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

A fuller list of contact points can be found on page 76.

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In brief

Statistics Board chair-designate, Sir Michael Scholar, takes up his post

A dynamic official statistical service fit for the demands of the 21st century is one of the objectives of Sir Michael Scholar, chair-designate of the new Statistics Board, who took up his post this month.

He wants to see official statistics regarded as a beacon of quality, both in the way they are collected and in how they are made available to an evermore-demanding public who want to see flexibility, innovation and relevance in a modern statistical service.

He placed the twin pillars of quality and integrity at the heart of official statistics.

"Trusted, high-quality statistics are as vital to our society as clean water and sound money. They are key to developing and maintaining a stable, vibrant economy and society," he said.

The new assessment role for the Board will be very important. The Board will have the power to challenge and investigate the quality and transparency of all official statistics. Key to this is the updating of the Code of Practice. All 1,300 national statistics will be assessed against the Code by a Head of Assessment, including data on the economy, education, health and crime.

The Board, which takes up its powers in April 2008, was established through the Statistics and Registration Services Act which received Royal Assent in July. The Board will report directly to Parliament and will be free from government control. The existing Office for National Statistics (ONS) will report to the Board and the National Statistician, who is Chief Executive of ONS, will be an Executive Member of the Board.

Sir Michael has been President of St John's College, Oxford, since 2001 and is currently chairman of the Conference of Colleges in Oxford. He has been a governor of the National Institute for Economic and Social Research since 2001. He was born in Merthyr Tydfil, South Wales and was educated at Cambridge, the University of California at Berkeley and Harvard.

He will be based at the ONS Corporate Headquarters in Newport, South Wales.

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Task Force on the quality of the Labour Force Survey

In spring 2007, the Statistical Office of the European Community (Eurostat) established a Task Force on the quality of the Labour Force Survey (LFS). The work of the Task Force is expected to run for two years with a final report expected in summer 2009. The first meeting of the Task Force was held in June 2007 and was attended by experts from Germany, Greece, Spain, France, Italy, the Netherlands, Poland, Portugal and the UK. Experts from the European Central Bank, the European Commission's Directorate responsible for employment policies and Eurostat also attended.

The main task of the Task Force is to look at issues relating to the quality of the LFS, particularly the estimates of employment and unemployment with regard to issues of accuracy, coherence and comparability of these statistics, both domestically and across the EU countries. The Task Force will make recommendations for both short-term and longer-term solutions. It will not only look at problems, but also identify good practice to be shared with other Member States.

The Task Force will examine and report the quality perspective across the dimensions of relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability and coherence. Its members are expected to summarise the views from their countries in terms of both the producers' and the users' perspectives, preferably from known sources and without significant extra work.

The second meeting of the Task Force will be held in October and will focus on the topics of relevance and accuracy. In between meetings the EU countries not participating will receive progress reports at the six-monthly Labour Market Statistics (LAMAS) Working Groups at Eurostat, Luxembourg.

Contact

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Local area labour markets

The latest local area labour market data show that the area with the highest employment rate was South Northamptonshire (90.1 per cent) while the lowest rate was in Tower Hamlets (52.6 per cent). There is a considerable variation within each region. For example, in the region with the highest average rate, the South East (78.3 per cent), employment varies between 89.1 per cent in West Oxfordshire and 68.7 per cent in Thanet.

The area with the highest unemployment rate in the twelve months ending December 2006 was Tower Hamlets (14.2 per cent), while the lowest rate was in Eden, Cumbria (2.1 per cent). Again, there were considerable variations within regions. In the region with the lowest average rate, the South West (3.7 per cent), unemployment varied between Plymouth (6.0 per cent) and Cotswold and Purbeck (both 2.4 per cent). London had the highest average rate (7.6 per cent), but individual boroughs varied between Tower Hamlets (14.2 per cent) and Richmond upon Thames (4.1 per cent).

The latest estimates of jobs density (2005) show there were 0.84 jobs per working-age resident in the UK. London had the highest jobs density at 0.93 compared with 0.74 in the lowest region, the North East. The local area with the highest jobs density was the City of London, with almost 50 jobs per working-age resident, while the lowest was in Chester-le-Street, North East, and Carrickfergus, Northern Ireland, both with 0.39 jobs per resident.

People who work in the City of London had the highest earnings, with median full-time gross pay of £883 a week as at April 2006. The lowest pay was for people who work in Torridge, South West, at £306 a week.

The report, 'Local area labour markets: Statistical indicators July 2007', was published on the National Statistics website on 31 July 2007. It also contains sections looking at economic inactivity, ethnicity and the labour market, claimants of Jobseeker's Allowance (the claimant count), and earnings by place of residence. It brings together data from a number of different sources – the Annual Population Survey, Annual Business Inquiry, Annual Survey of Hours and Earnings, and administrative data on benefits from the Department for Work and Pensions – to give an overall

picture of the labour market, looking at both labour supply and demand in each area.

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

More information

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

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Work and worklessness

The latest 'Work and worklessness among households' First Release was published on 29 August 2007. The Release provides information about working-age households, and about the adults and children living in them, by household economic activity status. It includes estimates of workless working-age households, and the adults and children living in them, by household type, region, and ethnicity. It also gives estimates of employment rates by parental status.

Figures show that the rate of worklessness for working-age households in the three months to June 2007 was 16.1 per cent, representing 3.04 million households, 0.4 percentage points higher than in the previous year and 0.5 percentage points lower than five years earlier.

The proportion of working-age people living in workless households was 11.8 per cent (4.35 million people), up 0.5 percentage points from the previous year and down 0.2 percentage points from five years earlier. There were 1.80 million children living in such households, 15.9 per cent of all children in working-age households.

The employment rate for lone parents in the three months to June 2007 was 57.1 per cent, 0.8 percentage points up from the previous year and 3.8 percentage points higher than five years earlier. In contrast, the rate for married or cohabiting mothers was 71.7 per cent, 0.5 percentage points higher than in the previous year and 0.9 percentage points higher than five years earlier.

The data in the Release are from the Labour Force Survey household data sets, which have been designed specifically for analyses at the household and family level, and for person-level analyses involving the characteristics of the families and households that people live in. The latest Release shows estimates for Q2 (April to June) 2007 and a back series for Q2 of 1997, 1999 and 2001 to 2006.

More information

www.statistics.gov.uk/statbase/product.asp?vlnk=8552

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UPDATES

Updates to statistics on www.statistics.gov.uk

6 August

Index of production

Manufacturing: 0.7% quarterly rise in Q2
www.statistics.gov.uk/cci/nugget.asp?id=198

9 August

UK trade

Deficit narrowed to £3.6 billion in June 2007
www.statistics.gov.uk/cci/nugget.asp?id=199

13 August

Producer prices

Factory gate inflation falls to 2.4% in July
www.statistics.gov.uk/cci/nugget.asp?id=248

14 August

Inflation

July: CPI down to 1.9%; RPI at 3.8%
www.statistics.gov.uk/cci/nugget.asp?id=19

15 August

Average earnings

Pay growth slows in year to June 2007
www.statistics.gov.uk/cci/nugget.asp?id=10

Employment

Rate rises to 74.4% in three months to June 2007
www.statistics.gov.uk/cci/nugget.asp?id=12

16 August

Retail sales

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

20 August

Public sector

July: £8.6 billion current budget surplus
www.statistics.gov.uk/cci/nugget.asp?id=206

22 August

Service prices

SPPI inflation at 2.5% in Q2 2007
www.statistics.gov.uk/cci/nugget.asp?id=253

23 August

Business investment

0.8% rise in Q2 2007
www.statistics.gov.uk/cci/nugget.asp?id=258

Motor vehicles

Car production rises in the three months to July
www.statistics.gov.uk/cci/nugget.asp?id=376

24 August

GDP growth

UK economy rose by 0.8% in Q2 2007
www.statistics.gov.uk/cci/nugget.asp?id=192

Index of services

0.8% three-monthly rise into June
www.statistics.gov.uk/cci/nugget.asp?id=558

29 August

Work and worklessness among households

Lone parents in employment – rate at 57.1%
www.statistics.gov.uk/cci/nugget.asp?id=409

FORTHCOMING RELEASES

Future statistical releases on www.statistics.gov.uk

4 September

Mergers and acquisitions involving UK companies – Q2 2007

6 September

Index of production – July 2007

10 September

Producer prices – August 2007

11 September

UK trade – July 2007

12 September

Labour market statistics – September 2007

MM19: Aerospace and electronic cost indices – June 2007

Public sector employment – Q2 2007

13 September

International comparisons of productivity

Public and private sector breakdown of labour disputes

Retail sales – August 2007

SDM28: Retail sales – August 2007

14 September

Digest of engineering turnover and orders – July 2007

MM24: Monthly review of external trade statistics – July 2007

MQ10: UK trade in goods analysed in terms of industries – Q2 2007

18 September

Consumer price indices – August 2007

MM22: Producer prices – August 2007

19 September

Average weekly earnings – July 2007

20 September

Public sector finances – August 2007

24 September

Focus on consumer price indices – August 2007

Motor vehicle production – August 2007

25 September

Business investment revised results – Q2 2007

Investment by insurance companies, pension funds and trusts – Q2 2007

Public sector finances: supplementary (quarterly) data

26 September

Balance of payments – Q2 2007

Consumer trends – Q2 2007

Experimental market sector gross value added (GVA) – Q2 2007 update

Monthly digest of statistics – September 2007

Quarterly national accounts – Q2 2007

27 September

Index of services – July 2007

Productivity – Q2 2007

28 September

Distributive and service trades – July 2007

Financial intermediation services indirectly measured – Q2 2007

Government deficit and debt under the Maastricht Treaty

2 October

Profitability of UK companies – Q2 2007

5 October

PM34.10: Motor vehicle production business monitor – August 2007

Economic review

September 2007

Anis Chowdhury
Office for National Statistics

SUMMARY

GDP continued to grow robustly in 2007 quarter two, driven mainly by the services sector and supported by an upturn in manufacturing output. On the expenditure side in 2007 quarter two, business investment and household spending strengthened. The current account deficit narrowed in 2007 quarter one. The trade deficit narrowed in 2007 quarter two. The labour market remains buoyant but average earnings remains relatively subdued. The public sector finances position deteriorated in July 2007. Both consumer and producer price inflation fell in July, although it is clear that some upward pressure remains amongst producer prices.

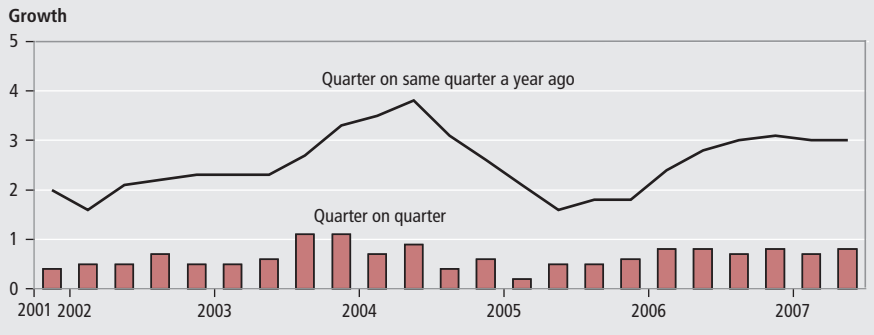
GROSS DOMESTIC PRODUCT

Second quarter growth of 0.8 per cent

GDP growth for the second quarter of 2007 is estimated to have grown fairly strongly, by 0.8 per cent, up from 0.7 per cent growth in the previous quarter. The annual rate of growth was 3.0 per cent, unchanged from the previous quarter. The latest M2 GDP release for 2007 quarter two contains more information than that contained in the preliminary estimate. It gives first estimates for the main expenditure categories and more complete information on the output side. It is still, however, based on as yet incomplete information **(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.

Figure 1
Gross Domestic Product



OTHER MAJOR ECONOMIES

Global growth weakens

Preliminary data for 2007 quarter two are now available for the other major OECD countries and these show a mixed, but overall, a weakening picture of the world economy.

US GDP data for the second quarter of 2007 showed an upturn compared to the sharp deceleration in quarter one. Growth was a fairly strong 0.8 per cent in the second quarter, an acceleration from subdued 0.2 per cent growth in the previous quarter. The strengthening in growth in the latest quarter may partly be attributed to weak quarter one data, particularly in terms of government consumption and net exports. In the second quarter, growth was mainly led by government spending, which grew by 4.3 per cent after contracting by 0.5 per cent in the previous quarter. Corporate non-residential investment also accelerated, by 8.1 per cent following 2.1 per cent growth in the previous quarter, but this was mainly concentrated in structural spending. Net exports also contributed to growth, with growth of 1.2 per cent after a contraction of 0.5 per cent in the previous quarter. The upsides to growth were partially offset by lower growth in consumer spending, partly due to the impact of higher energy prices. Consumption growth was 1.3 per cent in quarter two, a marked slowdown from growth of 3.7 per cent in quarter one. Residential investment also exhibited weakness, with growth contracting by 9.3 per cent in 2007 quarter two.

Japan's GDP growth slowed sharply in 2007 quarter two. Growth was just 0.1 per cent compared to growth of 0.8 per cent in the previous quarter. The marked deceleration was partly due to a weak net export picture, with exports growing by 0.9 per cent compared to 3.4 per cent in the previous quarter. Residential investment also contracted markedly, by 3.5 per cent in quarter two. This was offset by a strong bounce back in private residential investment, which grew by 1.2 per cent following growth of 0.3 per cent in quarter one. Household consumption showed modest growth of 0.4 per cent after 0.8 per cent growth in the previous quarter.

Growth in the three biggest mainland EU economies – Germany, France and Italy – also exhibited signs of weakening. According to the Eurostat's initial estimate, euro area GDP grew by 0.3 per cent in 2007 quarter two. This is a deceleration compared to growth of 0.7 per cent growth in the previous quarter.

German GDP growth according to the initial estimate showed a deceleration in the latest quarter. Growth was 0.3 per cent compared to a modest growth of 0.5 per cent in the previous quarter. Growth was mainly driven by an increase in exports which grew by 0.9 per cent, following a fall of 0.3 per cent in quarter one. Imports in contrast fell by 0.9 per cent in the second quarter. Household consumption expenditure also contributed to growth, but by a lesser extent. Growth was 0.6 per cent, reversing the marked decrease of 1.8 per cent in the previous quarter. This was countered by a negative contribution from investment which fell by 1.3 per cent in 2007 quarter two, reversing positive growth of 2.1 per cent in the previous quarter; strong growth in capital and machinery investment was offset by a strong decrease in construction investment. Government expenditure made a neutral contribution to growth. French GDP growth slowed in 2007 quarter two; growth was 0.3 per cent compared to growth of 0.5 per cent in quarter one. The deceleration was partly due to a weak net export picture with imports growing by 2.1 per cent from 0.7 per cent in the previous quarter and exceeding exports. The weakening in GDP growth was also partly due to virtually flat business investment which decelerated sharply from the previous quarter. This was offset by fairly strong growth in household consumption expenditure of 0.6 per cent, up marginally from 0.5 per cent in the previous quarter. The initial estimate of Italian GDP growth was just 0.1 per cent following 0.3 per cent growth in the previous quarter. The breakdown to the growth was not yet available at the time of writing, although early indications point towards a zero contribution from industrial production in quarter two.

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 was 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. In July, the index fell by 0.5 percentage points. This could be partly attributable, in addition to the above, to the markets risk aversion towards assets associated with the US sub prime housing market.

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)**. In July 2007, the pound appreciated by 2.4 per cent against the dollar. Against the euro, the pound was virtually flat. Overall, the effective exchange rate appreciated by 0.6 per cent.

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

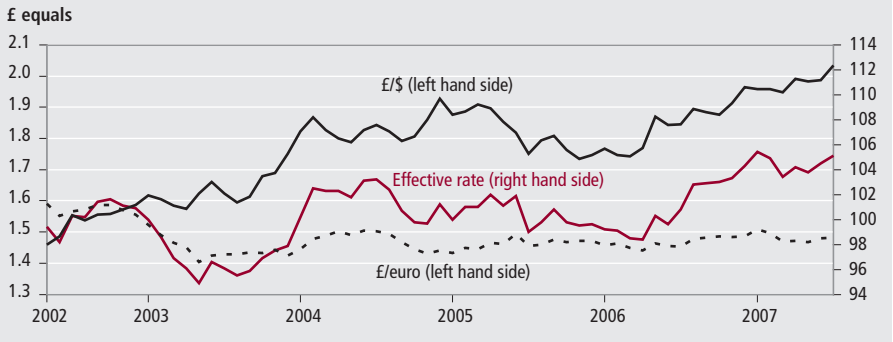
In contrast, there have been particular concerns in recent months regarding the relative weakness of US GDP growth. Furthermore, inflationary pressures have been relatively subdued in the US. This may have lessened the likelihood of further interest rate rises in the US, which currently stand at 5.25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

Figure 2
Exchange rates



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 3.0 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 0.6 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. In July 2007, the headline index rose to 61.8. 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 0.7 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, down marginally from growth of 1.1 per cent in the previous quarter **(Figure 4)**. The contribution to GDP growth was also provided by fairly strong growth in the output of the mining and quarrying industries (including oil & gas) which grew by 0.8 per cent in 2007 quarter two, down from 1.0 per cent in the previous quarter. On an annual basis, output contracted by 2.7 per cent, a lower rate of contraction compared to a decrease of 7.1 per cent in 2007 quarter one. This was offset by a weakening in the output of the electricity, gas and water supply industries where virtually flat growth was recorded, following an increase of 1.5 per cent in 2007 quarter one. On an annual basis, output fell by 0.7 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 was flat, 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)**. In the past, it has not been unusual for the path of business indicators and official data to diverge over the short term. These differences happen partly because the series are not measuring exactly the same thing. External surveys measure the direction rather than the magnitude of a change in output and often inquire into

Figure 3
Construction output

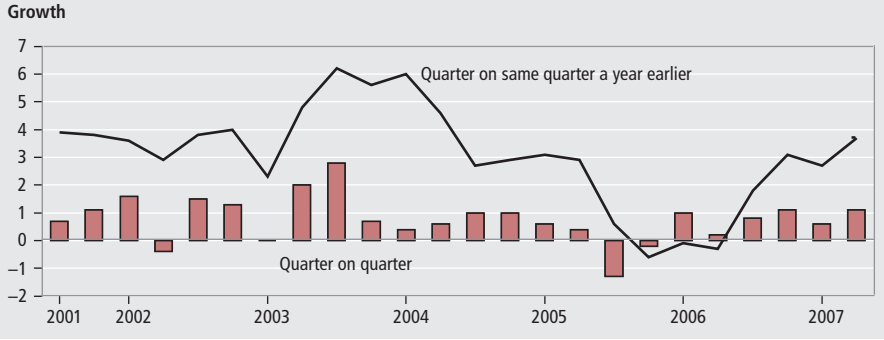


Figure 4
Manufacturing output

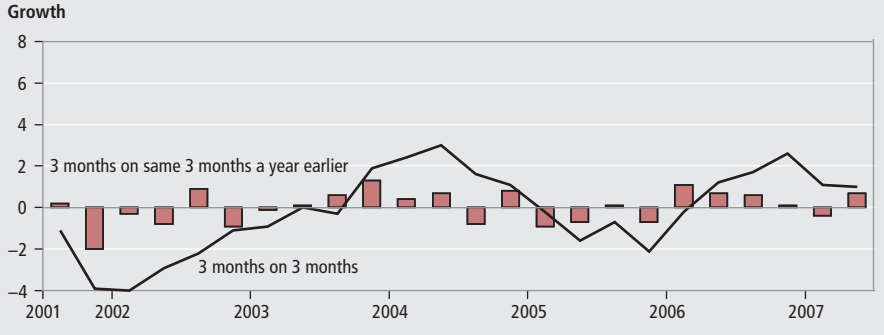
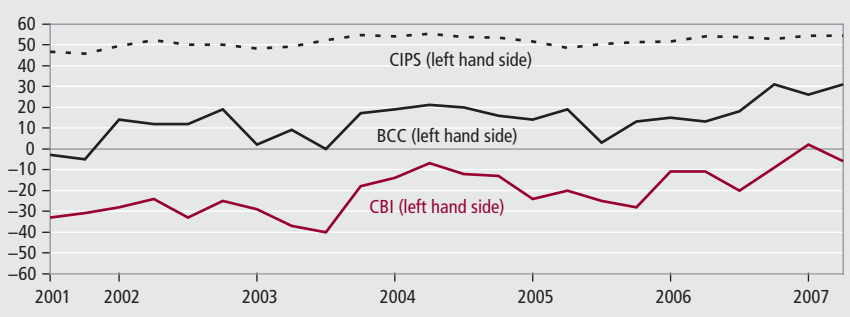


Figure 5
External manufacturing indicators



expectations rather than actual activity. However, in the latest quarter, there appears to be signs of the gap narrowing, with some external measures.

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. In July 2007, the headline index strengthened to 55.7. 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 2 in the previous quarter. According to the latest survey in August, the index had bounced back to plus 6. 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)**. Growth on an annual basis, 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 1.5 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 0.9 per cent, but was down from 1.6 per cent growth in the previous quarter. The output of the distribution, hotels and catering sector also grew fairly strongly at 0.7 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 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 previous quarter and continued to be led by new orders. In July 2007, the index was 57.0. 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.

Figure 6
Services output

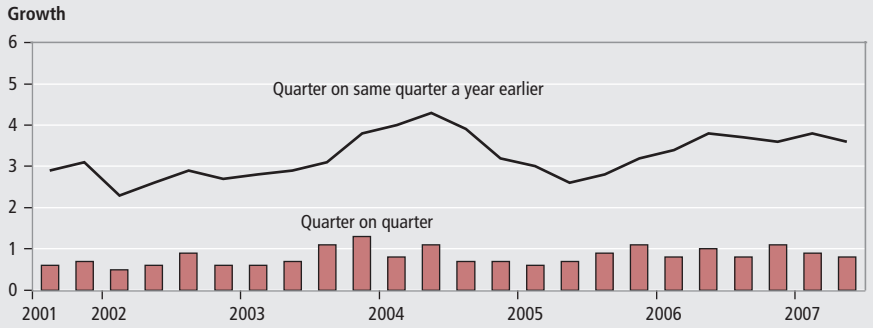
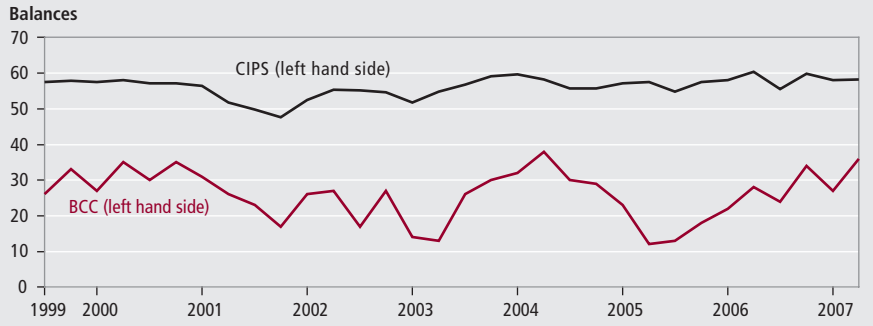


Figure 7
External services



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 9 points to plus 36, and was the highest since 2004 quarter two. The net balance for home orders fell 4 points to plus 24, the lowest since 2006 quarter three.

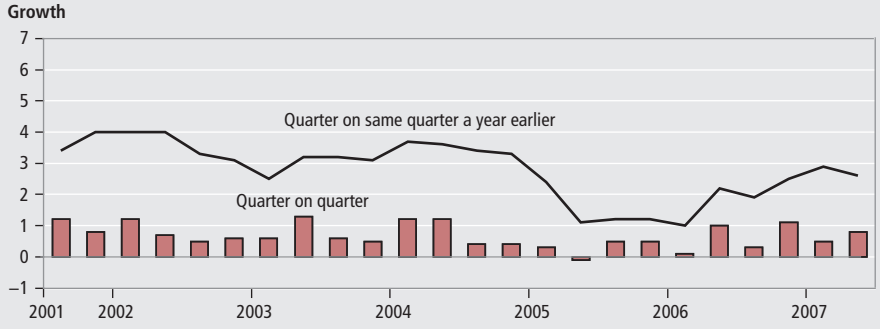
EXPENDITURE

Consumers' spending strengthens

Household consumption expenditure growth accelerated in 2007 quarter two at a fairly strong rate of 0.8 per cent. This follows relatively modest growth of 0.5 per cent in the previous quarter. Growth compared with the same quarter a year ago was 2.6 per cent, down from 2.9 per cent in the previous quarter **(Figure 8)**. But it must be noted that consumer expenditure growth has been fairly volatile over the last few years. In terms of expenditure breakdown, the growth in household consumption expenditure was mainly driven by an acceleration in durable and semi-durable goods expenditure. There was also a pick up in non-durable goods expenditure. This was slightly offset by a marginal slowdown in services expenditure.

There are a number of reasons why household consumption expenditure could have strengthened. One key indicator of

Figure 8
Household demand



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.

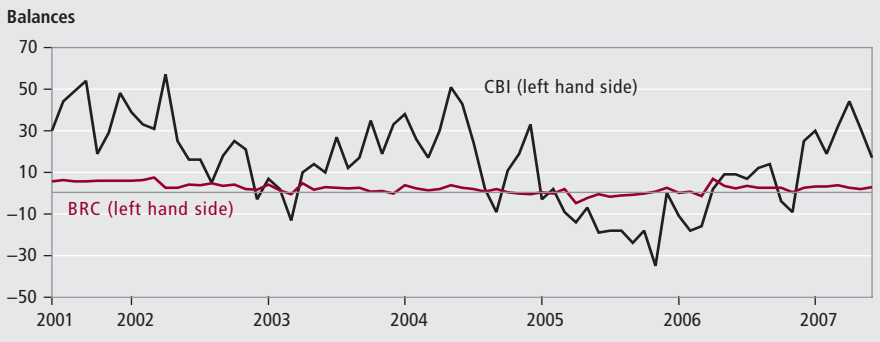
Retail sales figures are published on a monthly basis and the latest available figures for July showed buoyant growth, although down from the previous month **(Figure 9)**. This may suggest that in the second quarter and going into the third quarter, interest rate rises don't seem to be having much of an impact as yet on spending. 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 July 2007 was 1.1 per cent higher than the previous three months. This followed growth of 1.4 per cent in the three months to June. On an annual basis, retail sales continued to grow strongly. Retail sales on the latest three month on the same three months a year ago rose by 4.0 per cent, compared to 3.9 per cent in the three months to June compared to the same period a year ago.

At a disaggregated level, retail sales growth during the three months to the end of July was driven by an acceleration in growth in the 'Predominantly non-food stores' sector which grew by 2.1 per cent, down from 2.3 per cent growth in the previous month. Within this sector in the three months to July, growth was registered across most sectors and was led by the 'Non specialised stores' sector which grew by 5.0 per cent. The 'Household goods stores' sector also recorded strong growth of 4.9 per cent. In contrast, retail sales growth in the 'Textile, clothing and footwear stores' sector showed a fall of 2.4 per cent. The buoyancy in retail sales could be partly attributed to the fall in shop prices, which fell by 1.1 per cent in July.

External surveys for retail showed a mixed picture. The CBI in its monthly Distributive Trades survey report that retail sales volumes grew in July with a balance of plus 18, marginally up from plus 17 in June, but still slower than the 31 recorded in May. The BRC report that retail sales increased by 1.2 per cent on a like-for-like basis in July, down from 3.0 per cent in the previous month **(Figure 10)**.

Figure 9
Retail sales

Figure 10
External retailing indicators



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, may discourage borrowing and in the process displace consumer expenditure on certain goods.

However, Bank of England figures illustrate that interest rate rises over the past year don't seem to have had much of an impact on spending to date. Also, the fall in real disposable income, partly due to fiscal drag effects of higher taxation seen in 2007 quarter one, doesn't appear to have had much of a spill-over effect into quarter two.

Bank of England borrowing figures show that although overall net lending decreased in 2007 quarter two, net lending still remains fairly buoyant and in fact net borrowing increased in June compared to May. Total net lending to individuals was £29.3 billion in the second quarter of 2007 compared to £31.6 billion in the first quarter. Net lending secured on dwellings was £27.3 billion in 2007 quarter one, down from £29.3 billion in the previous quarter. Unsecured lending (consumer credit) was £2.2 billion in 2007 quarter two, roughly unchanged from £2.3 billion in the previous quarter.

Other measures of expenditure also show a relatively strong picture and which may explain the acceleration in household spending. M4 (a broad money aggregate of UK money supply) rose by £50.6 billion in 2007 quarter two, up from £44.8 billion in quarter one. M4 lending (excluding the effects of securitisations etc) rose by £75.0 billion in 2007 quarter two, up from £73.6 billion in the previous quarter.

The increase in house prices may have been a source of expenditure through household equity withdrawal. Although there are signs of an underlying slowdown in 2007 quarter two compared to quarter one, annual house price inflation still remains fairly buoyant. Bank of England figures for 2007 quarter one show HEW at

a strong £13.2 billion and which may have continued at a broadly similar level in 2007 quarter two.

Finally, underlying fundamentals such as the prevalence of a relatively healthy labour market, together with a confident outlook on the economy by consumers, may have underpinned buoyant consumption growth. Consumers may also have resorted to current spending in anticipation of higher borrowing costs in the future.

BUSINESS DEMAND

Business investment strengthens

Total investment weakened in 2007 quarter two, compared to the previous quarter. Growth contracted by 1.1 per cent following an increase of 1.1 per cent in the previous quarter. On an annual basis, total investment grew by 5.3 per cent, a slowdown from 8.9 per cent growth in the previous quarter. The weakening in total investment was primarily driven by a contraction in dwellings investment.

Business investment grew relatively strongly throughout 2006. In 2007 quarter one, business investment weakened. In the latest quarter, there appears to be turnaround. Business investment grew by 0.8 per cent in 2007 quarter two, in contrast to the fall of 0.6 per cent in the previous quarter. Business investment on an annual basis slowed but still continues to grow fairly robustly. Growth was 7.4 per cent, down from 9.4 per cent annual growth in the previous quarter **(Figure 11)**.

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 6.

GOVERNMENT DEMAND

Government expenditure strengthens

Government final consumption expenditure grew strongly in 2007 quarter two. Growth accelerated to 0.8 per cent from 0.5 per cent in quarter one. Growth quarter on quarter a year ago also accelerated. Growth was 2.1 per cent, compared to 1.1 per in 2007 quarter one **(Figure 12)**.

Figure 11
Total fixed investment

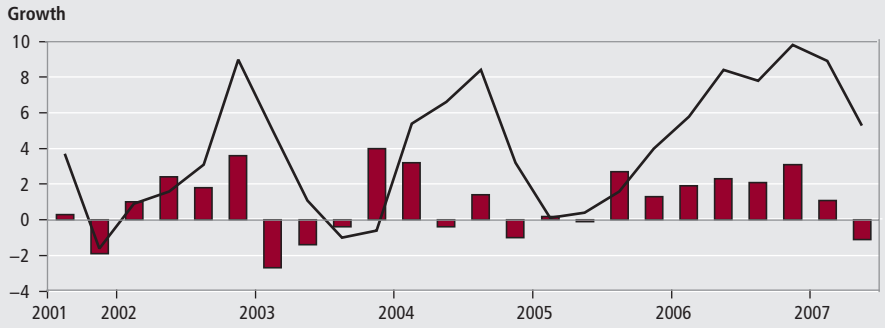
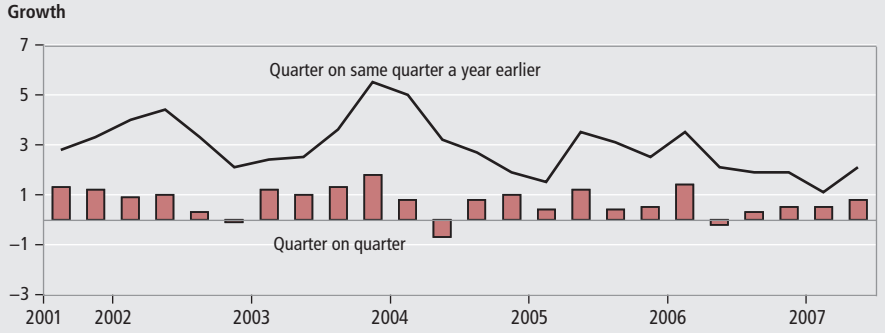


Figure 12
Government spending



Public sector finances worsen

The latest figures on the public sector finances report in the current financial year to July 2007 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 July 2007, the current budget was in deficit by £8.6 billion; this compares with a deficit of £8.1 billion in July 2006. In the financial year April to July 2007/08, the deficit was £4.5 billion; this compares with a deficit of £3.1 billion in the financial year April to July 2007. Net borrowing was £6.5 billion in July 2007; this compares with £6.4 billion in July 2006. In the financial year April to July 2007/08, net borrowing was £10.1 billion; this compares with net borrowing of £9.2 billion in the financial year April to July 2006/07. There was an increase in corporation tax, income tax and VAT receipts in July, however, this continued to be outweighed by expenditure, particularly on government capital projects.

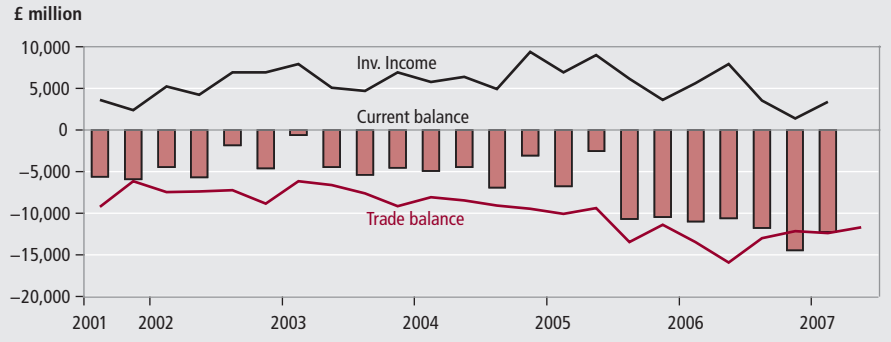
Since net borrowing became positive in 2002, following the current budget moving from surplus into deficit, net debt as a proportion of annual GDP has risen steadily. Public sector net debt in July 2007 was 36.4 per cent of GDP. This compares with 36.1 per cent of GDP in July 2006. In the financial year 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 narrows

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 13)**. 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 the 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

Figure 13
Balance of payments



£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 two showed the UK continuing to have a large trade deficit in goods with levels of imports rising faster than exports, although it narrowed in the latest quarter. This has provided a negative contribution towards GDP growth in the second quarter. The deficit on trade in goods and services in 2007 quarter two was £11.7 billion, compared with a deficit of £12.3 billion in the previous quarter. The goods trade deficit narrowed, falling to £19.8 billion from £20.8 billion in 2007 quarter one. In terms of growth, exports of goods fell by 1.6 per cent in 2007 quarter two whilst imports of goods fell by 1.0 per cent. Services exports were flat whilst services imports rose by 1.5 per cent. Total exports fell by 1.0 per cent whilst total imports fell by 0.4 per cent.

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 £0.2 billion in 2007 quarter two, down from £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 9 points to plus 30. The export orders balance rose 6 points to plus 26. In contrast, the CBI reported in its quarterly survey that the balance of export order volumes was at minus 5. The latest CBI survey reported the balance on the export order book at minus 3 in August from minus 8 in July.

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 June 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.

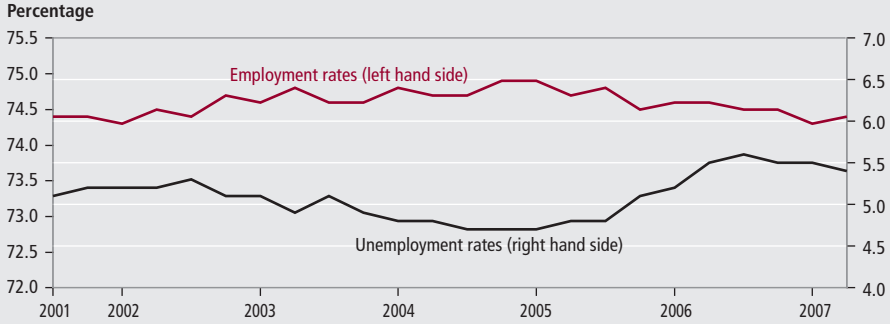
Looking at a detailed level, the increase in the employment level appears to be mainly driven by a rise in employees, particularly full time employees, offset by a decrease in the number of people in self-employment, continuing the tend from the previous few months.

The current working age employment rate was 74.4 per cent, in the three months to June 2007, up 0.1 percentage points from the three months to March 2007 but down 0.1 percentage points from a year earlier. The number of people in employment rose by 93, 000 over the quarter, and up 144,000 over the year, to leave the employment level standing at 29.07 million in the three months to June 2007. The unemployment rate was 5.4 per cent, in the three months to June 2007, down 0.2 percentage points from the three months to March 2007 and down 0.1 percentage point from a year earlier (**Figure 14**). The number of unemployed people fell by 45,000, from the three months to March, and was down 29,000 from a year earlier, leaving the unemployment level currently standing at 1.65 million.

Employment and unemployment

According to the LFS, in the period April to June 2007, the number of people in employment rose by 93,000. The increase was led by a rise in employees of 101,000, offset by a decrease in self-employment of 21,000. From another perspective, the number of people in full-time employment rose by 120,000, whilst people in part-time employment fell by 27,000.

Figure 14
Employment and unemployment



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 July showed the claimant count level at 855, 300 down 8,500 on the month and down 99,800 on a year earlier. The claimant count rate in July 2007 was 2.6 per cent. The rate was virtually 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 653, 800 job vacancies in the three months to July 2007, up 14,900 from the previous three months and up 61,800 from the same period a year earlier.

Inactivity level rises

The working age inactivity rate was 21.2 per cent in the three months to June 2007, unchanged from the three months to March 2007, but up 0.2 percentage points from a year earlier. In level terms, the number of economically inactive people of working age was up 7,000 over the quarter to leave the level standing at 7.95 million in the three months to June 2007. The largest inactivity increase was amongst those categorised as those 'Looking after family/ home' (up 35,000) followed by the 'Student' category (up 22,000). This was offset by decreases in inactivity, with the largest amongst those categorised as 'Long-term sick' (down 50,000), followed by those categorised as 'Temporary sick' (down 7,000). On an annual basis, inactivity rose by 124,000, with the largest rises being amongst those categorised as 'Student' (up 84,000), followed by the 'Looking after family/ home' category (up 46,000) and 'Retired' (up 28,000). This was offset by a decrease in those categorised as 'Long-term sick' (down 45,000).

Average earnings remain subdued

Average earnings growth showed a weakening picture in June 2007. Average earnings (including bonuses) decreased in the latest reference period. It fell by 0.2 percentage points from the previous month to 3.3 per cent. Average earnings growth (excluding bonuses) was 3.4 per cent, down 0.1 percentage point from the previous month. In terms of the public and private sector split, the gap in wages was stable in June. Average earnings (excluding bonuses) grew by 3.1 in the public sector, down 0.1 percentage point from the previous month, and grew by 3.5 per cent in the private sector, down 0.1 percentage points from the previous month. The gap of 0.4 percentage points, remaining unchanged 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 buoyant; input prices fall

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. According to the latest figures in July, output prices eased slightly, but continued to show signs of inflationary pressures; this despite the fall in input prices. This may suggest that firms were still attempting to maintain 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. In the year to July, input prices rose by just 0.1 per cent, down from 2.3 per cent in June. The core input price index rose by 1.1 per cent, down from 3.0 per cent in June. The fall in the input price index was mainly driven by a fall in gas and crude oil prices which fell by 20.9 per cent and 4.7 per cent respectively. The decrease was also assisted by lower growth in metal prices, which grew by 7.9 per cent compared to 14.2 per cent in June 2007.

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. According to the latest figures, output prices continued to show fairly strong growth and there was a pick up in the output core price index. The output price index rose by 2.4 per cent in the year to July, an easing from 2.5 per cent growth

in June. The core output price index rose by 2.3 per cent, up from 2.2 per cent in June. The growth in output prices were mainly drive by base metal and secondary raw materials which rose by 9.1 per cent and 17.2 per cent in the twelve months to July.

Consumer prices fall

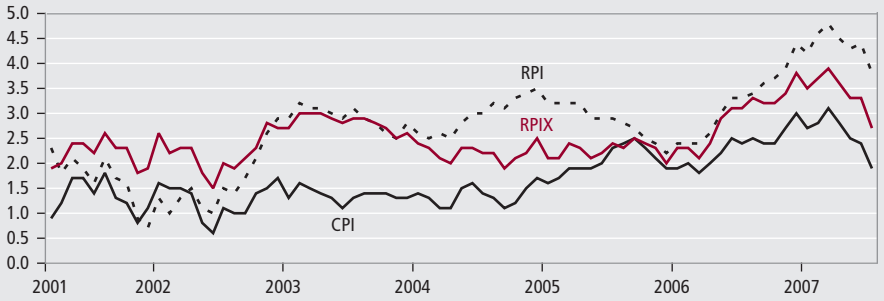
Growth in the consumer price index (CPI) – the Government's target measure of inflation – fell in July to 1.9 per cent from 2.4 per cent in June and from the March peak of 3.1 per cent; and fell below Government's 2.0 per cent inflation target for the first time since March 2006 **(Figure 15)**.

The largest downward contribution came from food prices, as supermarkets led price cuts across a range of products including bread and cereals, meat, fish, fruit and vegetables. In addition, price increases last July on beef and shop bought milk were not repeated this year.

Another large downward contribution came from furniture and furnishings, with average prices falling over the month by more than 10 per cent, a record for July, following record increases for June last month. Widespread sale prices were available on a range of items in July including kitchen, bedroom and lounge furniture.

Figure 15
Inflation

Growth, month on month a year ago



Other large downward contributions came from: transport, with average petrol prices recorded across July falling by around 0.3p per litre, compared with an increase of nearly 2p last year; housing and household services, as energy bills continued to fall due to the phasing in of gas and electricity tariff reductions and some new cuts this month; and; recreation and culture, where July saw some price reductions for digital cameras and camcorders, personal computers, recording media and theatre admissions.

The only large upward effect on the CPI annual rate came from clothing and footwear, with the effect of summer sales being smaller this July than a year ago, particularly for women's outerwear.

RPI inflation fell to 3.8 per cent in July, down from 4.4 per cent in June and was influenced by similar factors to those that affected the CPI. RPIX inflation – the all items RPI excluding mortgage interest payments – was 2.7 per cent in July, down from 3.3 per cent in June.

Independent forecasts

August 2007

UK forecasts

The tables below supplement the Economic Review by providing a forward-looking view of the UK economy. The tables shows 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*	*2.4*	*3.1*
Inflation rate (Q4, per cent)			
CPI	*2.1*	*1.4*	*2.5*
RPI	*4.0*	*2.9*	*4.5*
Claimant unemployment (Q4, million)	0.89	0.81	1.10
Current account (£ billion)	–45.2	–58.2	–29.1
Public Sector Net Borrowing (2007–08, £ billion)	34.2	24.2	40.0

2008

	Average	Lowest	Highest
GDP growth (per cent)	*2.3*	*–0.3*	*2.8*
Inflation rate (Q4, per cent)			
CPI	*2.0*	*1.5*	*3.0*
RPI	*2.8*	*1.7*	*4.6*
Claimant unemployment (Q4, million)	0.92	0.73	1.25
Current account (£ billion)	–46.9	–68.8	–25.4
Public Sector Net Borrowing (2008–09, £ billion)	33.1	20.4	43.0

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 May	2007 Jun	2007 Jul
GDP growth - chained volume measure (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	0.6	0.7	0.1	..
Manufacturing	CKYY	–1.2	1.3	0.1	–0.4	0.7	0.4	0.2	..
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	0.7	1.7	–1.4	..
Electricity, gas and water supply	CKYZ	–0.4	–2.6	–2.0	1.5	0.1	2.4	1.0	..
Business services and finance	GDQN	4.4	5.2	1.0	1.0	1.6	..	..	..
Household demand									
Retail sales volume growth	EAPS	2.0	3.3	1.4	0.4	1.4	0.4	0.4	0.7
Household final consumption expenditure growth (CVM)	ABJR	1.5	1.9	1.1	0.5	0.8	..	..	..
GB new registrations of cars (thousands)[1]	BCGT	2,444	2,340	446	678	573	185	221	..
Labour market[2,3]									
Employment: 16 and over (thousands)	MGRZ	28,674	28,895	29,036	28,981	29,074	29,074	..	..
Employment rate: working age (%)	MGSU	74.7	74.6	74.5	74.3	74.4	74.4	..	..
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	934.9	934.9	..	..
Unemployment: 16 and over (thousands)	MGSC	1,426	1,657	1,687	1,700	1,654	1,654	..	..
Unemployment rate: 16 and over (%)	MGSX	4.7	5.4	5.5	5.5	5.4	5.4	..	..
Claimant count (thousands)	BCJD	861.7	944.7	947.1	916.3	877.1	877.9	863.8	855.3
Economically active: 16 and over (thousands)	MGSF	30,100	30,552	30,723	30,681	30,728	30,728	..	..
Economic activity rate: working age (%)	MGSO	78.5	78.9	79.0	78.8	78.8	78.8	..	..
Economically inactive: working age (thousands)	YBSN	7,933	7,843	7,854	7,939	7,946	7,946	..	..
Economic inactivity rate: working age (%)	YBTL	21.5	21.1	21.0	21.2	21.2	21.2	..	..
Vacancies (thousands)	AP2Y	616.8	595.0	602.0	636.8	645.8	641.8	645.8	653.8
Redundancies (thousands)	BEAO	126	145	130	145	120	120	..	..
Productivity and earnings annual growth									
GB average earnings (including bonuses)[3]	LNNC	..	..	4.0	4.5	3.3	3.5	3.3	..
GB average earnings (excluding bonuses)[3]	JQDY	..	..	3.7	3.6	3.4	3.5	3.4	..
Whole economy productivity (output per worker)	A4YN	..	..	2.1	2.7	..	..	..	..
Manufacturing productivity (output per job)	LOUV	..	..	..	..	..	3.4	3.4	..
Unit wage costs: whole economy	LOJE	..	..	1.6	2.4	..	..	..	..
Unit wage costs: manufacturing	LOJF	..	..	..	..	..	0.2	0.4	..
Business demand									
Business investment growth (CVM)	NPEL	15.7	–4.2	4.1	–0.6	0.8	..	..	..
Government demand									
Government final consumption expenditure growth	NMRY	2.7	2.4	0.5	0.5	0.8	..	..	..
Prices (12–monthly percentage change – except oil prices)									
Consumer prices index[1]	D7G7	2.1	2.3	2.7	2.9	2.6	2.5	2.4	1.9
Retail prices index[1]	CZBH	2.8	3.2	4.0	4.5	4.4	4.3	4.4	3.8
Retail prices index (excluding mortgage interest payments)	CDKQ	2.3	2.9	3.5	3.7	3.4	3.3	3.3	2.7
Producer output prices (excluding FBTP)[4]	EUAA	2.1	2.3	2.6	2.6	2.3	2.3	2.1	2.2
Producer input prices	EUAB	11.7	9.5	3.4	–0.7	0.9	1.2	2.1	0.0
Oil price: sterling (£ per barrel)	ETXR	30.358	35.929	31.637	29.946	34.052	32.639	35.497	37.217
Oil price: dollars ($ per barrel)	ETXQ	55.046	66.107	60.633	58.527	67.640	64.760	70.514	75.708

Seasonally adjusted unless otherwise stated

	Source CDID	2005	2006	2006 Q4	2007 Q1	2007 Q2	2007 May	2007 Jun	2007 Jul
Financial markets									
Sterling ERI (January 2005=100)	BK67	100.5	101.0	103.5	104.6	104.2	103.8	104.5	105.1
Average exchange rate /US$	AUSS	1.820	1.843	1.917	1.955	1.987	1.984	1.986	2.034
Average exchange rate /Euro	THAP	1.463	1.467	1.485	1.492	1.473	1.468	1.481	1.482
3-month inter-bank rate	HSAJ	4.57	5.26	5.26	5.56	5.93	5.76	5.93	6.00
Selected retail banks: base rate	ZCMG						5.50	5.50	5.75
3-month interest rate on US Treasury bills	LUST	3.92	4.89	4.89	4.91	4.68	4.60	4.68	4.82
Trade and the balance of payments									
UK balance on trade in goods (£m)	BOKI	–68,789	–83,631	–20,040	–20,818	–19,836	–6,443	–6,266	..
Exports of services (£m)	IKBB	115,182	124,586	31,596	32,340	32,540	10,799	10,804	..
Non-EU balance on trade in goods (£m)	LGDT	–31,912	–45,598	–12,567	–11,736	–10,792	–3,539	–3,385	..
Non-EU exports of goods (excl oil & erratics)[5]	SHDJ	119.8	118.0	112.5	115.2	115.1	113.3	122.0	..
Non-EU imports of goods (excl oil & erratics)[5]	SHED	116.8	124.4	127.6	127.1	127.9	123.0	132.4	..
Non-EU import and price index (excl oil)[5]	LKWQ	101.2	103.9	103.2	104.4	104.5	104.7	104.3	..
Non-EU export and price index (excl oil)[5]	LKVX	100.1	101.5	100.2	101.9	102.0	102.0	102.0	..
Monetary conditions/government finances									
Narrow money: notes and coin (year on year percentage growth)[6]	VQUU	3.1	5.0	5.0	4.1	4.8	4.6	4.8	..
M4 (year on year percentage growth)	VQJW	11.3	13.3	12.8	13.0	12.9	13.9	12.9	..
Public sector net borrowing (£m)	–ANNX	40,525	32,052	12,634	–2,676	16,501	9,054	7,013	–6,451
Net lending to consumers (£m)	RLMH	19,750	13,106	3,327	2,402	2,341	907	971	1,095

External indicators – non–ONS statistics

		2007 Jan	2007 Feb	2007 Mar	2007 Apr	2007 May	2007 Jun	2007 Jul	2007 Aug
Activity and expectations									
CBI output expectations balance	ETCU	12	28	21	18	18	25	10	13
CBI optimism balance	ETBV	–7			16			–2	
CBI price expectations balance	ETDQ	11	16	19	14	26	18	17	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.
6 Replacement for series M0 which has ceased publication.

For further explanatory notes, see Notes to tables on page 72.

FEATURE

Globalisation: what are the main statistical challenges?

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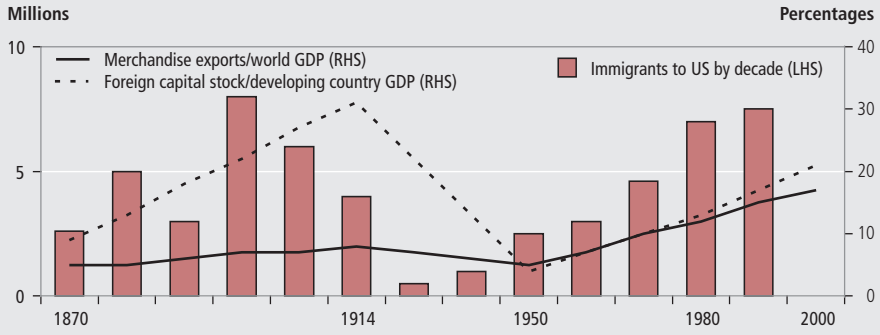
SUMMARY

This article provides an overview of the challenges faced by the Office for National Statistics (ONS) to meet policy and wider evidence needs on the ongoing process of social and economic integration. Globalisation has been singled out by the UK Government as one of the main challenges and opportunities facing the country. Migration is the main work priority for ONS in this area. Other crucial challenges are posed by new forms of 'weightless' trade, increasing specialisation in internationally engaged firms, greater importance of intangible investment, unprecedented financial integration and the wide range of social and economic impacts on the population. This article documents the progress made towards meeting these challenges, and concludes that increased, and more focused, interdepartmental and international co-operation is needed. It also invites external contributions to the ongoing consultation on the future ONS work programme.

Globalisation has become one of the most prominent topics in current political and economic debate. The Office for National Statistics (ONS) plays a key role in documenting and communicating the complex phenomena brought about by the recent global wave of social and economic integration. This article provides an overview of the policy needs for an evidence base on globalisation, the key measurement challenges, and explains what Government statisticians and ONS are doing to improve the accuracy and relevance of official statistics to meet users' needs.

This article considers globalisation as a multi-faceted process of structural economic and social change, characterised by the opening of national economies to trade, foreign capital and foreign workers. Historians have documented similar episodes in the past but, despite the coincidences, the increased level of integration in recent years is very distinct from previous waves. As **Figure 1** shows, the most recent wave of globalisation is actually the third wave of a phenomenon that dates back to 1870. The first wave stretches from the late 19th century to the start of World War I. It was triggered by advances in transport and reductions in trade barriers, matched by massive migration flows. The end of World War I brought in an era of protectionism, as nations erected trade barriers such as tariffs. World economic growth stagnated and exports as a percentage of world income fell back to the 1870 level. Following World War II, a second wave of globalisation emerged, lasting from about 1950 to 1980. It focused on integration between developed countries as Europe, North America and Japan restored trade relations through a series of multilateral trade liberalisations.

Figure 1
Globalisation in perspective, 1870 to 2000



Source: World Bank

There are several features that make the current wave of globalisation a rather unprecedented phenomenon. Its main distinctive features can be summarised as follows:

- rising flows of goods, services and capital movements in international trade, both between and within companies, supported by rounds of multilateral liberalisation leading from GATT (General Agreement on Tariffs and Trade) to the WTO (World Trade Organisation). These have been accompanied by a significant removal of restrictions to capital flows
- increasing international specialisation, as emerging countries integrate into the world trading system and open up to foreign investment. Transnational value chains become more pervasive and important in value
- greater rewards from innovation and skills, as firms access more and larger markets with new products. Top performers command premium prices from a global customer base
- changes in the balance of global activity, with emerging economies in the East driving global growth at rates largely unprecedented in scale
- increasing pressures on resources, including energy, and the environment, with increasing awareness of the cross-boundary impacts of national economic activity on climate
- acceleration in migration levels, particularly from poorer to richer countries

The policy interest in globalisation evidence and statistics

Policy makers seek to translate political vision into programmes and actions to deliver effective 'outcomes' – desired changes in the real world. ONS is committed to supporting the Government's evidence-based policy making agenda (Cabinet Office 1999), helping policy makers integrate experience, judgement and expertise with the best available evidence from systematic research.

The UK Government has looked at these changes as part of its strategic review of long-term public expenditure plans (HM Treasury 2004). This review identifies globalisation as one of the key challenges facing the country, alongside technological change, demographic change (notably an ageing population), climate change and continuing global uncertainty (HM Treasury 2006).

Recent policy documents see globalisation more as an opportunity than as a threat, arguing that there are large potential gains to producers and consumers in the UK and worldwide from further openness (DTI 2004a, 2004b). The UK Government also acknowledges the importance of complementary economic and development policies without which increased openness may not deliver sustainable benefits.

The demand for a forward-looking, comprehensive evidence base on global socioeconomic changes continues to evolve with new issues and challenges. Key questions raised include:

- what are the key economic and social impacts of globalisation?
- who are the main winners and losers?
- what are the main trends to report on over the next years?
- what policies work to harness opportunities, while supporting those faring worse as a result of these structural changes?
- how will demand for, and delivery of, public services be affected by globalisation?

Official statistics play a significant role in supporting public sector accountability in the UK. The widespread use of targets and performance indicators seeks to focus government on delivering results while informing the public about what they can expect the Government to deliver. Aspects of globalisation emerge in some of these performance indicators, relating to objectives such as the removal of trade barriers, achieving relative improvements in international competitiveness rankings and increasing the level of inward foreign direct investment.[1]

The globalisation measurement challenges

ONS's primary responsibility is the production of key statistics about the society and economy of the UK, delivered in partnership with statisticians and other analysts in government departments who are not only users but also key providers of UK official statistics. It also administers the statutory registration of births, marriages and deaths in England and Wales. The

Box 1

UK 2007 Comprehensive Spending Review (CSR) challenges

The focus of the next CSR, due to report in autumn 2007, will be equipping the UK for the key long-term challenges ahead and making long-term investment decisions. These challenges can be summarised as follows:

- demographic and socio-economic change, with rapid increases in the old-age dependency ratio on the horizon, and rising consumer expectations of public services
- the intensification of cross-border economic competition, with new opportunities for growth, as the balance of international economic activity shifts toward emerging markets such as China and India
- the rapid pace of innovation and technological diffusion, which will continue to transform the way people live and open up new ways of delivering public services
- continued global uncertainty with ongoing threats of international terrorism and global conflict, and the continued imperative to tackle global poverty, and
- increasing pressures on natural resources and global climate, requiring action by governments, businesses and individuals to maintain prosperity and improve environmental care

impacts of globalisation permeate all strands of ONS activity. What does this imply? Why does measurement matter?

From a policy viewpoint, poor measurement of the economic and social aspects of globalisation can be damaging. Potential unintended consequences may include:

- poor planning of public services delivery and resource allocation, if insufficient provision is made for immigrant communities when forecasting local demand for services
- underestimating the economy's productive potential and overall competitiveness
- errors in the forecasting of inflationary pressures when setting out monetary policy if cheaper imports or migration levels have not been well accounted for
- inappropriate allocation of foreign aid to developing countries as a result of poor indicators of need and opportunity
- poorly informed public opinion about globalisation trends and policies, with prejudice substituting for real information
- partial understanding by policy makers of public perceptions and preferences about policies and their outcomes, with potential impacts on their long-term sustainability

ONS is constantly reviewing its approach to measurement to deal with workers, firms and consumers as they increasingly interact across borders in new ways, using new technologies. Measurement needs to be brought in line with new developments and policy evidence demands (Clayton and Lynch 2003). In doing so, it is vital to treat economic and social issues in an integrated fashion because a co-ordinated approach yields benefits in terms of consistency and efficiency.[2] The remainder of this section describes some of the main issues that UK statisticians and ONS in particular need to deal with in modernising their analysis of transboundary economic activity and population mobility.

Migration

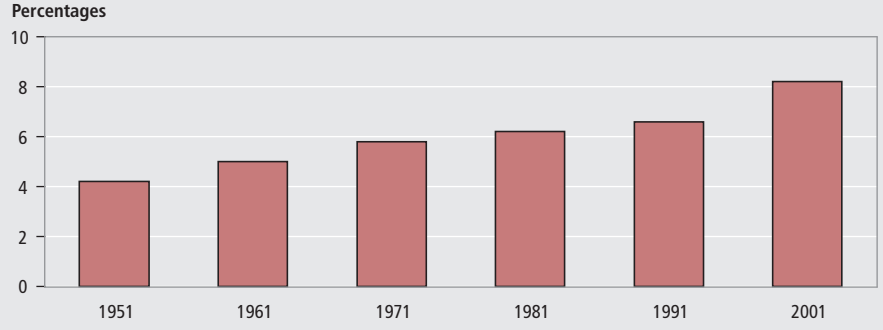
From a public point of view, migration is probably the most visible feature of the recent wave of globalisation. Migration statistics matter for policy because they feed into population estimates and projections for the future (see also **Figure 2**). These are used for planning, resource allocation, business decisions and a broad range of public policy purposes. Migration figures also provide essential contextual information, for in-depth analysis and in calculating rates for key demographic measures, such as dependency ratios, and key economic indicators, such as unemployment rates. With greater mobility, population and migration statistics have assumed increased importance for macroeconomic policy. They are crucial for judging the size of the potential labour supply and therefore the extent to which the economy can grow in a non-inflationary way.

Understanding the causes of migration is also critical for policy. Migratory flows are very heterogeneous, as are individual motives to relocate. Relocation incentives relate to differences in economic conditions between countries, and flows often reverse as economic conditions change. Information and communication technologies also increase awareness about living standards and opportunities abroad. Regional conflicts and global instability also contribute to increases in numbers of refugees and asylum seekers. In summary, understanding what drives people to migrate is crucial for the design and eventual success of a wide range of policies.

The legal frameworks for migration differ between countries and over time. Since statistics are often built upon national administrative processes, reliability and comparability of records over time and across countries can be compromised. It has long been recognised that international migration is one of the most difficult components of population change to measure accurately. Large numbers of people travel into and out of the UK every year (see **Figure 3**), although migration numbers can be very different between one part of the country and another.

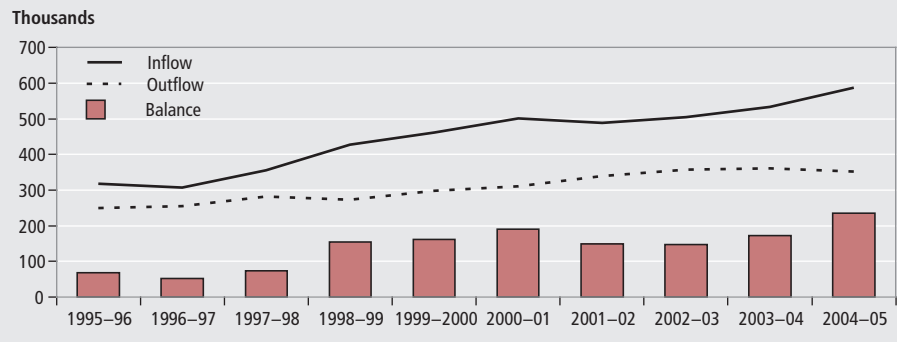
There is no single, comprehensive source which can provide the information required for statistical purposes, at national and local levels. In the UK, the interdepartmental taskforce on migration statistics has noted the multiplicity of potential but imperfectly co-ordinated administrative and statistical sources on migration (ONS 2006). The taskforce has recommended to progress the work towards achieving full coverage through the 'e-Borders' project by 2014. This is a Home Office-led programme aimed to deliver timely data and intelligence on passengers seeking to enter or leave the country. While this is being completed, the taskforce has proposed extending the coverage of ONS's passenger surveys and further developing its household surveys and Population Census.

Figure 2
Changes in the share of the UK population born abroad



Source: ONS Population Censuses (1951 to 2001)

Figure 3
Total international migration in the UK



Source: ONS, Analyses of Population Change. Series MN32, Table 1.3

The challenge for household and business surveys, registers and Censuses is formidable. Most countries like the UK have no unified, comprehensive register framework for individuals. In its absence, migration accentuates the difficulties for a co-ordinated delivery of 'cradle to grave' policies providing integrated personal services over the lifetime, including health, education and pensions.

'Weightless' electronic trade and new trade in services

The widespread use of the internet has enabled consumers to purchase goods such as books, music and films, without the need for these products to be shipped across borders in the form of DVDs or books. Substantial statistical, taxation and trade policy issues arise because these products are being increasingly transmitted via data files through borderless virtual networks. These trades may not be picked up by statistics if transaction values are below customs authority thresholds and because many small e-commerce companies are poorly reflected on business registers. Furthermore, most surveys may miss final consumers' e-commerce imports, largely because they are not fully aware of their precise overseas origin.

ONS is therefore concentrating on keeping its surveys on trade in services up to date with new developments. It will also seek to build on customs administrative sources to improve the accuracy of trade estimates, complementing these with further evidence from household and e-commerce surveys. This is an area where international co-ordination, particularly within the EU, can deliver substantial benefits, as exemplified by the ongoing pilot study led by Eurostat on international sourcing.

Co-ordination and clarity of purpose are also crucial in terms of establishing how national statistical organisations like ONS address questions on relatively controversial topics such as offshoring. ONS's approach should be fair and objective in its assessment of economic and social impacts. Firstly, exports and imports of services should be treated on an comparable basis – public opinion is certainly more sensitive to increases in imports and the potential, short-term job losses. Secondly, attributing changes in labour markets to changes in trade patterns requires analysis that is beyond the scope of usual ONS activity. Instead, concentration should be on providing the evidence for policy makers and external analysts to draw those inferences using the identifying assumptions they find appropriate and are willing to justify.[3]

Increased specialisation in supply chains

ICT developments and reduced tariffs and transport costs have enabled many firms to set up profitable production chains that span national boundaries. This process of increased specialisation is now occurring both within vertically integrated multinational companies (through foreign direct investment) and across companies without ownership links. Independent statistical analysis of ONS sources at a disaggregated level using the Virtual Microdata Lab has provided valuable insights to policy makers on the behaviour of multinationals and other internationally engaged companies. The analysis of their contribution to economic activity, for example, has emphasised their higher propensity to undertake knowledge intensive activities in the UK (Criscuolo *et al* 2005). Research also shows, for example, that foreign and UK-owned multinationals no longer replicate their domestic structures horizontally across countries. They focus instead on locating their activities to get the best from their integrated operations.

The UK and international statistical communities are very much aware of the measurement problems resulting from forcing UK national frameworks onto companies that behave as if there were no frontiers, or that adjust their financial reporting to minimise their overall tax liability. Furthermore, international specialisation challenges some working assumptions on structural ratios of businesses that are used to produce key economic statistics such as GDP from short-term indicators of turnover.

The key lesson is that measurement frameworks that are easily recognisable by, and applied to, internationally engaged firms need to continue to be developed. The UK has been involved in the development of a reporting model for multinationals, supporting the reporting requirements of international institutions such as the European Central Bank, the European Commission and the IMF. This work revealed a lack of cross-country consistency in the treatment of business units that needs to be resolved before multinationals are approached to reveal their full range of activities across the EU.

Transactions in intangible assets

Policy makers are becoming increasingly aware that trade statistics designed for an earlier age may fail to capture the sizeable flow of intangible assets such as business and technological knowledge across national borders. Companies exchange these assets with their foreign suppliers and subsidiaries as they set up global supply chains. Little is known about flows on these assets, termed 'dark matter' by some economists, because they have real impacts; one cannot see them in the data but they appear to explain some data inconsistencies

Box 2

Distortions to trade statistics: the 'missing trader' fraud

Estimates of trade and gross domestic product (GDP) have been affected in recent years by the so called 'missing trader' fraud. Fraudsters take advantage of the VAT system where goods are zero- rated on transactions between EU members. Missing trader fraud occurs when a trader imports goods from another country VAT-free, sells them on to another trader with VAT included and then disappears without paying tax to the government. The goods, usually high-value, low-volume goods such as mobile phones or computer chips, are often re-exported, at which point the exporter reclaims the VAT from HM Revenue & Customs, resulting in revenue loss. The goods can sometimes be imported and exported many times, with the VAT reclaimed each time. This is known as carousel fraud.

The impact of these practices on tax receipts has been estimated to be considerable. Because the Intrastat system used to record trade figures relies on the accuracy of VAT returns, this means that exports are captured but imports are not. Missing traders import goods free of VAT and sell them charging VAT before tax authorities have had time to follow up the VAT registration. The required adjustment to increase imports results in a deterioration of the trade position and a reduction to the expenditure measure of GDP.

Box 3

An example of measurement challenges exacerbated by globalisation: the case of 'phantom GDP'

The US magazine Business Week (18 June 2007) stirred up the debate on the treatment of imports in calculating GDP and productivity growth. Its main argument is that import prices do not reflect the cost savings from switching to buying goods and services abroad as opposed to producing them in the home country. The suspicion is that price inflation for new imported goods could be systematically overstated as it is not possible to establish that the domestic goods are being replaced by others of similar characteristics. If offshoring intensifies, the real, inflation-adjusted growth rate of imports is likely to be reported as lower than it really is. This would lead to a higher measure of expenditure GDP growth than the actual figure, the excess being described by as 'phantom GDP'.

Globalisation processes appear to accentuate the methodological problems of using base-weighted deflators rather than current-weighted deflators to produce 'volume' measures but so does technological change. This explains the emphasis placed by ONS and many other countries on using chain-linked volume indices. It is also important to note that even if real output growth is overestimated, this can be entirely compatible with terms of trade and welfare gains accruing to the home country that 'offshores' production.

(see Hausman and Sturzenegger 2006). Although the actual magnitude of these flows is uncertain, it has been suggested that trade in intangibles could explain puzzles such as the persistently high levels of the US current account deficit. Central bankers and policy makers in general react to these theories with a mixture of enthusiasm and scepticism. They expect statistical agencies to play an important role in assessing whether these asset flows are statistically and economically significant.

These measurement problems are often interrelated. For example, in an increasingly globalised world, cheaper imports could be the counterpart to unmeasured exports of knowledge and intellectual capital, often transacted within individual multinational corporations. For example, which country enjoys the benefits of the R&D undertaken by an affiliate in one country with funding from another one? Do statistics fully report the extent of knowledge exports and imports? **Table 1** shows the remarkable degree of openness of R&D activity in the UK. The discrepancies between alternative sources on trade in R&D appear to be due to differences in definitions and coverage, but still require further investigation. Judging from recent trends on investment in intangible assets in the UK and the dynamism of particular sectors such as business services and finance, increasing policy interest in this subject is expected.

In the face of this, national statistical organisations, including ONS, need to assess whether National Accounts should continue to exclude certain intellectual assets from the production boundary and treat as them current expenditure. Failure to address this problem within accounting frameworks could lead to ever-diverging views of the economy and increasing difficulties in reconciling different sources. ONS has worked with Eurostat, HM Treasury and the former Department of Trade and Industry (now Department for Business, Enterprise and Regulatory Reform) to analyse the treatment of different forms of intangible investment (Giorgio Marrano, Haskel and Wallis 2007). If counting these investments is a priority, difficult questions need to be asked about what trade in these assets actually means, particularly if no change in ownership is involved.

Table 1

Exports and imports of research and development: different sources based on different definitions

	R&D exports (£ billion)	R&D imports (£ billion)	R&D in UK funded from abroad (£ billion)	R&D abroad funded by UK (£ billion)	Implied balance as percentage of R&D performed in the UK
2002					
Balance of payments	2.1	0.6			*8*
R&D statistics			4.1	1.6	*13*
2005					
Balance of payments	4.7	2.0			*12*
R&D statistics			4.2	2.3	*9*

Source: ONS (Gross Expenditure in R&D, 2007; UK Balance of Payments, Pink Book 2007).

Greater financial integration

A major feature of the recent wave of globalisation is the unprecedented level of financial integration. This is evidenced by the increasing volume and variety of financial transactions, reflecting a combination of financial markets deregulation, sharp reductions of foreign exchange and capital controls, and the creation of new financial instruments. For example, residents in a given country now own more foreign assets and foreign residents own more domestic assets. The widespread use of financial derivatives also means that risks are more spread across the world but the potential for contagion can also be higher.

In the UK, responsibility for financial statistics is shared with the Bank of England. This is also an area of particular interest to UK policy makers because of the relative importance of the financial sector. A key area of current development work at ONS is the measurement of financial intermediation services. International co-ordination in the area of financial statistics is facilitated by guidance provided by the IMF.

The interaction between financial integration and migration is reflected by the increasing importance of workers' remittances. ONS does not publish separate estimates of these flows, as defined by the IMF Balance of Payments manual. They are included within the published series for other receipts of, and payments by, households and non-profit institutions serving households. It is estimated that workers' remittances may account for about 75 per cent of the total, although these estimates are highly uncertain, which is why they are not published separately on a regular basis. ONS aims to improve the quality of these estimates through ongoing improvements to household surveys.

Inequality and disaggregated statistics

Globalisation, like any other process of structural change, can have very different impacts on individuals in different groups of society. Macroeconomic aggregates may fail to reflect individual perceptions of the impact of economic and social transformations. ONS contributed to the recent UK Equalities Review and is leading a cross-government review of social equalities data. The Equalities Review addressed the underlying causes of inequality, disadvantage and persistent discrimination in society and recognised globalisation as a key driver of changes to inequality.

The evidence suggests that global integration delivers high rewards to successful enterprise and specialist skills, but can also lead to perceptions of unfairness. Globalisation can be a challenge to unskilled individuals and, possibly, to relatively skilled individuals whose services can also be purchased abroad. As the range of tradable goods and services increases, migration is no longer the only way in which workers from different countries interact in the labour market. Globalisation also impacts on individuals as consumers, as relative prices of purchased goods change. As **Figure 4** shows, prices of imported goods declined relative to imported services and household consumption over the period 1999 to 2005.

In response to these issues, ONS has developed a range of new products that ultimately help individuals make sense of some of these changes and reconcile them with their personal experience. Two initiatives clearly stand out: the 'Personal Inflation Calculator' is a web-based tool that allows users to calculate an inflation rate based on their personal expenditure patterns, rather than the average basket of goods and services used in published statistics. The calculator weighs together price indices from the RPI to arrive at a personal inflation rate. It shows, for example, that households with relatively higher levels of expenditure on goods and services open to international competition have experienced lower rates of inflation in recent years. 'Neighbourhood Statistics', another web-based tool, provides quick web access to a wealth of information on demographic, economic, health and other characteristics of the chosen local population.

Concluding remarks

Transparency and confidence

It requires continuous effort to maintain the level of trust and confidence of users on the quality of statistical outputs. This is why ONS seeks to communicate openly and effectively the nature and scale of the globalisation measurement challenge. There are mutual gains from engaging in this dialogue, as users are critical in providing the evidence that is needed to raise the game in providing reliable and relevant statistical outputs.

Focus on statistics

With scarce resources at its disposal, ONS needs to be aware of its strengths and limitations in dealing with new social and economic phenomena. Maintaining public confidence in the integrity of statistical outputs requires it to focus on the description of the phenomena it is best placed to measure, leaving the role of analysing what this means for policy to policy officials, think tanks and academics. It is not the responsibility of a statistical agency like ONS to try to offer answers to questions such as whether globalisation is good or bad or whether government policies are making things better. The governance and publication of official statistics is ONS's responsibility, while others are best placed to explain to the public whether the achievement of a target validates policy or failure to meet it is actually due to other confounding factors or events. Doing otherwise would compromise the integrity of the statistics.

Comparability

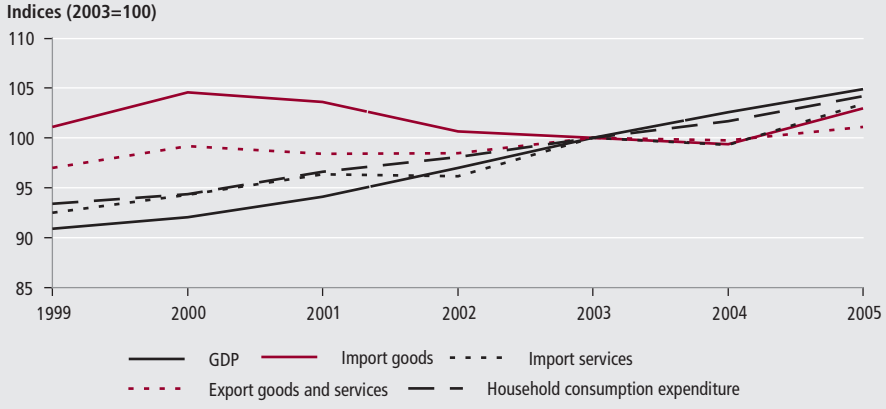
Official statistics also need to respond to other significant challenges with a clear global dimension, such as climate change and sustainability. In order to meet the evidence needs of markets and policy makers, assessment is needed in how to develop measurement frameworks, including environmental satellite accounts, that are genuinely comparable across countries.

Collaboration and innovation

International comparability and consistency become particularly important in the handling of transboundary phenomena. While economic and social changes require ONS to re-examine its conventions, it also needs to think seriously about the value its customers place on the stability of the measurement frameworks and statistical series. International discussions, led by Eurostat, UN and OECD among others, provide a useful forum for testing approaches to new problems. For example, Eurostat plays a key role in helping the EU assess its progress towards the Lisbon goal of becoming 'the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion'. The reporting system in place is the outcome of intense co-operation between national statistical agencies and Eurostat. It has made a substantial contribution to European-wide evidence-based policy making, demonstrating how much progress can be made. ONS is also in the early stages of a project delivering a pan-European co-ordinated analysis of ICT microdata. This should provide the blueprint for future, more accurate international comparative analyses on any subject by building on the actual micro sources. Furthermore, new ground is being broken through joint work on a Multinational Enterprise Register to address some of the measurement problems raised in this article.

These examples show that addressing the

Figure 4
Changes in import prices: implied price deflators for selected components of expenditure GDP



Source: ONS Blue Book 2006

complexity of the globalisation challenge requires ONS to share expertise at home and abroad and be open to innovative solutions. They also demonstrate the importance of OECD and Eurostat leadership in the area of globalisation statistics and the systematic co-operation with UK government departments.

Priorities

As part of the ongoing consultation on ONS's statistical work programme (ONS 2007), users are invited to provide views on which products and services are most important, and how these need to be improved. Globalisation is being factored into this exercise, as reflected by the priority given to migration sources and analysis. Feedback is welcomed on what aspects of globalisation require further investment and suggestions on where ONS should be reducing activity and spending less, with a view to improving the service it provides.

Notes

1 These examples are derived from the UK Department of Trade and Industry (now Department for Enterprise, Business and Regulatory Reform) Public Service Agreements from the 2004 Spending Review.

2 For example, ONS sees the future development of labour accounts as a potential bridge between the social and economic statistics workstreams. This is likely to be particularly fruitful as the challenges of globalisation, particularly on migration, inequality and skills are addressed.

3 Attributing changes in the number of jobs to services imports requires making assumptions about what would have happened had a firm not opened a subsidiary abroad or decided to import certain services. While some firms may explicitly report on that link, other companies may choose to alter new investment plans and this would go unnoticed. Some plants might just shut down if the option to import services were not available. It would be also extremely difficult to attribute the reverse phenomenon, namely how many jobs are 'inshored'. The comparative strength of an organisation like ONS is to provide accurate and detailed estimates of job flows and trade in goods and services, but without aiming to draw causal links when the inference requires value judgements.

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FEATURE

New labour productivity measures from the ABI – 1998 to 2005

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SUMMARY

This article presents new current price labour productivity data calculated using published data from the Annual Business Inquiry (ABI). This is an update of previous work by Daffin and Lau (2002) where results for 1998 to 2000 were provided. The results in this article contain revised data for this period[1] and new data for 2001 to 2005. The rest of the article discusses the results, the quality of the estimates and also industry-specific data issues.

The Annual Business Inquiry (ABI) is a relatively new survey that was introduced between 1998 and 2001. The main advantage of the ABI over its predecessors is that financial and employment data are collected together in this single survey and aggregates are calculated using a common methodology. Therefore there is greater consistency between output and input data and it is possible to derive coherent labour productivity measures with the results. This article presents such measures and discusses issues regarding their quality, as well as giving reasons why estimates cannot be published for certain industries.

Until recently the Office for National Statistics (ONS) released two sets of labour productivity indices. The Productivity First Release contained quarterly data for the 'Whole Economy', 'Total Production' and 'Total Manufacturing' as well as the manufacturing subsections, based on chained-volume measures (CVM) of gross value added (GVA). In addition, the release 'Labour Productivity Indices for the Non-Production Industries' contained experimental[2] estimates for 'Total Services', 'Distribution, Hotels and Catering' and 'Agriculture, Forestry and Fishery'. However, as of March 2007, all of these series have been brought together in the Productivity First Release, although the series for the non-production sectors are still marked as experimental. Their status is set to be reviewed in time for the December 2007 release, at which point additional series for the service sector may be included if they are judged to be of sufficient quality. Estimates of labour productivity for the market sector will be included in the September release. The Productivity First Release and associated data sets can be found at www.statistics.gov.uk/statbase/product.asp?vlnk=7476

To produce the estimates contained in the First Release, the output data used are from the National Accounts, and the employment estimates are taken from the quarterly Short-Term Employment Survey (STES), and benchmarked to annual ABI data. Therefore, while the official estimates are mainly based on the ABI, National Accounts coherence and balancing adjustments reduce the consistency of the output and input (employment) data. The aim of this article is to provide productivity estimates that have not been subject to such adjustments. In addition, the official productivity estimates are in constant prices to show the evolution of productivity over time. However, the data in this article are in current prices, thus allowing the comparison of productivity levels across industries but maintaining the ability to gauge broad trends across time. The ABI also allows a more detailed analysis of the service sector than is currently provided by official ONS measures.

The results in this article are based on ABI published data which are available on the National Statistics website at www.statistics.gov.uk/abi/
Data for 2005 are final as of June 2007. It

should be noted, however, that the ABI estimates do contain some inconsistency over time. Currently, only estimates for the last two years, 2004 and 2005, are consistent on a rolling basis, as certain quality issues, errors and omissions have not been taken on back to 1998. More consistent output estimates are available from the Input-Output analyses, but these do not contain employment figures necessary to produce productivity measures

Data issues

It should be noted that the GVA measures compiled from the ABI are only approximate as they do not contain adjustments for taxes and subsidies, or received income-in-kind. Therefore they are different from the GVA estimates contained in the Input-Output Supply Use tables which are compiled on a European System of Accounts (ESA) 95 basis. Data contained in the Input-Output analyses also contain the following adjustments:

- **conceptual adjustments** – these are established adjustments used to translate data sources into national accounts concepts. Among these are the exclusion of business spending in the retail sector from household final expenditure and also adjustments for undeclared income in the income measure
- **quality adjustments** – these are further adjustments made after the conceptual adjustments to allow for known biases and discontinuities in the source data, for instance, as a result of revisions analysis. Once the basis for the adjustment becomes clear, it may eventually be added to the methodology as a conceptual adjustment
- **coherence adjustments** – these are adjustments made after the data have been validated against alternative data sources and there has been an analysis of any discrepancies

For further detail see Penneck and Mahajan (1999).

For industries where the ABI estimate of approximate GVA per job is considered flawed, the estimate has been withdrawn. The industries where this applies are:

- SIC (2003) divisions 1 ('Agriculture, Hunting and related service activities'), 2 ('Forestry, logging and related service activities') and 5 ('Fishing') – although financial data for these industries have been collected since 2000 (2001 in the case of division 1), approximate GVA per job estimates have not been published. These are excluded mainly because the data are relatively new as well as the prevalence of grants and subsidies in these industries

- SIC (2003) division 62 ('Air Transport') – the ABI time series is of poor quality with changes being more reflective of improved measurement over time rather than real economic change. Therefore estimates for this industry and its subsections have been withdrawn

- SIC (2003) divisions 65–67 ('Financial Intermediation') and 75 ('Public Administration and Defence; Compulsory Social Security') – financial data for these industries are either not collected by the ABI or, in the case of divisions 65–67, not currently published. Only data for activities auxiliary to financial intermediation are collected. Therefore, estimates for these industries are not available

- SIC (2003) division 70 ('Real Estate Activities') – this estimate has been withdrawn as the approximate GVA measure excludes capital expenditure. The nature of the industry means GVA is not a representative measure. For instance, in the early years of a development, there will be high levels of capital expenditure but no turnover and vice-versa in following years.

- SIC (2003) divisions 73 ('Research & Development') are affected by the exclusion of government grants, affecting the GVA values,[3] and are therefore withdrawn. Parts of SIC (2003) 91.1 and 91.3 (both within 'Activities of Membership organisations not elsewhere classified') are similarly affected and are therefore withdrawn

- SIC (2003) divisions 80 ('Education') and 85 ('Health and Social Work') – estimates for these industries have been withdrawn for two reasons. Firstly the estimate would not be representative of the industry as a whole as the ABI is not sent to public bodies, and secondly Government grants are again excluded from the data, sometimes resulting in negative GVA values

There are other industries where, although labour productivity estimates are published, users should exercise caution when interpreting the results. These are:

- SIC (2003) divisions 15.9 ('Manufacture of beverages'), 16 ('Manufacture of tobacco products') and 51.3 ('Wholesale of food, beverages and tobacco') – GVA estimates for industries involving alcohol and tobacco can be volatile. The reason for this is that the timing of the release of goods from bonded warehouses changes to minimise duty

Box 1

Methodology used to calculate ABI year-average employment

ABI year-average employment = ABI year-average employees + ABI working proprietors + ABI unpaid workers

Year-average employees are calculated by taking the point-in-time ABI data, at the reporting unit level, and then applying factors from the STES data (local unit level). For instance, for 2005:

(Stes December 2004+(3* Stes March 2005)+(3* Stes June 2005)+ (3* Stes September 2005)+(2* Stes December 2005))/12* Stes December 2005)

This is done separately for each of the male/female/full-time/part-time splits by STES SIC section building blocks. They are applied to the December returns before grossing, to bring employment figures to a year-average level.

There are no STES data on working proprietors or unpaid workers that can be used to adjust these two series. Working proprietor data exist on the IDBR and unpaid workers are available from the Labour Force Survey, but these series cannot be considered reliable enough to adjust the ABI data at three-digit SIC level. These data are therefore December estimates and may contain seasonality.

payments, as shown by the results for SIC (2003) divisions 51.35 to 51.37 where productivity levels move from 6.6 in 1998 to 117.3 in 1999 and to 19.3 in 2003

- SIC (2003) division 23.2 ('Manufacture of refined petroleum products') – a similar problem arises in this industry. Firms in this sector can change the point at which they report their duty payments so, for example, one year, payments will appear in wholesale, and another year in refining. This is a general problem that can also affect other industries. Attempts are made by ONS to minimise such differences but caution should still be exercised when comparing data across years

- Finally, due to volatility and issues with data quality:

  - SICs 1110 and 1120 have been aggregated to 1100
  - SICs 2111 and 2112 have been aggregated to 2110
  - SICs 5111 to 5119 have been aggregated to 5110
  - SICs 5121 to 5125 have been aggregated to 5120
  - SICs 5135 to 5137 have been aggregated to 5135–37
  - SICs 5271 to 5274 have been aggregated to 5270
  - SICs 5511 and 5512 have been aggregated to 5510
  - SICs 7230 and 7240 have been aggregated to 72.3/72.4

In addition, for some industries at SIC (2003) four-digit level, estimates are not published because they are deemed to be disclosive. Also, where the estimate of employment is less than 500, the data have been suppressed. However, data for these industries are included within broader aggregates such as the two-digit and section level estimates.

The denominator used in the productivity estimates presented in this article is ABI year-average employment. The methodology used to create this variable is provided in **Box 1**. It is calculated by adjusting the annual point-in-time ABI estimate using quarterly STES data. This method is preferred because although it means some of the consistency between the output and employment data is lost, it also means that any seasonality is removed. It should be noted that this variable is based on the number of full-time and part-time workers at a point in time and then adjusted to produce a year-average figure. Therefore it is not based on a measure of full-time equivalents. The impact of this on labour productivity estimates should be borne in mind when interpreting the results. For instance, part-time workers are far more prevalent in the service sector compared with manufacturing, thus artificially reducing the labour productivity estimate in services. At some point in the future attempts may be made to produce estimates for the number of full-time equivalents.

Pre ABI data

Although approximate GVA data are published from 1995, employment data that are consistent with this are only published from 1998. Between 1995 and 1998, employee data were collected using the Annual Employment Survey (AES). Due to methodological and coding differences between the AES and ABI, the AES is not used to derive labour productivity estimates before 1998.

Analysis of results

The main value in the following set of results lies in its level of sectoral detail. Official productivity data for the service sector are relatively sparse, with only indices for 'Total services' and 'Distribution, hotels and catering' currently produced (although the series may be expanded to split the latter in the near future). In contrast, the ABI provides information down to the SIC four-digit level. However, it should again be noted that the data are in current prices, meaning they allow comparisons across industries, but do not show real changes across time. Also, as mentioned above, the ABI does not provide complete coverage of the service sector with sections J ('Financial Intermediation') and L ('Public Administration and Defence') not covered, and data for sections M ('Education') and N ('Health and Social Work') being unrepresentative of the industry.

In general, the service sector tends to exhibit lower labour productivity levels, and also growth, than the production sector, a phenomenon commonly referred to as 'Baumol's Disease' or the 'Baumol Effect' (Baumol and Bowen 1966). The theory is that services are much more labour intensive than the production sector and benefit from technological advance to a much lesser extent. In general, although not always, the product of labour is the service itself, rather than a means to production – the common example given by Baumol is that it takes the same number of musicians to play a Beethoven string quartet today as it did in the 19th century. This applies to various service sector industries – for instance, it is hard to conceive of how productivity improvements among hairdressers could be as significant as those among manufacturers, where capital intenisty is far greater. However, for many service sector industries, this appears

Table 1
ABI 'approximate GVA per job', current prices

SIC03 section	Description	1998	1999	2000	2001	2002	2003	2004	2005
									£ thousand
C-O[1]	All sectors covered by the ABI	28.8	30.3	31.3	32.3	33.0	34.2	36.3	38.4
C-E	Production sector	38.5	40.4	42.7	43.7	46.5	47.2	51.7	56.3
C-F	Production sector plus construction	36.1	38.0	40.1	41.8	43.9	45.3	49.0	53.1
G-O[1]	Service sector	25.3	26.8	27.5	28.4	28.8	30.1	31.8	33.4
									Ratio to all sectors (C-O[1]) = 1.00
C-O[1]	All sectors covered by the ABI	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C-E	Production sector	1.34	1.33	1.37	1.35	1.41	1.38	1.42	1.46
C-F	Production sector plus construction	1.25	1.25	1.28	1.30	1.33	1.33	1.35	1.38
G-O[1]	Service sector	0.88	0.88	0.88	0.88	0.87	0.88	0.88	0.87

Note:
1 Excludes SIC03 sections A, B, J, L, M, N and division 70 (section K).

to be changing with the development in information and communication technology (ICT) which has resulted in massive innovation to both products and processes in much of the service sector, particularly in finance and business services (OECD 2007).

Results for broad sector levels are provided in Table 1. The data seem to support Baumol's theory, although there is also the issue that many of the improvements in the quality of the output of the service sector are not adequately captured in official data, meaning productivity in this sector is actually understated. The greater employment of part-time workers in services compared with production also has an impact, as discussed previously. The second part of the table shows that the service sector achieves just 87 to 88 per cent of the average productivity level of all sectors, compared with 133 to 146 per cent in the production sector. This picture is supported by Figure 1 which charts average real annual growth in labour productivity since 1980 (Productivity First Release).

Table 2 shows that, by 2005, while the ratio of employment in the service sector to production sector was over four, GVA was only 2.5 times greater than that created in the production sector. Therefore, labour productivity in services is just 60 per cent of the level in production. Between 1998 and 2005, the productivity gap between production and services has widened slightly, and is probably the result of labour resources being drawn from the production sector into services.

While disparities in broad section-level data are interesting, there is also huge variation in performance within these sectors. To illustrate this, the following chart, **Figure 2**, ranks SIC divisions (two-digit) in terms of their labour productivity performance, from 1 to 43, for 1998 to 2005.

Figure 1
Average annual real growth rates of output per job

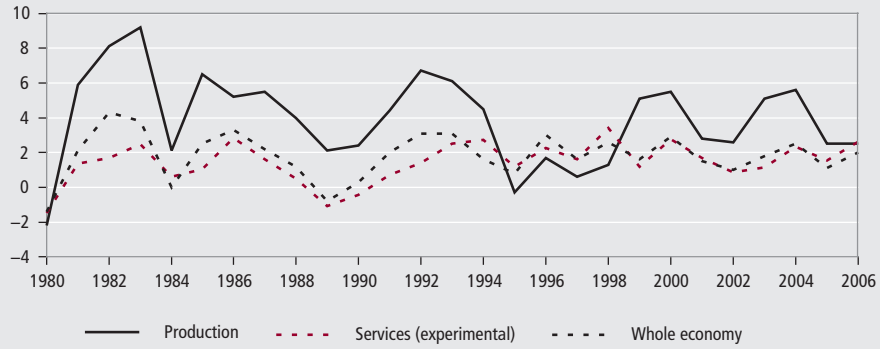
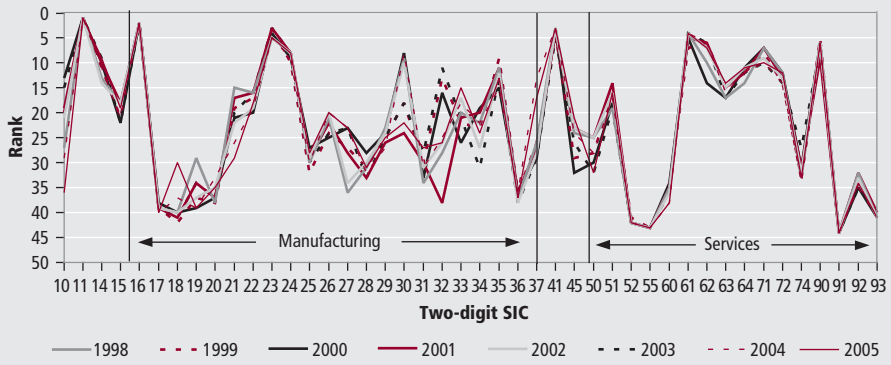


Table 2
Ratio of service sector (G–O) to production sector (C–E)

Ratio

	1998	1999	2000	2001	2002	2003	2004	2005
Year-average employment	2.66	2.84	3.03	3.24	3.53	3.68	3.86	4.11
Approximate GVA	1.75	1.89	1.95	2.11	2.19	2.34	2.38	2.44

Figure 2
Relative productivity performance



Performance varies greatly within each broad sector and is consistent across years. The industry with the best performance in each of the eight years is division 11 (extraction of crude petroleum and natural gas), partially explained by the high level of capital intensity in this industry and also the high oil prices witnessed in recent years. In second place, every year for each of the eight years, was division 16 (manufacture of tobacco products), although these figures will be affected by the timing of duty payments as discussed earlier.

Other industries that consistently ranked high in the period studied were:

- division 23 (manufacture of coke, refined petroleum products and nuclear fuel)
- division 41 (collection, purification and distribution of water)

Again this is likely to be reflective of the level of capital intensity in these industries as well as the level of automation in business processes.

Looking more closely at the service sector, the highest ranked industries were:

- division 61 (water transport)
- division 71 (renting of machinery and equipment without operator and of personal and household goods)
- division 90 (sewage and refuse disposal, sanitation and similar activities)

In distribution there was a marked difference in performance between wholesale (division 51) and retail (division 52), with the latter coming out near the bottom. This is partially a reflection of the level of labour intensity in this industry, although it contrasts with the performance of the retail sector in other countries, most notably the US. However, it should again be noted that this analysis is based on the number of jobs with no distinction made between full-time and part-time workers. As part-time workers make up such a significant proportion of employment in this sector, the productivity measures here probably understate the sector's true performance. The same argument applies to division 55 (hotels and restaurants). Labour productivity for the main service industries can be seen in Table 3.

In recent years there has been considerable interest in the main ICT-related industries because of their strong productivity performance. **Table 4** shows the productivity ranking of the main ICT-related industries, with the median rank

Table 3
ABI 'approximate GVA per job' for the major service sectors, current prices

£ thousand

SIC03	Description	1998	1999	2000	2001	2002	2003	2004	2005
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles	38.5	40.3	38.7	43.2	41.4	44.4	48.5	49.2
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	14.8	16.4	16.6	16.8	17.4	18.0	18.9	19.5
55	Hotels and restauraunts	11.3	11.9	12.6	13.1	13.8	13.6	15.0	14.9
Section I: 60-64	Transport, storage and communication	38.8	40.5	41.6	41.3	41.5	45.4	47.5	50.4

Table 4
Productivity performance of industrial subsections handling ICT

Ranking

SIC03 division	Description	1998	1999	2000	2001	2002	2003	2004	2005
30	Manufacture of office machinery and computers	8	18	18	24	9	10	8	22
32	Manufacture of radio, televisions and communication equipment and apparatus	16	13	11	38	28	26	25	26
64	Post and telecommunications	11	12	12	12	14	11	12	11
71	Renting of machinery and equipment without operator and of personal and household goods	7	8	10	7	7	9	10	10
72	Computer and related activities (including hardware and software consultancy)	12	14	14	13	12	13	14	12

for all industries being 22 or 23. As can be seen, almost all of these industries in general performed better than the average with the main exception being division 32 ('Manufacture of radio, televisions and communication equipment and apparatus'), whose rank has declined significantly since 1998.

Therefore, where gaps exist in labour productivity measures, particularly at a detailed level in the service sector, ABI data can provide a useful resource in comparing performance across industries. However, its limitations should be noted, mainly:

- that it cannot be used to show real growth – prices are very volatile in certain sectors, especially those related to oil or ICT. Therefore caution must be exercised when comparing across sectors let alone time
- that key sectors in the UK economy have no data, particularly sections J (Financial intermediation) and L (Public administration and defence)
- that the ABI does not capture improvements in the quality of service sector output as they will not be fully reflected by higher prices
- that there is no information on the breakdown of hours worked per employee
- the fact that for some industries the ABI is not representative of the real economy
- and finally other reporting and accounting issues discussed previously in the article

Presented in the Appendix are labour productivity estimates at section and two-digit level in **Table A1** and **Table A2,** respectively. Estimates at four-digit level are available in Table A3 in the electronic version of this article at www.statistics.gov.uk/statbase/product.asp?vlink=14692

Notes

1 The main differences between this data set and that previously published lies in revisions made to data from 1998 to 2000. The data used this time are also more accurate with GVA being in £ thousands and employment in actuals, rather than £ millions and thousands respectively, which also causes some differences.

2 Experimental statistics are statistics that are in testing phase and have not yet been fully developed. Therefore they do not have National Statistic status.

3 Much R&D activity takes place within the non-market sector where different concepts and processes are used to calculate GVA. For further information see ONS (2006), pp 187–210.

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Table A1

Current price 'approximate GVA per job' for 1998 to 2005, industry section (excluding SIC divisions 12, 65–67, 70, 75–85 and also 13 in 2003–2005)

£ thousand

Section			1998	1999	2000	2001	2002	2003	2004	2005
C-O		All sectors covered by the ABI	28.7	30.1	31.1	32.1	32.8	34.0	36.1	38.2
C-F		Production sector plus construction	36.1	38.0	40.1	41.8	43.9	45.3	49.0	53.1
C-E		Production sector	38.5	40.4	42.7	43.7	46.5	47.2	51.7	56.3
G-O		Service sector	25.2	26.5	27.2	28.1	28.6	29.8	31.4	33.1
H-O		Service sector excluding wholesale and retail trade	26.7	27.7	29.0	29.6	30.2	31.3	33.1	35.4
C		Mining and quarrying	162.8	198.3	297.4	316.3	288.1	260.5	297.9	369.9
	CA	Mining and quarrying of energy-producing materials	238.0	295.7	496.0	533.0	472.2	428.6	477.9	601.4
	CB	Mining and quarrying except energy-producing materials	49.9	52.8	53.5	55.5	49.8	48.3	61.6	74.0
D		Manufacturing	33.9	35.2	35.9	36.6	39.3	40.2	43.7	45.1
	DA	Manufacture of food products, beverages and tobacco	35.9	37.4	38.0	39.8	43.4	44.7	47.7	48.6
	DB	Manufacture of textiles and textile products	19.6	18.7	19.9	22.8	24.4	25.0	26.4	29.7
	DC	Manufacture of leather and leather products	20.1	24.4	28.9	28.6	34.4	27.8	27.0	30.0
	DD	Manufacture of wood and wood products	25.0	23.3	25.9	25.7	26.9	30.2	33.7	34.8
	DE	Manufacture of pulp, paper and paper products; publishing and printing	36.1	39.4	40.6	40.4	42.7	42.0	45.4	45.4
	DF	Manufacture of coke, refined petroleum products and nuclear fuel	84.0	120.0	88.9	97.5	87.3	84.4	103.4	92.8
	DG	Manufacture of chemicals, chemical products and man-made fibres	52.5	55.2	60.9	62.5	63.5	66.8	70.8	77.5
	DH	Manufacture of rubber and plastic products	29.8	28.9	30.7	31.8	33.2	34.1	36.0	38.0
	DI	Manufacture of other non-metallic mineral products	32.8	33.5	34.8	36.0	40.1	41.9	46.1	46.0
	DJ	Manufacture of basic metals and fabricated metal products	30.4	29.5	30.2	30.7	31.5	32.6	35.6	37.3
	DK	Manufacture of machinery and equipment not elsewhere classified	33.0	32.7	33.5	32.8	36.9	38.8	39.8	42.2
	DL	Manufacture of electrical and optical equipment	35.2	36.6	39.1	31.4	37.4	39.7	44.2	43.5
	DM	Manufacture of transport equipment	39.9	42.8	38.2	43.8	45.3	43.2	48.1	49.7
	DN	Manufacturing not elsewhere classified	25.6	26.3	25.4	27.8	27.9	28.2	32.1	33.7
E		Electricity, gas and water supply	109.9	114.9	107.2	110.6	132.2	127.4	135.5	169.9
F		Construction	27.2	29.8	31.6	35.9	36.7	40.0	41.9	45.4
G		Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	22.7	24.5	23.9	25.6	25.7	27.0	28.6	28.8
H		Hotels and restaurants	11.3	11.9	12.6	13.1	13.8	13.6	15.0	14.9
I		Transport, storage and communication	38.5	38.5	39.7	39.5	40.4	43.6	45.4	48.7
K		Real estate, renting and business activities	31.1	32.1	34.0	34.4	34.8	36.4	38.2	40.9
O		Other community, social and personal service activities	23.0	25.0	25.1	26.3	27.0	27.4	29.4	32.2

Table A2

Current price 'approximate GVA per job' for 1998 to 2005, two-digit SIC (excluding SIC divisions 12, 13, 40, 65–67, 70, 73 and 75–85)

£ thousand

SIC03		1998	1999	2000	2001	2002	2003	2004	2005
10	Mining of coal and lignite; extraction of peat	46.1	37.0	41.9	37.7	35.8	40.2	36.9	32.1
11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying	330.1	419.2	703.0	766.0	657.3	573.5	611.5	744.4
14	Other mining and quarrying	50.3	52.9	53.5	55.5	49.8	48.3	61.6	74.0
15	Manufacture of food products and beverages	33.9	35.3	35.9	38.2	41.4	42.8	45.5	*
16	Manufacture of tobacco products	166.3	188.4	211.3	178.9	245.6	211.2	250.6	*
17	Manufacture of textiles	21.8	21.1	22.5	24.0	25.0	26.5	25.2	26.6
18	Manufacture of wearing apparel; dressing and dyeing of fur	17.0	15.9	16.8	21.0	23.4	22.7	28.8	36.2
19	Tanning and dressing of leather; manufacture of handbags, saddlery, harness and footwear	20.1	24.4	28.9	28.6	34.4	27.8	27.0	30.0
20	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	25.0	23.3	25.9	25.7	26.9	30.2	33.7	34.8
21	Manufacture of pulp, paper and paper products	35.1	38.0	37.7	39.2	43.1	40.2	40.7	37.4
22	Publishing, printing and reproduction of recorded media	36.4	39.9	41.4	40.7	42.6	42.4	46.5	47.3
23	Manufacture of coke, refined petroleum products and nuclear fuel	84.0	120.0	88.9	97.5	87.3	84.4	103.4	92.8
24	Manufacture of chemicals and chemical products	52.5	55.2	60.9	62.5	63.5	66.8	70.8	77.5
25	Manufacture of rubber and plastic products	29.8	28.9	30.7	31.8	33.2	34.1	36.0	38.0
26	Manufacture of other non-metallic mineral products	32.8	33.5	34.8	36.0	40.1	41.9	46.1	46.0
27	Manufacture of basic metals	33.8	30.6	34.8	32.0	29.3	30.5	43.5	43.8
28	Manufacture of fabricated metal products, except machinery and equipment	29.4	29.2	28.9	30.4	32.1	33.1	33.9	35.8
29	Manufacture of machinery and equipment not elsewhere classified	33.0	32.7	33.5	32.8	36.9	38.8	39.8	42.2
30	Manufacture of office machinery and computers	52.9	38.2	39.0	35.5	61.2	62.9	73.5	45.1
31	Manufacture of electrical machinery and apparatus not elsewhere classified	26.8	29.8	31.2	30.7	30.4	32.4	35.6	38.3
32	Manufacture of radio, television and communication equipment and apparatus	42.9	47.8	51.7	24.1	35.0	37.5	41.7	39.4
33	Manufacture of medical, precision and optical instruments, watches and clocks	32.6	34.0	36.5	37.3	40.3	43.1	48.2	50.9
34	Manufacture of motor vehicles, trailers and semi-trailers	37.4	33.8	30.4	37.4	37.5	37.3	43.9	43.2
35	Manufacture of other transport equipment	43.6	55.5	48.9	52.0	56.2	51.4	53.8	58.0
36	Manufacturing of furniture; manufacturing not elsewhere classified	25.5	26.1	25.1	27.4	27.3	27.6	29.7	32.0
37	Recycling	28.9	30.9	30.7	32.7	35.9	36.3	59.2	49.1
41	Collection purification and distribution of water	94.6	91.8	78.4	94.4	129.5	104.7	117.2	154.1
45	Construction	27.2	29.8	31.6	35.9	36.7	40.0	41.9	45.4
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	28.2	30.2	29.6	33.6	36.5	38.7	39.6	35.8
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles	38.5	40.3	38.7	43.2	41.4	44.4	48.5	49.2
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	14.8	16.4	16.6	16.8	17.4	18.0	18.9	19.5
55	Hotels and restaurants	11.3	11.9	12.6	13.1	13.8	13.6	15.0	14.9
60	Land transport; transport via pipelines	25.9	27.3	28.6	27.9	29.5	28.6	27.3	30.7
61	Water transport	70.1	61.9	78.9	85.0	106.2	85.3	112.4	120.7
63	Supporting and auxiliary transport activities; activities of travel agencies	42.3	42.8	39.5	41.7	41.5	45.2	48.5	51.8
64	Post and telecommunications	50.1	48.1	50.5	48.4	48.2	57.2	60.8	63.8
71	Renting of machinery and equipment without operator and of personal and household goods	59.0	57.1	52.8	63.4	66.3	65.9	64.6	71.4
72	Computer and related activities	46.7	47.0	44.2	46.4	50.0	51.1	56.2	61.6
74	Other business activities	27.3	28.2	31.4	30.6	30.5	32.1	33.5	35.6
90	Sewage and refuse disposal, sanitation and similar activities	66.0	74.7	62.8	56.2	82.1	76.3	75.4	89.9
91	Activities of membership organisations not elsewhere classified	11.2	10.6	8.8	8.1	8.9	8.1	10.2	10.4
92	Recreational, cultural and sporting activities	25.7	27.6	28.7	30.4	31.3	31.3	32.5	35.5
93	Other service activities	16.6	19.2	20.6	22.5	20.2	21.7	23.7	25.1

Table A3

Current price 'approximate GVA per job' for 1998 to 2005, four-digit SIC (excluding SIC divisions 12, 13, 40, 65–67, 70, 73 and 75–85)

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
Mining and quarrying including oil and gas extraction								
1010	46.7	36.9	42.1	37.6	34.7	40.2	37.0	32.2
1100	330.1	419.2	703.0	766.0	657.3	573.5	611.5	744.4
1411	49.5	28.4	46.4	53.4	53.7	51.8	54.2	49.0
1412	48.2	59.4	*	50.1	52.9	*	*	*
1421	56.8	58.8	56.9	59.5	50.5	48.1	69.2	90.4
1422	36.5	44.6	47.6	41.3	41.9	43.5	44.3	47.5
1430	43.2	39.3	38.1	41.9	40.1	49.3	50.2	*
1440	70.0	75.5	80.5	63.6	87.1	86.7	63.7	*
1450	18.5	38.4	56.9	55.4	54.3	43.9	54.2	*
Manufacturing								
1511	22.9	25.5	22.5	26.1	28.4	31.6	33.0	34.8
1512	17.5	17.2	20.1	25.1	29.2	24.0	23.4	24.4
1513	26.4	24.2	25.1	25.9	28.7	29.2	28.0	30.9
1520	17.7	17.6	17.5	21.5	22.6	24.3	26.4	29.2
1531	38.2	60.3	57.7	56.4	56.5	60.5	64.6	62.0
1532	29.9	51.8	54.1	50.7	48.1	50.2	52.2	54.8
1533	31.7	29.5	28.3	38.5	31.3	30.1	34.8	34.8
1551	35.0	31.0	34.8	34.9	47.7	45.0	38.3	37.7
1552	34.5	27.5	27.3	25.7	34.1	42.5	39.2	40.9
1561	66.9	62.6	61.2	58.3	*	*	*	76.1
1562	76.8	48.5	66.0	86.4	*	*	*	39.8
1571	29.0	38.9	20.3	32.1	40.0	43.8	39.4	37.0
1572	63.2	58.7	60.8	65.0	78.1	63.4	79.3	87.0
1581	17.2	18.5	20.6	21.7	24.4	26.5	29.4	26.6
1582	23.9	24.4	26.3	26.4	24.9	30.0	35.1	46.9
1584	46.3	45.7	55.7	60.3	62.6	76.5	90.4	89.6
1586	52.5	78.1	100.1	99.7	101.5	111.6	101.9	139.9
1587	39.9	35.8	32.8	39.3	47.4	56.2	54.9	67.1
1589	*	36.0	36.6	38.8	36.9	45.2	45.7	50.2
1591	83.3	72.3	78.5	83.3	87.4	104.9	135.4	142.8
1596	57.1	74.9	68.1	62.6	69.1	58.2	53.7	52.8
1597	47.8	35.7	40.5	55.7	47.5	69.2	57.8	54.6
1598	54.2	63.4	55.2	60.0	54.6	63.7	71.2	62.9
1600	166.3	188.4	211.3	178.9	245.6	211.2	*	*
1711	22.8	18.7	30.4	35.1	65.0	*	*	*
1712	22.5	27.8	25.6	27.3	23.1	23.0	20.6	29.8
1713	17.9	20.4	28.5	24.3	31.5	23.2	23.3	26.7
1716	26.5	16.6	21.9	22.5	22.8	22.5	24.0	14.4
1721	21.5	17.5	22.2	24.6	27.5	17.3	25.0	15.0
1722	20.8	29.3	18.2	22.2	22.9	29.8	24.0	14.1
1723	24.8	21.6	19.1	33.8	22.9	22.7	21.4	19.1
1724	27.1	27.2	25.4	29.7	31.9	35.0	32.6	30.2
1725	26.8	12.5	19.6	18.8	*	*	10.7	*
1730	25.9	23.2	25.7	29.8	33.6	33.7	28.7	23.8
1740	16.5	21.0	20.0	22.6	20.9	27.2	23.5	28.4
1751	25.9	25.4	26.2	25.4	29.6	28.1	30.1	35.8
1752	28.7	24.9	26.1	31.7	23.5	28.8	30.0	23.7
1753	37.4	32.9	31.5	31.0	43.6	35.7	34.4	39.7
1754	25.8	19.0	24.1	25.1	21.9	28.0	29.7	27.3
1760	28.2	21.7	24.8	24.6	28.9	26.3	23.3	17.9
1771	22.4	20.4	15.8	17.2	26.0	19.7	20.7	23.5
1772	16.1	16.0	20.2	14.9	18.7	15.2	17.2	17.4
1810	25.8	33.5	20.1	15.1	23.3	44.4	49.2	*
1821	17.2	15.9	24.8	20.9	31.1	22.4	25.4	31.7
1822	14.9	17.1	16.8	24.1	26.5	27.6	32.7	39.8

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
1823	20.1	14.6	17.6	20.6	16.2	24.6	22.4	30.1
1824	17.8	14.2	14.1	17.7	20.8	16.6	27.5	36.6
1910	22.2	29.7	28.4	21.2	34.0	36.2	40.8	41.1
1920	20.3	26.3	20.3	19.2	29.8	21.7	24.3	31.2
1930	19.7	22.8	33.1	36.2	36.7	28.9	24.7	25.7
2010	27.1	27.5	23.5	23.2	28.0	31.4	33.7	40.5
2020	43.3	38.5	37.9	32.2	35.8	40.8	44.4	43.2
2030	21.3	20.4	26.0	26.1	27.1	30.8	34.9	34.4
2040	28.6	21.8	25.2	24.6	23.0	25.7	27.9	29.9
2051	23.4	21.2	22.6	23.8	23.6	24.5	25.6	*
2052	25.5	18.4	28.8	*	*	29.9	*	*
2110	43.7	49.5	46.8	51.9	61.2	51.9	47.6	50.9
2121	31.9	30.8	29.9	31.1	34.0	34.2	37.6	38.3
2122	44.8	43.9	52.0	55.5	66.4	59.6	52.4	15.7
2123	29.8	35.4	36.7	29.8	30.9	37.3	38.5	37.5
2124	24.7	55.0	32.9	45.0	40.1	32.8	30.4	44.3
2125	29.5	35.3	40.3	36.7	34.0	30.0	32.6	33.2
2211	44.2	59.0	49.0	50.8	52.7	56.1	55.9	69.7
2212	51.1	53.8	55.2	50.6	51.7	47.8	55.1	54.3
2213	42.4	45.2	50.4	46.9	48.7	59.5	56.5	60.3
2214	99.7	26.6	46.1	48.3	78.4	75.1	40.8	39.3
2215	10.9	24.7	25.7	33.3	35.7	22.3	37.7	35.2
2222	31.9	33.7	35.6	34.6	36.9	34.2	39.5	36.7
2223	27.4	26.8	25.7	25.5	25.5	27.4	29.4	30.2
2225	29.8	30.8	37.8	39.1	37.9	31.0	39.0	50.5
2231	62.2	46.0	63.6	39.6	27.9	52.2	61.8	47.5
2232	51.6	53.4	43.3	53.9	55.1	48.3	49.2	45.1
2233	43.0	47.8	21.4	35.9	40.5	46.1	21.5	62.6
2320	114.4	171.3	121.0	*	*	*	*	*
2330	60.5	83.9	60.4	*	*	*	*	*
2413	33.5	35.4	42.7	55.4	59.2	67.9	66.9	66.6
2414	81.6	63.4	74.2	84.1	100.7	86.1	99.1	111.8
2415	37.8	41.1	53.2	55.7	55.2	69.7	68.6	61.9
2416	41.9	39.1	54.6	44.3	45.8	60.2	52.9	48.5
2417	41.2	46.2	53.9	66.9	56.1	65.5	67.1	63.1
2420	69.6	69.6	83.6	75.7	89.1	85.6	83.4	78.1
2430	38.4	37.5	41.8	39.7	48.4	48.8	57.2	58.9
2441	35.0	52.7	39.6	50.9	38.8	40.5	31.1	33.9
2442	73.7	76.4	82.6	94.7	81.6	96.2	95.7	121.6
2451	31.7	39.9	36.8	38.7	46.7	42.7	63.2	62.3
2452	38.5	49.8	64.2	55.9	50.3	50.0	48.5	44.6
2461	35.3	29.0	33.0	33.6	29.0	35.4	38.1	37.0
2462	51.1	42.6	56.8	48.9	53.7	46.4	63.5	65.3
2463	40.3	42.3	47.7	47.7	54.1	54.8	66.0	77.0
2464	70.7	121.8	51.5	49.7	47.4	46.1	*	65.0
2465	34.2	44.7	38.2	40.3	39.3	44.5	*	49.8
2466	52.5	47.1	60.8	54.6	52.2	52.9	60.7	59.1
2470	52.7	53.9	67.9	53.7	128.2	98.0	73.5	75.6
2511	43.4	43.9	37.0	43.1	66.9	66.6	70.3	69.5
2512	21.1	22.3	24.2	19.6	24.0	28.9	22.5	42.9
2513	27.6	26.9	30.4	27.5	33.8	35.1	34.7	37.6
2521	33.9	32.3	38.0	42.1	39.1	38.7	38.9	41.6
2522	34.7	31.7	31.6	35.4	34.5	36.6	41.2	42.2
2523	25.7	25.7	27.8	30.9	29.7	30.3	32.7	34.8
2524	26.6	26.5	27.8	25.8	27.8	28.9	31.6	32.7

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
2612	*	*	23.2	*	32.6	*	*	*
2613	40.7	44.8	44.1	44.3	47.4	48.3	54.6	53.6
2614	34.7	33.9	35.8	35.3	27.2	42.7	55.5	56.7
2615	28.2	17.4	47.6	36.1	25.8	35.3	41.6	31.0
2621	18.1	15.7	17.0	16.7	19.3	21.6	22.9	23.5
2622	36.1	44.2	40.9	40.0	43.7	43.7	77.4	*
2624	41.5	23.7	*	*	*	*	*	*
2625	10.7	14.6	19.1	28.3	7.0	20.1	23.2	28.3
2626	28.6	31.5	33.2	29.3	31.3	32.1	28.5	40.0
2630	29.6	22.0	21.4	20.9	15.9	24.2	32.6	29.5
2640	36.7	36.9	33.0	37.0	38.8	45.9	49.4	48.4
2651	64.4	77.1	95.6	96.0	97.0	115.2	82.3	69.5
2661	33.0	33.2	32.9	35.3	42.7	41.7	48.2	48.2
2662	122.3	124.5	114.3	153.6	145.0	148.8	171.9	172.4
2663	47.7	55.0	41.2	48.1	74.7	60.7	73.0	53.3
2664	49.2	28.4	42.1	48.4	27.8	*	*	*
2665	27.5	30.9	32.4	21.2	32.4	*	*	*
2666	22.9	24.9	33.0	50.5	22.1	29.6	32.9	30.3
2670	24.5	23.5	23.5	34.0	40.3	23.2	28.6	33.0
2681	35.4	24.8	29.0	30.8	25.5	29.4	33.7	35.3
2682	36.7	33.0	44.1	40.5	44.0	46.2	46.5	54.9
2710	38.7	32.2	35.3	18.7	16.3	21.8	49.2	38.8
2721	23.1	23.3	34.5	29.4	34.8	30.0	32.6	48.7
2722	33.1	29.8	29.8	39.8	38.3	34.8	46.4	53.2
2731	22.1	22.4	26.7	27.1	28.5	30.1	40.0	*
2732	45.1	37.8	32.3	39.7	24.5	36.5	54.1	*
2733	37.1	26.9	38.9	26.8	26.9	37.7	50.1	53.0
2734	26.3	39.0	27.3	26.6	27.4	34.4	33.2	45.4
2735*****	32.4	22.9	57.1	15.6	19.3	**	**	**
2741	66.2	99.2	117.9	187.3	104.1	72.7	130.0	161.6
2742	39.8	39.8	37.9	41.7	40.5	39.6	44.6	53.2
2743	31.5	24.1	37.0	39.9	31.0	48.6	94.1	76.9
2744	33.1	24.4	43.6	32.4	28.9	39.3	38.0	33.5
2745	45.6	35.4	41.8	45.7	44.6	48.7	52.1	55.9
2751	26.6	24.8	26.7	27.8	28.8	27.4	31.3	32.7
2752	24.2	24.1	27.2	25.6	31.4	35.2	33.2	33.1
2753	23.6	19.9	26.6	25.8	30.9	28.5	28.8	32.2
2754	24.3	24.1	34.3	33.7	25.1	22.9	29.3	34.3
2811	33.5	33.5	30.7	31.8	32.7	35.2	35.7	34.3
2812	30.0	25.1	26.0	30.4	28.3	28.1	34.9	33.6
2821	26.3	27.5	28.0	36.9	32.5	42.9	39.0	41.6
2822	34.9	37.3	31.1	36.5	37.6	35.7	37.3	46.5
2830	38.6	32.8	38.3	39.8	39.4	41.2	48.6	56.3
2840	27.8	27.7	29.0	30.7	28.4	25.3	27.1	29.6
2851	30.0	27.5	24.6	27.7	29.0	29.2	29.6	29.6
2852	28.4	28.7	29.0	27.8	30.3	31.8	33.2	35.9
2861	30.5	29.8	18.1	*	*	*	36.7	78.4
2862	31.2	24.1	31.1	30.1	35.9	32.5	31.6	37.5
2863	20.3	25.0	22.1	*	*	*	30.8	33.2
2871	26.5	29.4	23.5	25.3	27.3	29.7	43.0	31.0
2872	52.4	59.7	60.8	59.9	66.3	55.8	54.2	60.3
2873	26.3	32.9	29.1	28.8	33.3	36.5	41.1	46.4
2874	25.8	25.7	25.4	26.5	26.6	33.7	36.2	28.2
2875	24.6	26.5	26.6	25.4	27.7	29.7	33.1	36.6
2911	53.3	42.2	34.9	41.9	48.8	38.9	57.5	58.6

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
2912	36.8	33.2	38.6	35.0	33.9	38.8	40.4	43.5
2913	34.8	33.7	35.8	36.9	38.8	37.3	39.1	40.3
2914	32.8	29.9	32.9	28.7	32.9	35.4	23.6	32.1
2921	25.3	27.2	33.8	34.1	35.7	40.6	42.4	35.5
2922	30.6	31.8	35.6	29.8	36.6	38.6	39.2	47.4
2923	33.3	30.9	29.4	37.6	38.1	37.5	38.5	43.4
2924	30.2	30.2	30.4	32.1	28.9	36.3	39.1	34.4
2931	49.7	36.0	41.2	51.2	68.1	76.6	*	7.0
2932	23.2	29.1	27.2	25.8	32.3	33.8	*	34.6
2940	32.7	42.6	39.5	30.9	40.9	32.1	34.5	44.0
2951	37.5	25.4	25.8	34.9	29.5	76.7	41.4	42.5
2952	39.8	46.0	33.6	40.9	48.5	58.7	53.0	46.7
2953	29.8	34.2	32.1	30.4	36.0	37.6	39.0	46.3
2954	21.3	20.8	27.7	21.9	31.7	30.4	28.3	38.3
2955	25.3	19.6	38.6	41.5	32.5	26.8	41.6	31.9
2956	35.5	32.3	33.5	30.7	34.6	35.5	39.0	41.1
2960	32.1	32.7	37.9	31.4	42.7	44.6	46.3	57.5
2971	27.0	25.0	30.0	28.8	35.8	38.3	42.7	30.9
2972	24.1	28.4	28.4	22.0	27.6	27.4	33.8	34.3
3001	20.2	18.3	30.6	27.1	31.5	45.6	49.3	40.9
3002	62.5	43.4	41.3	37.7	70.3	67.7	82.1	47.0
3110	24.3	29.9	31.4	28.0	28.4	30.7	34.5	41.8
3120	31.9	32.7	31.6	33.9	34.4	34.8	39.0	39.1
3130	26.6	26.2	29.5	30.4	25.7	34.9	42.1	35.2
3140	28.1	26.4	29.5	23.2	25.6	27.7	27.3	34.9
3150	22.1	26.4	28.3	26.6	29.1	29.0	27.9	39.1
3161	19.3	29.8	32.5	25.8	28.0	30.2	28.5	27.6
3162	28.4	30.6	33.4	33.9	30.8	32.7	38.3	38.3
3210	36.5	38.6	44.7	34.5	39.5	39.0	40.2	44.8
3220	63.2	69.3	65.5	10.0	27.2	38.5	41.8	37.1
3230	25.8	26.0	34.4	32.8	40.9	34.1	43.8	34.0
3310	31.2	36.1	37.3	34.2	41.5	37.2	41.2	43.7
3320	33.0	33.0	38.8	40.3	43.8	50.5	54.7	56.6
3330	39.4	39.3	38.0	28.6	40.1	37.2	45.9	61.5
3340	30.4	32.9	25.7	36.1	24.4	30.2	37.7	39.1
3350	20.9	23.4	28.7	23.6	29.7	34.4	37.4	38.3
3410	44.2	38.3	31.9	46.6	44.8	44.9	56.5	49.9
3420	26.1	26.2	26.0	26.4	29.8	30.7	33.4	36.5
3430	32.7	30.9	29.9	31.8	32.6	32.0	34.3	38.3
3511	34.2	51.5	30.6	28.0	29.1	33.8	37.4	31.2
3512	21.4	22.8	23.4	38.5	25.9	26.9	32.8	27.9
3520	*	46.0	37.0	34.0	36.9	32.5	28.7	50.6
3530	53.4	61.9	56.6	62.1	69.9	61.2	63.9	69.6
3541	22.0	21.7	35.1	51.1	73.5	63.1	44.6	41.9
3542	16.7	26.1	37.8	26.8	17.9	19.5	22.2	22.6
3543	34.6	22.4	43.3	39.6	30.4	31.1	32.4	33.3
3550	31.0	19.5	21.2	20.7	20.7	32.0	35.3	26.7
3611	23.3	26.4	23.2	24.9	26.9	24.3	27.1	32.0
3612	31.9	28.9	30.4	32.0	28.4	30.0	34.5	39.3
3613	32.0	31.2	31.3	29.6	27.9	29.3	32.3	38.9
3614	22.5	22.8	20.3	24.1	25.6	26.7	24.8	27.1
3615	24.6	24.6	23.1	25.7	24.1	24.6	25.0	24.5
3621	66.5	40.0	31.3	29.4	*	*	*	*
3622	27.8	33.4	36.4	39.6	*	*	*	*
3630	16.2	21.1	25.9	34.5	25.0	28.1	32.5	26.4

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
3640	26.0	27.4	32.1	34.2	35.1	32.3	32.1	48.5
3650	29.9	27.6	33.6	29.9	31.5	31.3	39.5	37.5
3661	23.4	33.2	40.0	33.1	27.0	49.3	35.8	23.2
3662	19.3	26.4	30.3	29.8	22.2	27.4	32.3	32.1
3663	22.4	23.9	23.0	25.4	26.3	25.0	30.1	28.4
3710	39.4	36.7	38.7	33.3	48.5	50.8	92.5	61.9
3720	19.1	23.3	20.9	31.8	23.9	25.6	34.0	36.6
Electricity, gas and water supply								
SIC03	1998	1999	2000	2001	2002	2003	2004	2005
4100	94.6	91.8	78.4	94.4	129.5	104.7	117.2	154.1
Construction								
4511	32.0	34.1	39.9	39.2	44.3	36.2	39.0	36.6
4512	67.6	50.4	25.0	43.8	25.0	27.6	26.9	28.0
4521	28.6	32.1	34.0	40.5	42.3	48.5	51.4	54.3
4522	23.1	26.4	29.4	30.1	33.2	34.7	35.0	40.5
4523	26.6	28.2	26.6	34.0	34.6	34.0	40.2	45.3
4524	42.2	25.6	36.9	17.5	33.9	80.6	59.0	54.3
4525	22.8	32.7	35.3	34.0	37.4	30.0	34.4	47.0
4531	27.3	27.5	29.4	31.9	34.4	35.6	37.1	39.4
4532	31.9	29.1	28.2	30.3	31.2	38.4	37.3	36.7
4533	28.5	25.5	26.8	29.9	31.9	34.5	34.6	32.4
4534	19.8	21.6	29.3	32.8	27.5	36.1	28.4	43.7
4541	30.9	30.7	25.4	32.9	32.5	34.6	51.1	48.8
4542	27.3	26.5	32.2	35.2	28.4	37.4	32.6	39.3
4543	27.8	27.9	35.0	37.2	42.0	39.6	32.4	34.2
4544	18.8	22.8	26.1	26.0	26.8	28.0	27.6	32.4
4545	25.5	31.4	24.9	34.3	21.9	31.4	37.6	35.9
4550	29.8	36.0	31.5	39.6	40.3	34.7	49.6	49.2
Distribution								
5010	34.9	37.7	35.8	43.5	47.6	51.3	51.1	46.0
5020	22.4	25.3	24.2	24.6	25.8	25.9	24.6	26.9
5030	24.5	24.2	23.6	25.2	30.3	30.9	36.1	27.0
5040	33.3	20.1	36.1	29.2	30.9	32.9	30.9	19.7
5050	17.0	18.5	22.8	28.3	23.8	31.2	39.5	33.4
5110	40.0	40.4	36.8	45.0	40.9	49.3	67.3	48.7
5120	24.8	31.2	23.8	31.4	25.3	32.3	29.4	33.7
5131	32.7	23.0	22.6	31.8	42.8	33.0	36.7	37.6
5132	22.4	29.4	25.6	28.3	29.0	27.2	34.9	35.1
5133	33.4	29.2	31.7	28.8	34.7	27.0	43.4	55.3
5134	50.0	46.5	46.0	61.8	63.7	49.7	54.5	50.7
5135-37	6.6	117.3	36.4	81.6	50.7	19.3	45.2	66.6
5138	26.8	33.3	23.9	21.5	28.2	27.8	39.5	39.2
5139	16.5	23.1	20.0	26.2	25.2	33.2	32.2	25.8
5141	40.0	35.3	36.4	41.1	40.0	39.3	36.1	35.7
5142	37.0	38.0	35.7	40.9	40.7	53.1	52.3	45.9
5143	62.0	53.0	53.5	54.9	53.3	54.9	60.0	42.4
5144	33.7	37.7	33.6	27.7	31.1	26.1	29.5	35.4
5145	28.9	23.5	35.0	33.9	31.7	35.0	36.3	38.4
5146	44.5	63.9	60.8	63.2	66.3	80.7	71.0	78.2
5147	32.4	38.3	36.0	31.3	37.0	35.1	37.2	37.6
5151	69.4	107.4	72.4	94.1	126.8	212.3	276.4	254.7
5152	30.4	39.2	32.0	35.8	43.0	40.8	54.8	60.2
5153	29.8	27.7	28.1	34.7	29.6	38.0	38.6	37.9
5154	30.3	30.5	28.5	29.1	31.2	32.3	35.8	37.7

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
5155	58.0	65.6	50.1	55.3	39.8	46.8	52.2	61.4
5156	44.4	44.0	45.8	38.2	32.5	40.5	38.1	85.7
5157	31.1	31.4	28.0	36.3	36.4	44.3	53.9	69.6
5164*****	57.0	49.0	61.9	66.9	58.2	**	**	**
5170*****	33.0	28.3	32.2	40.8	29.4	**	**	**
5181***	44.3	37.8	30.6	43.3	30.7	29.1	37.6	40.6
5182***	44.1	35.4	41.4	46.8	42.2	47.6	53.9	56.9
5183***	37.2	27.9	40.4	49.8	30.6	34.1	42.5	39.5
5184****	**	**	**	**	**	52.0	56.6	55.5
5185****	**	**	**	**	**	42.9	53.4	41.2
5186****	**	**	**	**	**	48.7	45.1	49.6
5187***	51.1	47.6	47.0	50.8	45.7	46.2	43.4	55.3
5188***	23.9	24.9	26.0	30.3	37.6	36.5	44.5	45.7
5190****	**	**	**	**	**	35.2	42.9	45.9
5211	16.2	17.3	16.9	14.6	14.4	14.6	14.9	15.9
5212	15.5	14.3	15.4	17.0	19.7	20.9	19.9	21.8
5221	8.9	10.8	10.2	12.5	12.6	12.5	14.8	14.6
5222	13.0	14.6	13.8	13.3	17.5	16.1	17.1	19.6
5223	14.2	12.1	13.9	15.7	15.2	17.4	13.6	19.0
5224	9.6	12.5	11.2	12.3	12.5	11.8	13.4	14.2
5225	7.0	6.0	7.7	7.2	8.7	8.2	9.0	8.8
5226	6.4	7.8	8.3	9.9	7.3	9.0	11.2	12.4
5227	11.3	14.3	13.8	15.3	15.3	14.8	15.3	16.6
5231	15.7	15.4	16.4	18.5	21.4	20.1	23.6	27.1
5232	13.4	8.6	29.5	28.2	30.1	33.7	38.4	27.4
5233	10.5	15.2	12.1	12.1	15.7	15.6	19.1	15.6
5241	12.0	14.5	15.9	15.0	15.3	15.3	16.6	14.5
5242	12.6	18.7	17.6	19.1	19.2	20.4	20.8	22.5
5243	10.5	10.3	11.9	13.1	14.5	15.8	16.3	18.0
5244	19.1	21.2	23.1	24.0	23.8	25.1	26.8	23.1
5245	18.6	16.1	18.9	22.5	22.6	20.6	25.3	23.2
5246	17.5	22.3	20.9	20.7	21.8	21.7	23.9	22.2
5247	10.5	11.0	12.3	13.9	14.8	14.7	15.2	14.6
5248	13.9	16.5	17.3	19.0	19.2	21.8	22.1	21.3
5250	20.1	20.2	23.1	27.4	23.9	21.8	31.4	32.7
5261	26.4	23.3	15.9	19.4	24.1	23.6	28.9	31.5
5262	8.6	9.5	8.5	8.9	6.7	9.5	9.6	15.9
5263	18.1	16.9	24.9	22.5	22.7	21.6	23.2	30.8
5270	13.9	19.2	19.6	17.3	17.0	18.1	21.2	22.5
Hotels and catering								
5510	15.9	18.1	18.6	19.2	18.7	18.6	20.5	19.9
5521	13.2	12.6	17.9	13.9	13.4	14.0	14.2	14.2
5522	36.5	18.7	32.7	34.6	32.2	34.4	38.7	42.1
5523	15.7	14.4	18.8	17.1	20.9	19.4	20.5	23.3
5530	9.8	10.4	11.6	11.9	12.0	11.8	12.5	12.7
5540	10.3	10.4	10.5	11.6	12.7	12.9	14.7	13.8
5551	8.1	*	9.8	11.7	13.7	16.5	7.6	19.8
5552	9.6	9.8	10.3	10.1	13.1	11.6	13.8	14.7
Transport, storage and communication								
SIC03	1998	1999	2000	2001	2002	2003	2004	2005
6010	32.9	39.2	47.2	50.8	60.0	42.2	36.0	*
6021	27.9	25.7	24.6	22.6	22.7	25.5	25.2	25.9
6022	18.0	17.6	17.0	14.1	18.2	18.1	18.0	18.0
6023	16.8	18.5	18.4	14.7	18.6	20.2	20.6	26.8
6024	25.3	27.7	29.1	29.2	29.8	29.7	28.3	32.3

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
6110	74.0	71.7	84.8	93.7	115.1	94.1	117.9	127.3
6120	16.3	18.2	34.5	28.1	32.9	27.0	37.3	26.6
6311	27.6	35.9	37.8	37.4	41.8	48.0	46.4	55.5
6312	29.7	31.5	29.7	29.9	30.2	34.3	35.0	38.6
6321	88.7	92.6	67.6	81.8	69.5	52.1	85.1	65.0
6322	53.3	65.4	53.0	53.2	66.4	71.5	63.7	68.9
6323	95.6	85.9	83.8	92.7	84.6	86.4	91.4	94.8
6330	25.6	25.0	24.3	27.2	29.6	37.1	31.4	38.8
6340	39.6	43.7	45.2	37.1	37.0	38.9	43.1	52.8
6412	30.0	27.4	*	*	*	*	*	*
6420	84.9	82.4	83.7	73.2	80.9	97.2	111.1	115.7
Renting and business activities								
7110	104.5	106.1	79.6	116.6	104.9	107.0	109.0	112.4
7122	19.9	48.0	40.8	18.0	13.2	14.6	23.4	16.5
7131	58.1	53.7	25.8	26.6	35.4	49.0	40.2	53.4
7132	41.5	41.6	42.3	44.0	49.0	48.9	48.9	56.6
7133	202.8	67.8	151.1	189.5	101.3	69.8	100.8	113.1
7134	52.8	53.9	49.8	54.6	59.2	57.3	55.3	51.4
7140	24.7	26.8	26.1	31.7	35.6	30.3	30.4	32.5
7210	43.0	31.2	28.4	40.6	26.7	47.0	66.7	52.9
7220	52.4	49.0	50.6	49.7	53.7	54.5	57.6	67.9
7221****	**	**	**	**	**	58.6	57.7	48.9
7222****	**	**	**	**	**	54.3	57.6	68.5
72.3/72.4	55.4	65.8	55.2	54.6	54.4	51.1	56.3	51.2
7250	26.9	35.9	36.0	44.5	39.9	38.2	41.5	44.1
7260	28.6	36.0	29.2	36.4	44.4	43.3	51.3	51.8
7411	36.0	37.9	43.5	45.7	45.9	47.0	49.6	54.6
7412	38.6	38.4	39.3	44.3	44.9	45.7	44.6	47.9
7413	19.6	25.0	25.6	23.6	24.6	22.9	31.5	25.6
7414	49.5	49.1	53.8	46.2	42.3	47.1	46.6	52.9
7415	69.1	29.0	37.8	51.0	43.2	15.1	18.3	4.5
7420	39.5	37.9	40.6	41.7	38.3	46.4	45.8	50.5
7430	29.5	29.7	30.1	28.7	31.7	44.3	45.2	39.7
7440	39.2	61.3	62.6	53.8	56.4	60.7	53.9	73.3
7450	17.6	19.4	22.2	20.1	21.7	22.2	24.1	24.9
7460	14.1	15.6	17.2	17.4	20.0	19.7	20.8	23.7
7470	6.0	6.5	6.8	7.8	8.5	9.5	9.7	9.8
7481	19.6	23.1	27.9	21.9	22.3	24.8	31.6	32.2
7482	20.8	22.1	20.1	25.8	29.7	23.9	36.3	32.5
7485***	23.8	29.1	22.1	27.5	25.6	29.3	37.5	34.5
7486****	**	**	**	**	**	21.5	16.4	18.0
7487***	35.7	37.3	42.7	37.3	35.2	36.9	42.0	42.3
Other services								
9000	66.0	74.7	62.8	56.2	82.1	76.3	75.4	89.9
9001****	**	**	**	**	**	182.8	165.7	200.8
9002****	**	**	**	**	**	37.7	41.3	49.0
9003****	**	**	**	**	**	48.7	39.9	46.6
9111	30.0	26.6	27.1	26.6	33.6	25.1	35.1	31.5
9112	25.0	21.9	21.4	17.5	19.9	23.7	26.4	36.5
9120	32.0	32.0	28.9	30.6	38.2	28.2	33.0	36.8
9131	-1.4	-4.7	-4.4	-6.5	-7.6	-4.1	-6.0	-6.3
9132	2.7	*	-3.2	-2.8	-1.4	-1.3	-1.0	-4.6
9133	10.1	11.3	8.9	8.8	8.3	8.0	9.5	9.9

Table A3
Continued

£ thousand

SIC03	1998	1999	2000	2001	2002	2003	2004	2005
9211	28.9	56.9	50.5	28.0	25.8	48.4	36.0	40.4
9212	108.0	75.9	106.4	169.4	123.9	143.6	126.2	172.4
9213	18.8	17.2	21.6	20.3	28.4	34.6	29.7	29.7
9220	65.6	66.2	78.7	88.6	90.5	81.6	96.1	108.5
9231	33.9	34.8	32.7	32.7	35.2	38.8	41.0	34.8
9232	19.9	17.4	15.9	12.6	16.4	21.1	21.0	24.5
9233	29.6	24.7	32.1	35.1	41.3	42.0	38.1	40.8
9234	37.1	25.3	21.4	31.4	48.5	24.6	31.1	26.7
9240	61.3	66.8	73.3	103.3	*	44.8	54.9	77.9
9253	10.7	14.1	5.8	8.5	8.4	8.0	9.6	8.9
9261	11.1	8.7	9.8	10.1	9.8	11.5	11.4	12.4
9262	13.9	17.3	16.8	18.9	20.4	22.7	20.6	23.5
9271	24.1	30.1	29.8	26.5	34.4	30.5	36.4	40.4
9272	11.3	11.5	10.6	14.0	13.1	13.5	14.4	14.4
9301	14.9	15.8	20.2	18.2	19.6	17.6	15.9	17.6
9302	10.2	11.4	12.7	13.9	12.3	11.7	13.9	13.7
9303	19.6	24.7	22.5	30.8	28.5	29.9	32.7	28.0
9304	18.7	17.8	24.8	25.1	20.2	22.6	16.4	18.6
9305	20.5	23.9	24.9	27.4	24.7	29.7	33.0	37.9

Notes:
* Information suppressed to avoid disclosure or because employment estimate is less than 500.
** Not available.
*** Change of industry classification from SIC92 to SIC03 - pre-2003 data have been assigned to the new classification.
SIC 5161 to 5181
SIC 5162 to 5182
SIC 5163 to 5183
SIC 5165 to 5187
SIC 5166 to 5188
SIC 7483 to 7485
SIC 7484 to 7487
**** New SIC from 2003.
***** SIC discontinued from 2003.

FEATURE

Derek Bird
Office for National Statistics

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

SUMMARY

This article provides a guide to the different sources of statistics on trade union membership, strikes and lockouts in the UK, covering business and household surveys as well as administrative sources. The article sets out some of the history and the current details of each source and also describes the legislative backdrop against which the statistics are collected and published. The author presented the paper at the Joint UNECE/ILO/Eurostat seminar on quality of work that took place in Geneva in April 2007. This was described in an 'In brief' article in the July 2007 edition of *Economic & Labour Market Review*.

The UK has a long history of monitoring the state of the social dialogue.[1] Currently, there are a number of complementary sources of information that allow the UK to analyse this important area of labour market statistics with a degree of confidence. The analysis is important from a policy perspective, even at a time when the indicators that monitor the failure of the social dialogue process, namely labour disputes figures, are at a historically low level.

Before looking at the indicators, it is worth considering the legislative framework that influences and shapes the social partnership. Such a review will allow an assessment of whether the level of conflict between social partners is because there is the freedom for either party to express themselves, and take what they might consider to be appropriate and legitimate action, or if the absence of any demonstration of the failure of a dialogue is because the balance of power is tipped too heavily in favour of one or other of the parties in the relationship.

The legislative background

The primary legislation concerning the social dialogue derives from the Trade Union and Labour Relations (Consolidation) Act of 1992, though important amendments to the Act were made in the Employment Relations Act of 1999 and, more recently, in the Employment Relations Act 2004. The 1999 Act shifted the balance of power, providing greater protection for workers and their rights of association. Thus, the current framework sees individuals having a statutory right to join a trade union, and a trade union has a statutory right to seek recognition by the employer at an enterprise. This creates an environment where collective bargaining can occur in anticipation of a reduction in damage that poor labour relations can cause, for example, in respect of loss of production and low productivity. In this context, collective bargaining covers negotiation of pay, hours of work and holidays.

In cases where an employer refuses to recognise a union, it has the right to be heard by the Central Arbitration Committee (CAC), which has legal powers to force recognition (and all that comes with it) subject to certain conditions. For the CAC to provide a ruling, the bargaining unit in which the union is seeking recognition must have 21 or more employees, where at least 10 per cent must be members of the union and a majority of employees in the unit must be likely to favour recognition. Additionally, a union must secure a majority of those voting for recognition and at least 40 per cent of the workers in the bargaining unit. Thus, the penetration of unionism is likely to be greater in larger enterprises.

In addition to the right to join a union and for the union to be recognised, legislation also protects employees involved in a strike from dismissal. It also legislates such that union officials may accompany employees at disciplinary or grievance hearings and outlaws discrimination in the workplace on the grounds of union membership. Importantly, the governance arrangements that come with the legislative

framework provide the first of the sources of information on the social dialogue, in the form of administrative information that is required to be provided to, and published by, the Certification Officer. The Certification Officer[2] is responsible for:

- maintaining a list of trade unions and employers' associations
- receiving and scrutinising annual returns from trade unions and employers' associations
- determining complaints concerning trade union elections, certain other ballots and breaches of trade union rules
- ensuring observance of statutory requirements governing mergers between trade unions and between employers' associations
- overseeing the political funds and the finances of trade unions and employers associations
- certifying the independence of trade unions

This statutory duty allows the Certification Officer to produce annual estimates of the number of employers' associations and trade unions, and the number of members of those trade unions. The production of information based on union administrative records dates back to 1892, so the current set continues a long line of reporting. However, as with much administrative information, there are drawbacks, in that the returns are not made with policy analysis or statistical reporting in mind, rather for the statutory purposes that serve the Certification Officer. As a result, the amount of information available is limited, and subject to some degree of error. For example, while the Certification Officer's annual report indicates how many employers' associations and trade unions there are, the number of union members reported may be an overestimate because they historically have included members who may have left the labour market and become economically inactive. Similarly, it is not possible to disaggregate the information by region or industry sector, for example, and so production of estimates of employer association and union density is difficult. Thus, the Certification Officer's information is typically used as a check total against which to quality assure alternative estimates based on statistical surveys.

Before considering those survey sources of estimates, the definitions of a trade union and an employers' association, which apply under law in the UK, will be briefly considered. According to the Trade Union and Labour Relations (Consolidation) Act 1992, a 'trade union' means an organisation (whether temporary or permanent):

- which consists wholly or mainly of workers of one or more descriptions and whose principal purposes include the regulation of relations between workers of that description or those descriptions and employers or employers' associations, or
- which consists wholly or mainly of:
  - constituent or affiliated organisations which fulfil the conditions in the above bullet point (or themselves consist wholly or mainly of constituent or affiliated organisations which fulfil those conditions), or
  - representatives of such constituent or affiliated organisations, and whose principal purposes include the regulation of relations between workers and employers or between workers and employers' associations, or the regulation of relations between its constituent or affiliated organisations.

An 'employers' association' means an organisation (whether temporary or permanent):

- which consists wholly or mainly of employers or individual owners of undertakings of one or more descriptions and whose principal purposes include the regulation of relations between employers of that description or those descriptions and workers or trade unions, or
- which consists wholly or mainly of:
  - constituent or affiliated organisations which fulfil the conditions in the above bullet point or themselves consist wholly or mainly of constituent or affiliated organisations which fulfil those conditions), or
  - representatives of such constituent or affiliated organisations, and whose principal purposes include the regulation of relations between employers and workers or between employers and trade unions, or the regulation of relations between its constituent or affiliated organisations.

These definitions guide the collection of statistics on union membership and employers' associations, while for definitions of strikes, lockouts and associated variables, the International Labour Organisation's (ILO) *Resolution concerning statistics of strikes, lockouts and other action due to labour disputes*, adopted by the Fifteenth International Conference of Labour Statisticians in January 1993, needs to be examined.

Trade union membership statistics

The Department for Business, Enterprise and Regulatory Reform (BERR) (formerly the Department of Trade and Industry (DTI)) is responsible, in conjunction with the Office for National Statistics (ONS), for publishing the trade union National Statistics. As noted above, official government statistics on union membership have been collected regularly for over a century, but today, the primary source of information on union membership is the UK's Labour Force Survey (LFS). In the past, analyses of trade union membership were published by ONS in articles in its journal *Labour Market Trends*, but from 2004 these were replaced by the publication of an annual National Statistics report, the latest of which refers to trade union membership in 2005.[3]

The annual report contains estimates of trade union membership from the LFS for autumn 2005, for both employees and all those who are in employment. Estimates are presented for the number and proportion of people in employment who are trade union members in both the UK and Great Britain, and for employees whose pay and conditions are affected by collective agreements. The report also provides trade union densities by age, sex, ethnicity, income, major occupation, industry, full and part-time employment, sector, nation and region. Additionally, information is provided on collective agreement coverage and trade union presence.

Trade union questions in the Labour Force Survey

A question in the LFS on trade union membership has been asked annually since 1989 of all individuals in employment. Questions on trade union presence and recognition were introduced in 1993 and the question on collective agreements was introduced in 1996. The questions relating to trade union membership were reordered and reworded in 1999; these changes affect

the time series for trade union presence and collective agreements.

The union questions were altered substantially in the 1999 questionnaire. The exact wording and sequence of the questions is shown in **Table 1**.

The following should be noted:

- the question that asks whether any of the people at the respondent's place of work are members of a trade union or staff association is designed to measure trade union presence. Previously, it was asked of all in employment; now it is only asked to those who say that they are not union members
- before 1999 the question on whether the respondent's pay and conditions were directly affected by collective agreements (TUCOV) was only asked where the respondent first identified unions as being present at the workplace (TUPRES), and then whether or not they were recognised (TUREC). This meant that the number of people whose pay and conditions were affected by collective agreement was an underestimate. For this reason the routeing of the question was changed in the 1999 LFS and is now asked of all in employment[4]
- it is possible that some non-sampling error arises in the series of questions on trade unions because of measurement problems. Around a third of the sample responses are from proxy respondents, and the data show that this group is less likely to be union members than those responding on their own behalf
- on the question of coverage of collective agreements, it is known from surveys of employers that only a small proportion of public sector workplaces are not covered, and that these arrangements are generally made at head office level or across many organisations. It is therefore likely that employees who are not union members and who work in small workplaces in the public sector may be unaware that collective bargaining arrangements apply to their organisation. Consequently there may be a downward bias to this measure

Thus, by combining information collected through these questions, the LFS provides a rich source of information on union membership, collective agreements, trade union presence and union density. As well as the demographic characteristics of the union members, it is possible to analyse the information according to the nature of the employers' business, the length of service of the employee, their earnings, and whether there is a premium accruing to them either as a consequence of their union membership or because of the presence of collective bargaining at the workplace.

The Workplace Employment Relations Survey (WERS)

The second source of information on union membership, density and collective agreements is the Workplace Employment Relations Survey (WERS). This survey has been conducted five times, beginning in 1980 and subsequently in 1984, 1990, 1998 and, most recently, in 2004. The survey provides a nationally representative account of the state of employment relations and working life inside British workplaces. The survey is jointly sponsored by BERR the Advisory, Conciliation and Arbitration Service, the Economic and Social Research Council and the Policy Studies Institute.

In keeping with its predecessors, WERS 2004 contained both a cross-section and a panel element.

Table 1
Structure of trade union questions in the Labour Force Survey

Previous union questions	Current union questions
All in employment: TUPRES At your place of work, are there any unions, staff associations or groups of unions?	All in employment: UNION Are you a member of a trade union or staff association?
If yes: TUREC Is it/are any of them recognised by management for negotiating pay and conditions of employment?	If no: TUPRES Are any of the people at your place of work members of a trade union or staff association?
If yes: TUCOV Are your pay and conditions of employment directly affected by agreements between your employer and any trade union(s) or staff association?	All in employment: TUCOV Are your pay and conditions of employment affected by agreements between your employer and any trade union(s) or staff association?
All in employment: UNION Are you a member of a trade union or staff association?	

Source: Office for National Statistics

The cross-section survey contained the following components:

- a face-to-face interview with the senior manager who has responsibility for employment relations or personnel issues (average duration: 110 minutes)
- a four-page, self-completion questionnaire on the financial performance of the establishment over the past 12 months
- a face-to-face interview with a trade union representative and a non-union employee representative, where present (average duration: 45 minutes), and
- an eight-page, self-completion questionnaire distributed to a random selection of up to 25 employees at each workplace

The panel survey (covering 1998 to 2004) returned to a random selection of workplaces that participated in the 1998 cross-section survey. A face-to-face interview was conducted with a main management respondent, with the specific intention of identifying change since 1998. Around 1,000 establishments took part in the Panel survey.

For the 2004 survey, face-to-face interviews were conducted with around 3,200 managers and almost 1,000 worker representatives. Over 20,000 employees completed and returned a self-completion questionnaire.

WERS has documented and comprehensively monitored the state of employment relations in workplaces in Britain over the past two decades. The survey design has remained consistent in parts throughout the series, in order to generate data that are comparable across the period 1980 to 2004, though equally it has responded to changing interests in the employment relations' arena by adding new areas of enquiry and reducing other areas in scope. In particular, the 1998 survey underwent substantial redesign and marked the move away from detailed questioning on union organisation and collective bargaining and towards a greater focus on the management of employees.

WERS 2004 collected data on the membership of trade unions or independent staff associations from two sources. The survey of employees provides a first-hand account of whether each employee is a union member, while the cross-section survey of managers provides the manager's estimate of the number of union members within each sampled workplace. The findings from the latest

WERS provide an up-to-date account of the state of employment relations in Britain, together with information on changes that have occurred in workplaces since the last survey was conducted.

The design and conduct of the survey

While WERS underwent significant redesign in 1998 due to changes in the world of work, the sponsors considered that further major revisions to both the structure and content of the 2004 survey were not necessary. Further, the need for continuity in design and content were considered to be important, particularly given the strong interest in assessing the nature and extent of change since the last survey was conducted. Nonetheless, a consultation exercise with various user groups (policy makers, practitioners, think-tanks, academic researchers) suggested the need for change in a number of key areas and these are reflected in the final survey design and survey instruments.

Survey content

The various parts of the survey cover different aspects of social dialogue. In broad terms, the management survey covered areas such as trust, business strategy and computer use. The survey of employees included questions on wellbeing, trust and computer use as well as questions on job satisfaction, work-life balance and consultation. The following lists show the extent of the areas covered in the survey:

The cross-section management interview in WERS 2004 contains questions on:

- recruitment and training
- consultation and communication
- employee representation
- payment systems
- grievance and discipline
- equal opportunities
- work-life balance
- health and safety
- flexibility and performance

The cross-section interview with employee representatives contains questions on:

- structure of representation at the workplace
- time spent on representative duties
- means of communication with employees
- incidence of negotiation and consultation over pay and other matters
- involvement in redundancies, discipline and grievance matters
- incidence of collective disputes and industrial action
- relations with managers
- union recruitment

The cross-section questionnaire for employees contains questions on:

- working hours
- job influence
- job satisfaction
- working arrangements
- training and skills
- information and consultation
- employee representation
- pay

Coverage

An important innovation in WERS 2004 was the greater coverage of small workplaces, with funding from the Small Business Service enabling workplaces that employed between five and nine employees to be included in the cross-section survey for the first time. Their inclusion expands the scope of the survey so that it covers 700,000 workplaces (37 per cent of all workplaces in Britain) and 22.5 million employees (91 per cent of all employees in employment). The survey population is all British workplaces with five or more employees, excluding those within the following sections of the Standard Industrial Classification (2003): A (agriculture, hunting and forestry); B (fishing); C (mining and quarrying); P (private households with employed persons); and Q (extra-territorial organisations and bodies). The sample for the cross-section was drawn from the ONS Inter-Departmental Business Register. In addition to the industry exclusions, workplaces that took part in the 1998 WERS were also excluded to avoid duplication in sample selection between the cross-section and the panel.

The majority of these workplaces are small: some 76 per cent have fewer than 25 employees. Yet while they are numerous, small workplaces – which might include workshops, small retail outlets, restaurants or surgeries – account for only a quarter of all employees in employment. The majority of jobs are located in larger workplaces, such as hospitals, manufacturing plants or local government offices. Indeed, workplaces with 500 or more employees account for only 1 per cent of workplaces but 20 per cent of all employees.

Survey structure

The survey contained both a cross-section and a panel element. For the purposes of the survey, a workplace was defined as comprising 'the activities of a single employer at a single set of premises'. Branches of a high street bank, a head office or a factory are thus workplaces in their own right. The main element of the cross-section was an interview with the senior manager responsible for employment relations on a day-to-day basis at the workplace (the 'cross-section survey of managers'). Most interviews with managers (86 per cent) took place on site, with the remainder being conducted elsewhere, typically at the head office. The manager was a designated personnel specialist in 28 per cent of workplaces where interviews were conducted on site.

There were three further elements to the cross-section survey. First, a short self-completion questionnaire was distributed to a random selection of (up to) 25 employees (the 'survey of employees'). Second, interviews were conducted with both a union and non-union representative at the workplace, where present (the 'survey of employee representatives'). This meant that, in some workplaces, two interviews were conducted with employee representatives. It represented a departure from previous surveys where a single interview took place with an employee representative, and where preference was given to interviewing union representatives in workplaces where both a union and a non-union employee representative were present.

Third, a new self-completion questionnaire designed to collect quantitative data about the financial performance of the workplace (the 'financial performance questionnaire'), was adopted. The 1998 to 2004 panel survey was conducted in a random sub-sample of workplaces that had participated in the 1998 survey, had continued to be in operation throughout the six-year period, and had employed at least ten employees ('continuing workplaces'). In these workplaces, a single interview was conducted with the manager. The panel element of WERS is integral to understanding change. Combining data from the 1998 and 2004 cross-section surveys of managers together with data from the panel survey allows an assessment of how much change is due to alterations in the composition of the population of

workplaces – for example, the move away from manufacturing towards service sector workplaces – and how much is due to changes in the behaviour of continuing workplaces.

Data availability

The survey data are publicly available for secondary analysis for bona fide research purposes from the UK Data Archive, based at the University of Essex. The previous surveys in the WERS series are also available from the Archive at www.data-archive.ac.uk/

The Annual Survey of Hours and Earnings (ASHE)

The next source considered is the ONS annual structural survey of earnings and hours of work. While the Annual Survey of Hours and Earnings (ASHE) is, as its name suggests, primarily designed to provide statistics on earnings and hours of work, it also includes a question on the collective agreement arrangements in workplaces. The ASHE survey is relatively new, replacing its predecessor the New Earnings Survey (NES) in 2004. ASHE asks employers to indicate whether an employee's pay was set with reference to an agreement affecting more than one employee, for example, where it is agreed collectively by a trade union or worker's committee. Where it is, the employer is asked to indicate the nature of the agreement. These are categorised as:

- national or industry agreement
- subnational agreement
- organisational agreement
- workplace agreement
- national or industry supplemented by a subnational, organisational or workplace agreement

ASHE is based on a random 1 per cent sample of employees in employment and, as well as collective agreements, captures information, or is linked with administrative data, on the employee and the workplace. Thus, it is possible to analyse the collective agreement data in conjunction with pay, hours of work, gender, age, location, occupation, industry, size of enterprise and length of service

However, the limitation of information to broadbrush categories set out in the bullet points above means that some users' needs are no longer being met. This is because the NES provided information on employees who were covered by specific collective agreements, which were used by both parties in the social dialogue when negotiating new pay rates. **Table 2** give examples of the type of collective agreements where information was previously available, but where it no longer is.

Table 2
Collective agreements where information is no longer available

National Health Service	Hospital doctors and dentists
	Other doctors and dentists
	Administration and clerical staff Whitley Council
	Nurses and midwifery staff
	Ancillary staff Whitley Council
	Maintenance staff
	Professional and technical staff A Whitley Council
	Professional and technical staff B Whitley Council
	Ambulancemen Whitley Council
Universities (old and new)	Academic and academic-related staff (old)
	Clinical academic staff (old)
	Lecturers (new)
	Clerical staff (old)
	Computer operators (old)
	Technical staff (old)
	Administrative, professional, technical and clerical staff (new)
	Manual staff (old)
	Manual staff (new)
Police and fire services	Police service – ranks below sergeant only
	Fire service – operational ranks below leading fire officer
	Fire service – operational ranks from leading fire officers and above
	Fire service – control room and non-operational staff

In response to continuing interest in these and other agreements categories, in particular from public sector pay review bodies, ONS has undertaken work to attempt to model the categories using other classification variables available in ASHE. A methodology that relies on a pragmatic approach has been developed, which produces results close to figures originally published in NES. However, some of the original agreements have not been able to be modelled or have been combined with other agreements to produce a new category.

Initially, the work involved identifying employees who had been allocated to specific collective agreements in the past and their characteristics used to define the models for allocating people in the current data sets. However, when the estimates were produced, there were concerns that the results were significantly different from the historic figures for these series. Some of the levels were very different and the number of jobs allocated to individual collective agreements was sometimes many times higher than the existing information.

The problem with the initial method was that it included everyone with similar characteristics to any individual who had previously been allocated to a category. For example, if a retail assistant had been miscoded to the teaching collective agreement, all retail assistants with pay set by a collective agreement would now be included in the wrong category. As a result, an alternative approach was adopted, using a more pragmatic method to define the collective agreement groupings. While still being informed by historical information, the key factor for the revised approach was to define the collective agreement group from the descriptions and categories of the various classifications. As an example, a teaching collective agreement would generally include those individuals in

teaching occupations and the education industry with pay set by a collective agreement. Although most of the NES categories could be modelled in this way, there were some that proved problematic. For example, it was not possible to distinguish between similar occupations within 'old' and 'new' universities. This work is ongoing within ONS and is likely to lead to publication in the shape of provisional estimates for user comment in the near future. It is expected that the generation of more specific information on collective agreements for individual occupational or industry groups will improve the usefulness of these statistics.

Statistics on strikes and lockouts

The final area that is considered relates to the ILO Resolution concerning statistics of strikes, lockouts and other action due to labour disputes, adopted by the Fifteenth International Conference of Labour Statisticians held in Geneva in 1993. The UK has a very long history in respect of collecting information on labour disputes: indeed it is able to produce a series that stretches back over 100 years, with a reasonably consistent methodology underpinning the estimates over the length of the period. Analyses of the statistics are published in annual articles that look at the state of the social dialogue in the UK, and separately in an international comparisons article, again produced each year. The international comparisons article draws heavily on information published by the ILO and the Organisation for Economic Co-operation and Development. The following section looks at various aspects of the statistics and then goes on to compare the UK approach with that set out in the ILO resolution.

Coverage

Information about labour disputes in the UK is collected by ONS from a number of sources. Certain major industries and public bodies provide regular centralised returns, but more often the information is collected directly from the employer or trade union involved after ONS has been notified of a dispute or has identified one from press reports. Until September 1996, the Employment Service local office network collected this information on behalf of ONS. ONS publishes figures on labour disputes each month. They appear in the Labour Market Statistics First Release and are published in Tables 6.29 and 6.30 of the online tables section of *Economic & Labour Market Review*.

Definition of stoppages

The statistics cover stoppages of work in progress in the UK during a year caused by labour disputes between employers and workers, or between workers and other workers, connected with terms and conditions of employment. A distinction can be drawn between stoppages that started in the current year and those that started in earlier years.

The statistics exclude disputes that do not result in a stoppage of work, for example, work-to-rules and go-slows; this is because their effects are not quantifiable to any degree of certainty. Stoppages involving fewer than ten workers or lasting less than one day are also excluded, unless the total number of working days lost in the dispute is 100 or more.

Stoppages over issues not directly linked to terms and conditions between workers and employers are omitted, although in most years these are not significant. For example, in 1986, one stoppage was considered to be political (a protest in the coal industry against the visit of an MP) and it was excluded from the figures. The total working days lost amounted to less than 1,000. The next known dispute to be excluded was in 1991. This involved a boycott by self-employed market traders who, after increased rent and changes to the market rules, kept their stalls closed for about 20 weeks.

The statistics include 'lockouts', where employers prevent their employees from working by refusing entry to the place of work, and 'unlawful', that is, unlawfully organised strikes. However, no distinction is made between a 'strike' and a 'lockout' or between 'lawful' and 'unlawful' stoppages. This is principally because of the practical difficulty in deciding which category a particular stoppage falls into. It was for similar reasons that a distinction between 'official' and 'unofficial' disputes was no longer made after 1981.

Working days lost

Working days lost are defined as the number of days not worked by people involved in a dispute at their place of work. In measuring the number of working days lost, account is taken only of the time lost in the basic working week. Overtime work is excluded, as is weekend working where it is not a regular practice. Where an establishment is open every day, and runs two or more shifts, the statistics will record the number of working days lost for each shift. In recording the number of days lost, allowance is made for public and known annual holidays, such as factory fortnights, occurring within the strike's duration. No allowance is made for absence from work for such reasons as sickness and unauthorised leave. To allow the data to be seen in context, the estimates are also calculated as rates of days lost per 1,000 workers; this approach facilitates the international comparisons referred to above.

Where strikes last less than the basic working day, the hours lost are converted to full-day equivalents. Similarly, days lost by part-time workers are converted to full-day equivalents. The number of working days lost in a stoppage reflects the actual number of workers involved at each point in the stoppage. This is generally less than the total derived by multiplying the duration of the stoppage by the total number of workers involved at any time during the stoppage, because some workers would not have been involved throughout.

In disputes where employers dismiss their employees and subsequently reinstate them, the working days lost figure includes those days lost by workers during the period of dismissal.

For disputes where employers dismiss their employees and replace them with another workforce, the statistics cannot assume that working days lost by the sacked workers continue indefinitely. In such cases, the statistics measure the number of days lost in terms of the size of the replacement workforce. For example, where an employer initially recruits 100 workers and wishes to build up to 300, the number of working days lost on day one will be 200 and will then progressively reduce on subsequent days, eventually to zero when the new workforce reaches the target of 300.

Number of stoppages

There are difficulties in ensuring complete recording of stoppages, in particular for short disputes lasting only a day or so, or involving only a few workers. Because of this recording difficulty and the cut-off applied, the number of working days lost is considered to be a better indicator of the impact of labour disputes than the number of recorded stoppages.

Workers involved

The figures for workers involved are for workers both directly and indirectly involved at the establishment where the dispute occurred. Workers indirectly involved are those who are not themselves parties to the dispute but are laid off because of the dispute. However, the statistics exclude workers at other sites who

are indirectly affected (because of a shortage of material from a supplier who is in dispute, for example). This is partly because of the difficulty in deciding to what extent a particular firm's production problems are due to the effects of a strike elsewhere or some other cause. Workers involved in more than one stoppage during the year are counted in the statistics for each stoppage in which they take part. Part-time workers are counted as whole units.

The statistics try to record the number of workers who are involved at any time in the stoppage. For example, consider a three-day strike where there were 200 workers involved on the first day; 300 on the second day, of whom 100 were involved for the first time; and 200 on the third day, of whom 50 were involved for the first time. The total number of workers involved in the dispute is 350 – the sum of all those involved on the first day, and those joining for the first time on subsequent days. However, the number of workers taking strike action for the first time during a dispute cannot always be ascertained easily. In such cases, the statistics record the highest number involved at any one time (300 in the above example). Take another example, where there are 200 workers involved in a stoppage on each of days one, two and three. It may be necessary to assume that there were a total of 200 workers involved, although it is possible, but unlikely, that as many as 600 workers could have been involved. For this reason, the statistics may underestimate the number of workers involved in a dispute. However, the estimate of the number of working days lost is unaffected by this consideration.

Comparisons with the methods recommended by the ILO Resolution

The UK's statistics on strikes and lockouts conform fairly well to the definitions set out in the ILO Resolution, but the main differences in the methodologies are set out below (with the paragraph numbers relating to the ILO Resolution):

- 8. The statistics should cover all employees directly involved. If possible, employees indirectly involved should also be covered, and the data relating to them should be collected and presented separately. Where relevant to national circumstances and practices, self-employed workers directly involved in action due to labour disputes could also be covered, and the data relating to them collected and presented separately

  ONS does not include self-employed staff in its figures, but otherwise complies with the definition.

- 11. Where possible, the data should be collected, compiled and presented separately with respect to strikes and to lockouts. Where relevant, the corresponding data could also be compiled and presented separately for each of the other forms of action

  ONS counts strikes and lockouts as the same thing, it does not count them separately.

- 13. The criterion used to identify a single strike or a single lockout should be the labour dispute in question. Therefore, the following should be counted as one strike or one lockout: c) temporary work stoppages, due to one labour dispute, occurring among employees in one establishment at a different time, or, where relevant, among one group of self-employed workers at different times, in which the period between stoppages is not more than two months

  If a strike continues for continuous months then it is counted as one strike. However, if a strike occurs in, say, January then in March (with no strike action in February), it will be counted as two separate strikes.

- 24 b (7) Disputes not arising from collective bargaining: protest (such as the expression of grievance with respect to a government policy or decision affecting conditions of work)

  This is not a reason used by ONS, although all other reasons listed under 24b of the ILO resolution are. Also, ONS does not collect data for political strikes.

Conclusion

The UK has an extensive range of sources that yield information on the state of the social dialogue in the UK. These include long established surveys conducted on consistent bases, both over time and in accordance with international guidelines. The surveys are supplemented with data from administrative systems provided by the legislative framework within which the social dialogue sits. The surveys cover both households and businesses, and collect information from employers and employees, including worker representatives. The range of variables is wide and allows analyses of the characteristics of the employee, the workplace and the state of employee relations. The statistics, which continue to be developed and improved, are seen to be important indicators that are widely used in developing or monitoring labour market policies.

Notes

1 Defined by the International Labour organisation to include all types of negotiation, consultation or simply exchange of information between, or among, representatives of governments, employers and workers, on issues of common interest relating to economic and social policy.

2 See www.certoffice.org/pages/index.cfm?pageID=home for more information on the role of the Certification Officer.

3 See www.dti.gov.uk/files/file25737.pdf

4 Because of this change, users of the survey results over time must be aware that data derived from the TUCOV variable in the 1999 data set are not directly comparable with those of previous years due to the change in the question's coverage.

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FEATURE

A preliminary analysis of the differences between AWE and the AEI

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SUMMARY

This article presents the preliminary results of the AEI/AWE reconciliation project, a project which seeks to reconcile the movements in the two main measures of short-term earnings growth – the Average Earnings Index (AEI) and Average Weekly Earnings (AWE).

The article sets out the background to the project, describes the two measures and explains the main differences between them. It then presents the preliminary results of the reconciliation project. Each of the main methodological differences between the two measures is shown to contribute significantly to the differences between the two series. The article concludes by discussing which of the two measures might be better and then summarises the work that is in hand to move AWE to National Statistic status.

This article presents the preliminary results of an ongoing project on the reconciliation of the two main measures of short-term earnings growth – the current National Statistic, the Average Earnings Index (AEI) and the experimental series Average Weekly Earnings (AWE). This work will be of interest to users as it should help to improve understanding of the reasons for the differences between the two series as well as provide guidance on which of the two measures is the more appropriate to use.

The article is an updated version of the one under the same title released on the National Statistics website on 25 July 2007. It has been updated to incorporate two months' additional data in the analysis; the opportunity has also been taken to update some of the text. The work is, however, still ongoing. It is currently being reviewed and updated, with the aim of:

- providing further quality assurance
- extending the period of the analysis
- incorporating additional factors or providing further breakdowns of the existing factors
- assessing how sensitive the results are to the order in which the reconciliation is conducted

For this reason, it is important to treat the data accompanying this article as provisional and subject to change as the project progresses.

Background

There are two main measures of short-term earnings growth, the AEI and AWE. The AEI is the current National Statistic, published each month in the integrated Labour Market First Release. AWE is an experimental series published on the web one week after the AEI. It is important to emphasise that there are conceptual differences between the AEI and AWE – they are measuring different things. AWE was developed to meet one of the recommendations of the Turnbull-King review:

> 'The Office for National Statistics (ONS) should investigate the production of an index which reflects more closely movements in true average earnings.'

This recommendation arose from the fact that the AEI is not an index of true average earnings in the sense that it is calculated using fixed employment weights when aggregating the average wage for each industry. In contrast, in AWE, the weights are recalculated each month, allowing the measure to capture the changing industrial structure of employment.

Both the AEI and AWE use the same data source, the Monthly Wages and Salaries Survey (MWSS). The AEI is a measure of the growth in average earnings, derived by calculating the growth in the weighted average pay for businesses responding to the survey in successive months (the

'matched' sample). AWE, on the other hand, is a measure of the level of average earnings, derived by separately weighting the earnings and employment data for the sampled businesses in each month and then calculating the ratio. The growth in AWE can, of course, be calculated and compared with the growth in the AEI. The two formulae for the growths are presented in the Appendix in **Figure A1** and **Figure A2**.

AWE was launched as an experimental series in August 2005. An accompanying article (see www.statistics.gov.uk/cci/article.asp?id=1182) sets out the background to its development and describes the main differences (both conceptual and methodological) between AWE and the AEI. The article also describes the further work needed to move AWE to National Statistic status. In particular, although the estimation method used for total earnings and total employment in AWE is described in the article as better than that used in the AEI, it was recognised that further development work was needed in a number of areas, including on imputation and the treatment of outliers.

Table A1 in the Appendix describes the main differences between the two series. As a preliminary to the later discussion on the results of the reconciliation project, it is useful to say a little more about some of these differences:

- *weighting* – this is the conceptual difference described above. AWE uses industry employment weights relating to the reference month, whereas the AEI uses industry employment weights fixed at the previous July. This means that changes in the relative sizes of industries from month to month, changing the composition of employment between industries, can affect the AWE growth rate but they do not affect the AEI. Thus, for example, if the proportion of employees in retail (a low-paid sector) increases, then AWE growth will fall, even if there is no change in pay rates. The AEI, however, will not be affected
- e*stimation* – the two series are based on different types of estimator: the AEI is based on matched pairs, only using those businesses that have responded to successive months, while AWE uses all the data returned each month and 'grosses up' using a standard ratio estimator based on information on the Inter-Departmental Business Register (IDBR). Also, the estimation formulae are different and will give rise to a difference between the two series even when all the other differences – including the conceptual differences – are removed. In other contexts (for example, the RPI/CPI reconciliation), this type of difference is often described as a formula effect. The differences between the two formulae can be seen by examining Figures A1 and A2 – the AEI is effectively a 'number raised' estimator via the grossing factor g while AWE uses the employment data on the IDBR
- *imputation* – the term 'imputation' is often used to denote the process for estimating for non-response. There is very little imputation in the AEI – the unmatched part of the sample (and the non-sampled part of the population) is implicitly estimated for using the information in the matched sample. In AWE, the unmatched part of the sample is directly used where there is a response, and imputed for where there is not a response by carrying forward previous information for the businesses in question. This increases the effective sample size used in AWE
- *outliers* – in general, a business will be treated as an 'outlier' if it is very different (that is, behaves in a different way) to other businesses in the same industry and/or size-band. Businesses which are outliers are given a reduced weight in the estimation. The outlier procedures used in the AEI and AWE are different – the AEI procedures are based on the impact on growth while the AWE procedures are based on levels. In general, the current 'gates' used in the two series mean that the AEI tends to treat more businesses as outliers than AWE. The AEI also tends to treat more of the data as atypical – if a contributor is an outlier in the AEI, all its data are treated as atypical while AWE uses separate procedures for regular pay and bonuses
- *small businesses* – businesses with fewer than 20 employees are not covered in the MWSS, the survey underpinning both the AEI and AWE. Small businesses are estimated for in AWE by making use of the data for larger businesses and the information from the Annual Survey of Hours and Earnings (ASHE). In contrast, smaller businesses are excluded from the calculation of the average pay in the AEI, although they are included in the industry weights.

Figure 1
Comparison of whole economy AEI and AWE, including bonuses and arrears

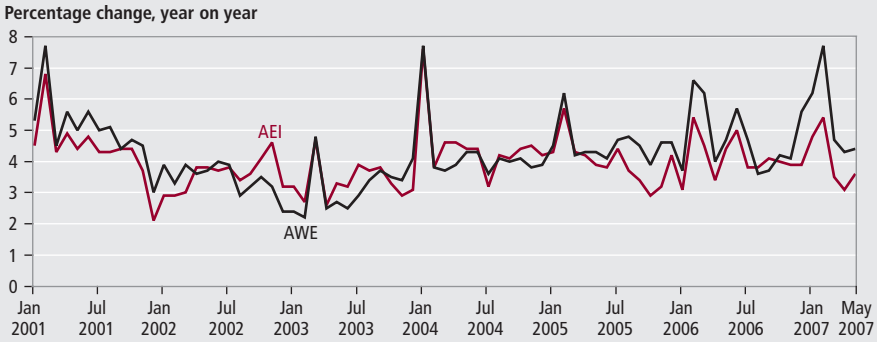
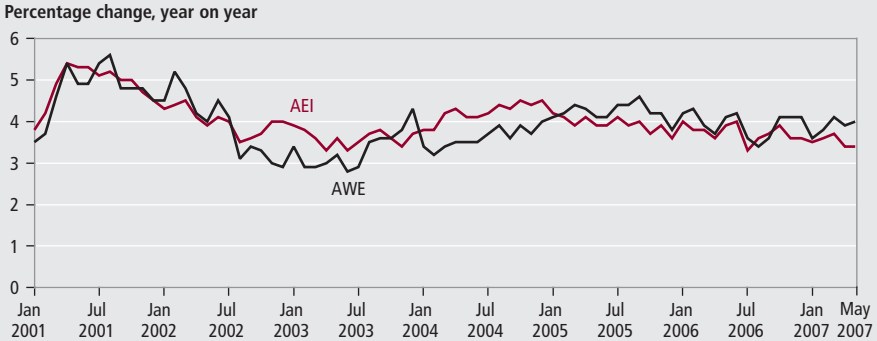


Figure 2
Comparison of whole economy AEI and AWE, excluding bonuses and arrears



These differences – both conceptual and methodological – lead to differences between the two series. **Figure 1** and **Figure 2** compare 12-month growth rates for both series for the period January 2001 to May 2007 – for both the including and excluding bonuses and arrears series (note that the data here – and indeed all the data presented in the article – are not seasonally adjusted).

It is worth noting that, for each series, successive 12-month growth rates tend to be similar because they share a period of common inflation during the intervening 11 months. As a consequence, the expectation is to see relatively long periods during which AWE growth rates are consistently greater or less than those for the AEI. It is therefore more sensible to consider those periods of consistent differences as a whole rather than paying excessive attention to individual months. On this basis, analysis of the charts may be condensed to consideration of three main periods (as opposed to 77 individual months):

- January 2001 to September 2002 – AWE growth rates are usually greater than or similar to those for the AEI
- October 2002 to December 2004 – AWE growth rates are usually less than or similar to those for the AEI
- January 2005 to May 2007 – AWE growth rates are usually greater than or similar to those for the AEI

Looking at Figure 1, AWE growth is seen to be higher than AEI growth through much of 2005 and early 2006, with quite notable differences emerging in the most recent months. Differences in Figure 2 tend to be smaller, although here, too, AWE growth is currently stronger than the AEI.

At the time of the launch of AWE, comparisons were only available up to April 2005. The differences between the series including bonuses and arrears were, in general, lower then and analysis at the time suggested that the conceptual differences between the two provided a good explanation for the differences, or most of the differences. However, during the latter half of 2005 and the first half of 2006, the differences grew in significance and the conceptual differences often moved in a different direction, so that after putting the two series on the same conceptual basis, the differences were even higher than suggested by the original data.

The growing concern over the size of the real differences between the two series provides the background to the need for the reconciliation project. The project has also been seen as an important part of the work needed in order to move AWE to National Statistic status.

The conceptual difference between AWE and the AEI

As noted above, there is an important conceptual difference between AWE and the AEI. They are measuring different things. Changes in AWE reflect changes in wage rates as well as changes in the composition of employment, both within and between industries. The AEI, because it uses fixed industry employment weights, does not capture changes in the composition of employment between industries.

However, one of the features of AWE is the ability to decompose the growth rates into two separate series, one measuring the pure earnings effect, the other measuring the effect of changing employment. The two decomposed series have been available since the launch of AWE and are published each month at the same time.

Figure 3 and **Figure 4** compare the AEI and AWE with the decomposed AWE series measuring the pure earnings effect. The differences between the AEI and AWE during much of 2002 and 2003 are seen to be partly or largely explained by the composition effect. During this period, decomposed AWE is seen to be growing at a stronger rate than AWE and closer to the AEI. This means that during this period the employment estimates from AWE are generally increasing in lower-paid industries such as retail and education and decreasing in higher-paid industries such as financial intermediation.

More recently, the graphs show that the composition effect tends to add to the size of the differences between the two series since early 2005. During this period, decomposed AWE continues to grow more strongly than AWE but the AEI is actually growing less strongly than AWE.

The reconciliation project

The aim of the reconciliation project is to quantify the contribution of each of the main differences between the AEI and AWE. There are a number of possible

Figure 3
Comparison of whole economy AEI, AWE and AWE decomposed, including bonuses and arrears

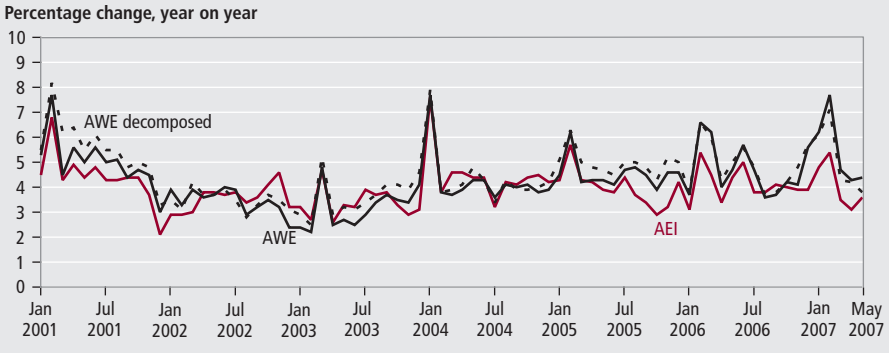
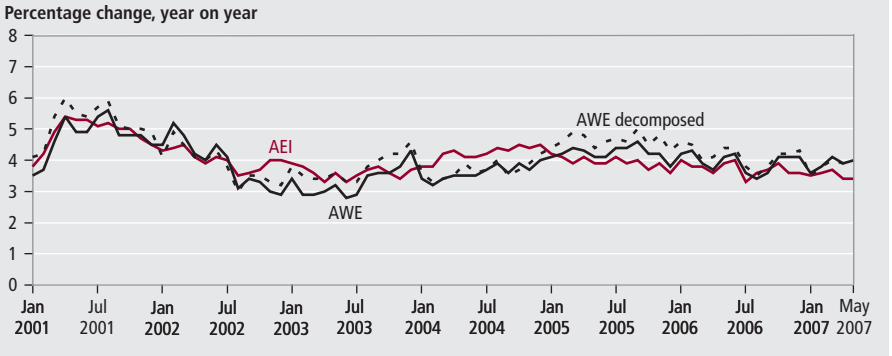


Figure 4
Comparison of whole economy AEI, AWE and AWE decomposed, excluding bonuses and arrears



approaches, but the most sensible seemed to be a staged approach, either starting with AWE and moving in stages towards the AEI or starting with the AEI and moving towards AWE. This ensures that the separate factors are quantified independently, although it is recognised that the sizes of the effects may be sensitive to the order in which they are considered.

The reconciliation started with AWE and moved in stages towards the AEI. In the first stage, the two samples were put on the same basis by reproducing AWE using only the data for the matched contributors used in the AEI. A comparison of this alternative version of AWE with real AWE then shows the combined effect of the additional sample used in AWE and the adjustment for smaller businesses. These two parts were separately quantified at a later stage by recalculating AWE excluding this adjustment.

In the second stage of the analysis, AWE outlier procedures in the alternative version of AWE were replaced with the AEI procedures. A comparison of these two series – one using AWE outliers and the other AEI outliers – then shows the contribution of the effect of different outlier procedures.

The third main stage involved comparing the series using AEI outliers with the AEI. Differences between these two series show the impact of the formula effect, as well as any residual differences that might be present because of unidentified differences or errors or omissions in the identified differences. Note that the residual will include any remaining differences with the smaller businesses – the effect of including them in the industry weights in the AEI. It will also implicitly include a component due to composition effects.

The results of the analysis are presented in the Appendix in **Table A2** and **Table A3**, the first covering the including bonuses and arrears comparison, the second the excluding bonuses and arrears comparison. The results are also presented graphically in **Figure A3** and **Figure A4** – Figure A3 shows the differences alone while Figure A4 also shows the AEI and AWE on the same scale. Tables A2 and A3 present AWE and AEI growth rates in the first and final columns. Between them are columns showing the contributions of all the factors discussed above to the stage-by-stage transformation from AWE to the AEI. The penultimate column contains the cumulative effect of these contributions (that is, AEI growth rates less AWE growth rates). Note that the composition effect has been presented at the start of the comparison and the residual component mentioned above has been adjusted accordingly. The composition effect presented here is the effect published each month in the supplementary tables accompanying AWE; this may be something of an approximation in this context as the effect implicitly left in the residual above is not quite the same thing. This approximation will be addressed in the next update of the work.

The results show for this particular time period (January 2005 to May 2007) that when moving from AWE to the AEI:

- overall there is generally a reduction in growth (because the AEI is lower than AWE)
- as noted earlier, the employment decomposition effect is generally positive
- each of the methodological differences – the matched pairs effect, outliers, small businesses and the formula and residual – can contribute significantly to the differences
- in general, removing the additional sample from AWE tends to reduce growth (as shown in the heading titled 'matched pairs')
- the outlier effect (replacing the AWE system with the AEI system) generally causes an increase for the series excluding bonuses, but is more mixed for the series including bonuses (and as one would expect the size of the effect for the latter is more marked, particularly for January and February 2007)
- the effect of excluding small businesses from AWE has a more mixed effect, although the size of this is relatively small especially for the series excluding bonuses
- the remaining difference (the formula effect and any residual) generally tends to reduce growth

It should be emphasised that this is a relatively short time period to interpret. Although there are 29 months, runs in the data would be expected because growth rates in successive months are highly correlated. Further, the differences in statistical terms could be viewed as modest – for example, when judged against the confidence intervals for the AEI which are ± 0.7 per cent for annual growth rates excluding bonuses and arrears and ± 2.3 per cent for the rates including bonuses and arrears.

Which is better – the AEI or AWE?

The reconciliation project shows that much of the difference between the AEI and AWE is explained by differences in estimation methods. An obvious question to ask is which of the two measures is using the better estimation method for growth rates.

One way of answering this question is to compare direct measures of the accuracy of the AEI and AWE. Measures of sampling variability for the AEI are published in the monthly Labour Market First Release. For recent periods, the magnitude of the confidence intervals for 12-month growth rates are ± 0.7 per cent for the series excluding bonuses and arrears and ± 2.3 per cent for the series including bonuses and arrears. Unfortunately, measures of sampling variability are not yet available for AWE. However, it is worth noting that the observed differences between AEI and AWE growth rates are within the range of sampling variability anticipated for the AEI.

Another way of assessing the relative quality of the two series is to compare them against the earnings data used in the National Accounts, which are based on HM Revenue & Customs data for historical periods (the AEI data are currently used for more recent periods). The results of this comparison are inconclusive and further work is needed here.

With no direct comparison of accuracy available, the methodological differences relating to each of the stages in the reconciliation tables are considered instead:

- *matched pairs* – the AEI uses a matched pairs sample in order to avoid the additional variability caused by having different businesses in the samples for different months, although this reduces the sample size and may lead to bias if there are systematic differences between the included and excluded businesses. AWE has a larger sample size in each month but this may be offset by the month-to-month volatility caused by changes to the sample of businesses. The accuracy of growth rates also depends on the accuracy of the imputation method used in AWE, which could be biased as it simply carries forward the previous pay for up to five months
- *outliers* – the picture here favours the AEI. The AEI method directly addresses outliers in terms of growth, thus ensuring more stable estimated growth rates. Conversely, the AWE

method is based on levels, not growth. It is clear that the existing AWE method needs to be improved, as experience has shown that the results can be susceptible to large revisions following late returns to the survey (AWE for December 2006 were revised upwards significantly during the January 2007 round as the result of a late return leading to one contributor changing its outlier status). It is possible that the AWE method needs some modification to make it less volatile

- *small businesses* – in principle, AWE should be more accurate as it allows for differences between smaller and larger businesses in the level of average earnings. The AEI merely assumes that growth rates for smaller businesses are the same as those for large businesses. As with the AWE imputation method, however, this advantage depends on the accuracy of the method used and there is little evidence on which to base any conclusions
- *formula* – in principle, AWE uses a more accurate estimator for levels of average earnings and, for earnings levels, should be better than the AEI, but this advantage may be less important for growth rates.

The imputation and outlier procedures are currently being reviewed as part of the work needed to move AWE to National Statistic status. This work may throw more light on the quality of the existing methods used in both AWE and the AEI.

Moving AWE to National Statistic status

The article accompanying the launch of AWE as an experimental series set out five main areas where additional work or development was needed in order to move the series to National Statistic status:

- *seasonal adjustment* – a seasonally adjusted AWE series has since been developed and is released every month alongside AWE
- *outliers* – the use of the Winsorisation technique is currently being examined
- *sampling variation* – estimates of sampling variability are currently being developed
- *imputation* – work on imputing regular pay has been completed; work on imputing bonuses is underway
- *re-engineering of the IDBR* – at the time of the article it was felt that AWE might remain experimental until the re-engineering of the IDBR was completed

Given sufficient progress in the first four areas above and given the other development work that is in hand – for example, the reconciliation with the AEI and the work that has been done on AWE revisions – there does not seem to be a good reason to allow the delays in re-engineering to unduly delay the move of AWE to National Statistic status.

The article also noted the planned development work concerning the needs of the National Accounts. Although not discussed in the current article, this work is also in hand.

Next steps

The analysis presented in this article is currently being quality assured. It is also being extended, by increasing the timescale of the analysis, by adding to the detail (adding additional factors) and by assessing the sensitivity of the results. Extending the analysis may raise issues with the work that has been done. ONS plans to update this article by the end of 2007; in the meantime, the analysis should be regarded as highly provisional.

Care also needs to be taken in drawing any conclusions at this stage about the relative quality of the two outputs. As noted above, AWE may be superior because of its greater effective sample size and its more standard methodology, but there may be issues with the precise imputation method being used, and recent experience with the outlier methodology suggests that it may not be sufficiently robust. AWE is still an experimental series and further work is needed before it can be considered a reliable measure of earnings growth.

The need to review the imputation and outlier procedures was noted in the article accompanying the launch of AWE as an experimental series. This work has to a certain extent been delayed while work was devoted to the reconciliation project. It will now progress alongside the further work on reconciliation with a view to moving AWE to National Statistic status by March 2008.

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APPENDIX

Figure A1
AEI formula for growth from month t-1 to t

$$\Delta_t = \frac{R^t}{R^{t-1}} = \frac{\sum_h \sum_g w^t_{hg} R^t_{hg}}{\sum_h \sum_g w^t_{hg} R^{t-1}_{hg}}$$

where

$$R^t_{hg} = \frac{\sum_{i \in S'_{hgt}} y^t_{hgi}}{\sum_{i \in S'_{hgt}} x^t_{hgi}}; \quad R^{t-1}_{hg} = \frac{\sum_{i \in S'_{hgt}} y^{t-1}_{hgi}}{\sum_{i \in S'_{hgt}} x^{t-1}_{hgi}}$$

$$w^t_{hg} = \frac{z^T_h}{Z^T} \times \frac{g^t_{hg} \sum_{i \in S'_{hgt}} x^t_{hgi}}{\sum_g \left(g^t_{hg} \sum_{i \in S'_{hgt}} x^t_{hgi} \right)}$$

$$g^t_{hg} = \frac{N^T_{hg}}{n^t_{hg}}$$

and where

h = industry (two-digit SIC, public/private)

g = size-band (20–99, 100–499, 500–999, 1,000+)

S'_{hgt} = matched pairs sample for industry h and size-band g (returned for *t and t-1*)

y^t_{hgi} = wages and salaries data for firm i (industry h, size-band g, from MWSS form)

x^t_{hgi} = employee data for firm i (industry h, size-band g, from MWSS form)

z^T_h = IDBR employment for industry h at time T (previous July)

Z^T = total IDBR employment for time T (previous July)

n^t_{hg} = number of firms responding to MWSS in industry h and size-band g

N^T_{hg} = number of firms on IDBR in industry h and size-band g at time T (previous July)

Figure A2
AWE formula for growth from month t-1 to t

$$\Delta_t = \frac{R^t}{R^{t-1}}$$

where

$$R^t = \frac{\sum_{h \in H} \left\{ z^t_{h0} A^T_{h0} + \sum_g \left(\frac{1}{f}\right)_{hgt} \sum_{i \in S_{hgt}} x^t_{hgi} \right\} R^t_h}{\sum_{h \in H} \left\{ z^t_{h0} + \sum_g \left(\frac{1}{f}\right)_{hgt} \sum_{i \in S_{hgt}} x^t_{hgi} \right\}}$$

$$R^t_h = \frac{\sum_g \left(\frac{1}{f}\right)_{hgt} \sum_{i \in S_{hgt}} y^t_{hgi}}{\sum_g \left(\frac{1}{f}\right)_{hgt} \sum_{i \in S_{hgt}} x^t_{hgi}}$$

$$\left(\frac{1}{f}\right)_{hgt} = \frac{\sum_{i=1}^{N^t_{hg}} z^t_{hgi}}{\sum_{i \in S_{hgt}} z^t_{hgi}}$$

and where

h = industry (two-digit SIC, public/private)

g = size-band (20–99, 100–499, 500–999, 1000+)

A^T_{h0} = factor for under earnings for firms with fewer than 20 employees (from ASHE in previous year)

S_{hgt} = returns for industry h and size-band g (including imputations)

y^t_{hgi} = wages and salaries data for firm i (industry h, size-band g, from MWSS form)

x^t_{hgi} = employee data for firm i (industry h, size-band g, from MWSS form)

z^t_{h0} = IDBR employment for firms with fewer than 20 employees in industry h

z^t_{hgi} = IDBR employment for firm i (industry h, size-band g)

N^t_{hg} = number of firms on IDBR in industry h and size-band g

Table A1
Differences between the AEI and AWE

	AEI	AWE
What it measures	Monthly change in average earnings, per job	Average weekly wage, per job
Source of data	Monthly Wages and Salaries Survey	Monthly Wages and Salaries Survey
Weighting	Each company represents a number of similar companies, based on employment. This number is updated annually	Each company represents a number of similar companies, based on employment. This number is updated monthly
Estimation	Matched-pairs estimator, calculates monthly change in earnings per employee	Ratio estimator, grossed to the ONS business register
Imputation	No automatic rules – some manual imputation	Previous pay carried forward from a maximum of five months ago
Outliers	Based on growth – if total pay is an outlier, all the data (both the regular pay and the bonus) are treated as atypical	Based on levels – separate procedures for regular pay and bonuses
Firms with fewer than 20 employees	Included in the industry employment weights but average earnings Growth is assumed to move in line with the larger businesses	Included in the industry employment weights with estimates of average earnings adjusted using factors derived from the Annual Survey of Hours and Earnings
Sample size (number used)	About 8,500 (7,500) companies	About 8,500 (8,000) companies

Table A2
Reconciliation of the differences between the AWE and AEI, including bonuses and arrears

Percentage change, year on year

			Breakdown of differences						
			Definitional	Methodological					
		AWE	Employment composition	Matched pairs	Outliers	Small businesses	Formula and residual	Total (AEI - AWE)	AEI
2005	Jan	*4.49*	*0.56*	*0.26*	*–0.86*	*0.10*	*–0.22*	*–0.16*	*4.34*
	Feb	*6.23*	*0.02*	*–0.43*	*–0.05*	*0.26*	*–0.33*	*–0.52*	*5.71*
	Mar	*4.32*	*0.63*	*–0.71*	*0.03*	*0.06*	*–0.00*	*0.01*	*4.33*
	Apr	*4.28*	*0.53*	*–0.34*	*–0.16*	*0.18*	*–0.26*	*–0.05*	*4.24*
	May	*4.44*	*0.34*	*–0.25*	*–0.39*	*0.31*	*–0.60*	*–0.59*	*3.85*
	Jun	*4.14*	*0.34*	*–0.16*	*–0.39*	*0.01*	*–0.19*	*–0.38*	*3.76*
	Jul	*4.69*	*0.32*	*0.02*	*–0.22*	*0.06*	*–0.46*	*–0.27*	*4.42*
	Aug	*4.75*	*0.23*	*–0.49*	*–0.61*	*0.09*	*–0.27*	*–1.06*	*3.69*
	Sep	*4.49*	*0.32*	*–0.75*	*–0.24*	*0.07*	*–0.45*	*–1.05*	*3.44*
	Oct	*3.91*	*0.39*	*–0.86*	*–0.27*	*0.07*	*–0.31*	*–0.98*	*2.93*
	Nov	*4.59*	*0.54*	*–0.47*	*–0.55*	*0.05*	*–0.93*	*–1.37*	*3.22*
	Dec	*4.63*	*0.33*	*–0.09*	*–0.13*	*0.13*	*–0.62*	*–0.39*	*4.24*
2006	Jan	*3.65*	*0.14*	*–0.98*	*0.53*	*0.14*	*–0.35*	*–0.52*	*3.13*
	Feb	*6.63*	*–0.04*	*–0.26*	*–0.82*	*0.40*	*–0.51*	*–1.23*	*5.41*
	Mar	*6.18*	*–0.16*	*–0.42*	*–0.43*	*0.39*	*–1.05*	*–1.67*	*4.51*
	Apr	*4.02*	*0.27*	*–0.36*	*0.06*	*–0.02*	*–0.54*	*–0.58*	*3.44*
	May	*4.65*	*0.29*	*–0.27*	*0.04*	*–0.01*	*–0.30*	*–0.25*	*4.40*
	Jun	*5.67*	*–0.05*	*–0.64*	*0.01*	*0.11*	*–0.11*	*–0.68*	*4.98*
	Jul	*4.71*	*0.11*	*–0.40*	*–0.19*	*–0.01*	*–0.38*	*–0.86*	*3.84*
	Aug	*3.59*	*0.11*	*0.14*	*0.14*	*–0.01*	*–0.21*	*0.17*	*3.76*
	Sep	*3.73*	*0.07*	*0.31*	*0.21*	*–0.03*	*–0.19*	*0.37*	*4.11*
	Oct	*4.24*	*0.00*	*0.33*	*–0.10*	*–0.04*	*–0.42*	*–0.22*	*4.02*
	Nov	*4.08*	*0.73*	*0.10*	*0.01*	*–0.07*	*–0.97*	*–0.19*	*3.89*
	Dec	*5.64*	*0.07*	*–1.50*	*0.07*	*–0.05*	*–0.32*	*–1.73*	*3.90*
2007	Jan	*6.17*	*–0.08*	*0.49*	*–1.12*	*0.53*	*–1.15*	*–1.33*	*4.84*
	Feb	*7.66*	*–0.55*	*–0.36*	*–1.31*	*0.37*	*–0.36*	*–2.21*	*5.45*
	Mar	*4.73*	*–0.39*	*–0.13*	*–0.31*	*0.13*	*–0.57*	*–1.28*	*3.45*
	Apr	*4.29*	*–0.05*	*0.13*	*–0.20*	*–0.04*	*–0.98*	*–1.14*	*3.15*
	May	*4.35*	*–0.50*	*–0.52*	*0.45*	*0.11*	*–0.32*	*–0.78*	*3.57*

Table A3

Reconciliation of the differences between the AWE and AEI, excluding bonuses and arrears

Percentage change, year on year

			Breakdown of differences						
			Definitional	Methodological					
		AWE	Employment composition	Matched pairs	Outliers	Small businesses	Formula and residual	Total (AEI - AWE)	AEI
2005	Jan	4.11	0.28	0.07	0.03	0.07	–0.36	0.09	4.19
	Feb	4.23	0.39	–0.14	0.02	0.04	–0.44	–0.13	4.10
	Mar	4.45	0.43	–0.59	0.18	0.13	–0.67	–0.53	3.91
	Apr	4.31	0.47	–0.32	0.08	0.16	–0.57	–0.17	4.14
	May	4.27	0.31	–0.28	0.01	0.23	–0.64	–0.37	3.90
	Jun	4.15	0.40	–0.40	0.12	0.01	–0.38	–0.25	3.90
	Jul	4.40	0.26	–0.38	0.27	0.13	–0.54	–0.26	4.14
	Aug	4.37	0.26	–0.62	0.27	0.07	–0.41	–0.44	3.93
	Sep	4.60	0.33	–0.70	0.20	0.07	–0.55	–0.65	3.96
	Oct	4.20	0.28	–0.77	0.23	0.10	–0.34	–0.50	3.70
	Nov	4.25	0.54	–0.50	0.19	0.08	–0.68	–0.37	3.88
	Dec	3.76	0.49	–0.32	0.30	0.19	–0.78	–0.12	3.64
2006	Jan	4.22	0.33	–0.60	0.25	0.12	–0.36	–0.25	3.97
	Feb	4.28	0.25	–0.52	0.33	0.15	–0.66	–0.45	3.82
	Mar	3.93	0.06	–0.28	0.14	0.08	–0.18	–0.18	3.75
	Apr	3.66	0.40	–0.26	0.23	0.02	–0.41	–0.02	3.64
	May	4.07	0.30	–0.18	0.09	–0.07	–0.32	–0.19	3.88
	Jun	4.25	0.17	–0.44	0.14	0.01	–0.09	–0.22	4.03
	Jul	3.59	0.25	–0.40	0.08	–0.03	–0.19	–0.31	3.28
	Aug	3.38	0.16	0.05	–0.01	–0.00	–0.01	0.19	3.57
	Sep	3.58	0.17	–0.04	0.07	–0.01	–0.03	0.16	3.74
	Oct	4.08	0.09	0.04	0.01	–0.03	–0.28	–0.17	3.91
	Nov	4.06	0.17	–0.24	–0.04	–0.09	–0.23	–0.43	3.63
	Dec	4.13	0.12	–0.28	–0.03	–0.10	–0.26	–0.54	3.59
2007	Jan	3.62	–0.10	–0.11	0.14	0.18	–0.21	–0.10	3.52
	Feb	3.85	–0.02	–0.57	0.18	0.08	0.08	–0.26	3.59
	Mar	4.14	–0.09	–0.54	0.18	0.09	–0.08	–0.43	3.70
	Apr	3.93	–0.05	–0.44	0.22	0.07	–0.38	–0.58	3.35
	May	4.04	–0.26	–0.86	0.32	0.06	0.10	–0.64	3.40

Figure A3
Reconciliation of the differences between the AEI and AWE

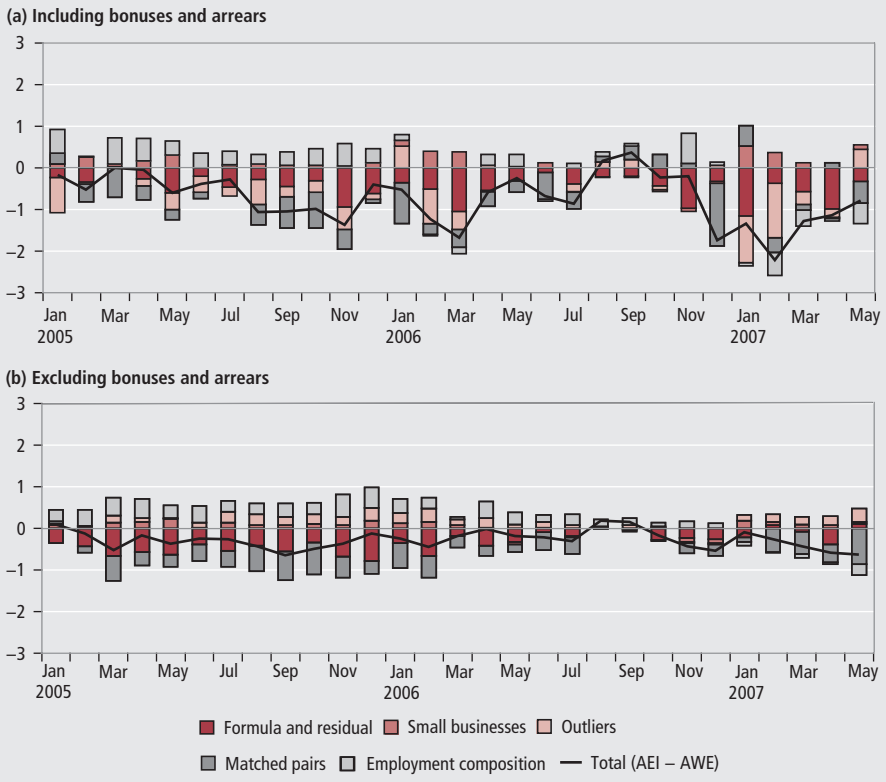
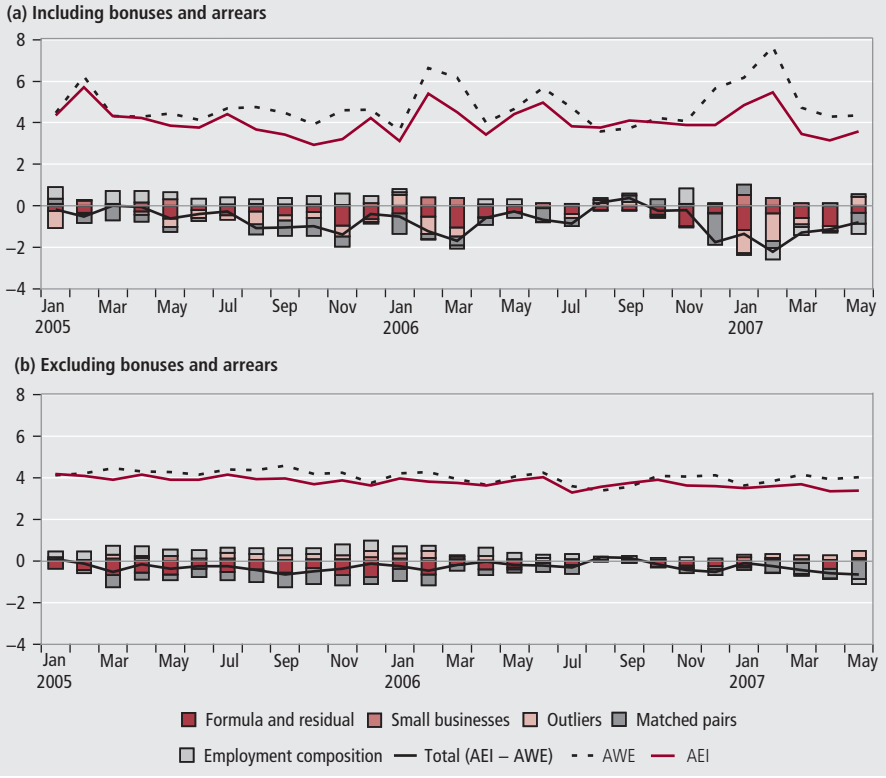


Figure A4
AEI, AWE and reconciliation of the differences between the two



FEATURE

Mapping trends in the care workforce using SOC 1990 and SOC 2000

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SUMMARY

The number of people working in an occupation and their characteristics (age, sex, qualifications, and so on) can change over time. Such changes can be monitored using the Standard Occupational Classification (SOC) system. However, changes in the definition of occupations when the SOC is revised can raise issues of comparability. This article uses data from the Labour Force Survey to examine changes in the care workforce from the late 1990s to 2005. The care workforce is defined in the article using the SOC. Comparison of the care workforce over this short period of time showed some marked changes. However, it is difficult to be sure which changes reflect real changes in the workforce and which are due to changes in classification between the SOC 1990 and the SOC 2000.

A clear policy agenda has emerged that calls for the social care, childcare, education and health services to work together in an integrated way to achieve common outcomes. This agenda is set out in the 'Every Child Matters' (DfES 2003) and 'Youth Matters' (DfES 2005b) green papers. The Children's Workforce Strategy (DfES 2005a) has introduced a common core of skills and knowledge, which aims to ensure that the children's workforce has a shared language and common understanding of issues.

Within this context, a research study was commissioned by the Department for Education and Skills (DfES) to explore the extent and nature of interprofessional collaboration within the diverse children's workforce of health, childcare and social services. This study employed multiple methodologies, including secondary analysis of the Labour Force Survey (LFS). This analysis was to provide the context for the remainder of the research project, focusing on interprofessional working in multi-purpose children's settings such as children's centres and extended schools (Simon *et al* forthcoming). In addition to mapping the numbers working within the care workforce using up-to-date national data, it was also of interest to provide some indication of change over a period of rapid policy development. The analysis was therefore compared with an earlier mapping of the care workforce (Simon *et al* 2003), also using LFS data.

The secondary analysis mapped the characteristics and working conditions of the care workforce using the LFS for 2001 to 2005. These results were compared with the earlier findings using the LFS for 1997 to 1999 (Simon *et al* 2003). The care workforce was defined using occupations in the Standard Occupational Classification (SOC). The SOC uses information on the tasks or duties carried out, job titles, what people state they mainly do in their jobs, and whether any special qualifications or training are required for people to carry out their job. For those in paid employment, this information is taken about their main job, and for those unemployed, the information is taken about their most recent main job (OPCS 1990; ONS 2000a, 2000b). The SOC 1990 was developed for the 1991 Census and was revised as SOC 2000 for the 2001 Census to take account of changes in the occupational structure; it was introduced in the LFS for the first time for 2001.

The earlier mapping study used the SOC 1990 to define the care workforce. However, for the new research study, the SOC 2000 was used. The main purpose of this article is to consider the consequences of changes to the SOC between SOC 1990 and SOC 2000 for comparing trends over time.

Defining the care workforce using the SOC

The care workforce was defined using SOC as those occupations directly involved in the provision of care. Social care managers were excluded. The data used were from the LFS, made available through

the UK Data Archive. To increase sample size, several years of data were combined. The earlier research study combined three spring LFS quarters (March to May) for the years 1997 to 1999, and the new research study combined five spring LFS quarters for the years 2001 to 2005. In each of these combined files, the population weight variable was divided by the number of years of data being combined, in order to provide an averaged population estimate. Roughly the same answers would result by taking separate results from each quarter and averaging them or by combining the files and then dividing the weights by the number of data sets combined (Simon and Owen 2005). All figures in this article are rounded to the nearest thousand.

In estimating changes in workforces over time, two major coding issues are apparent. The first issue is that, over time, new codes appear that did not exist in previous SOC coding and existing codes become modified. The second issue is that although people describe themselves as doing the same job, changes occur over time in the ways these people are assigned to each occupation group. Both of these changes will have an impact when comparing workforce sectors over time, both in terms of numbers and their characteristics. The Office for National Statistics (ONS) conducted an exercise where a sample of records from the 1991 Census and from the LFS for the quarters December 1996 to February 1997 and June to August 2000 were coded using both SOC 1990 and SOC 2000 (Birch 2000). Results from that analysis have been used here to illustrate how new occupational codes, the updating of codes and the reassignment of occupations can all result in difficulties when trying to assess change over time.

Care workforce

Using the LFS data for 1997 to 1999 and the SOC 1990 definitions, the care workforce in England was estimated to be just over 1 million workers. This was subdivided into two occupation groups, the social care workers and the childcare workers. The social care workers group comprised five occupations, which together accounted for 754,000 workers (**Table 1**). The occupations that made up this group were 293: 'Social workers, probation officers', 370: 'Matrons, houseparents', 371: 'Welfare, community and youth workers', and 644: 'Care assistants and attendants'. As there was no specific category for the job title of 'home help', in order to include them in the social care workforce, the occupation code 958: 'Cleaners, domestics' was included but only those working in the social work industry. This was done using the Standard Industrial Classification. The estimates are shown in Table 1.

Table 1
Social care workers as defined by SOC 1990 and SOC 2000

Thousands

SOC 1990 titles (and codes)	Population numbers LFS 1997–99	SOC 2000 titles (and codes)	Population numbers LFS 2001–05
Social workers, probation officers (293)	97	Social workers (2442)	68
Matrons, houseparents (370)	61	Houseparents and residential wardens (6114)	28
Welfare, community and youth workers (371)	144	Youth and community workers (3231)	67
		Housing and welfare officers (3232)	105
Care assistants, attendants (644)	427	Care assistants/home carers (6115)	463
Cleaners/domestics (in social work industry without accommodation) (958)	26	N/A code in 2000	
Total	**754**	**Total**	**732**

Table 2
Childcare workers as defined by SOC 1990 and SOC 2000

Thousands

SOC 1990 titles (and codes)	Population numbers LFS 1997–99	SOC 2000 titles (and codes)	Population numbers LFS 2001–05
Nursery nurses (650)	94	Nursery nurses (6121)	128
Other childcare and related occupations (659)	230	Childminders and related occupations (6122)	101
Playgroup leaders (651)	24	Playgroup leaders/assistants (6123)	51
Total	**348**	**Total**	**280**

The childcare workers group for 1997 to 1999, using SOC 1990 definitions, accounted for 348,000 workers, and comprised three occupations: 650: 'Nursery nurses', 651: 'Playgroup leaders' and 659: 'Other childcare and related occupations'. The estimates are shown in **Table 2**.

Using the LFS data for 2001 to 2005 and the SOC 2000 definitions, the care workforce also accounts for just over 1 million workers in England. However, changes to the definitions of occupations in SOC 2000 meant it was not possible to make exact comparisons using the same occupations. The occupations chosen for social care, and their estimates, are also shown in Table 1. The occupations were 2442: 'Social workers', 6114: 'Houseparents and residential wardens', 3231: 'Youth and community workers', 3232: 'Housing and welfare officers' and 6115: 'Care assistants and home carers'. These are not identical to the occupation categories in SOC 1990, but appear very similar, so that some comparisons between the earlier and later data sets should be possible. The social care workforce estimated from 2001 to 2005 LFS data was 732,000. This is a slight drop. But does this represent a real contraction of the social care workforce, or a change in the classification?

The childcare workers group, in 2001 to 2005, was estimated as 280,000 workers. This represents a significant decline in numbers, at a time when there has been a policy emphasis on increasing the number of childcare places (DfEE 1998). Again, the occupations are slightly different using SOC 2000: they were 6121: 'Nursery nurses', 6122: 'Childminders and related occupations' and 6123: 'Playgroup leaders/assistants' (Table 2). The question again arises, is this a real drop or an artefact of the changing classifications?

Changes in the childcare workforce

Of the three occupational groups, one, 'Nursery nurses', kept the same title in both SOC 1990 and SOC 2000 and the numbers show an expected slight increase. Another was modified from 'Playgroup leaders' to 'Playgroup leaders/assistants'. This expansion of the scope is associated with more than a doubling in numbers, from 24,000 to 51,000. However, registration data from DfES and Ofsted suggest that the playgroup sector has been declining, from 15,600 registered playgroups in 1998 (DfEE 1999) to 11,600 in 2003 (Ofsted 2003). So this increase in the workforce probably reflects not a real growth, but a reclassification and inclusion of playgroup assistants. It is clear from the ONS analysis (Birch 2002), that some people who were given the SOC 2000 code of 'Playgroup leader/assistant' would have been given the SOC 1990 code of 'Childminders and

Table 3
Relationship between SOC 1990 code 659[1] and SOC 2000 codes

Percentages

SOC 2000	SOC 2000 unit group title	Male			Female		
		Census 1991	LFS 1996/97	LFS 2000	Census 1991	LFS 1996/97	LFS 2000
3121	Architectural technologists and town planning technicians	-	-	-	-	*25.0**	-
3567	Occupational hygienists and safety officers (health and safety)	-	-	-	-	-	*7.1*
6121	Nursery nurses	-	-	-	*5.8*	*5.9*	-
6122	Childminders and related occupations	*100.0**	*100.0*	*90.0*	*96.0*	*92.6*	*86.6*
6123	Playgroup leaders/assistants	*20.0*	-	*72.7*	*44.7*	*45.6*	*54.9*
6124	Educational assistants	*20.0*	-	-	*18.6*	-	-
6213	Travel and tour guides	-	-	-	-	-	*14.3*
6219	Leisure and travel service occupations n.e.c.	-	-	-	-	-	*25.0**
9244	School mid-day assistants	*100.0**	*100.0**	*100.0**	*89.2*	*93.6*	*86.6*

Notes:
1 Other childcare and related occupations n.e.c.
* denotes estimate based on fewer than five cases.

Source: Birch (2002) Table 1b

related occupations'. This third subgroup of childcare workers has a slight change of title: for SOC 1990 it was 'Other childcare and related occupations', and for SOC 2000 it was 'Childminders and related occupations'. Although these titles might suggest that the categories are very similar, the number more than halved, from 230,000 to 101,000. It is, therefore, obvious that a number of people who would have been classified as 'Other childcare and related occupations' using SOC 1990 were being coded differently using SOC 2000 definitions.

The ONS analysis (Birch 2002) shows that about half the people who would have been coded as 'Playgroup leaders/assistants' using SOC 2000 would indeed have been coded as 'Other childcare and related occupations' using SOC 1990. However, some people who would have been coded as 'Other childcare and related' in SOC 1990 would have been coded into a new occupation introduced in SOC 2000. This is 9244: 'School mid-day assistants'. This occupation did not exist as a separate category in SOC 1990. The ONS analysis shows that, in their samples, around 90 per cent of people who would have been coded as 'School mid-day assistants' using SOC 2000 would have been coded as 'Other childcare and related occupations' using SOC 1990. This relationship is shown in **Table 3**, which is derived from Table 1b of Birch (2002).

This table shows results for all the people in the three samples who were coded under the SOC 1990 code 659, 'Other childcare and related occupations'. The three samples are shown separately, and results for male and female are also shown separately. Each row represents a different code from SOC 2000 which was applied to these people. Since there are relatively few males in these occupations, this discussion will be confined to females. Some codes are probably simply errors. The table shows that 25.0 per cent of females who were coded as 3121: 'Architectural technologists and town planning technicians' using SOC 1990 in the subsample of the LFS for 1996/97 were also coded as 'Childminders and related occupations' using SOC 2000. No one in any of the other samples was coded in these two ways. The asterisk with the 25.0 per cent is used to indicate that the estimate is based on fewer than five cases. This would seem to be a simple coding error.

Another row represents 6121: 'Nursery nurses'. A very small number of people coded as 'Nursery nurses' using SOC 2000 were also coded as 'Other childcare and related occupations' using SOC 1990, rather than as 'Nursery nurses'. This suggests that ambiguities in the way some people describe their occupation may result in them being classified as 'Nursery nurses' or not.

The next row is much clearer. This represents SOC 2000 code 6122: 'Childminders and related occupations'. Across the three samples (for females), between 86.6 and 96.0 per cent of people with this code were also coded as 'Other childcare and related occupations' using the SOC 1990. It shows the very close relationship between the two codes. However, it is not a symmetrical relationship. This is illustrated in **Table 4**, which shows the reverse mapping of SOC 1990 codes onto the single SOC 2000 code of 6122: 'Childminders and related occupations'. The table is derived from Table 1a of Birch (2002) and shows that (for females) between 39.7 and 46.6 per cent of those coded as 'Other childcare and related' using SOC 1990 were also coded as 'Childminders and related occupations' using SOC 2000. It is evident from Table 3 that many of them have been assigned to the new code 9244: 'School mid-day assistants'. The final row shows that (for females) between 86.6 and 93.6 per cent of people with that code would have been coded as 'Other childcare and related' using SOC 1990. The corresponding table in Birch (2002) for 'School mid-day assistants' shows that between 36.4 and 50.2 per cent of people coded as 'Other childcare and related' using the SOC 1990 were switched to this new code.

The apparent reduction in 'other' childcare occupations can therefore be seen to be mainly due to a new occupational code being used in the SOC 2000 which accounted for many who would have been 'Other childcare and related occupations' using SOC 1990. Looking at the text descriptions in the SOC 1990 and SOC 2000 manuals does not make this change apparent. Part of the description for SOC 1990 refers to meals: under 'tasks' that people to be coded as 'Other childcare

Table 4
Relationship between SOC 2000 code 6122[1] and SOC 1990 codes

Percentages

SOC 1990	SOC 1990 unit group title	Male			Female		
		Census 1991	LFS 1996/97	LFS 2000	Census 1991	LFS 1996/97	LFS 2000
370	Matrons, houseparents	-	-	*6.3*	-	*13.9*	*17.3*
651	Playgroup leaders	-	-	-	-	-	*6.3*
659	Other childcare and related occupations n.e.c.	*44.4*	*66.7*	*45.0*	*32.4*	*46.6*	*39.7*

Note:
1 Childminders and related occupations.

Source: Birch (2002) Table 1a

and related occupations' may perform it says, 'prepares and serves children's meals' (OPCS 1990: 205). However, the description of tasks for the SOC 2000 code for 'Childminders and related occupations' includes the following: 'prepares and serves children's meals and supervises children during meals' (ONS 2000a: 211). Thus, for an occupation which appeared unchanged between SOC 1990 and SOC 2000, it would be easy to misinterpret a fall in the number of people employed as a real change when it was merely a reflection of a change in coding, with a new occupation being created largely as a subset of an old one.

Changes in the social care workforce

There is a similar change in one of the occupations designated as social care, but here the change is more evident. This involves the occupation in SOC 1990 coded as 293: 'Social workers, probation officers'. In SOC 2000 these two occupations are coded separately: 2442: 'Social workers' and 2443: 'Probation officers'. As can be seen from Table 1, there were 97,000 'Social workers, probation officers' in 1997 to 1999 using the SOC 1990 definition and 68,000 'Social workers' in 2001 to 2005 using the SOC 2000 definition. (There were, in addition, 8,000 'Probation officers', so removing them does not account for all of the difference.) The change in the title of the code makes it clear that there is a discontinuity in the definition, so it is unlikely that anyone would be misled into thinking that the number in the occupation had reduced significantly over the period. However, it does make it impossible to estimate whether the number of social workers is expanding or declining. More than that, it makes it impossible to monitor such issues as whether the occupation is becoming more gender specific, whether it is recruiting black and minority ethnic staff, or whether the level of training is increasing. These are all-important questions as far as the occupation is concerned, but the revision of the coding makes it impossible to even consider them with these data (or any other data set that uses the SOC).

Similarly, the single code 371: 'Welfare, community and youth workers' in SOC 1990 is split in SOC 2000 into two separate codes: 3232: 'Housing and welfare officers' and 3231: 'Youth and community workers'. The number in this occupation in 1997 to 1999 was estimated as 144,000, and for the two occupations for 2001 to 2005 the combined total was 172,000 (Table 1). This may reflect a growth in the sector, or the addition of the term 'housing' in SOC 2000 may indicate that the scope of the code has increased, and so drawn in people who would have been coded differently using SOC 1990. It is clear from the tables in Birch (2002) that between half and three-quarters of people coded as 'Youth and community workers' using SOC 2000 and between a half and two-thirds of those coded as 'Housing and welfare officers' would be coded as 'Welfare, community and youth workers' using SOC 1990. The rest are coded into other, mostly care, occupations.

An SOC 1990 code designated as part of the social care workforce was 370: 'Matrons, houseparents'. As can be seen from Table 1, it was estimated that there were 61,000 people in this occupation using the 1997 to 1999 LFS. The nearest code for SOC 2000 was 6114: 'Houseparents and residential wardens'. This was a much smaller occupation using estimates from LFS for 2001 to 2005, just 28,000. There is no reason to suppose that the activities conducted by people in this occupation declined over this short period, so it is more likely that people doing the same jobs were assigned to different codes. From the tables in Birch (2002), it is clear that this is what has happened. Birch's Table 1a shows that, in her samples, of the people coded as 370: 'Matrons, houseparents' using SOC 1990, about half were coded as 6114: 'Houseparents and residential wardens' using SOC 2000 and most of the rest were coded as 1185: 'Residential and day care managers'. So this category has largely been split into two, although this is not evident from the job titles.

What these changes mean for comparing trends over time

This example, of using the LFS to examine changes in the care workforce over time, demonstrates some of the problems brought about by the updating of the SOC. Codes are not constant over time. Some new categories have appeared. An example is the 'School mid-day assistants', who were previously coded within the 'care related' category of 'Other childcare and related occupations', but who in SOC 2000 appear to be more appropriately counted as part of the education workforce than the childcare workforce. In other cases, groups have been split, for example, the 'Housing and welfare officers' and 'Youth and community workers', who in SOC 1990 were both included within the one occupation code of 'Welfare, community and youth workers'. Some codes have become broader, such as the 'Playgroup leaders/assistants', while other codes now have much narrower classifications, such as the 'Childminders and related occupations'. These changes in classification over time make it difficult to compare like with like.

It is necessary for the SOC to be regularly reviewed and updated, because of the changing nature of occupations. Otherwise new occupations could not be accommodated and the classification would increasingly be dominated by occupations which no longer have the significance they once had. In discussing the revision of SOC 1990, ONS has noted that:

> certain occupational areas were developing rapidly, but were not well-defined in SOC 1990. These included information technology occupations, customer service jobs, conservation and environment-related occupations and a wide range of jobs in what can loosely be termed 'caring' and 'community work' occupations. (ONS 2000a: 1)

The classification also needs to reflect the changing status of occupations and perhaps their changing skill levels. However, the changes in the classification make it almost impossible to monitor how occupations are evolving. For example, it is known that childcare is a very gender-segregated occupation, and there is a government target to increase the percentage of men working in the sector (Cameron *et al* 2001). Yet the discontinuities in the childcare occupations make it difficult to monitor whether this is being achieved.

Similarly, there is a drive to increase the level of qualifications amongst social workers (DfES 2006), but the change in the classification for social workers makes it almost impossible to see if there has been any change between periods coded using different versions of the SOC.

Monitoring the size and composition of occupations, and their conditions of employment is something that the long span of the LFS should make possible. Changes to the occupational classification can render this task difficult or impossible. Anyone wanting to conduct such a study needs to take care that the occupations they are comparing have remained consistent over time. Users should consult the definition volumes for SOC 1990 and SOC 2000 to check for consistency, but also consult the ONS User Guide (Birch 2002) which gives the results of coding some samples of data using both classifications. These tables give insight into how the codes have shifted over time.

Users could be helped with this issue if, within the SOC manuals, they are alerted to the creation of any new categories since previous versions of the SOC. They could also be helped if it is made explicit for occupations that have not changed since the previous SOC that, although the actual occupation remains unchanged, in order to reflect additional duties this occupation now performs, some additional descriptive information has been added in the new SOC. This would help users to distinguish between real and definitional changes to the SOC.

ACKNOWLEDGEMENTS

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Methods explained

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

Data reduction and model selection techniques

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SUMMARY

Researchers and analysts now have access to increasingly large data sets. This article outlines some of the problems of dealing with a large number of variables and explains some of the techniques that can be used to reduce the number of available indicators to a more manageable size. This can be helpful in analysing the data or in modelling and forecasting work

Due to a proliferation of business and consumer surveys, the development of panels and better access to financial market data, large dimensional data sets have in recent years become increasingly available to statisticians and social scientists. While this undoubtedly offers better opportunities for empirical work, dealing with a large number of variables can present problems for data users. First, there are analytical issues of having to reckon with a large number of competing indicators, all of which measure the underlying variable of interest imperfectly. Second, as the number of variables approaches or exceeds the number of time observations, the problems of degrees of freedom and multicolinearity arise when using the data for modelling and forecasting purposes.

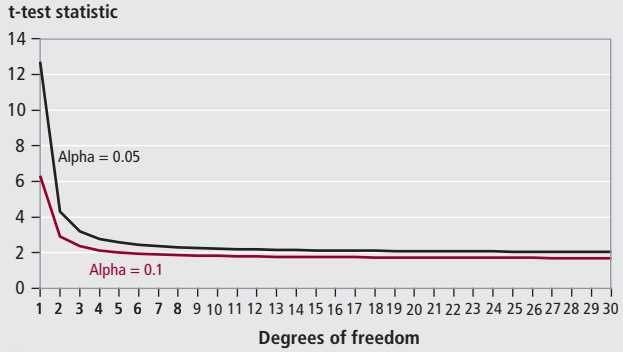
For example, suppose interest was in developing a model to explain the dependent variable y using a total of n available indicators. In principle, the following simple linear model could be estimated:

$$y = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \ldots\ldots + \beta_n x_n + u \qquad (1)$$

Degrees of freedom are the number of independent bits of information that can be used to estimate each parameter. If the time series has t observations, and there are n coefficients $\beta_1, \beta_2, \ldots\ldots, \beta_n$ then there are t-n degrees of freedom.

When the number of indicators exceeds the number of observations (n>t), there is insufficient information to uniquely determine the coefficients in (1) and the model cannot be estimated. Even if n<t, as n approaches t, the distributions used for hypothesis testing become so wide that it is almost impossible to judge statistical significance. This can be seen in **Figure 1** which plots the required t-test statistic to reject a null hypothesis at the 10 per cent and 5 per cent significance levels. At low degrees of freedom, this test-statistic is unlikely to reject a null hypothesis that any coefficient is significantly different from zero even if it is the case that the variable concerned is a genuine causal factor.

Figure 1
Required t-test statistic to reject a null hypothesis at different numbers of degrees of freedom



Note:
Alpha is the level of significance required

A second potential problem with estimating (1) is multicolinearity. A high degree of correlation between competing indicators makes it difficult to select the relevant variables based on t-tests alone, as standard errors become large. Some of the resulting issues are:

- small changes in the data produce wide swings in parameter estimates
- coefficients may have the 'wrong' sign or implausible magnitudes
- coefficients have very high standard errors and low significance levels even though they are jointly significant and the R^2 for the regression is quite high

A lack of degrees of freedom and the presence of multicolinearity mean that multivariate models are usually restricted to lower dimensions. However, how should the best combination of indicator variables from a potentially very large collection be selected? For example, a set of 30 indicators can be arranged into more than 1 billion different models.

This article approaches the problem in two ways:

- **data reduction** – factor analysis is based on the notion that many variables are driven by a reduced number of common factors or shared trends. These can be extracted from the underlying data set using principal components analysis or dynamic factor analysis

- **model selection** – as a relatively large number of different models can be formed from a small number of indicators, identifying the most significant combination of variables is subject to high search costs. However, recent developments in general-to-specific modelling techniques have reduced these, improving the efficiency of model selection

To demonstrate the usefulness of these techniques, examples are based on a number of business survey indicators of the output of UK manufacturing industry, as presented in **Table 1**. Although the methods described are general, the applications discussed in this article relate to time series models.

Table 1
Business survey indicators of UK manufacturing output (1991Q1 to 2007Q1)

Organisation	Survey	Indicator
Chartered Institute of Purchasing and Supply (CIPS)	Report on Manufacturing	Output Deliveries
Confederation of British Industry (CBI)	Quarterly Industrial Trends Survey	Output Home deliveries Export deliveries
British Chambers of Commerce (BCC)	Quarterly Economic Survey	Home deliveries Export deliveries

Data reduction techniques using factor analysis

The basic insight is that strong co-movements between time series offer the opportunity to summarise the information from a large set of data by a smaller number of common factors.

For example, if the set of n indicator variables in (1) can be replaced with a set of m<n factors $f_1, f_2,.....f_m$ which account for the underlying common trends, then model (2) represents a feasible alternative:

$$y = \theta_1 f_1 + \theta_2 f_2 + \theta_3 f_3 + ... + \theta_m f_m + v \qquad (2)$$

There are two main approaches to extracting factors from a set of data. These are principal components and dynamic factor analysis.

Principal components

The basic methodology was developed by Hotelling (1933) and later applied by Stone (1947) to show that most of the variation in a large number of national accounts series could be interpreted by just three components: trend, cycle and rate of change of cycle.

A principal component (PC) is simply a linear combination of the variables in the data set, where each is designed in turn to account for the maximal variance of that data. So, for a set of n indicators, there will be n corresponding PCs, where the first PC is constructed to account for maximal variance, the second to account for maximal variance of that not accounted for by the first PC, and so on. If the underlying data are driven by a small number of factors, then most of the variance in that data will be accounted for by a relatively small number of PCs. Furthermore, PCs are designed to be orthogonal to each other, so the problem of multicollinearity that might otherwise beset estimation of (1) is reduced.

The methodology is based on the eigenvalues and eigenvectors for the variance-covariance matrix of the set of indicators. Eigenvalues and eigenvectors essentially describe the transformation properties of a matrix, where the eigenvector describes the direction of the transformation and the corresponding eigenvalue the strength. Hence, the first PC reflects a combination of indicators based on the eigenvector associated with the largest eigenvalue of the variance-covariance matrix. The second PC is based on the eigenvector associated with the second largest eigenvalue, and so on. If the data exhibit strong co-movements between indicators (that is, sets of indicators are strongly correlated with each other), then it will be the case that the transformation properties of the matrix are dominated by relatively few eigenvectors. This will be apparent if the first few eigenvalues are relatively large.

Table 2 shows the PC analysis of the set of seven indicators listed in Table 1. Here, the first PC accounts for over 65 per cent of the total variance in the set of indicators, whereas the first two PCs together account for almost 80 per cent of the total.

Table 2
Principal component analysis of the set of seven manufacturing indicators from Table 1

Principal component	Eigenvalue	Variance proportion explained	Cumulative variance proportion
1	4.562	0.652	0.652
2	0.982	0.140	0.792
3	0.782	0.112	0.904
4	0.444	0.063	0.967
5	0.147	0.021	0.988
6	0.054	0.008	0.996
7	0.029	0.004	1.000

In selecting the number of relevant PCs, a conventional rule of thumb is to look for a step change in the eigenvalues, which in this case occurs between the first and second PCs. Alternatively, when the data have been standardised as in this case, another rule of thumb is to select the PCs corresponding to eigenvalues greater than one. This suggests that the first PC on its own is an adequate representation of the set of seven indicators.

The composition of the first PC can be observed in **Table 3** by looking at the eigenvector associated with the largest eigenvalue. If all the data are driven by a common factor, it is normally the case that the factor loadings in the first PC are fairly equal. The evidence here suggests that the CIPS data, particularly that relating to deliveries, is less correlated with the rest of the sample. Because it has more independent variation from the rest, the second principal

Table 3
The normalised eigenvectors associated with the two largest eigenvalues, forming the basis for the first two PCs

Variable	Eigenvector 1	Eigenvector 2
CIPS output	0.1198	0.3657
CIPS deliveries	0.0551	1.3570
CBI output	0.1714	–0.1507
CBI home deliveries	0.1669	0.0029
CBI export deliveries	0.1588	–0.1788
BCC home deliveries	0.1670	–0.1759
BCC export deliveries	0.1610	–0.2203

component would be expected to be quite correlated with this variable, which is confirmed by looking at the factor loadings of the second eigenvector in Table 3.

In **Figure 2, Figure 3** and **Figure 4,** the first two principal components are plotted against the CIPS, CBI and BCC survey data, respectively. Here, it can be seen that the first principal component is strongly correlated with the CBI, BCC and CIPS output data, whereas the second principal component mirrors the movements in the CIPS deliveries data. It can be concluded that the original set of seven indicators can be summarised by one or two principal components.

The power of the PC approach is greatest when the indicator set is very large. A recent article by this author (Chamberlin 2007) showed that a set of over 400 business survey and financial markets indicators could adequately be described by eight PCs. The approach is also very good at isolating sources of idiosyncratic movements and potential outliers, as these are often identified as individual PCs and can therefore be discarded.

Figure 2
Principal components and the CIPS survey
Standardised units

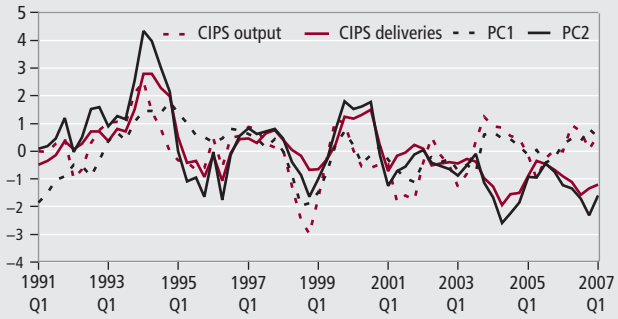


Figure 3
Principal components and the CBI survey
Standardised units

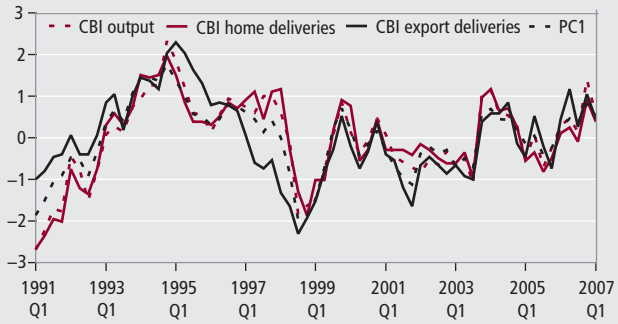


Figure 4
Principal components and the BCC survey
Standardised units

The main problem is that a PC which explains a very small proportion of the variation in the set of indicators might explain a large part of the variation of the dependent variable *y* in the model of interest. For example, if interest were in constructing a set of variables to model and forecast the official Index of Manufacturing published by the Office for National Statistics (ONS), then it cannot be discounted that the CIPS data, or specifically the CIPS delivery data, might outperform the first PC. The variable-specific parts to the CIPS data set that reduces its correlation with other surveys might just be an important ingredient in explaining movements in *y*.

Recent work by Forni *et al* (2003) has extended this basic approach. Traditional factor analysis looks to partition variables into common and variable-specific parts, but it is assumed that there is no cross-correlation at any lead or lag between the variable-specific components. This could be a problem. Suppose two industries are represented by an input-output relationship, possibly with a lag so that an idiosyncratic shock to B may eventually propagate to A. Their generalised technique, often referred to as dynamic principal components, allows a limited degree of cross-correlation between the idiosyncratic components, allowing more information to be extracted from large panels.

Dynamic factor models

This is essentially a generalisation of the PC approach and is designed to take account of the dynamic interrelationships between variables. Stock and Watson (1989) pioneered the method which has subsequently been widely applied and updated: for example, see Garratt and Hall (1996) for a UK application. The aim is to extract from a set of variables a latent variable which can be interpreted as the underlying common trend in the data. Therefore, each standardised data series can be expressed as a combination of this common variable, known as the state (S_t) and a variable-specific component $e_{i,t}$:

CIPS output = $S_t + e_{1,t}$	[Var $(e_1) = C_1$]	(3)
CIPS deliveries = $S_t + e_{2,t}$	[Var $(e_2) = C_2$]	(4)
CBI output = $S_t + e_{3,t}$	[Var $(e_3) = C_3$]	(5)
CBI home deliveries = $S_t + e_{4,t}$	[Var $(e_4) = C_4$]	(6)
CBI export deliveries = $S_t + e_{5,t}$	[Var $(e_5) = C_5$]	(7)
BCC home deliveries = $S_t + e_{6,t}$	[Var $(e_6) = C_6$]	(8)
BCC export deliveries = $S_t + e_{7,t}$	[Var $(e_7) = C_7$]	(9)
$S_t = S_{t-1} + w_t$	[Var (w)= 1]	(10)

Equations (3) to (9) are measurement equations, describing the relationship between the observed manufacturing indicators and the unobserved state variable. Equation (10) describes the dynamic process that represents movements in the state variable. In this case it is a simple random walk. If the dynamic term in (10) were removed, so that $S_t = w_t$, this model would become static and produce a similar outcome to the first PC in the above analysis. For this reason, the PC methodology is often referred to as static factor analysis.

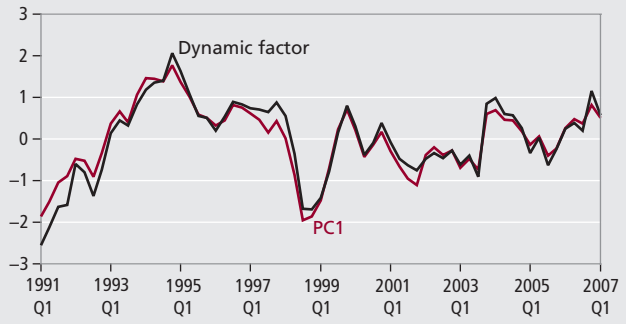
The system of equations (3) to (10) can be estimated using the Kalman filter. This is a recursive algorithm which updates its estimates of the unobserved state variable as each new data point

arrives. A good description of the Kalman filter is given in Harvey (1991). Because almost any linear model can be expressed in the required state-space form, this constitutes a very flexible modelling approach. The above system is just one example. In practice, the modeller has almost free range to determine the number of unobserved variables, the dynamic structure of the state equations and the form of the measurement equations.

The key elements in this system are the noise-to-signal ratios. As the variance of the error term in the state equation is normalised to 1, these are given by the coefficients C_i, for i = 1 to 7, which determines for each indicator how much of the variable is driven by the common trend and how much by the variable-specific part. The lower the noise-to-signal ratio, the more the series is represented by the underlying common trend, and less by its own idiosyncratic features. These hyperparameters can be imposed or, as in this case, estimated using maximum likelihood methods.

Figure 5 plots the estimated state variable compared with the first PC from above. There is a fairly close association between the two which is unsurprising given the limited dynamics in the model.

Figure 5
Comparing static and dynamic factor analysis of business survey indicators of manufacturing output



Analysing the noise-to-signal ratios (**Table 4**) implies that the common trend is strongly related to the CBI data on output, home deliveries and the BCC data on home deliveries. The CIPS data, especially those on deliveries, are again given a lower weight, with more of the variance in these series explained by the indicator-specific component. As a factor extraction technique, the same criticisms made of the PC approach apply here.

Table 4
Noise-to-signal ratios for the system (3) to (10), estimated by maximum likelihood

Variable	Coefficient	Standard error	Z-statistic	Probability
C(1)	0.916	0.113	8.106	0.000
C(2)	1.384	0.254	5.445	0.000
C(3)	0.035	0.012	2.996	0.003
C(4)	0.070	0.021	3.254	0.001
C(5)	0.469	0.105	4.475	0.000
C(6)	0.122	0.027	4.506	0.000
C(7)	0.484	0.130	3.728	0.000

Factor reduction techniques offer a convenient way of summarising the main features of a data set. This can be useful when a lack of degrees of freedom or multicolinearity make estimation of a model such as (1) infeasible, but in doing so potentially useful independent sources of information are often discarded, so the alternative model (2) may not be best-fitting. The next section on model selection suggests how this problem might be addressed.

Model selection

When dealing with a large number of indicators, a common approach is to attempt to select a subset that best explains the variable of interest. The general-to-specific (GETS) modelling approach consists of starting from a very general statistical model, which captures the essential characteristics of the underlying data set, and then using standard testing procedures to reduce its complexity by eliminating statistically insignificant variables. At each stage of deletion, the validity of the reductions made should be checked to ensure the selected model continues to pass diagnostic tests (that is, it is congruent).

The main criticism of GETS is that it suffers from high 'search costs' and path dependence, meaning that it is very difficult to retrieve the best model from among all the possible combinations of variables. A study by Lovell (1983) of trying to select a small relation (0 to 5 regressors) hidden in a large database (40 variables) found a low success rate.

High search costs can easily be understood from the theory of repeated testing. Conducting 40 independent tests at the 5 per cent significance level means that there is only a $(1–0.05)^{40} = 0.13$ chance that no tests reject by chance. A type one error is the probability of rejecting a hypothesis that is true; in this case there is a 1–0.13 = 0.87 chance that in 40 tests one or more irrelevant variables will be maintained in the model. This is quite large and shows how repeated testing can generate spurious results. Failing to reject irrelevant variables means that they may stay in the regression and act as proxies for variables that do matter, and which are subsequently omitted. Therefore, under repeated testing, the probability of retaining variables that should not enter a relationship would be high because a multitude of tests on irrelevant variables must deliver some significant outcomes by chance.

A possible solution is to raise the size of the test by using larger critical values. For example, at a 0.5 per cent significance level, there is a $(1–0.005)^{40} = 0.89$ chance that no tests reject simply by chance. Raising the size of the test lowers the probability of type 1 errors from 0.87 to 0.11. Unfortunately, more stringent criteria for avoiding rejections when the null is true lower the power of rejection when it is false. That is, in attempting to lower the probability of maintaining irrelevant variables by raising critical values, the chance probability of rejecting the relevant ones is increased (a type 2 error). The size versus power trade-off is a well-known phenomenon in econometric modelling.

Path dependence refers to the fact that the order in which the variables are deleted generally matters, so the final model is dependent on the path taken to get there. Hence, a multitude of terminal models can result from the same starting point, making it difficult to identify the best underlying model.

Recent advancements in automating GETS procedures have reduced the search costs associated with exploring multiple deletion paths

from a general model and choosing between alternative terminal models. Krolzig and Hendry (2001) have significantly aided this with the development of their PcGets software, which has built upon the earlier innovations by Hoover and Perez (1999).

Starting with a general unrestricted model (GUM), the PcGets algorithm works like a series of sieves, searching multiple deletion paths, checking that congruence is maintained at each stage and then using encompassing tests to select between terminal models. The rationale for these steps is as follows:

- **search many reduction paths** – this is designed to mitigate the problem of path dependence, leading to misspecification, as important variables are deleted and irrelevant variables are retained as proxies. Exploring several paths gives the opportunity for error correction in the light of wrong decisions. Searching all feasible paths increases the probability that some models will retain the variables that matter while eliminating those that do not

- **maintaining congruence** – the algorithm only undertakes reductions which leaves diagnostic tests as insignificant. Diagnostics act as a constraint on reduction and the choice of diagnostics and their significance levels adds to the size of the selection process

- **selection of the terminal model by encompassing** – each search path is terminated when there are no further possible reductions or when deletion induces a diagnostic test failure. Encompassing is the notion of being able to account for the results obtained by rival models given one's own findings. Therefore, if model A encompasses model B, then model A accounts for all of the variance in the dependent variable explained by model B. In this sense, encompassing implies variance-dominance, that is, a badly-fitting model cannot account for the variance of a well-fitting model

In the encompassing stage of the PcGets algorithm, all distinct non-nested models are collected and encompassing is used to eliminate those which are dominated. If a unique choice does not result, it implies that the remaining models are incomplete, that is, each explains some variance in the dependent variable not accounted for by other models, but no model is dominant. The PcGets algorithm then forms the union of resulting models which becomes the new starting point for path searches. The algorithm repeats until the union is unchanged between successive rounds.

Simply choosing the best-fitting model offers no protection against picking a spurious relationship. When a given path eliminates a variable that matters, other variables proxy such an effect, leading to spuriously large and misspecified models. However, some other paths will retain that variable and in the encompassing tests the proxies will be frequently revealed as conditionally redundant, inducing a smaller final model focused on the genuine causal factors.

Although PcGets is an automatic procedure, there is still a role to be played by the practitioner. This predominately involves choosing the form of the GUM and the significance levels of the variable deletion and diagnostic tests, which act as constraints on the paths the algorithm explores and therefore have an important bearing on the terminal models produced. If required, the practitioner can also initiate forced searches that maintain certain variables of interest in the model.

In **Table 5** and **Table 6,** the PcGets software is used to find a relationship between the set of business survey indicators and ONS's Index of Manufacturing. Estimation of the GUM is shown in Table 5, and the final dominant model in Table 6. In **Table 7,** a number of different measures of 'goodness of fit' are presented for each model.

Table 5
GUM: dependent variable – ONS Index of Manufacturing, three-month on three-month growth rate (1991Q1 to 2007Q1)

Variable	Coefficient	Standard error	t-value	t-probability
Constant	–5.264	2.164	–2.433	0.018**
CIPS output	0.072	0.036	2.000	0.051*
CIPS deliveries	0.032	0.023	1.401	0.167
CBI output	0.016	0.031	0.506	0.615
CBI home deliveries	0.010	0.028	0.359	0.721
CBI export deliveries	–0.009	0.017	–0.517	0.607
BCC home deliveries	–0.005	0.020	–0.222	0.825
BCC export deliveries	0.005	0.018	0.287	0.776
Seasonal Q1	–0.025	0.295	–0.084	0.933
Seasonal Q2	–0.146	0.280	–0.521	0.604
Seasonal Q3	0.241	0.284	0.849	0.400

Table 6
Final model estimated by PcGets from the GUM in Table 5

Variable	Coefficient	Standard error	t-value	t-probability
Constant	–4.231	1.554	–2.722	0.008**
CIPS output	0.083	0.029	2.856	0.006**
CBI output	0.019	0.007	2.737	0.008**

Table 7
Information criteria for goodness of fit and parsimonious specification of the model

	GUM (Table 5)	Final model (Table 6)
Residual sum of squares	32.35	35.58
R^2	0.37	0.31
Adjusted R^2	0.26	0.28
Akaike Information Criterion	–0.36	–0.51
Schwartz Criterion	0.01	–0.41

In terms of the residual sum of squares and R^2 statistics, the original GUM is a better-fitting model. However, these statistics can never deteriorate when more variables are added to the model, so a judgement based on these criteria could lead to over-fitting. This might lead one away from the best forecasting model because adding variables can increase the variance of the forecast error.

Alternative measures such as adjusted R^2, the Akaike Information Criterion and the Schwartz Criterion are measures of goodness of fit that increasingly penalise the loss of degrees of freedom that results from adding more variables to the model. These statistics suggest that the reduced-form final model can be accepted as a more parsimonious representation of the GUM.

Although PcGets is a powerful tool aiding model selection, there are some obvious limitations in its use. Because it starts with estimating

a GUM, then all the problems identified in estimating (1) still apply. The GUM will be indeterminate if there are insufficient degrees of freedom, and the presence of multicolinearity can reduce the efficiency of the algorithm leading to a proliferation of final models.

Recent work by Castle and Hendry (2006) has started to explore how PcGets might deal with these problems. They find that the procedure is still quite successful if the set of indicators is divided into smaller subgroups, where in each the variables are selected to reduce the incidence of multicolinearity. PcGets is then run on these models and a union of the final models formed as a new GUM.

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Key time series

National accounts aggregates

Last updated: 24/08/07

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	343,639	305,422	122.9	123.0		111.0	111.2	110.7	110.6
Percentage change, quarter on corresponding quarter of previous year[4]									
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	*6.9*	*7.0*	*6.9*	*7.0*		*3.0*	*3.2*	*3.7*	*3.8*

Notes:

Source: Office for National Statistics

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

Gross domestic product: by category of expenditure

Last updated: 24/08/07

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

	Domestic expenditure on goods and services at market prices											
	Final consumption expenditure			Gross capital formation								
	Households	Non-profit institutions[1]	General government	Gross fixed capital formation	Changes in inventories[2]	Acquisitions less disposals of valuables	Total	Exports of goods and services	Gross final expenditure	*less* imports of goods and services	Statistical discrepancy (expenditure)	Gross domestic at product market prices
	ABJR	HAYO	NMRY	NPQT	CAFU	NPJR	YBIM	IKBK	ABMG	IKBL	GIXS	ABMI
2001	653,326	27,155	217,359	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	191,060	7,703	64,221	56,308	705	327	320,326	83,347	403,673	93,413	180	310,440
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	*2.6*	*3.7*	*2.1*	*5.3*			*2.4*	*–13.4*	*–1.3*	*–13.5*		*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: 15/08/07

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
Apr-Jun 2005	47,753	30,126	28,693	1,433	17,628	*63.1*	*60.1*	*4.8*	*36.9*
Apr-Jun 2006	48,131	30,613	28,930	1,683	17,518	*63.6*	*60.1*	*5.5*	*36.4*
Jul-Sep 2006	48,224	30,696	28,986	1,711	17,527	*63.7*	*60.1*	*5.6*	*36.3*
Oct-Dec 2006	48,316	30,723	29,036	1,687	17,593	*63.6*	*60.1*	*5.5*	*36.4*
Jan-Mar 2007	48,409	30,681	28,981	1,700	17,728	*63.4*	*59.9*	*5.5*	*36.6*
Apr-Jun 2007	48,502	30,728	29,074	1,654	17,773	*63.4*	*59.9*	*5.4*	*36.6*
Male	MGSM	MGSG	MGSA	MGSD	MGSJ	MGWH	MGSS	MGSY	YBTD
Apr-Jun 2005	23,146	16,314	15,480	833	6,832	*70.5*	*66.9*	*5.1*	*29.5*
Apr-Jun 2006	23,353	16,553	15,578	975	6,800	*70.9*	*66.7*	*5.9*	*29.1*
Jul-Sep 2006	23,404	16,636	15,642	994	6,768	*71.1*	*66.8*	*6.0*	*28.9*
Oct-Dec 2006	23,457	16,625	15,661	964	6,832	*70.9*	*66.8*	*5.8*	*29.1*
Jan-Mar 2007	23,509	16,637	15,665	971	6,872	*70.8*	*66.6*	*5.8*	*29.2*
Apr-Jun 2007	23,561	16,676	15,730	946	6,885	*70.8*	*66.8*	*5.7*	*29.2*
Female	MGSN	MGSH	MGSB	MGSE	MGSK	MGWI	MGST	MGSZ	YBTE
Apr-Jun 2005	24,607	13,812	13,212	599	10,796	*56.1*	*53.7*	*4.3*	*43.9*
Apr-Jun 2006	24,778	14,061	13,352	708	10,717	*56.7*	*53.9*	*5.0*	*43.3*
Jul-Sep 2006	24,819	14,060	13,344	716	10,759	*56.6*	*53.8*	*5.1*	*43.4*
Oct-Dec 2006	24,859	14,099	13,375	723	10,761	*56.7*	*53.8*	*5.1*	*43.3*
Jan-Mar 2007	24,900	14,044	13,315	728	10,856	*56.4*	*53.5*	*5.2*	*43.6*
Apr-Jun 2007	24,940	14,052	13,344	709	10,888	*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
Apr-Jun 2005	36,983	29,049	27,633	1,416	7,933	*78.5*	*74.7*	*4.9*	*21.5*
Apr-Jun 2006	37,252	29,430	27,775	1,656	7,822	*79.0*	*74.6*	*5.6*	*21.0*
Jul-Sep 2006	37,310	29,475	27,794	1,681	7,835	*79.0*	*74.5*	*5.7*	*21.0*
Oct-Dec 2006	37,351	29,497	27,832	1,665	7,854	*79.0*	*74.5*	*5.6*	*21.0*
Jan-Mar 2007	37,391	29,453	27,777	1,675	7,939	*78.8*	*74.3*	*5.7*	*21.2*
Apr-Jun 2007	37,432	29,486	27,861	1,626	7,946	*78.8*	*74.4*	*5.5*	*21.2*
Male	YBTG	YBSL	YBSF	YBSI	YBSO	MGSP	MGSV	YBTJ	YBTM
Apr-Jun 2005	19,125	15,951	15,125	826	3,174	*83.4*	*79.1*	*5.2*	*16.6*
Apr-Jun 2006	19,294	16,149	15,186	963	3,145	*83.7*	*78.7*	*6.0*	*16.3*
Jul-Sep 2006	19,334	16,221	15,241	980	3,114	*83.9*	*78.8*	*6.0*	*16.1*
Oct-Dec 2006	19,373	16,217	15,260	957	3,156	*83.7*	*78.8*	*5.9*	*16.3*
Jan-Mar 2007	19,411	16,225	15,264	961	3,185	*83.6*	*78.6*	*5.9*	*16.4*
Apr-Jun 2007	19,449	16,258	15,325	932	3,191	*83.6*	*78.8*	*5.7*	*16.4*
Female	YBTH	YBSM	YBSG	YBSJ	YBSP	MGSQ	MGSW	YBTK	YBTN
Apr-Jun 2005	17,857	13,098	12,508	590	4,759	*73.3*	*70.0*	*4.5*	*26.7*
Apr-Jun 2006	17,958	13,281	12,589	692	4,677	*74.0*	*70.1*	*5.2*	*26.0*
Jul-Sep 2006	17,975	13,254	12,553	701	4,722	*73.7*	*69.8*	*5.3*	*26.3*
Oct-Dec 2006	17,978	13,280	12,572	708	4,698	*73.9*	*69.9*	*5.3*	*26.1*
Jan-Mar 2007	17,981	13,227	12,513	714	4,753	*73.6*	*69.6*	*5.4*	*26.4*
Apr-Jun 2007	17,983	13,228	12,535	693	4,755	*73.6*	*69.7*	*5.2*	*26.4*

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: 14/08/07

Percentage change over 12 months

	Consumer prices						Not seasonally adjusted, except for series PLLW, RNPE and RNPF Producer prices			
	Consumer prices index (CPI)			Retail prices index (RPI)			Output prices		Input prices	
	All items	CPI excluding indirect taxes (CPIY)[1]	CPI at constant tax rates (CPI-CT)	All items	All items excluding mortgage interest payments (RPIX)	All items excluding mortgage interest payments and indirect taxes (RPIY)[2]	All manufactured products	Excluding food, beverages, tobacco and petroleum products	Materials and fuels purchased by manufacturing industry	Excluding food, beverages, tobacco and petroleum products
	D7G7	EL2S	EAD6	CZBH	CDKQ	CBZX	PLLU[3]	PLLW[3]	RNPE[3]	RNPF[3]
2003 Jan	1.3			2.9	2.7	2.9	1.3	0.9	1.7	–2.2
2003 Feb	1.6			3.2	3.0	3.1	1.5	1.1	2.5	–2.0
2003 Mar	1.5			3.1	3.0	3.2	2.1	1.3	0.8	–1.5
2003 Apr	1.4			3.1	3.0	2.9	1.6	1.3	–1.3	–0.6
2003 May	1.3			3.0	2.9	2.7	1.1	1.2	–0.1	–0.2
2003 Jun	1.1			2.9	2.8	2.7	1.1	1.2	0.0	–1.2
2003 Jul	1.3			3.1	2.9	2.8	1.3	1.3	0.6	–0.5
2003 Aug	1.4			2.9	2.9	2.7	1.5	1.2	1.9	0.0
2003 Sep	1.4			2.8	2.8	2.7	1.4	1.4	1.3	1.0
2003 Oct	1.4			2.6	2.7	2.4	1.5	1.3	2.5	1.2
2003 Nov	1.3			2.5	2.5	2.1	1.7	1.4	4.6	1.7
2003 Dec	1.3	1.1	1.1	2.8	2.6	2.2	1.8	1.5	2.0	0.4
2004 Jan	1.4	1.5	1.3	2.6	2.4	2.0	1.6	1.4	–0.3	0.0
2004 Feb	1.3	1.3	1.1	2.5	2.3	1.9	1.6	1.5	–1.3	–0.5
2004 Mar	1.1	1.1	1.0	2.6	2.1	1.7	1.4	1.5	0.9	–0.1
2004 Apr	1.1	1.1	1.0	2.5	2.0	1.8	1.8	1.3	2.9	–0.2
2004 May	1.5	1.4	1.3	2.8	2.3	2.2	2.5	1.4	5.6	0.7
2004 Jun	1.6	1.5	1.4	3.0	2.3	2.3	2.6	1.4	3.7	1.3
2004 Jul	1.4	1.4	1.2	3.0	2.2	2.0	2.6	1.7	3.7	1.4
2004 Aug	1.3	1.3	1.1	3.2	2.2	2.0	2.8	2.2	4.6	2.3
2004 Sep	1.1	1.0	0.9	3.1	1.9	1.7	3.1	2.3	8.1	3.8
2004 Oct	1.2	1.2	1.1	3.3	2.1	2.0	3.5	2.9	9.2	4.8
2004 Nov	1.5	1.4	1.4	3.4	2.2	2.2	3.5	2.9	6.7	4.6
2004 Dec	1.7	1.7	1.6	3.5	2.5	2.5	2.9	2.5	4.4	4.2
2005 Jan	1.6	1.7	1.5	3.2	2.1	2.0	2.6	2.5	9.6	7.5
2005 Feb	1.7	1.7	1.6	3.2	2.1	2.0	2.7	2.5	11.0	8.2
2005 Mar	1.9	2.0	1.8	3.2	2.4	2.3	2.9	2.4	11.1	7.4
2005 Apr	1.9	2.0	1.9	3.2	2.3	2.3	3.3	2.6	10.0	7.0
2005 May	1.9	2.0	1.8	2.9	2.1	2.2	2.7	2.5	7.6	6.5
2005 Jun	2.0	2.2	1.9	2.9	2.2	2.2	2.5	2.3	12.0	7.4
2005 Jul	2.3	2.5	2.3	2.9	2.4	2.5	3.1	2.2	13.9	8.6
2005 Aug	2.4	2.6	2.3	2.8	2.3	2.3	3.0	1.9	12.8	7.5
2005 Sep	2.5	2.6	2.4	2.7	2.5	2.5	3.3	2.1	10.5	5.7
2005 Oct	2.3	2.5	2.3	2.5	2.4	2.3	2.6	1.4	8.9	7.0
2005 Nov	2.1	2.3	2.1	2.4	2.3	2.3	2.3	1.3	13.6	9.6
2005 Dec	1.9	2.1	1.8	2.2	2.0	2.0	2.4	1.7	17.9	12.1
2006 Jan	1.9	2.1	1.9	2.4	2.3	2.3	2.9	1.8	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	10.6	8.9
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	2.0
2007 May	2.5	2.6	2.3	4.3	3.3	3.4	2.4	2.3	1.2	3.3
2007 Jun	2.4	2.5	2.2	4.4	3.3	3.3	2.5	2.1	2.1	2.9
2007 Jul	1.9	2.0	1.7	3.8	2.7	2.6	2.4	2.2	0.0	1.1

Notes:

Source: Office for National Statistics

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

NOTES TO TABLES

Identification (CDID) codes

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

Conventions

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

The following standard symbols are used:

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

CONCEPTS AND DEFINITIONS

Labour Force Survey 'monthly' estimates

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

Labour market summary

Economically active

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

Economically inactive

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

Employment and jobs

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

Unemployment

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

Unemployed people:

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

Other key indicators

Claimant count

The number of people claiming Jobseeker's Allowance benefits.

Earnings

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

Productivity

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

Redundancies

The number of people who:

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

plus the number of people who:

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

Unit wage costs

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

Vacancies

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

Directory of online tables

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

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

Weblink: www.statistics.gov.uk/elmr_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	M	✔
6.08	Total workforce hours worked per week	Q	•
6.09	Total workforce hours worked per week by region and industry group	Q	•
6.10	Job-related training received by employees	Q	✔
6.11	Unemployment rates by previous occupation	Q	✔

Weblink: www.statistics.gov.uk/elmr_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@lsc.gov.uk

DfES Public Enquiry Unit
0870 000 2288

For statistical information on

Average Earnings Index (monthly)
01633 819024

Claimant count
020 7533 6094

Consumer Prices Index
020 7533 5874

Earnings
Annual Survey of Hours and Earnings
01633 819024

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

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

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

Economic activity and inactivity
020 7533 6094

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

Employee jobs by industry
01633 812318

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

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

Labour costs
01633 819024

Labour disputes
01633 819205

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

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

New Deal
0114 209 8228

Productivity and unit wage costs
01633 812766

Public sector employment
General enquiries
020 7533 6178

Source and methodology enquiries
01633 812362

Qualifications (DfES)
0870 000 2288

Redundancy statistics
020 7533 6094

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

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

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

Subregional estimates
01633 812038

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

Annual Population Survey, local area statistics
020 7533 6130

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

Trade unions (DTI)
Employment relations
020 7215 5934

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

Employer-provided training (DfES)
0114 259 4407

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

Unemployment
020 7533 6094

Vacancies
Vacancy Survey: total stocks of vacancies
020 7533 6162

ONS economic and labour market publications

ANNUAL

Financial Statistics Explanatory Handbook

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

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

Foreign Direct Investment (MA4)

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)

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

Share Ownership

2006 edition

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

United Kingdom Balance of Payments (Pink Book)

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

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

United Kingdom National Accounts (Blue Book)

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

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

First releases

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

QUARTERLY

Consumer Trends

2007 quarter 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 2

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

First releases

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

MONTHLY

Financial Statistics

August 2007. Palgrave Macmillan, ISBN 978-0-230-52591-7. Price £45.

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

Focus on Consumer Price Indices

July 2007

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

Monthly review of external trade statistics (MM24)

July 2007

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

Producer Price Indices (MM22)

July 2007

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

First releases

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

OTHER

The ONS Productivity Handbook: a statistical overview and guide

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

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

Labour Market Review

2006 edition. Palgrave Macmillan, ISBN 1-4039-9735-7. Price £40.

www.statistics.gov.uk/products/p4315.asp

National Accounts Concepts, Sources and Methods

www.statistics.gov.uk/products/p1144.asp

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www.statistics.gov.uk/products/p7163.asp

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Measuring government output: issues for Children's Social Care Services
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Regional economic indicators, August 2007, with a focus on differences in sub-regional economic performance
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Standard errors for the PPI

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Measuring societal wellbeing

Using administrative data for statistical purposes