (2006) *Strong and Prosperous Communities: The Local Government White Paper*. TSO: UK.
- Department for Education and Skills (2004) *Every Child Matters: Change for Children in Social Care*. DfES: UK.
- Department for Education and Skills (2005a) Children in Need Census at www.dfes.gov.uk/rsgateway/DB/VOL/v000647/index.shtml
- Department for Education and Skills (2005b) Child Protection and Referrals, CPR3, at www.dfes.gov.uk/rsgateway/DB/VOL/v000632/VOL01-2006textv1.pdf
- Department for Education and Skills (2006) SSDA 903 Annual return on Looked After Children at www.dfes.gov.uk/rsgateway/DB/VOL/v000646/vweb01-2006.pdf
- Department of Health (1995) *Looking After Children: Assessment Action Records for Children Aged Under 1; 1–2; 3–4; 5–9; 10–14; 15; Plus Essential Information Records, Care Plans, Placement Plans and Review Forms*, HMSO: London.
- Department of Health (2005) PSS EX1 Annual return of expenditure on Looked After Children at www.dh.gov.uk/en/Publicationsandstatistics/Statistics/StatisticalCollection/DH_4109541
- Office for National Statistics (2005) 'Improvements to the National Accounts measure of output of adult social services', *Economic Trends* 622, pp 46–56.
- Office for National Statistics (2007) 'Measuring performance in our public services' *Economic & Labour Market Review*, 1(2), p 3.
- Parker R A, Ward H, Jackson S, Aldgate J and Wedge P (1991) *Looking After Children: Assessing Outcomes in Child Care*. HMSO: London.
- Pritchard A (2004) 'Measuring government health services output in the UK national accounts: the new methodology and further analysis', *Economic Trends* 613, pp 69–81.
- Soper J B, Holmes H, Hu X and D'souza E (2006) *Valuing Changes in Welfare to Individuals and Society Resulting from the Government's Provision of Children's Social Services in England*, Interim Report. Department for Education and Skills: London at www.dfes.gov.uk/rsgateway/DB/RRP/u015088/index.shtml
- Soper J B, Holmes H, Hu X and D'souza E (2007) *Valuing Changes in Welfare to Individuals and Society Resulting from the Government's Provision of Children's Social Services in England*, Final Report. Department for Education and Skills: London at www.dfes.gov.uk/research/data/uploadfiles/RW104.pdf
- Strengths and Difficulties Questionnaire at www.sdqinfo.com/
- UK Centre for the Measurement of Government Activity at www.statistics.gov.uk/about/data/methodology/specific/publicsector/output/default.asp
- Ward H (1995) *Looking After Children: Research into Practice*. HMSO: London.

FEATURE

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Regional economic indicators

August 2007

with a focus on differences in sub-regional economic performance

SUMMARY

This quarter, regional economic indicators (REI) focuses on explaining the differences in sub-regional Gross Value Added per head from the UK average, decomposing the differences into four explanatory factors; productivity, employment rate, commuting rate and activity rate. The headline indicators cover the nine English Government Office regions, Northern Ireland, Scotland and Wales: the European Nomenclature of Units for Territorial Statistics (NUTS) level 1 regions of the UK. The term 'region' is used for convenience. They present an underlying picture of regional economic performance, productivity (including an update to 2005 of the productivity analysis published in the February article) and welfare. Labour market data and indicators of the factors that drive productivity are also included.

Focus on differences in sub-regional economic performance

Differences in regional economic performance exist at the NUTS1 regional level but even larger divergences exist at the sub-regional level within the larger regions. Economic performance is often measured using Gross Value Added (GVA) per head. This analysis looks at the differences in GVA per head from the UK average in 2004 in the 133 NUTS3 local areas, and decomposes these differences into four explanatory factors:

- productivity (per job)
- employment rate
- commuting rate
- activity rate

This sub-regional analysis was based on the same principles as the methodology used for the previously published regional-level analysis (Swadkin and Hastings, 2007). Further details on the methodology, including definitions, were presented in the earlier article. The difference at the regional level was that a five component breakdown was possible which incorporated the preferred productivity indicator of GVA per hour worked and the effect of 'hours worked per job'. At the sub-regional level the lack of a compatible hours worked series limited this analysis to the four component breakdown where average labour productivity is defined as GVA per filled job.

The sub-regional analysis presented here for 2004 was based on some different

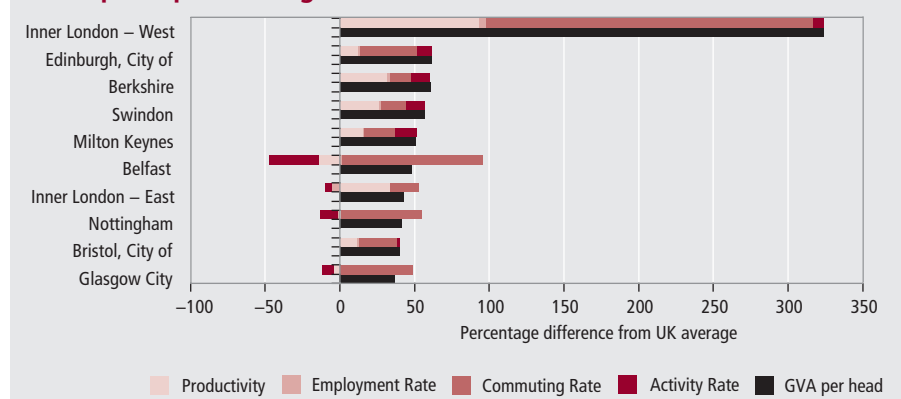
data sources that were used in the regional analysis previously published. At the sub-regional level the best data sources available are in some cases different to those at the regional level. The sources used however have maintained the consistency necessary within the model, by constraining to regional data where necessary. Workplace based employment data were taken from the sub-regional workforce jobs series and residence based employment from the Annual Population Survey and constrained to regional totals. The regional level analysis has been further extended to the year 2005 later in this article.

Figure 1 shows the ten NUTS3 areas with the largest positive divergence of GVA per head from the UK average in 2004 (consistent with the Regional Accounts estimates published in December 2006) with their explanatory four component breakdown. The UK average is represented by the vertical axis at zero. The components that contribute negatively to the economic performance of each region are shown on the left hand side of the axis and the factors that increase performance are shown on the right.

The very high GVA per head measure in Inner London West (324 percentage points above the UK average) was explained largely by inward commuting effects which can be seen in Figure 1 to have positively contributed to GVA per head. Commuting also had significant effects in other urban areas; Belfast, Nottingham, Glasgow and Edinburgh, as evident in Figure 1. The commuting rate in this analysis is defined

Figure 1

Explaining the differences in GVA per head from the UK average in the top ten performing NUTS3 areas, 2004



as the workplace-based labour force as a proportion of the residence based labour force. Therefore, the areas where commuting explains the high figure for regional GVA per head are those with evidence of inward commuters (reflected in high commuting rates that occur when the labour force calculated by where people work is larger for that area than the labour force based on residents only).

The reverse impact of these positive commuting effects were evident in surrounding areas that experienced negative effects of commuting. For example, South Nottinghamshire, Outer London – East and North East and Outer London – South NUTS3 areas had large commuting outflows, as did Outer Belfast to a lesser extent. Other areas where these commuting effects were seen to have negative contributions to the areas' performance in GVA per head against the UK average were in more rural areas in Scotland (the two most notable examples were (a) East Lothian and Midlothian and (b) East Dunbartonshire, West Dunbartonshire and Helensburgh & Lomond).

In the cities of Belfast and Nottingham the activity rate component appeared particularly low, despite GVA per head levels being significantly above the UK average in these areas. The activity rate is the proportion of the population that is participating in the labour force. Figure 1 shows that in these cities the participation in the labour force was low and negatively contributed to the performance of GVA per head against the UK average. A similar pattern, although to a much lesser extent, is evident in Glasgow and Inner London – East. In the other high performing NUTS3 areas illustrated in Figure 1, participation rates in the labour force contributed positively to economic performance.

Productivity in this analysis is measured as GVA per filled job. The relatively high GVA per head in nearly all of the areas illustrated in Figure 1 can be partly attributed to high levels of productivity. The only exceptions were Belfast and Glasgow, although compared to the whole of the UK their productivity levels were not significantly low. The six areas where productivity contributed most positively to

relative GVA per head performance were concentrated in London and the South East.

Figure 2 shows the contribution of productivity and other factors to economic performance at the other end of the economic performance scale – the ten NUTS3 areas with the lowest GVA per head. The chart shows the four component breakdown for these areas, and for most of them, low productivity was an important contributory factor to low GVA per head, particularly in two of the three Scottish areas illustrated. Notably low productivity in Torbay and the Isle of Wight also contributed negatively to relative GVA per head. Only these four areas out of the bottom ten had an employment rate that contributed positively to their relative economic performance.

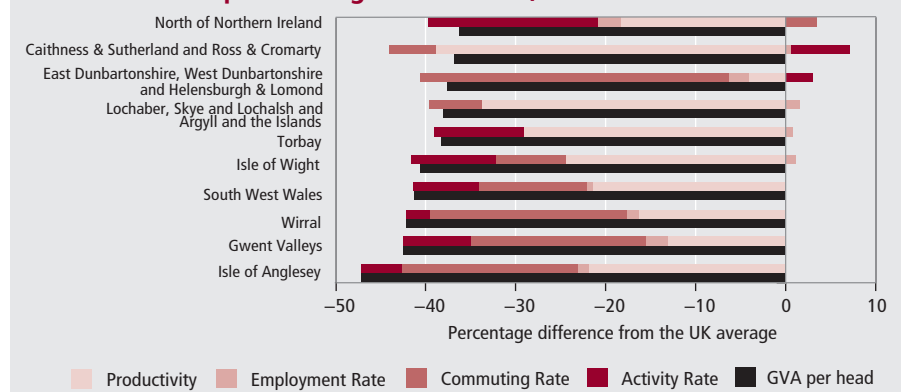
The employment rate component contributed more to the low economic performance against the UK average in the areas presented in Figure 2 (areas with relatively low GVA per head), than those in Figure 1 (areas with relatively high GVA per head) although in most of the areas its contribution was still smaller than that of other factors. The employment rate is defined here as workplace based employment as a proportion of the workforce. Therefore high employment rates suggest relatively low unemployment. Over recent years there has been relatively low unemployment in the UK but this analysis does suggest that at the more detailed geographic levels, low employment rates have accompanied poor economic performance, particularly in the areas where GVA per head is low against the UK average.

Figure 2 also shows the importance of activity rate on the economic performance of an area. Generally, low participation rates in the labour force contributed negatively to economic performance. Relatively high activity rates contributing positively to GVA per head were evident in only two of these ten bottom NUTS3 areas, most notably the Scottish area Caithness & Sutherland and Ross & Cromarty.

This analysis has shown the importance of identifying differences in economic performance within regions as well as between regions. Four components that can explain the differences were identified as productivity, employment rate, commuting rate and activity rate. The results presented for the NUTS3 areas showed how explanations can differ greatly between areas, due to the specific characteristics of the localities. The analysis was carried out using the best data sources currently available for the relevant geographic level.

Figure 2

Explaining the differences in GVA per head from the UK average in the bottom ten performing NUTS3 areas, 2004



Regional overview

Key figures on a regional basis indicate that:

- In 2005 London remained the region with the highest gross value added (GVA) per hour worked, 21.4 percentage points above the UK average. Northern Ireland had the lowest GVA per hour worked index measure, at only 80.7 per cent of the UK average
- London and the South East had the highest levels of Gross Disposable Household Income (GDHI) per head, at £15,885 and £14,941, respectively, but among the lowest annual percentage growth rates, at 3.2 per cent and 3.6 per cent, respectively. The North East (£11,356) and Wales (£11,851) had the lowest GDHI per head
- the South East had the highest employment rate in the first quarter of 2007, at 78.2 per cent; London had the lowest rate, at 69.9 per cent, compared with the UK employment rate of 74.3 per cent

Headline indicators

This section presents a selection of regional economic indicators that provide an overview of the economic activity of UK regions. The productivity indicator has been updated in light of the revised regional GVA per hour worked estimates published in July 2007. Analysis that decomposed the differences of regional GVA per head from the UK average, into five explanatory variables (published in the February edition of this article) has been extended to 2005.

Regional performance

The February edition of this article presented the newly published (in December 2006) data on economic performance in terms of headline workplace-based nominal GVA and GVA per head for the UK regions. It should be noted that nominal figures do not take account of inflation or regional differences in prices. The data demonstrated little change in 2005 from the previous year in the distribution of GVA among the regions. London and the South East continued to account for the largest share of UK GVA (19.1 per cent and 14.6 per cent, respectively) while Northern Ireland (2.3 per cent) and the North East (3.4 per cent) had the smallest.

Table 1 shows that all regions experienced growth in nominal GVA in 2005, although this growth was considerably lower than that seen in 2003 and 2004. In 2005, overall UK growth was only 4.1 per cent compared with 5.9 per cent in the preceding two years. London, the North East and the East Midlands had the highest annual percentage growth (at 4.4 per cent) in 2005. The North East region had one of the smallest absolute values of GVA, but in 2005 the year-on-year growth in this region was comparable with the region that had by far the largest value of GVA (London). This shows that even the regions with the smaller economies are capable of growth rates comparable with the larger regions.

Due to the wide variations in geographical size among the regions, comparisons are more usefully expressed

in terms of GVA per head of population, rather than absolute values. In 2005, GVA per head for the UK was £17,677. London was the region with the highest GVA per head in 2005 at £27,088, well above (by 53 per cent) the UK average. GVA per head for the South East was also above the UK average (by 7 per cent), at £18,976 per head. Wales and the North East had the lowest GVA per head, at £13,813 and £14,048, respectively. Despite these figures being less than 80 per cent of the UK average, annual growth in these regions was high, at 3.9 and 3.7 per cent, respectively. Scotland and the East Midlands also had high annual growth rates in 2005.

Labour productivity

Labour productivity indicators provide the most effective comparisons of regional economic performance. The GVA per head measure, although accounting for different regional sizes, is affected by commuting. It can be artificially inflated because the numerator (GVA) includes the activity of the residents (who work and live there) and also the in-commuters, whereas the latter are excluded from the population denominator. This is illustrated in **Figure 3** in the case of London where the commuting problem is overcome by the labour productivity indicators (GVA per filled job and GVA per hour worked) which use workplace based measures for both the numerator and denominator. This more accurately apportions output against a measure of all those who contribute to producing that output, demonstrating how that the choice of indicator can greatly

Table 1

Headline workplace-based GVA at current basic prices: annual nominal growth of absolute GVA and GVA per head: by NUTS1 region

Percentages																
		United Kingdom	UK /less extra-regio ¹ and statistical discrepancy	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland	Extra-regio ¹
GVA annual																
percentage growth	2003	5.9	6.1	5.6	5.4	5.9	7.1	5.2	6.9	6.4	5.8	6.7	6.0	6.0	6.1	-1.1
	2004	5.9	6.0	6.1	5.7	5.7	6.7	5.5	6.5	6.3	5.5	6.5	5.9	5.9	6.1	1.9
	2005	4.1	3.9	4.4	3.7	3.7	4.4	3.8	3.9	4.4	3.3	4.0	3.9	4.1	3.8	16.9
GVA per head annual																
percentage growth	2005	3.4	3.3	3.9	3.4	3.2	3.7	3.2	3.0	3.1	2.6	3.4	3.7	3.7	3.0	N/A

Note:

1 Extra-regio is the contribution to economic activity that cannot be allocated to any region.

Source: Office for National Statistics

Figure 3

Comparison of regional economic indicators: by NUTS1 regions, 2005



Figure 4

GVA per hour worked: by NUTS1 regions



affect perceptions of the relative positions of regions. Figure 3 shows that, when using GVA per hour worked, there are significantly fewer and smaller differences in regional economic performance than when making comparisons based on other indicators. GVA per hour worked additionally takes into account any variations in labour market structures across the regions, such as the proportions of full-time and part-time workers or job share availability. It is for these reasons that GVA per hour worked is the preferred indicator of productivity.

Figure 4 shows the regional GVA per hour worked productivity indices on a time series basis. The regions that improved their productivity relative to the UK average between 2001 and 2005 were London, the East of England, the South West and Scotland. This chart does suggest that since 2001 there has been some widening in the regional productivity differences between the highest and lowest performing regions. Productivity in London was the highest in all years and by 2005 was above the UK average by 5 percentage points more than it was in 2001 (although there was a small decline in 2005 compared with 2004). The

opposite occurred in the region with lowest productivity; Northern Ireland, where the productivity gap as measured against the UK average, widened by 8 percentage points across the same time period.

In terms of the annual change in the GVA per hour worked indicator, five regions experienced declining productivity against the UK average in 2005: the East Midlands, London, the South East, Scotland and Northern Ireland. However these declines were of less than 2 percentage points except in the East Midlands where productivity declined by nearly 4 percentage points against the UK average in 2005. This has been attributed to an unusually large increase in total hours worked in the East Midlands. Even though total hours worked increased in other regions too, generally these were significantly smaller.

The February 2007 edition of Regional Economic Indicators introduced a time-series analysis on the differences of regional economic performance from the UK average (in terms of GVA per head) and decomposed these differences into five explanatory components: productivity (GVA per hour worked), hours worked per job, employment rate, commuting rate

and activity rate. The regional differences in GVA per head from the UK average were presented in Figure 3. In light of the updated regional productivity data on GVA per hour worked it has been possible to extend the analysis to 2005, and the results are presented in Figure 5. Information on the methodology and source data is available in the February article.

The results for 2005 differ very little from the 2004 results published in the February article. GVA per head in London was identified in Figure 3 as significantly greater than the UK average. Figure 5 shows that the majority of this divergence can be explained by high productivity (GVA per hour worked) and a large commuting rate (high proportions of in-commuters). The only other regions where productivity had similarly positive impacts on economic performance were the South East and the East of England. Commuting rates were seen to have negative impacts on economic performance in many other regions notably the East of England and the East Midlands. It appears that economic performance in London could have benefited from the productive capacity of commuters arriving from these regions, at the expense of those regions' own economic performance.

GVA per head in Northern Ireland was below the UK average. Figure 5 shows this divergence can be explained by below average productivity and activity rates, which outweighed the positive contributions from the above-average hours per job component. Similarly, low productivity and activity rates help explain the divergence of GVA per head below the UK average in Wales.

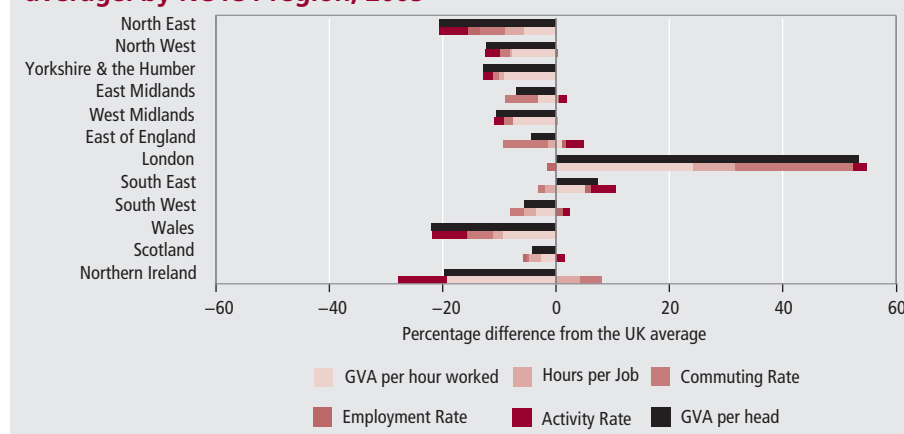
The employment rate appeared to have little impact on economic performance in most regions, except the North East where it explained two percentage points of the region's difference in economic performance below the UK average.

Welfare

Regional Gross Disposable Household Income (GDHI) up to 2005 was published in March 2007. The estimates are published at current basic prices and so do not take into account inflation effects or regional price differences. GDHI measured in absolute terms (£ million) does not take into account the population distribution both within and across regions. For more reliable comparisons of income distributions, the residence based measure of GDHI per head can be used as an indicator of the welfare of people living in a region. Table 2 shows these data from

Figure 5

Explaining the regional differences in GVA per head from the UK average: by NUTS1 region, 2005



2000 to 2005. In 2005, London (£15,885), the South East (£14,941) and the East of England (£14,198) were the only regions where GDHI per head was greater than the UK average. However, Table 2 also shows that London and the South East were the regions which had the lowest percentage growth of this indicator between 2000 and 2005 (18.2 and 19.4 per cent, respectively). The three regions that had a level of GDHI lower than £12,000 per head (the North East, Wales and Northern Ireland) had among the largest improvements over this five-year period (at 22.6, 25.6 and 24.7 per cent growth, respectively). The East Midlands also saw large growth in its GDHI per head indicator between 2000 and 2005 (at 25.6 per cent).

Figure 6 illustrates this pattern in terms of regional GDHI per head in index form between 2000–2005. The horizontal axis represents the UK average of 100 and on this basis comparisons between regions can be made over time without bias from their

relative regional sizes. The three regions with GDHI per head above the UK average are clearly identifiable. Also evident is the decreased gap by which these regions performed above the UK average. Similarly, improvements against the UK average are evident in some of the regions with lower household income, particularly the East

Midlands and the devolved administrations. This does suggest that there has been a reduction in the regional disparities in terms of this indicator of welfare.

Median gross weekly earnings data for 2006 and revised data for 2004 and 2005 were published in October 2006. All regions experienced increases in median gross weekly earnings in 2006. London maintained the noticeable lead in 2006 as the region with the highest median gross weekly earnings for full-time employees, at £572. The North East had the lowest median earnings, at £399, followed by Wales at £403 and Northern Ireland at £405.

Figure 7 shows the data on gross median weekly pay, by sex, for 2006. Females across all UK regions had lower pay than males. However, in terms of annual percentage growth, pay for females outperformed that for males. The only regions where pay for females did not have higher annual growth than male pay in 2006 were the North East, the South East and Scotland. The annual growth rate of female pay was greatest in Northern Ireland.

Figure 6

Headline gross disposable household income per head: by NUTS1 region



Table 2

Headline GDHI per head at current basic prices: by NUTS1 region

	£ per head													
	United Kingdom ¹	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2000	10,906	9,261	9,979	9,964	9,972	9,949	11,681	13,439	12,509	10,806	11,124	9,433	10,168	9,270
2001	11,588	9,810	10,560	10,514	10,628	10,547	12,509	14,223	13,320	11,508	11,819	10,070	10,800	9,819
2002	11,930	10,147	10,874	10,834	11,008	10,854	12,909	14,495	13,652	11,868	12,151	10,456	11,199	10,176
2003	12,409	10,576	11,304	11,306	11,559	11,303	13,376	15,039	14,104	12,367	12,630	10,932	11,682	10,668
2004	12,773	10,920	11,673	11,687	11,993	11,670	13,722	15,396	14,424	12,718	12,990	11,322	12,047	11,086
2005 ²	13,279	11,356	12,186	12,197	12,522	12,133	14,198	15,885	14,941	13,258	13,494	11,851	12,554	11,564
Percentage change 2000 to 2005	21.8	22.6	22.1	22.4	25.6	22.0	21.5	18.2	19.4	22.7	21.3	25.6	23.5	24.7

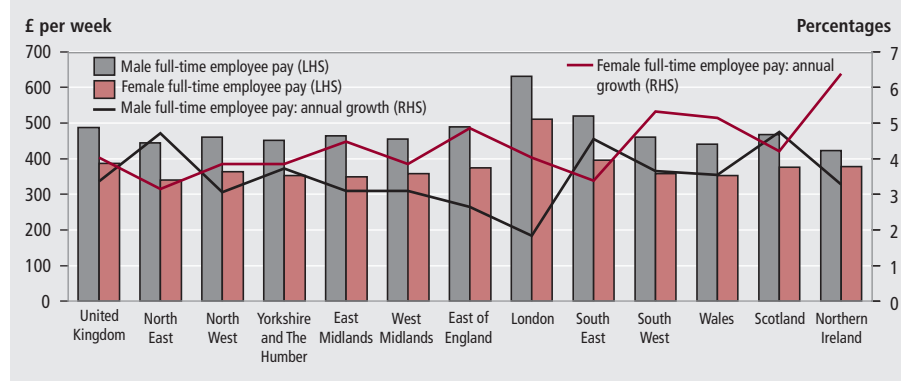
Notes:

1 UK less extra-regio.

2 Provisional.

Source: Office for National Statistics

Figure 7
Gross median weekly pay: by sex and NUTS1 region, 2006



Drivers of productivity

The following indicators represent the drivers of productivity as identified by HM Treasury and the Department for Business, Enterprise and Regulatory Reform (BERR) (formerly the Department of Trade and Industry (DTI)). Research and Development (R&D) statistics provide an indicator for innovation; VAT statistics on net registration change and business survival rates are indicators for enterprise; and regional trade in export goods is regarded as a suitable indicator for competition. Statistics on the qualifications of the working age population provide an indicator of skills available within the regions, as does information on the percentage of pupils achieving five or more grades A*-C at GCSE or equivalent level.

Innovation

Innovation is a necessary, although not sufficient, condition for economic success and therefore is recognised as an important driver of productivity. Innovation can mean either the invention of new and more valuable products or services, or the development of new processes that increase efficiency. R&D is an input to the innovation process and is defined by the Organisation for Economic Co-operation and Development (OECD, 2002) as 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of the stock of knowledge to devise new applications'.

Statistics on Business Expenditure on Research and Development consistent with these internationally agreed standards were published in November 2006. **Table 3** shows that the East of England and the South East had the highest business expenditure on R&D in 2005 and were the only regions where expenditure was higher than £3 billion. Northern Ireland, the North East and Wales remained the regions with the lowest R&D expenditure. The East of England had the highest percentage growth in 2005, at 23 per cent. Scotland and Northern Ireland were the regions with the next highest growth in 2005, at 18 and 17 per cent, respectively, despite being ranked low when comparing their absolute expenditure on R&D with other regions.

R&D as a percentage of GVA is a measure commonly used in international comparisons and can further explain the trends shown above. **Figure 8** shows that the East of England was the region with the highest share of R&D expenditure in terms of GVA (3.5 per cent in 2005) and that this has been the case since 2001. The large percentage growth of absolute expenditure in 2005 in this region, identified above, could now be attributed to a recovery from the relatively low level of R&D expenditure in 2004, evident in Figure 8.

London had the lowest R&D expenditure as a percentage of GVA in 2005, at just 0.3 per cent. This may reflect the choice businesses make over locating their R&D or the impact of regional industry composition. Although there appeared to be low levels of R&D in London, there may not be low levels of innovation. London has a large concentration of service industries; in 2005 they accounted for 87 per cent of total headline GVA there, which may not be R&D intensive if, for example, they rely heavily on human capital. If innovation occurred in other forms it would not be captured by the R&D measure. This also puts into context the large decline of 20.5 per cent in R&D expenditure in London in 2005, identifiable in Table 3.

Figure 8 also shows that there has been a steady decline of R&D expenditure in terms of GVA since 2001 in the South East.

Figure 8
Business expenditure on R&D as a percentage of headline workplace based GVA: by NUTS1 regions

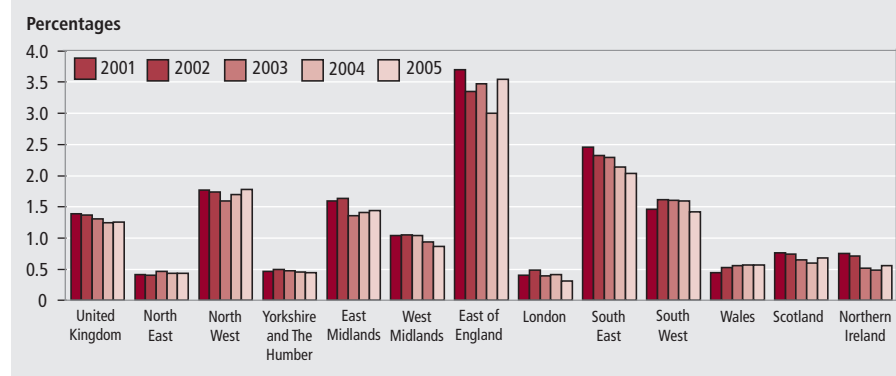


Table 3
Expenditure on research and development performed in UK businesses: by NUTS1 region, 2005

	United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
Expenditure (£ million)	13,410	158	1,887	350	1,019	735	3,316	630	3,163	1,201	231	584	136
Annual percentage change	4.6	3.3	8.3	0.6	6.1	-4.8	22.7	-20.5	-1.6	-7.4	2.2	18.2	17.2

Source: Office for National Statistics

This reinforces the decline in absolute expenditure in the South East evident in Table 3. The South East was, however, one of the five regions in 2005 with a level of R&D expenditure in terms of GVA greater than the UK average of 1.3 per cent; the other four regions were the North West, the East of England, the East Midlands and the South West.

Enterprise

Indicators of enterprise are published by the Small Business Service (SBS) of the DBERR. VAT registrations and deregistrations are the best official guide to the pattern of business start-ups and closures. They are an indicator of the level of entrepreneurship and the factors that influence the pattern of business start-ups, such as economic growth, which encourages new ventures and creates demand for business. The most recent data (as published in October 2006) were presented in previous editions of this article and remain accessible from the SBS website.

An alternative indicator is the business survival rate. Data on the proportion of businesses that remained registered for VAT three years after their initial registration were updated in February 2007. **Figure 9** shows the regional business survival rates for two different years of initial registration, 1995 and 2002, illustrating the percentage still trading three years later. For the most recent year, the region with by far the highest rate of business survivals was Northern Ireland (78.5 per cent) and the regions with the lowest were London (66.9 per cent) followed by the North East (70.4 per cent) and the West Midlands (70.6 per cent).

Figure 9 shows there were improvements in businesses survival rates in all regions over the time period, although the extent of

these did differ by region. Across the UK, between 1995 and 2002, business survival rates improved by 5.7 percentage points. The largest improvement (8.4 percentage points) was in the North West, closely followed by the North East (7.9 percentage points). By contrast, in Northern Ireland, the improvement over the time period was only 0.3 percentage points. However, Northern Ireland was identified above as the strongest region in terms of business survival rates, even though there was only a small increase between the two years. There was a decline in survival rates in Northern Ireland in the first half of this period and an improvement in the second half, whereas all other regions showed a consistent rise over the whole period, although from a lower base. The larger improvements in other regions could be due to many factors, but the figures do not suggest significant overall regional differences in the ability of new businesses to survive.

Competition

HM Revenue & Customs (HMRC) publishes regional trade statistics on export trade in goods by statistical value, which provide an indicator of competition. Trade in goods by definition excludes intangibles and services. The statistical value of export trade is calculated as the value of the goods plus the cost of movement to the country's border. New data for the first quarter of 2007 were published in June 2007, presented here in **Table 4**.

In the first quarter of 2007 there was a decrease in total exports from the UK (including trade that cannot be allocated to a region). Of these, the value of exports to other European Union (EU) member states fell by £623 million (a decrease of 2 per cent) when compared to figures for the last quarter of 2006, despite the accession of

two new member states on 1 January 2007. Exports to EU member states in the first quarter of 2007 decreased in five NUTS1 regions, with the largest fall of nearly 11 per cent in Scotland. Comparatively, in the first quarter of 2006 the value of UK exports to other EU member states had increased by over 31 per cent when compared to the last quarter of 2005. Exports to non-EU countries in the first quarter of 2007 decreased in all regions, except in Scotland where there was an increase of 12 per cent. For comparison in the first quarter of 2006 exports to non-EU countries had decreased in all regions except Wales.

Figure 10 shows the value of export goods as a percentage of headline workplace based regional GVA. This basis of interpreting the results is more useful than looking at the absolute numbers because it takes into account the differing sizes of regional economies. In 2005, the North East was the region where exports accounted for the highest percentage of GVA (23 per cent), although this had declined since 2003. A possible explanation could be the higher annual growth in GVA in 2005 than in exports. In all other regions in 2005, annual export growth was larger than annual GVA growth. The region where exports accounted for the smallest percentage of GVA (12 per cent) in 2005 was the South West, although this was a slightly larger proportion than in previous years. The most significant drop was in Scotland, where exports in 2005 accounted for 9 percentage points less in terms of GVA than they did in 2001.

Skills

The skills of workers are important to productivity as they define the capabilities that the labour force can input to the production process. It is useful to be able to analyse skills from two perspectives: the qualifications of the current working age population and the qualifications of young people representing the future capabilities of the labour force. The following data are available on ONS Regional Snapshot.

The latest data on the highest qualifications of the working age population (males aged 16 to 64 and females aged 16 to 59) are based on spring 2006 Labour Force Survey data. The characteristics of the local economies will dictate what labour skills are required and thus affect the comparability of these data. **Figure 11** shows the percentage of the working age population who have no qualifications, by region, against the UK average. Northern Ireland has the highest proportion with no

Figure 9
Three-year survival rates of VAT-registered enterprises, by year of initial registration: percentage still trading: by NUTS1 regions



Table 4

UK regional trade in goods – statistical value of exports: by NUTS1 region

		£ million												
		United Kingdom ¹	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	Wales	Scotland	Northern Ireland
EU exports														
2005	Q1	28,600	1,341	2,431	1,765	2,167	1,960	2,708	2,424	4,083	1,595	1,493	1,479	685
	Q2	29,675	1,372	2,674	1,726	2,279	2,155	2,838	2,170	4,266	1,552	1,340	1,544	751
	Q3	29,408	1,304	2,653	1,672	2,315	1,973	2,536	2,600	4,449	1,454	1,246	1,662	697
	Q4	32,267	1,369	2,789	1,728	2,416	2,139	2,883	2,642	4,938	1,701	1,306	1,629	746
2006 ³	Q1	42,294	1,363	3,482	2,138	2,877	2,792	3,367	4,345	5,348	1,786	1,483	1,701	790
	Q2	46,163	1,447	4,784	2,255	3,246	3,765	3,495	5,575	5,183	1,754	1,517	1,859	845
	Q3	32,062	1,417	3,067	1,573	2,475	2,779	2,640	2,175	4,291	1,585	1,367	1,710	830
	Q4	31,119	1,399	2,569	1,698	2,149	2,277	2,786	2,153	4,701	1,642	1,302	1,695	842
2007 ³	Q1	30,496	1,302	2,679	1,678	2,266	2,157	3,104	2,177	4,459	1,693	1,344	1,513	846
Non-EU Exports														
2005	Q1	18,880	556	1,803	1,087	1,371	1,369	1,576	3,638	2,852	793	698	1,264	390
	Q2	23,064	795	2,139	1,260	1,715	1,746	2,107	3,953	3,639	980	864	1,680	439
	Q3	23,995	816	2,260	1,232	1,786	1,770	2,049	4,528	3,784	1,094	839	1,739	429
	Q4	25,866	826	2,560	1,404	1,966	2,093	2,434	4,417	4,219	1,179	859	1,663	477
2006 ³	Q1	22,733	703	2,502	1,145	1,788	1,803	1,999	3,846	3,570	939	865	1,613	431
	Q2	24,283	701	2,633	1,247	1,830	1,797	2,058	4,147	3,946	1,071	952	1,766	483
	Q3	21,910	713	2,301	1,254	1,742	1,534	1,826	3,137	3,655	1,074	981	1,624	460
	Q4	23,482	848	2,421	1,313	1,791	1,579	2,022	3,939	3,460	1,113	947	1,495	505
2007 ³	Q1	21,082	807	2,261	1,247	1,621	1,479	1,783	3,484	3,058	917	839	1,683	469

Notes:

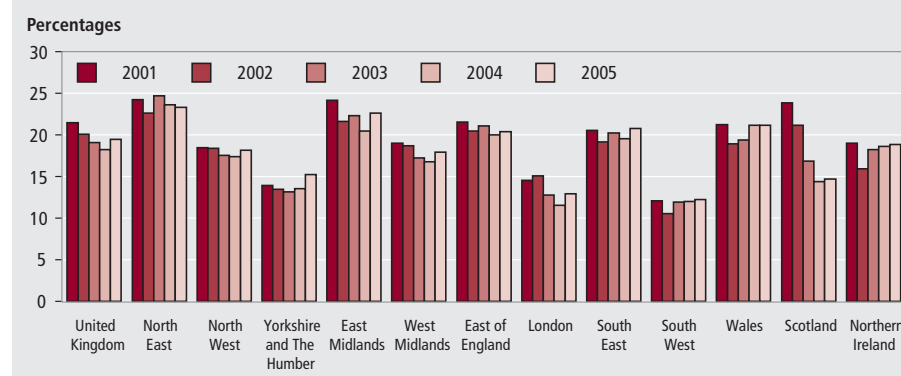
1 UK figure includes trade that cannot be allocated to a region

2 EU data refer to EU25 upto 2006 Q4 and EU27 as from 2007 Q1

3 Data are provisional

Source: HM Revenue & Customs

Figure 10
Value of total export goods as a percentage of headline workplace-based GVA: by NUTS1 regions



qualifications (8.6 percentage points above the UK average), whereas the opposite is the case in the South East and the South West (4.1 percentage points lower than the UK average). This does not necessarily mean that these regions have the most qualified working age population, but does indicate where there is a larger proportion of the working population with no qualifications. This may be due to the skill requirements dictated by the regional economies or it could mean that a significant number of

those with qualifications have migrated out of these regions.

Data on the percentage of pupils achieving 5 or more grades A*–C at GCSE level or equivalent in each region in 2005/06 are illustrated in **Figure 12**. Equivalent level qualifications are defined in Notes and Definitions on ONS Regional Snapshot. The regional breakdown for these data in England is only available for pupils at Local Authority maintained schools, although data for the devolved administrations is

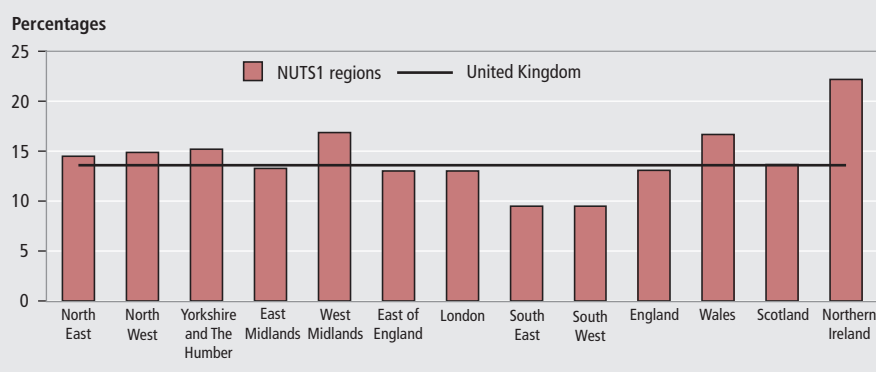
based on all schools. Given this it is possible to calculate two averages for England: one based on just local authority maintained schools, and one for all schools, as is presented in Figure 12. This shows that the average is higher when calculated on all schools, reflecting the likely higher results obtained by pupils in non-Local Authority establishments. Within Local Authority maintained schools in the English regions, London, East of England, South East and the South West performed above the England average for these schools, whilst Yorkshire and The Humber was the lowest region in England. Within the devolved administrations, based on data that include all schools, Northern Ireland had the highest proportion of pupils achieving 5 or more A*–C grades at GCSE or equivalent, and Wales had the lowest.

The labour market

Table 5 shows the seasonally adjusted employment rate, the number of people of working age in employment, expressed as a proportion of the population, from the Labour Force Survey (LFS).

In quarter one (January to March) of 2007, the UK employment rate was 74.3

Figure 11
Working age population with no qualifications: spring 2006



per cent, down 0.3 percentage points from a year ago and down 0.2 percentage points from quarter four (October to December) of 2006. Regional rates varied from 78.2 per cent in the South East to 69.9 per cent in London.

Three regions had an increase in the employment rate over the year. Scotland had a rise of 1.3 percentage points and the rate for Northern Ireland increased by 1.1 percentage points. The employment rate was unchanged over the year in the East of England, London and the North East. Six regions experienced falls in the employment rate. Yorkshire and The Humber had an annual fall of 1.5 percentage points and the West Midlands decreased by 1.1 percentage points.

Table 6 shows the unemployment rate (according to the internationally-consistent ILO definition) for persons aged 16 and over from the LFS. The UK rate in the first quarter of 2007 was 5.5 per cent, unchanged from the previous quarter but up 0.3 percentage points on a year earlier. Regionally, the rates ranged from 7.3 per cent in London to 3.9 per cent in the South West.

Over the year, unemployment has decreased in four regions – the East of England, London, Northern Ireland and Scotland by as much as 0.4 percentage points. The unemployment rose in eight regions. West Midlands had an increase of 1.2 percentage points.

Figure 12
Pupils achieving 5 or more grades A*–C at GCSE level or equivalent, 2005/06

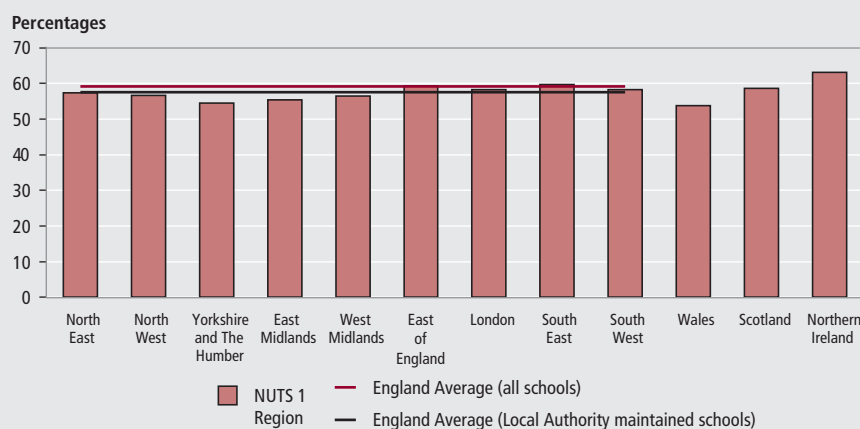


Table 5
Employment¹ rates for persons of working age: by NUTS1 region

		Percentages, seasonally adjusted													
		United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2004	Jan–Mar	74.8	69.8	73.9	74.2	76.4	73.9	79.6	70.2	78.6	79.3	75.2	72.6	74.4	67.1
	Apr–Jun	74.7	69.8	73.8	74.1	76.3	73.9	79.0	70.1	78.7	78.1	75.0	72.6	74.7	66.8
	Jul–Sep	74.7	70.1	73.5	74.3	75.6	75.1	78.9	69.4	79.0	78.7	75.1	71.3	75.0	67.0
	Oct–Dec	74.9	69.8	74.1	74.5	76.1	74.9	78.8	69.3	79.1	78.7	75.2	72.3	75.1	69.2
2005	Jan–Mar	74.9	70.3	73.3	74.5	76.4	74.7	78.8	69.8	78.9	78.8	75.1	71.7	75.3	68.8
	Apr–Jun	74.7	70.2	73.3	74.3	76.5	74.4	78.7	69.3	79.0	78.8	75.0	71.4	75.0	68.5
	Jul–Sep	74.8	69.7	73.5	74.7	77.2	74.0	78.5	69.5	78.9	78.3	75.0	72.3	75.2	69.9
	Oct–Dec	74.5	70.1	72.9	74.4	77.2	73.4	77.5	69.3	78.8	77.8	74.6	71.8	75.4	68.7
2006	Jan–Mar	74.6	70.9	73.4	74.2	77.0	73.8	77.4	69.9	78.8	78.1	74.9	71.5	75.3	69.4
	Apr–Jun	74.6	71.7	73.3	74.1	76.9	73.8	76.9	69.5	79.0	78.4	74.8	71.5	74.8	70.1
	Jul–Sep	74.5	70.9	73.5	73.5	77.1	73.9	77.0	69.5	78.9	77.8	74.7	72.1	75.2	68.9
	Oct–Dec	74.5	71.2	73.0	73.8	76.5	73.2	77.1	69.7	78.7	78.4	74.6	71.8	76.1	69.5
2007	Jan–Mar	74.3	70.9	72.5	72.7	76.0	72.7	77.4	69.9	78.2	78.0	74.3	71.7	76.6	70.5

Note:

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

Source: Labour Force Survey

Table 6

Unemployment rates for persons aged 16 and over: by NUTS1 region

Percentages, seasonally adjusted

		United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
		MGSX	YCNC	YCND	YCNE	YCNF	YCNH	YCNH	YCNH	YCNJ	YCNK		YCNM	YCNN	ZSFB
2004	Jan–Mar	4.8	5.6	4.5	4.8	4.7	5.5	3.4	7.0	3.8	3.0	4.7	4.6	5.8	5.3
	Apr–Jun	4.8	5.5	4.4	4.6	4.2	5.5	3.8	7.0	3.7	3.7	4.7	4.2	6.0	5.1
	Jul–Sep	4.7	5.9	4.5	4.6	4.1	5.0	3.6	7.2	3.6	3.3	4.6	4.9	5.3	5.0
	Oct–Dec	4.7	6.4	4.6	4.6	4.2	4.7	3.8	7.2	3.5	3.3	4.6	4.2	5.7	4.6
2005	Jan–Mar	4.7	5.8	4.7	4.4	4.3	4.7	3.8	6.7	3.7	3.6	4.6	4.6	5.5	4.8
	Apr–Jun	4.8	6.8	4.4	4.8	4.2	4.7	3.9	7.2	3.8	3.2	4.7	4.6	5.4	4.9
	Jul–Sep	4.8	6.7	4.5	4.5	4.4	4.7	4.1	6.7	4.0	3.7	4.8	4.6	5.5	4.3
	Oct–Dec	5.1	6.5	4.9	5.4	4.6	5.3	4.5	7.4	4.2	3.9	5.2	4.9	5.2	4.5
2006	Jan–Mar	5.2	6.6	4.9	5.4	5.0	5.2	4.8	7.7	4.5	3.6	5.3	4.8	5.3	4.4
	Apr–Jun	5.5	6.1	5.3	5.7	5.4	5.7	5.0	7.9	4.7	3.7	5.5	5.7	5.4	4.2
	Jul–Sep	5.6	6.9	5.6	6.0	5.3	6.1	5.0	8.0	4.5	3.9	5.7	5.4	5.0	4.7
	Oct–Dec	5.5	6.5	5.3	6.0	5.8	6.5	4.5	7.9	4.3	3.8	5.6	5.2	5.2	4.2
2007	Jan–Mar	5.5	6.8	5.7	6.2	5.5	6.4	4.7	7.3	4.6	3.9	5.7	5.5	4.9	4.2

Source: Labour Force Survey

Table 7

Economic inactivity rates for persons of working age: by NUTS1 region

Percentages, seasonally adjusted

		United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
2004	Jan–Mar	21.3	25.9	22.5	22.0	19.8	21.7	17.5	24.5	18.2	18.3	21.0	23.7	20.9	29.1
	Apr–Jun	21.5	26.0	22.7	22.3	20.3	21.6	17.8	24.5	18.2	18.9	21.2	24.1	20.5	29.4
	Jul–Sep	21.5	25.4	23.0	22.1	21.1	20.9	18.1	25.1	17.9	18.6	21.2	24.9	20.7	29.4
	Oct–Dec	21.3	25.3	22.3	21.8	20.5	21.3	18.0	25.3	17.9	18.6	21.1	24.5	20.2	27.4
2005	Jan–Mar	21.4	25.3	23.0	22.0	20.2	21.6	18.0	25.0	18.0	18.2	21.2	24.7	20.1	27.6
	Apr–Jun	21.5	24.6	23.2	21.9	20.1	21.8	18.1	25.2	17.8	18.5	21.2	25.1	20.6	27.8
	Jul–Sep	21.3	25.3	22.9	21.6	19.2	22.2	18.0	25.3	17.8	18.6	21.2	24.1	20.3	26.9
	Oct–Dec	21.4	25.0	23.3	21.2	18.9	22.4	18.7	25.1	17.7	18.9	21.2	24.4	20.4	28.0
2006	Jan–Mar	21.1	23.9	22.7	21.5	18.8	22.0	18.6	24.2	17.4	18.9	20.8	24.8	20.4	27.3
	Apr–Jun	21.0	23.5	22.5	21.3	18.6	21.6	18.9	24.4	17.1	18.4	20.7	24.0	20.8	26.7
	Jul–Sep	21.0	23.8	22.1	21.7	18.5	21.2	18.9	24.2	17.3	18.9	20.7	23.7	20.8	27.5
	Oct–Dec	21.0	23.7	22.8	21.3	18.7	21.6	19.1	24.2	17.7	18.4	20.8	24.1	19.7	27.4
2007	Jan–Mar	21.2	23.8	23.0	22.4	19.5	22.2	18.6	24.4	18.0	18.7	21.1	24.0	19.3	26.4

Source: Labour Force Survey

Table 7 shows economic inactivity rates for persons of working age from the LFS. The UK rate in the first quarter of 2007 was 21.2 per cent, up 0.2 percentage points from the previous quarter and up 0.1 percentage point on a year earlier. Across the regions, rates varied from 18.0 per cent in the South East to 26.4 per cent in Northern Ireland.

Compared with a year earlier, five regions had a decrease in the inactivity rate, and thus a corresponding increase in the working-age activity rate. Scotland had the largest annual fall of 1.1 percentage points. Six regions had an increase in the economic inactivity rate over the year. The

largest annual rise was in Yorkshire and The Humber (0.9 percentage points). The rate for the East of England was unchanged over the year.

Table 8 shows the number of employee jobs, not seasonally adjusted, from the Employers Surveys. The number of UK employee jobs was 27,048,000, an increase of 186,000 over the year to March 2007. In percentage terms, this was a 0.7 per cent increase.

There were annual increases in all regions except the North West which fell by 0.1 percentage point. The largest percentage rises were in Wales (3.0 per cent) and Northern Ireland (1.8 per cent).

Table 9 shows the claimant count rate (referring to people claiming Jobseeker's Allowance benefits as a proportion of the workforce). The UK rate was 2.7 per cent in June 2007, unchanged from May 2007, but 0.3 percentage points down on a year earlier. This national rate masks large variations between regions and component countries of the UK. For June 2007, the North East has the highest claimant count rate in the UK at 4.0 per cent. The North East is followed by the West Midlands (3.7 per cent), the North West and Yorkshire and The Humber, both at 3.1 per cent. The South East and the South

Table 8
Employee jobs:¹ by NUTS1 region

Thousands, not seasonally adjusted

	United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
Mar 03	26,012	994	2,935	2,131	1,735	2,305	2,263	3,917	3,618	2,086	21,984	1,097	2,263	669
Mar 04	26,238	1,007	2,973	2,199	1,744	2,304	2,292	3,898	3,607	2,132	22,156	1,118	2,284	681
Mar 05	26,654	1,026	2,997	2,219	1,813	2,333	2,302	3,962	3,643	2,164	22,459	1,153	2,346	696
Mar 06	26,861	1,053	2,934	2,234	1,833	2,333	2,311	4,012	3,710	2,190	22,610	1,184	2,368	700
Jun 06	27,035	1,061	2,946	2,243	1,844	2,341	2,331	4,035	3,735	2,211	22,749	1,203	2,383	700
Sep 06	27,073	1,057	2,936	2,252	1,854	2,342	2,345	4,034	3,737	2,209	22,766	1,219	2,384	704
Dec 06 ^r	27,328	1,071	2,958	2,264	1,884	2,359	2,363	4,086	3,765	2,224	22,975	1,229	2,409	715
Mar 07	27,048	1,058	2,931	2,251	1,856	2,337	2,323	4,060	3,719	2,197	22,733	1,219	2,383	712

Notes:

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

Source: Employer surveys

Table 9
Claimant count rates:¹ by NUTS1 region

Percentages, seasonally adjusted

	United Kingdom	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of England	London	South East	South West	England	Wales	Scotland	Northern Ireland
	BCJE	DPDM	IBWC	DPBI	DPBJ	DPBN	DPDP	DPDQ	DPDR	DPBM	VASQ	DPBP	DPBQ	DPBR
2002	3.1	5.0	3.5	3.6	2.9	3.5	2.1	3.5	1.6	1.9	2.9	3.5	3.8	4.4
2003	3.0	4.5	3.2	3.3	2.8	3.5	2.1	3.6	1.7	1.9	2.9	3.3	3.7	4.1
2004	2.7	4.0	2.8	2.8	2.5	3.3	2.0	3.5	1.6	1.6	2.6	3.0	3.4	3.6
2005	2.7	3.9	2.9	2.9	2.5	3.4	2.1	3.4	1.6	1.6	2.6	3.0	3.2	3.3
2006	2.9	4.1	3.3	3.3	2.8	3.9	2.3	3.4	1.8	1.8	2.9	3.1	3.1	3.2
2006 Jun	3.0	4.1	3.4	3.3	2.9	3.9	2.3	3.5	1.8	1.8	2.9	3.1	3.2	3.2
Jul	3.0	4.1	3.4	3.3	2.9	3.9	2.3	3.5	1.9	1.8	2.9	3.1	3.2	3.2
Aug	2.9	4.1	3.4	3.3	2.9	3.9	2.3	3.4	1.9	1.8	2.9	3.1	3.2	3.2
Sep	3.0	4.1	3.4	3.3	2.9	3.9	2.3	3.4	1.8	1.8	2.9	3.0	3.2	3.2
Oct	3.0	4.1	3.4	3.3	2.9	3.9	2.4	3.4	1.8	1.8	2.9	3.0	3.1	3.2
Nov	2.9	4.2	3.4	3.3	2.9	3.9	2.4	3.4	1.8	1.8	2.9	3.0	3.1	3.1
Dec	2.9	4.2	3.4	3.3	2.8	3.9	2.3	3.3	1.8	1.8	2.9	3.0	3.1	3.1
2007 Jan	2.9	4.1	3.3	3.2	2.8	3.9	2.3	3.3	1.7	1.8	2.8	2.9	2.9	3.0
Feb	2.8	4.2	3.3	3.2	2.8	3.9	2.3	3.2	1.7	1.8	2.8	2.9	3.0	3.0
Mar	2.8	4.1	3.3	3.2	2.8	3.8	2.3	3.2	1.7	1.7	2.8	2.9	2.9	3.0
Apr	2.8	4.1	3.2	3.1	2.7	3.7	2.2	3.1	1.7	1.7	2.7	2.9	2.9	2.9
May	2.7	4.0	3.2	3.1	2.7	3.7	2.2	3.1	1.6	1.6	2.7	2.8	2.8	2.9
Jun	2.7	4.0	3.1	3.1	2.7	3.7	2.2	3.0	1.6	1.6	2.7	2.8	2.8	2.8

Note:

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

Source: Jobcentre Plus administrative system

West had the lowest claimant count rates, at 1.6 per cent. The claimant count rate was 2.8 per cent in all three devolved administrations.

Compared with a year earlier, all regions had a lower claimant count rate. London had the largest decrease of 0.5 percentage points. Claimant count rates for Scotland and Northern Ireland fell by 0.4 percentage points.

ACKNOWLEDGEMENTS

The authors are grateful to Sumit Dey-Chowdhury for his assistance.

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REFERENCES

HM Revenue & Customs (2006) *Regional Trade Statistics* at: www.uktradeinfo.com/index.cfm?task=td_regstats

HM Treasury (2004) *Productivity in the UK 5: Benchmarking UK productivity performance. A consultation on productivity indicators*

Office for National Statistics *Annual Survey of Hours and Earnings 2006 Results* at www.statistics.gov.uk/StatBase/Product.asp?vlnk=13101

Office for National Statistics *Business Expenditure on Research & Development by Government Office Region* at www.statistics.gov.uk/statbase/tsdataset.asp?vlnk=572

Office for National Statistics *Productivity 1st quarter 2007* First Release at www.statistics.gov.uk/pdfdir/prod0707.pdf

Office for National Statistics *Regional GVA – December 2006* First Release at www.statistics.gov.uk/STATBASE/Product.asp?vlnk=14650

Office for National Statistics *Regional Household Income March 2007* First Release at www.statistics.gov.uk/statbase/Product.asp?vlnk=14651

Office for National Statistics *Regional Snapshot: Education and Training* at www.statistics.gov.uk/statbase/Product.asp?vlnk=14712

Organisation for Economic Co-operation and Development (2002) *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development*

Small Business Service, *Statistical Press Release October 24 2006: Business Start Ups and Closures: VAT registrations and*

de-registrations in 2005 at www.sbs.gov.uk/SBS_Gov_files/researchandstats/VATStatsPressReleaseOct2006.pdf

Small Business Service, *Three year survival rates of VAT registered businesses by region* at www.sbs.gov.uk/sbsgov/action/layer?r.l2=7000000243&r.l1=7000000229&r.s=tl&topicId=7000011767

Swadkin C and Hastings D (2007) 'Regional Economic Indicators with a focus on the differences in regional economic performance', *Economic & Labour Market Review* 1(2), pp 52–64.

Key time series

National accounts aggregates

Last updated: 20/07/07

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
2001	1,003,297	889,063	89.7	89.5	93.7	95.3	95.6	94.1	93.6
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	104.3	105.2	105.2	104.9	104.9
2006	1,299,622	1,154,959	116.2	116.3	106.2	108.1	108.2	107.5	107.4
2001 Q1	247,905	219,532	88.7	88.4	93.1	94.9	95.3	93.5	92.7
2001 Q2	249,597	220,901	89.3	88.9	93.4	95.0	95.3	94.0	93.3
2001 Q3	251,028	222,536	89.8	89.6	94.4	95.6	95.8	94.0	93.6
2001 Q4	254,767	226,094	91.1	91.0	94.1	95.9	96.0	95.0	94.9
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	104.1	104.4	104.4	104.2	104.1
2005 Q2	307,306	273,158	109.9	110.0	105.4	104.8	104.9	104.9	104.8
2005 Q3	308,515	273,676	110.4	110.2	103.5	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	316,789	281,680	113.3	113.4	104.8	106.9	107.0	106.0	106.0
2006 Q2	321,453	285,500	115.0	114.9	106.9	107.8	107.8	106.7	106.6
2006 Q3	328,388	291,766	117.5	117.5	106.7	108.5	108.6	108.2	108.2
2006 Q4	332,992	296,013	119.1	119.2	106.4	109.4	109.5	108.9	108.8
2007 Q1	336,652	298,773	120.4	120.3	107.9	110.1	110.3	109.3	109.0
2007 Q2						111.0	111.2		

Percentage change, quarter on corresponding quarter of previous year⁴

2001 Q1	5.0	5.3	5.1	5.4	3.3	2.9	2.9	2.1	2.2
2001 Q2	4.6	5.0	4.6	5.0	3.2	2.3	2.1	2.3	2.8
2001 Q3	4.1	4.5	4.2	4.6	3.1	2.4	1.9	1.8	2.6
2001 Q4	4.8	5.2	4.7	5.2	3.7	2.0	1.6	2.7	3.6
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	2.2	2.2	2.2	3.1	3.2
2005 Q2	4.1	4.2	4.2	4.3	2.1	1.6	1.6	2.5	2.4
2005 Q3	3.5	3.4	3.6	3.4	0.5	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	4.2	4.3	4.2	4.3	0.7	2.4	2.5	1.7	1.8
2006 Q2	4.6	4.5	4.6	4.5	1.4	2.9	2.8	1.7	1.7
2006 Q3	6.4	6.6	6.4	6.6	3.1	2.9	3.0	3.3	3.5
2006 Q4	6.0	5.8	6.0	5.9	2.2	3.1	3.1	2.7	2.5
2007 Q1	6.3	6.1	6.3	6.1	3.0	3.0	3.1	3.1	2.8
2007 Q2						3.0	3.2		

Notes:

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.

Source: Office for National Statistics

Gross domestic product: by category of expenditure

Last updated: 20/07/07

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

	Domestic expenditure on goods and services at market prices											
	Final consumption expenditure			Gross capital formation				Exports of goods and services	Gross final expenditure	less imports of goods and services	Statistical discrepancy (expenditure)	Gross domestic at product market prices
	Households	Non-profit institutions ¹	General government	Gross fixed capital formation	Changes in inventories ²	Acquisitions less disposals of valuables	Total					
	ABJR	HAYO	NMRY	NPQT	CAFU	NPJR	YBIM	IKBK	ABMG	IKBL	GIXS	ABMI
2001	653,326	27,155	217,359	178,203	5,577	342	1,082,333	277,694	1,360,205	294,449	0	1,066,217
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	746,030	29,944	252,359	216,667	3,758	66	1,248,825	361,541	1,610,366	401,614	592	1,209,344
2001 Q1	161,204	6,873	53,609	44,158	1,675	-26	267,565	71,295	339,027	73,841	0	265,267
2001 Q2	162,333	6,788	53,894	44,888	1,793	202	270,071	69,333	339,452	73,937	0	265,573
2001 Q3	164,239	6,762	54,600	45,017	1,726	30	272,481	67,921	340,353	73,327	0	267,163
2001 Q4	165,550	6,732	55,256	44,140	383	136	272,216	69,145	341,373	73,344	0	268,214
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	184,321	7,340	63,014	52,274	703	-128	307,523	95,198	402,721	104,029	181	298,873
2006 Q2	186,226	7,430	62,884	53,473	2,680	233	312,925	96,228	409,153	108,003	153	301,303
2006 Q3	186,733	7,523	63,087	54,606	1,258	-29	313,178	85,206	398,384	95,152	134	303,366
2006 Q4	188,750	7,651	63,374	56,314	-883	-10	315,199	84,909	400,108	94,430	124	305,802
2007 Q1	189,632	7,694	63,712	56,937	-699	73	317,347	84,201	401,548	93,809	151	307,890
2007 Q2												310,353

Percentage change, quarter on corresponding quarter of previous year

2001 Q1	2.1	3.9	1.8	3.0			2.8	9.7	4.3	9.0		2.9
2001 Q2	2.9	0.6	1.6	5.5			3.2	3.0	3.1	6.1		2.3
2001 Q3	3.4	-1.6	2.8	3.7			3.0	1.0	2.6	3.6		2.3
2001 Q4	4.0	-3.0	3.3	-1.6			2.7	-1.6	1.7	0.7		2.1
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	1.0	4.8	3.5	5.8			2.0	25.3	6.7	21.1		2.4
2006 Q2	2.2	6.3	2.1	8.4			3.9	20.9	7.5	22.8		2.8
2006 Q3	1.9	6.8	1.9	7.8			3.2	3.5	3.3	4.0		3.0
2006 Q4	2.5	7.3	1.9	9.8			3.5	-1.1	2.5	0.1		3.1
2007 Q1	2.9	4.8	1.1	8.9			3.2	-11.6	-0.3	-9.8		3.0
2007 Q2												3.0

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: 18/07/07

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
Mar-May 2005	47,719	30,100	28,674	1,426	17,618	63.1	60.1	4.7	36.9
Mar-May 2006	48,100	30,552	28,895	1,657	17,548	63.5	60.1	5.4	36.5
Jun-Aug 2006	48,193	30,717	29,015	1,702	17,476	63.7	60.2	5.5	36.3
Sep-Nov 2006	48,285	30,703	29,029	1,674	17,583	63.6	60.1	5.5	36.4
Dec-Feb 2007	48,378	30,677	28,982	1,694	17,701	63.4	59.9	5.5	36.6
Mar-May 2007	48,471	30,735	29,075	1,660	17,736	63.0	60.0	5.0	37.0
Male	MGSM	MMSG	MGSA	MGSD	MGSJ	MGWH	MGSS	MGSY	YBTD
Mar-May 2005	23,127	16,297	15,460	837	6,830	70.5	66.8	5.1	29.5
Mar-May 2006	23,336	16,533	15,563	971	6,803	70.8	66.7	5.9	29.2
Jun-Aug 2006	23,387	16,609	15,632	977	6,778	71.0	66.8	5.9	29.0
Sep-Nov 2006	23,439	16,617	15,664	953	6,822	70.9	66.8	5.7	29.1
Dec-Feb 2007	23,492	16,629	15,660	969	6,863	70.8	66.7	5.8	29.2
Mar-May 2007	23,544	16,689	15,734	955	6,855	70.9	66.8	5.7	29.1
Female	MGSN	MGSH	MGSB	MGSE	MGSK	MGWI	MGST	MGSZ	YBTE
Mar-May 2005	24,592	13,803	13,214	589	10,788	56.1	53.7	4.3	43.9
Mar-May 2006	24,764	14,019	13,332	686	10,745	56.6	53.8	4.9	43.4
Jun-Aug 2006	24,806	14,108	13,383	726	10,697	56.9	54.0	5.1	43.1
Sep-Nov 2006	24,846	14,086	13,365	721	10,760	56.7	53.8	5.1	43.3
Dec-Feb 2007	24,886	14,048	13,323	725	10,839	56.4	53.5	5.2	43.6
Mar-May 2007	24,927	14,046	13,341	705	10,881	56.3	53.5	5.0	43.7

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
Mar-May 2005	36,958	29,024	27,616	1,408	7,933	78.5	74.7	4.9	21.5
Mar-May 2006	37,230	29,388	27,757	1,631	7,843	78.9	74.6	5.5	21.1
Jun-Aug 2006	37,296	29,517	27,841	1,676	7,779	79.1	74.6	5.7	20.9
Sep-Nov 2006	37,337	29,484	27,837	1,647	7,853	79.0	74.6	5.6	21.0
Dec-Feb 2007	37,378	29,449	27,778	1,671	7,929	78.8	74.3	5.7	21.2
Mar-May 2007	37,419	29,491	27,858	1,633	7,928	78.8	74.5	5.5	21.2
Male	YBTG	YBSL	YBSF	YBSI	YBSO	MGSP	MGSV	YBTJ	YBTM
Mar-May 2005	19,111	15,932	15,103	829	3,179	83.4	79.0	5.2	16.6
Mar-May 2006	19,280	16,138	15,178	960	3,142	83.7	78.7	5.9	16.3
Jun-Aug 2006	19,322	16,209	15,244	965	3,113	83.9	78.9	6.0	16.1
Sep-Nov 2006	19,360	16,203	15,260	943	3,156	83.7	78.8	5.8	16.3
Dec-Feb 2007	19,398	16,216	15,256	961	3,182	83.6	78.6	5.9	16.4
Mar-May 2007	19,436	16,273	15,329	944	3,163	83.7	78.9	5.8	16.3
Female	YBTH	YBSM	YBSG	YBSJ	YBSP	MGSQ	MGSW	YBTK	YBTN
Mar-May 2005	17,847	13,092	12,513	579	4,755	73.4	70.1	4.4	26.6
Mar-May 2006	17,950	13,249	12,578	671	4,701	73.8	70.1	5.1	26.2
Jun-Aug 2006	17,975	13,308	12,598	711	4,666	74.0	70.1	5.3	26.0
Sep-Nov 2006	17,977	13,280	12,577	704	4,697	73.9	70.0	5.3	26.1
Dec-Feb 2007	17,980	13,233	12,523	710	4,747	73.6	69.6	5.4	26.4
Mar-May 2007	17,983	13,218	12,529	689	4,764	73.5	69.7	5.2	26.5

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: 020 7533 6094

Prices

Last updated: 17/07/07

Percentage change over 12 months

	Consumer prices						Not seasonally adjusted, except for series PLLW, RNPE and RNPF			
	Consumer prices index (CPI)			Retail prices index (RPI)			Producer prices			
							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	EL25	EAD6	CZBH	CDKQ	CBZX	PLLU ³	PLLW ³	RNPE ³	RNPF ³
2003 Jan	1.3			2.9	2.7	2.9	1.3	0.9	1.7	-2.2
2003 Feb	1.6			3.2	3.0	3.1	1.5	1.1	2.5	-2.0
2003 Mar	1.5			3.1	3.0	3.2	2.1	1.3	0.8	-1.5
2003 Apr	1.4			3.1	3.0	2.9	1.6	1.3	-1.3	-0.6
2003 May	1.3			3.0	2.9	2.7	1.1	1.2	-0.1	-0.2
2003 Jun	1.1			2.9	2.8	2.7	1.1	1.2	0.0	-1.2
2003 Jul	1.3			3.1	2.9	2.8	1.3	1.3	0.6	-0.5
2003 Aug	1.4			2.9	2.9	2.7	1.5	1.2	1.9	0.0
2003 Sep	1.4			2.8	2.8	2.7	1.4	1.4	1.3	1.0
2003 Oct	1.4			2.6	2.7	2.4	1.5	1.3	2.5	1.2
2003 Nov	1.3			2.5	2.5	2.1	1.7	1.4	4.6	1.7
2003 Dec	1.3	1.1	1.1	2.8	2.6	2.2	1.8	1.5	2.0	0.4
2004 Jan	1.4	1.5	1.3	2.6	2.4	2.0	1.6	1.4	-0.3	0.0
2004 Feb	1.3	1.3	1.1	2.5	2.3	1.9	1.6	1.5	-1.3	-0.5
2004 Mar	1.1	1.1	1.0	2.6	2.1	1.7	1.4	1.5	0.9	-0.1
2004 Apr	1.1	1.1	1.0	2.5	2.0	1.8	1.8	1.3	2.9	-0.2
2004 May	1.5	1.4	1.3	2.8	2.3	2.2	2.5	1.4	5.6	0.7
2004 Jun	1.6	1.5	1.4	3.0	2.3	2.3	2.6	1.4	3.7	1.3
2004 Jul	1.4	1.4	1.2	3.0	2.2	2.0	2.6	1.7	3.7	1.4
2004 Aug	1.3	1.3	1.1	3.2	2.2	2.0	2.8	2.2	4.6	2.3
2004 Sep	1.1	1.0	0.9	3.1	1.9	1.7	3.1	2.3	8.1	3.8
2004 Oct	1.2	1.2	1.1	3.3	2.1	2.0	3.5	2.9	9.2	4.8
2004 Nov	1.5	1.4	1.4	3.4	2.2	2.2	3.5	2.9	6.7	4.6
2004 Dec	1.7	1.7	1.6	3.5	2.5	2.5	2.9	2.5	4.4	4.2
2005 Jan	1.6	1.7	1.5	3.2	2.1	2.0	2.6	2.5	9.6	7.5
2005 Feb	1.7	1.7	1.6	3.2	2.1	2.0	2.7	2.5	11.0	8.2
2005 Mar	1.9	2.0	1.8	3.2	2.4	2.3	2.9	2.4	11.1	7.4
2005 Apr	1.9	2.0	1.9	3.2	2.3	2.3	3.3	2.6	10.0	7.0
2005 May	1.9	2.0	1.8	2.9	2.1	2.2	2.7	2.5	7.6	6.5
2005 Jun	2.0	2.2	1.9	2.9	2.2	2.2	2.5	2.3	12.0	7.4
2005 Jul	2.3	2.5	2.3	2.9	2.4	2.5	3.1	2.2	13.9	8.6
2005 Aug	2.4	2.6	2.3	2.8	2.3	2.3	3.0	1.9	12.8	7.5
2005 Sep	2.5	2.6	2.4	2.7	2.5	2.5	3.3	2.1	10.5	5.7
2005 Oct	2.3	2.5	2.3	2.5	2.4	2.3	2.6	1.4	8.9	7.0
2005 Nov	2.1	2.3	2.1	2.4	2.3	2.3	2.3	1.3	13.6	9.6
2005 Dec	1.9	2.1	1.8	2.2	2.0	2.0	2.4	1.7	17.9	12.1
2006 Jan	1.9	2.1	1.9	2.4	2.3	2.3	2.9	1.8	15.8	10.3
2006 Feb	2.0	2.1	2.0	2.4	2.3	2.3	2.9	1.8	15.4	10.7
2006 Mar	1.8	1.9	1.7	2.4	2.1	2.2	2.5	1.9	12.9	10.1
2006 Apr	2.0	2.1	2.0	2.6	2.4	2.3	2.5	2.2	15.2	10.1
2006 May	2.2	2.3	2.2	3.0	2.9	2.8	3.1	2.4	13.5	8.9
2006 Jun	2.5	2.6	2.4	3.3	3.1	3.2	3.4	2.8	10.9	8.8
2006 Jul	2.4	2.4	2.3	3.3	3.1	3.2	2.9	2.5	10.5	8.2
2006 Aug	2.5	2.6	2.4	3.4	3.3	3.4	2.7	2.3	8.0	7.8
2006 Sep	2.4	2.6	2.3	3.6	3.2	3.3	1.9	2.1	5.1	7.0
2006 Oct	2.4	2.7	2.3	3.7	3.2	3.3	1.6	2.6	4.7	6.1
2006 Nov	2.7	3.0	2.6	3.9	3.4	3.6	1.8	2.6	3.3	4.7
2006 Dec	3.0	3.2	2.9	4.4	3.8	3.9	2.2	2.5	2.1	2.8
2007 Jan	2.7	2.9	2.6	4.2	3.5	3.7	2.2	2.5	-2.1	1.7
2007 Feb	2.8	2.9	2.6	4.6	3.7	3.9	2.3	2.6	-0.8	1.4
2007 Mar	3.1	3.1	2.9	4.8	3.9	4.0	2.7	2.7	0.8	2.4
2007 Apr	2.8	2.9	2.6	4.5	3.6	3.7	2.4	2.4	-0.6	2.1
2007 May	2.5	2.6	2.3	4.3	3.3	3.4	2.4	2.2	1.3	3.5
2007 Jun	2.4	2.5	2.2	4.4	3.3	3.3	2.4	2.1	2.1	3.2

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_tables

Title	Frequency of update	Updated since last month
UK economic accounts		
1.01 National accounts aggregates	M	✓
1.02 Gross domestic product and gross national income	M	✓
1.03 Gross domestic product, by category of expenditure	M	✓
1.04 Gross domestic product, by category of income	M	.
1.05 Gross domestic product and shares of income and expenditure	M	.
1.06 Income, product and spending per head	Q	.
1.07 Households' disposable income and consumption	M	.
1.08 Household final consumption expenditure	M	.
1.09 Gross fixed capital formation	M	.
1.10 Gross value added, by category of output	M	✓
1.11 Gross value added, by category of output: service industries	M	✓
1.12 Summary capital accounts and net lending/net borrowing	Q	✓
1.13 Private non-financial corporations: allocation of primary income account	Q	.
1.14 Private non-financial corporations: secondary distribution of income account and capital account	Q	.
1.15 Balance of payments: current account	M	✓
1.16 Trade in goods (on a balance of payments basis)	M	✓
1.17 Measures of variability of selected economic series	Q	✓
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_tables

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	Q	.
4.08	Retail sales, new registrations of cars and credit business	M	✓
4.09	Inland energy consumption: primary fuel input basis	M	✓

Selected financial statistics

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

Further labour market statistics

6.01	Working-age households	A	.
6.02	Local labour market indicators by unitary and local authority	Q	.
6.03	Employment by occupation	Q	.
6.04	Employee jobs by industry	M	✓
6.05	Employee jobs by industry division, class or group	Q	.
6.06	Employee jobs by region and industry	Q	.
6.07	Key productivity measures by industry	Q	✓
6.08	Total workforce hours worked per week	Q	✓
6.09	Total workforce hours worked per week by region and industry group	Q	✓
6.10	Job-related training received by employees	Q	.
6.11	Unemployment rates by previous occupation	Q	.

Weblink: www.statistics.gov.uk/elmr_tables

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

☎ 020 7533 5866
✉ rpi@ons.gsi.gov.uk

Labour Market Statistics Helpline

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

Earnings Customer Helpline

☎ 01633 819024
✉ earnings@ons.gsi.gov.uk

National Statistics Customer Contact Centre

☎ 0845 601 3034
✉ info@statistics.gsi.gov.uk

Skills and Education Network

☎ 024 7682 3439
✉ senet@isc.gov.uk

DfES Public Enquiry Unit

☎ 0870 000 2288

For statistical information on

Average Earnings Index (monthly)

☎ 01633 819024

Claimant count

☎ 020 7533 6094

Consumer Prices Index

☎ 020 7533 5874

Earnings

Annual Survey of Hours and Earnings

☎ 01633 819024

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

☎ 01633 819008

Low-paid workers

☎ 01633 819024
✉ lowpay@ons.gsi.gov.uk

Labour Force Survey

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

Economic activity and inactivity

☎ 020 7533 6094

Employment

Labour Force Survey

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

Employee jobs by industry

☎ 01633 812318

Total workforce hours worked per week

☎ 01633 812766
✉ productivity@ons.gsi.gov.uk

Workforce jobs series – short-term estimates

☎ 01633 812318
✉ workforce.jobs@ons.gsi.gov.uk

Labour costs

☎ 01633 819024

Labour disputes

☎ 01633 819205

Labour Force Survey

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

Labour Force Survey Data Service

☎ 01633 655732
✉ lfs.dataservice@ons.gsi.gov.uk

New Deal

☎ 0114 209 8228

Productivity and unit wage costs

☎ 01633 812766

Public sector employment

General enquiries

☎ 020 7533 6178

Source and methodology enquiries

☎ 01633 812362

Qualifications (DfES)

☎ 0870 000 2288

Redundancy statistics

☎ 020 7533 6094

Retail Prices Index

☎ 020 7533 5874
✉ rpi@ons.gsi.gov.uk

Skills (DfES)

☎ 0114 259 4407
Skill needs surveys and research into skill shortages
☎ 0114 259 4407

Small firms (DTI)

Small Business Service (SBS)

☎ 0114 279 4439

Subregional estimates

☎ 01633 812038

Annual employment statistics

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

Annual Population Survey, local area statistics

☎ 020 7533 6130

LFS Subnational Data Service

☎ 020 7533 6135
✉ snds@ons.gsi.gov.uk

Trade unions (DTI)

Employment relations

☎ 020 7215 5934

Training

Adult learning – work-based training (DWP)

☎ 0114 209 8236

Employer-provided training (DfES)

☎ 0114 259 4407

Travel-to-Work Areas

Composition and review

☎ 020 7533 6114

Unemployment

☎ 020 7533 6094

Vacancies

Vacancy Survey: total stocks of vacancies

☎ 020 7533 6162

ONS economic and labour market publications

ANNUAL

Financial Statistics Explanatory Handbook

2007 edition. Palgrave Macmillan, ISBN 1-4039-9783-7. Price £45.

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

Foreign Direct Investment (MA4)

2005 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)

2005 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
- Business enterprise research and development
- Foreign direct investment
- Gross domestic expenditure on research and development
- Low pay estimates
- Regional gross value added
- Share ownership
- UK trade in services
- Work and worklessness among households

QUARTERLY

Consumer Trends

2007 quarter 1

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

United Kingdom Economic Accounts

2007 quarter 1. Palgrave Macmillan, ISBN 978-0-230-52618-1. Price £32.

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

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

2007 quarter 1

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

First releases

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

MONTHLY

Financial Statistics

July 2007. Palgrave Macmillan, ISBN 978-0-230-52590-0. Price £45.

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

Focus on Consumer Price Indices

June 2007

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

Monthly review of external trade statistics (MM24)

June 2007

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

Producer Price Indices (MM22)

June 2007

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

First releases

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

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List is provisional and subject to change.

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