Office for National Statistics

Economic & Labour Market Review

Contents

Vol 4 No 7
July 2010 edition

Office for National Statistics

palgrave macmillan

ISBN 978-0-230-27297-2
ISSN 1751–8326 (print)
ISSN 1751–8334 (online)

A National Statistics publication

National Statistics are produced to high professional standards set out in the Code of Practice for Official Statistics. They are produced free from political influence.

Not all the statistics contained within this publication are national statistics because it is a compilation from various sources.

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

About us

The Office for National Statistics

The Office for National Statistics (ONS) is the executive office of the UK Statistics Authority, a non-ministerial department which reports directly to Parliament. ONS is the UK government's single largest statistical producer. It compiles information about the UK's society and economy, and provides the evidence-base for policy and decision-making, the allocation of resources, and public accountability. The Director-General of the ONS reports directly to the National Statistician who is the Authority's Chief Executive and Head of the Government Statistical Service.

The Government Statistical Service

The Government Statistical Service (GSS) is a network of professional statisticians and their staff operating both within the Office for National Statistics and across more than 30 other government departments and agencies.

Palgrave Macmillan

This publication first published 2009 by Palgrave Macmillan.

Palgrave Macmillan in the UK is an imprint of Macmillan Publishers Limited, registered in England, company number 785998, of Houndmills, Basingstoke, Hampshire RG21 6XS.

Palgrave Macmillan in the US is a division of St Martin's Press LLC, 175 Fifth Avenue, New York, NY 10010.

Palgrave Macmillan is the global academic imprint of the above companies and has companies and representatives throughout the world.

Palgrave® and Macmillan® are registered trademarks in the United States, the United Kingdom, Europe and other countries.

A catalogue record for this book is available from the British Library.

Contacts

This publication

For information about this publication, contact the editorial team, email: elmr@ons.gsi.gov.uk

Other customer enquiries

ONS Customer Contact Centre
Tel: 0845 601 3034
International: +44 (0)845 601 3034
Minicom: 01633 815044
Email: info@statistics.gsi.gov.uk
Fax: 01633 652747
Post: Room 1015, Government Buildings,
Cardiff Road, Newport, South Wales NP10 8XG

www.ons.gov.uk

You can find a downloadable version of this publication at www.palgrave-journals.com/elmr

Media enquiries

Tel: 0845 604 1858
Email: press.office@ons.gsi.gov.uk

Subscriptions

Annual subscription £232, single issue £42.50 (from 1 January)
To subscribe, contact Palgrave Macmillan, tel: 01256 357893,
fax: 01256 812358, email: subscriptions@palgrave.com
www.palgrave.com/ons

Copyright and reproduction

Printing

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

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

Typeset by Curran Publishing Services, Norwich

In brief

Delay to the Quarterly National Accounts and this edition of Economic & Labour Market Review

The release of Quarterly National Accounts (Q1 2010) data was postponed from 30 June to 12 July 2010 after quality assurance revealed potential errors in the National Accounts data set. This means that the latest National Accounts data are unavailable for publication in this edition of *Economic & Labour Market Review* (ELMR) as well as the corresponding set of online Economics tables that were made available on 7 July 2010.

To reflect this, a number of changes to this edition have been made. The monthly Economic Review article, which describes key economic trends as recorded in official statistics, and the Key Indicators and Key Times Series data tables have been dropped as it would not be possible to include the most up-to-date statistics. All of these features will resume as normal in the August edition which is published online on 10 August 2010. The next set of online Economics tables, released on 2 August 2010, will also include new National Accounts data.

To replace the unavailable content in this edition a number of extra feature articles have been added. A total of nine articles are being published this month, covering recent developments in, and features of, the labour market; new data on services producer prices; and issues in measuring intangible investments and societal well-being.

Further information

www.statistics.gov.uk/pdfdir/qnanr0610.pdf

Contact

elmr@ons.gsi.gov.uk

Measuring outcomes for public service users – final report

In the UK public services account for around one-fifth of gross domestic product so taxpayers, service users and service providers have an interest in how government spends money on these services and whether the services are good value for money. However, ensuring best value for money is complicated by lack of a clear definition of the value of public services and information about the benefits they provide. These are the issues that the Measuring Outcomes for Public Services Users (MOPSU) project, which published its final report on 7 June 2010, aimed to inform as well as exploring the role of the voluntary sector in public service delivery.

MOPSU was a three-year project to develop new, and examine existing measures of public services outcomes. The initial focus was on two public service areas, adult social care and early years education. It was led by the UK Centre for the Measurement of Government Activity (UKCeMGA) at the Office for National Statistics in partnership with the National Council for Voluntary Organisations (NCVO), the Personal Social Services Unit (PSSRU) at the University of Kent, and the National Institute of Economic and Social Research (NIESR), and funded by HM Treasury under the Invest to Save Budget.

Research on the role of the voluntary sector in public service delivery found that:

- in 2007/08 the voluntary sector received £12.8 billion of funding from government, this accounted for approximately 36 per cent of voluntary sector income
- five service areas – employment and training, law and advocacy, education, housing and social services – are heavily dependent on government funding, receiving over half their income from government
- over half of the funding from local government to the voluntary sector went into the social services area
- In 2007/08 nearly three-quarters of government funding to the voluntary sector was in the form of contracts. This gives an indication of the level of involvement of the voluntary sector in delivering public services

Further information

www.ons.gov.uk/about-statistics/methodology-and-quality/measuring-outcomes-for-public-service-users/index.html

Contact

qmf@ons.gsi.gov.uk

Environmental Accounts 2010

The latest UK Environmental Accounts show that the level of greenhouse gas emissions created per unit of output (emissions intensity) by the UK economy (excluding households) fell 2.5 per cent between 2007 and 2008.

Emissions intensity in the manufacturing sector decreased 1.2 per cent in 2008 with emissions falling at a faster rate than economic output due to lower fossil fuel consumption. The continuing switch away from coal to natural gas for electricity generation meant emissions per unit of output also fell by 2.1 per cent in the electricity, gas and water supply sector. Emissions intensity fell by 3.3 per cent in transport and communications whilst increasing by 0.5 per cent in agriculture as output decreased at a faster rate than emissions.

These four industry sectors accounted for over 80 per cent of the emissions of greenhouse gases by the UK economy (excluding households) in 2008 and represented just over one-fifth of economic output.

The first signs of the economic downturn were seen in 2008 but the decrease in emissions intensity indicates that the overall fall in greenhouse emissions was not wholly driven by reduced economic growth. Emissions intensity has continued to improve across the non-household sector and greenhouse gas emissions per unit of output in 2008 were 43.9 per cent below those in 1990.

Over the same period, there were similar improvements in energy intensity and material productivity. Energy intensity (energy consumed per unit of output) decreased by 34.4 per cent and material productivity (output per unit of material consumption) increased 87.4 per cent.

For the household sector, greenhouse gas emissions increased by 0.2 per cent in 2008, with a 3.1 per cent rise in greenhouse gas emissions from domestic heating largely offset by a 3.4 per cent reduction in travel related emissions. Emissions from the household sector (which accounts for approximately one-fifth of total greenhouse gas emissions) have increased 5.5 per cent since 1990 but the small increase in 2008 follows three years of falling emissions.

On 11 June 2010, together with the publication of the latest Environmental Accounts, ONS launched a three month open consultation on the environmental accounts strategy. The key points on which we welcome feedback are:

- plans to move from a six-monthly to an annual publication in order to refocus resources on developing the accounts
- priorities for the development programme
- proposals to suspend some accounts which have not been updated for some time until they can be properly reviewed
- the role of Environmental Accounts in the wider cross-government programme on measuring societal wellbeing, that is, measures of progress and wellbeing that go beyond GDP

Further information

www.statistics.gov.uk/focuson/environmental/

www.ons.gov.uk/about/consultations/open-consultations/index.html

Contact

claire.gardner@ons.gsi.gov.uk

Household incomes – differences across the UK

The 42nd edition of *Regional Trends*, published by ONS on 8 June 2010, included a key article revealing marked differences in income levels in different parts of the United Kingdom.

The report 'Understanding income at small area level' examines the wide variations in patterns of average household net income within regions. These show that London had the highest average income at £620 per week in 2007/08. It also had the widest spread between lowest and highest incomes: 10 per cent of households had income of £820 a week or more, compared with the lowest 10 per cent whose income was £460 a week or less. The North East had the lowest average with £400 per week, and the narrowest spread after Wales. Only 10 per cent of households in the North East had net incomes of £480 a week or more. However, once housing costs have been taken into account the difference in average weekly net incomes between London and the North East is reduced (£510 per week in London compared with £350 per week in the North East).

Among other key findings of the report are:

- since 2004/05 Wales has seen the greatest increase in average income, rising 16 per cent over the three-year period
- the lowest regional increases between 2004/05 and 2007/08 were in the North West and South West
- the gap between highest and lowest incomes closed the most in the West Midlands and North East

Further information

www.statistics.gov.uk/regionaltrends42

Contact

paul.vickers@ons.gsi.gov.uk

Changes to 'working age' headline employment and inactivity rates

At present, the headline employment and inactivity rates from the Labour Force Survey (LFS) are described as working age. These working age rates are based on upper age limits of 59 for women and 64 for men, reflecting state pension ages in the UK. However, between 2010 and 2020, the state pension age for women will gradually increase, by one month every two months, from 60 to 65.

Following a public consultation and extensive discussions with key users within government, ONS has decided that, from the August 2010 edition of the Labour Market Statistical Bulletin, the current working age employment and inactivity rates will be replaced with headline rates based on those aged from 16 to 64 for both men and women. There will be a consistent time series going back to 1971 for the new headline employment and inactivity rates for the UK. This change will bring the UK into line with current international practice. The headline unemployment rate will continue to be based on the economically active population aged 16 and over.

Throughout the UK and regional Labour Market statistical bulletins, the current working age LFS series for employment, unemployment and inactivity will be replaced by series based on those aged from 16 to 64 for both men and women. LFS series based on men aged from 50 to 64 and women aged from 50 to 59 will be replaced by new series based on those aged from 50 to 64 for both men and women. Similarly, LFS series based on men aged 65 and over and women aged 60 and over will be replaced by series based on those aged 65 and over for both men and women. Series that currently use a working age denominator, such as the benefits proportions shown at Table 25 of the Labour Market Statistical Bulletin, will change to a denominator based on those aged from 16 to 64 for both men and women.

Further information is available in an article published in the January 2010 edition of *Economic & Labour Market Review*.

Further information

www.statistics.gov.uk/cci/article.asp?ID=2346

Contact

labour.market@ons.gsi.gov.uk

Women face shorter retirement as state pension age rises

At present women in the UK can expect to draw state pensions for around seven years longer than men. However, as women's state pension age (SPA) rises from 60 to 65 by April 2010, their life expectancy at SPA will decline so that their advantage over men will narrow to less than three years. These figures were revealed in 'Life expectancy and healthy ageing' which is the third chapter of *Pension Trends* published by ONS on 25 June 2010.

Life expectancy at state pension age has increased substantially for both men and women in the past 28 years. In 2009 women could expect to live nearly 25 years beyond state pension age compared to just 21 years in 1981, and men could expect 18 years compared to 13 years. However, under current legislation life expectancy at SPA is expected to level off between 2021 and 2051 for both sexes. This is because planned increases in SPA for both sexes, from 65 to 68 between 2024 and 2046, will match projected increases in life expectancy. These estimates do not reflect the recent policy

decision to bring forward the date at which SPA starts to rise to 66.

Life expectancies though differ according to social classing and where people life. For instance:

- in 2002–05, people at age 65 in the top social class group (professionals such as doctors, accountants and engineers) could expect to live 4.2 years longer than those in the bottom social class group (unskilled manual labourers)
- in 2007, women in England had the highest life expectancy at age 65 (20.2 years), while men in Scotland had the lowest (16.2 years)

Further information

www.statistics.gov.uk/pensiontrends

Contact

pension.trends@ons.gsi.gov.uk

Measuring the output of the prison and probation services

The UK Centre for the Measurement of Government Activity (UKCeMGA) is the part of ONS responsible for various measures of public service output and productivity. Two recent articles discuss improvements to the output measures for two of these service areas – the probation service (17 June 2010) and the prison service (24 June 2010).

The probation service is part of the criminal justice system. It supervises offenders who are given community and suspended sentences by the court, as well as offenders given custodial sentences both before and after their release. In the National Accounts there was £930 million of expenditure on the probation service in 2008 accounting for 0.06 per cent of GDP and 0.3 per cent of government consumption spending.

Following the Criminal Justice Act 2003 there have been large increases in the use of suspended and community sentences. New output data for this public service makes greater use of current data replacing previously extrapolated data. This reduces the overall index by 9 per cent between 1997 and 2008 and reduces the average annual growth rate from 4.9 per cent to 3.9 per cent over this period.

In 2008 there was £4 billion of expenditure on the prison service (0.3 per cent of GDP and 1.3 per cent of government consumption). Chained volume measures of prison output in the National Accounts is measured by the number of prisoners in Great Britain using end-month prisoner population figures from the Ministry of Justice and Scottish Prison Service. The new article proposes two improvements to the existing measure of output in National Accounts.

First, unit costs are used to differentiate between different functions of prison, where previously the different functions of prison were not weighted by the costs of provision. As a result, existing output measures take no account of the change in the mix of prisoners, for example an increase in high security prisoners.

Second, there has so far been an implicit assumption that output in Northern Ireland has changed at the same rate as output in Great Britain, which can now be relaxed by extending coverage to include the Northern Ireland Prison Service. These proposed methodological changes are calculated to have reduced average annual output growth between 2000 and 2008 by 0.1 percentage point, from 3.1 per cent to 3.0 per cent.

Further information

www.ons.gov.uk/about-statistics/ukcemga/index.html

Contact

ukcemga@ons.gsi.gov.uk

Budget and the CPI

ONS estimates that the measures announced in the June 2010 and previous Budgets and Pre-Budget Reports will add 1.77 percentage points to the one-month change in the consumer prices index (CPI) in 2010/11. This estimate assumes that changes to duty and indirect taxes are passed on in full to consumers as soon as they come into effect. The largest impact, accounting for 1.47 percentage points of the increase, reflects the planned rise in VAT to 20 per cent on 4 January 2011. This compares with an estimated increase of 1.72 percentage points as a result of the measures that were implemented in 2009/10.

It is estimated that the measures will add 1.67 percentage points to the one-month change in the retail prices index (RPI). The impact on the RPI is less than that for the CPI as the items measured by CPI and RPI that are subject to the standard rate of VAT, have overall, a lower weight in the RPI. This means that the increase in this form of taxation has less of an impact on the RPI. The measures implemented in 2009/10 were estimated to increase the RPI one-month change by 1.49 percentage points.

Further information

www.statistics.gov.uk/cci/article.asp?ID=2462

Contact

darren.morgan@ons.gsi.gov.uk

UPDATES

Updates to statistics on www.statistics.gov.uk

9 June

UK Trade

Deficit widened to £3.3 billion in April
www.statistics.gov.uk/cci/nugget.asp?id=199

10 June

Household income

Top to bottom income ratio four to one
www.statistics.gov.uk/cci/nugget.asp?id=334

Travel and tourism

Visits abroad down in April
www.statistics.gov.uk/cci/nugget.asp?id=352

11 June

Producer prices

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

Index of production

April shows 2.1% annual rise
www.statistics.gov.uk/cci/nugget.asp?id=198

15 June

Inflation

March 2010: CPI inflation 3.4%, RPI inflation 5.1%
www.statistics.gov.uk/cci/nugget.asp?id=19

16 June

Average weekly earnings

Regular pay growth decreases
www.statistics.gov.uk/cci/nugget.asp?id=10

Employment

Employment rate falls to 72.1%
www.statistics.gov.uk/cci/nugget.asp?id=12

Public sector

Employment decreases in Q1 2010
www.statistics.gov.uk/cci/nugget.asp?id=407

17 June

Retail sales

Volume growth increases in May
www.statistics.gov.uk/cci/nugget.asp?id=256

18 June

Public sector finances

May: £14.1 billion budget deficit
www.statistics.gov.uk/cci/nugget.asp?id=206

29 June

CPI and the budget

Estimated impact on inflation
www.statistics.gov.uk/cci/nugget.asp?id=336

Net investment

Institutional: £5.0 billion
www.statistics.gov.uk/cci/nugget.asp?id=396

30 June

Business investment

7.1% rise in first quarter 2010
www.statistics.gov.uk/cci/nugget.asp?id=374

FORTHCOMING RELEASES

Future statistical releases on www.statistics.gov.uk

2 July

Social Trends – 40

7 July

Profitability of UK companies – Q1 2010

8 July

Index of production – May 2010

9 July

Producer price index – June 2010

UK Trade – May 2010

12 July

Quarterly national accounts – Q1 2010

Balance of payments – Q1 2010

Index of services – April 2010

Financial statistics – July 2010

13 July

Consumer price indices – June 2010

Travel Trends 2009

Travelpac – 2009

Wider measures of public sector net debt

A generational accounts approach to long–term public finance in the UK

14 July

Average weekly earnings – May 2010

Workforce jobs revisions – June 2010

Labour market statistics – July 2010

Aerospace and electronic cost indices – April 2010

15 July

Overseas travel and tourism – Q1 2010

Overseas travel and tourism – May 2010

Productivity measures – Q1 2010

Consumer Trends – Q1 2010

16 July

Output and employment in the construction industry – April, May 2010

New orders in the construction industry – Q1 2010

Turnover and orders in production and services industries

20 July

Public sector finances – June 2010

21 July

Average earnings index – May 2010

22 July

Retail sales – June 2010

23 July

Gross domestic product preliminary estimate – Q2 2010

Index of services – May 2009

27 July

Public service productivity – 2010

30 July

UK National Accounts – the Blue Book 2010

UK Balance of Payments – the Pink Book 2010

Independent forecasts

June 2010

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 2010 and 2011 and are extracted from HM Treasury's Forecasts for the UK Economy.

2010

	Average	Lowest	Highest
GDP growth (per cent)	*1.2*	*0.9*	*2.2*
Inflation rate (Q4, per cent)			
CPI	*2.6*	*1.5*	*3.5*
RPI	*3.7*	*2.4*	*5.4*
Claimant count (Q4, million)	1.67	1.45	2.00
Current account (£ billion)	–19.8	–42.3	8.1
Public Sector Net Borrowing (2009–10, £ billion)	156.5	131.2	189.1

2011

	Average	Lowest	Highest
GDP growth (per cent)	*2.2*	*1.2*	*3.2*
Inflation rate (Q4, per cent)			
CPI	*1.8*	*0.3*	*3.3*
RPI	*3.1*	*1.4*	*4.2*
Claimant count (Q4, million)	1.68	1.43	2.30
Current account (£ billion)	–18.7	–62.9	17.8
Public Sector Net Borrowing (2010–11, £ billion)	131.2	89.0	201.0

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/data_forecasts_index.htm

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* (November 2009), published by OECD (Organisation for Economic Co-operation and Development).

2010

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	*2.5*	*1.8*	*0.9*	*1.9*
Consumer price (percentage change from previous year)	*1.7*	*–0.9*	*0.9*	*..*
Unemployment rate (per cent of the labour force)	*9.9*	*5.6*	*10.6*	*9.0*
Current account (as a percentage of GDP)	*–3.4*	*2.8*	*–0.1*	*–0.8*
Fiscal balance (as a percentage of GDP)	*–10.7*	*–8.2*	*–6.7*	*–8.3*

2011

	US	Japan	Euro area	Total OECD
Real GDP growth (per cent)	*2.8*	*2.0*	*1.7*	*2.5*
Consumer price (percentage change from previous year)	*1.3*	*–0.5*	*0.7*	*..*
Unemployment rate (per cent of the labour force)	*9.1*	*5.4*	*10.8*	*8.8*
Current account (as a percentage of GDP)	*–3.7*	*2.8*	*0.3*	*–0.8*
Fiscal balance (as a percentage of GDP)	*–9.4*	*–9.4*	*–6.2*	*–7.6*

Notes

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

ARTICLE

Helen Tam
Office for National Statistics

Characteristics of the underemployed and the overemployed in the UK

SUMMARY

Underemployment and overemployment represent two scenarios whereby there is a mismatch between an individual's preferred and actual number of work hours. This article examines the levels of underemployment and overemployment in the UK between 2001 and 2010, and describes changes at the time of the 2008-09 recession. Characteristics of the underemployed and the overemployed, in terms of work status, age, sex, qualification, occupation and industry, regions, and earnings, are also presented. These findings are reported while considering the impact of underemployment and overemployment on societal well-being.

Introduction

In the labour market, the theoretical assumption is that labour suppliers (workers) will naturally match themselves to jobs offering the number of working hours that they want (Golden and Gebreselassie 2007). In practice, constraints from employers and trade unions, standard hours typical for their industry and lack of labour mobility make this equilibrium difficult to achieve. Consequently, there are mismatches between a worker's actual and preferred number of hours worked, thus creating time-related underemployment and overemployment. Time-related underemployment reflects a desire for more working hours for more pay, whereas time-related overemployment reflects a desire for fewer working hours for less pay. While a mismatch of actual and preferred work hours may arise due to an individual's preferences and circumstances, it may also follow from the cyclical pattern of economic growth. For instance, overemployment may increase when the economy is above trend and decrease when the economy is below trend. For underemployment the opposite cyclical pattern would be expected.

Underemployment and overemployment may take other forms, for example, when there is a mismatch of skills required for the job and the skills possessed by the job-holder (such as under- and over-qualification). For the purposes of this article, however, only the time-related forms of underemployment and overemployment are considered. These are situations where the worker's preferred and actual working hours differ.

Economic consequences of underemployment and overemployment

Although unemployment is the conventional indicator of the state of the labour market, it may not fully capture the degree of spare capacity. For example, people working even just one hour during the reference week would be defined by the International Labour Organisation (ILO) as employed. For this reason, the full capacity of the labour market would be more accurately determined if underemployment is also taken into the account. In economic terms, underemployment implies extra labour supply that would add to the output of the economy. On the other hand, it may be tempting to assume that extra hours worked would automatically equate to a corresponding increase in production levels. However, there are likely to be hidden costs arising from overemployment, such as worker absences and fatigue, which could result in a decrease in productivity. In short, there are economic incentives to reduce the prevalence of both underemployment and overemployment.

Consequences of underemployment on well-being

From an individual's perspective, a lowering of underemployment and overemployment may benefit physical and psychological

well-being. Although unemployment is most strongly associated with poor economic and social consequences (see McLean 2005), time-related underemployment has nonetheless been found to have a significant and negative impact on aspects such as income level, welfare dependency and life satisfaction (see Wilkins 2007). Additionally, part-time workers who were underemployed (those who were involuntary part-time workers) reported particularly low levels of job satisfaction, although it may be the case that low job satisfaction itself was driving the desire to seek alternative employment (with longer hours), rather than the fact that lack of hours was the cause of low job satisfaction.

In relation to other aspects of mental health, Prause and Dooley (1997) assessed a group of recent school-leavers and found that after controlling for previous measures of self-esteem, compared to those who were adequately employed, self-esteem levels of involuntary part-time workers were significantly lower (and not significantly different from those of the unemployed).

In another longitudinal study, Dooley, Prause and Ham-Rowbottom (2000) found that a change in employment status, from adequately employed to underemployed (in terms of either working part-time involuntarily or receiving a lower wage) led to an increase in depression, even after controlling for previous depression levels and other potential mediating factors such as marital status, income levels and job satisfaction. There is, however, other evidence suggesting that compared to time-based underemployment, other forms of underemployment arising from a shortage of income, demotion in status and underutilisation of skills may create more severe health and mental problems in the individual (Friedland and Price, 2003).

Consequences of overemployment on well-being

In contrast to the well-documented negative effects of unemployment on health and well-being, it has been argued that there is a positive association between employment and well-being (for example, Shah and Marks, 2004). However, this relationship is not as simplistic as it seems, because there is a substantial proportion of the workforce whose well-being may be adversely affected by overemployment (for a review, see Sparks et al, 1997). Clearly, working beyond physical and mental limits causes fatigue. This may lead to a downward cycle where more time spent at work leaves less time to recover from fatigue. The potential link between overwork and other physiological problems, most notably cardiovascular disease, has received considerable scientific attention (for example, Sokejima and Kagamimori, 1998). Other potential health effects from overwork include musculoskeletal problems, higher risks of accidents and injury due to increased exposure to workplace hazards, and increased alcohol consumption and smoking (Spurgeon, 2003). More time spent at work also means that less time is spent at home and with family. Disruption of work-life balance is a common consequence of overemployment, and has been shown to be associated with increased work-family conflict, and indirectly with psychological distress (Major et al, 2002). Similarly, Artazcoz et al (2009) found that among men, compared to those working normal hours (30-40 per week), those working more than 50 hours per week reported poorer mental health, lower job satisfaction, less leisure-time activity and poorer sleep. The negative association between hours worked and wellbeing has also been shown to be exacerbated if overemployment was mandatory (Golden and Wiens-Tuers, 2008).

Aims of this article

It is notable that some of the research cited in the previous section specifically examined the relationship between wellbeing and number of hours worked, rather than underemployment or overemployment *per se*. While underemployment and overemployment are probably highly correlated with the number of hours worked, these states can be experienced regardless of the actual number of hours worked, so long as there is a preference to work more or fewer hours at the prevailing rate of pay. It is therefore reasonable to suggest that individuals who have self-classified themselves as underemployed or overemployed are more likely to have experienced the negative effects arising from these two conditions.

As will be explained in detail in the next section, the Labour Force Survey (LFS) uses personal preference for hours worked as the basis for classifying people as underemployed or overemployed. Given the negative effects of underemployment and overemployment on physical and mental well-being, this article investigates the prevalence of these two states of mismatch of preferred and actual work hours in the labour market. Recently, the extent of underemployment, and how it has increased as a consequence of the 2008-09 recession in the UK, have been discussed in the February 2010 issue of the *Economic and Labour Market Review* (Walling and Clancy, 2010). The present article will extend that work by examining the levels of underemployment and overemployment between 2001 and 2010, in order to ascertain whether there were related changes in these two measures, particularly during the 2008-09 recession. This article will also detail the characteristics of the underemployed and the overemployed, and assess how these two subgroups of the workforce are different from each other in terms of these characteristics.

Measuring underemployment and overemployment on the LFS

Questions are included in the Labour Force Survey (LFS) which can be used to measure both overemployment and underemployment in the UK. Responses on these questions, along with International Labour Organisation (ILO) definitions are used to produce an estimate for underemployment and overemployment (see **Box 1** and **Box 2**). Specifically, the LFS asks respondents if they were looking for a different (or additional) job during the reference week (LFS variable DIFJOB), and whether the reason for doing so was due to a desire for fewer or more working hours (LOOKM or LOOK8M, PREFHR). Respondents were also asked (if they were not looking for a different or additional job) whether they would like to work more hours at their current job at their basic rate of pay (UNDEMP), or whether they would like to work fewer hours at their current job (LESPAY2), even if this meant less pay (LESPAY3).

Those wanting to work more hours were only classified as underemployed if they were available to start working extra hours within two weeks, and if their 'constructed' working hours for the reference week fell within a certain threshold (more than 40 hours for people under 18 years of age, and more than 48 hours for people over 18 years of age). Constructed hours were taken to be actual hours worked for the reference week, unless this figure was less than the respondent's usual weekly hours due to non-economic reasons (such as holiday or sick leave), in which case, usual weekly hours was taken to be the constructed hours measure (Walling and Clancy, 2010).

Those wanting to work fewer hours were only classified as overemployed if they were also prepared to be paid less at

Box 1
Measuring underemployment and overemployment

Defining underemployment

The International labour organisation (ILO) defines time-related underemployment as where the number of hours of work for an employed person is insufficient, and that the person is willing to engage in more work and is not already working more than a specified number of hours.

Based on the ILO definition and data from the LFS, employed people (aged 16 or over) are classified as underemployed if:

- they are willing to work more hours because they want a job additional to their current job, want another job with longer hours, or want more hours in their current job
- they are available to start working longer hours within 2 weeks, and
- their 'constructed hours' during the reference week did not exceed 40 hours (if they are under 18 years of age) or 48 hours (if they are over 18 years of age)

Definition of constructed hours

The ILO recommends that actual hours worked for the reference week is used to capture individuals who worked fewer hours than usual due to economic reasons (for example, variable work hours, loss of hours due to industrial disputes or a downturn in business). However, a large proportion of the workers who were working shorter hours than usual in the reference week did so because of non-economic reasons (for example, sickness absence, annual leave). In order to produce an appropriate measure of hours worked in the reference week, the concept of constructed hours was created. This is defined as the actual number of hours worked in the reference week, unless this was fewer than the number of usual weekly hours due to non-economic reasons, in which case constructed hours equal usual weekly hours.

The **underemployment rate** is the number of underemployed people as a percentage of the total in employment, and excludes people who did not answer the necessary questions to classify them as either underemployed or not underemployed.

Defining overemployment

There is no international definition for overemployment, but in this article, employed people (aged 16 or over) are classified as overemployed if:

- they want to work fewer hours, either in a different job or in their current job, and
- they would accept less pay for shorter hours, either in a different job or in their current job

In this overemployment classification, no threshold for a minimum number of hours worked is applied because it is feasible for a person to want fewer hours even if they are working shorter than average hours.

The **overemployment rate** is the number of overemployed people as a percentage of the total in employment, and excludes people who did not answer the necessary questions to classify them as either overemployed or not overemployed.

Box 2
LFS weighting

Data from the LFS are weighted to reflect the changing population of the UK accordingly. Throughout this article, data up to Q2 (April to June) 2006 were weighted using 2007 population weights, whereas data since Q3 (July to September) 2006 were weighted using 2009 population weights.

the prevailing rate. Rules applied to derive underemployment and overemployment, and the number of people within these categories in Q1 (January to March) 2010 in the UK, are shown in **Figure 1**. In Q1 2010, close to 28.7 million people were in employment. Of these, nearly 3.5 million wanted to work more hours. However, after imposing the criterion relating to availability to start working extra hours within two weeks, and the threshold on constructed hours, just over 2.8 million people were classified as underemployed. Similarly, out of the total workforce, just over 9.8 million people wanted to work fewer hours, but only around 2.8 million of these could be classified as overemployed as they were prepared to be paid less for fewer hours. For the purposes of this article, those who did not express a wish for fewer or more hours, or failed to be classified as underemployed or overemployed, would be referred to as 'adequately employed'. According to Figure 1, the number of people who were adequately employed in Q1 2010 was approximately 23.2 million.

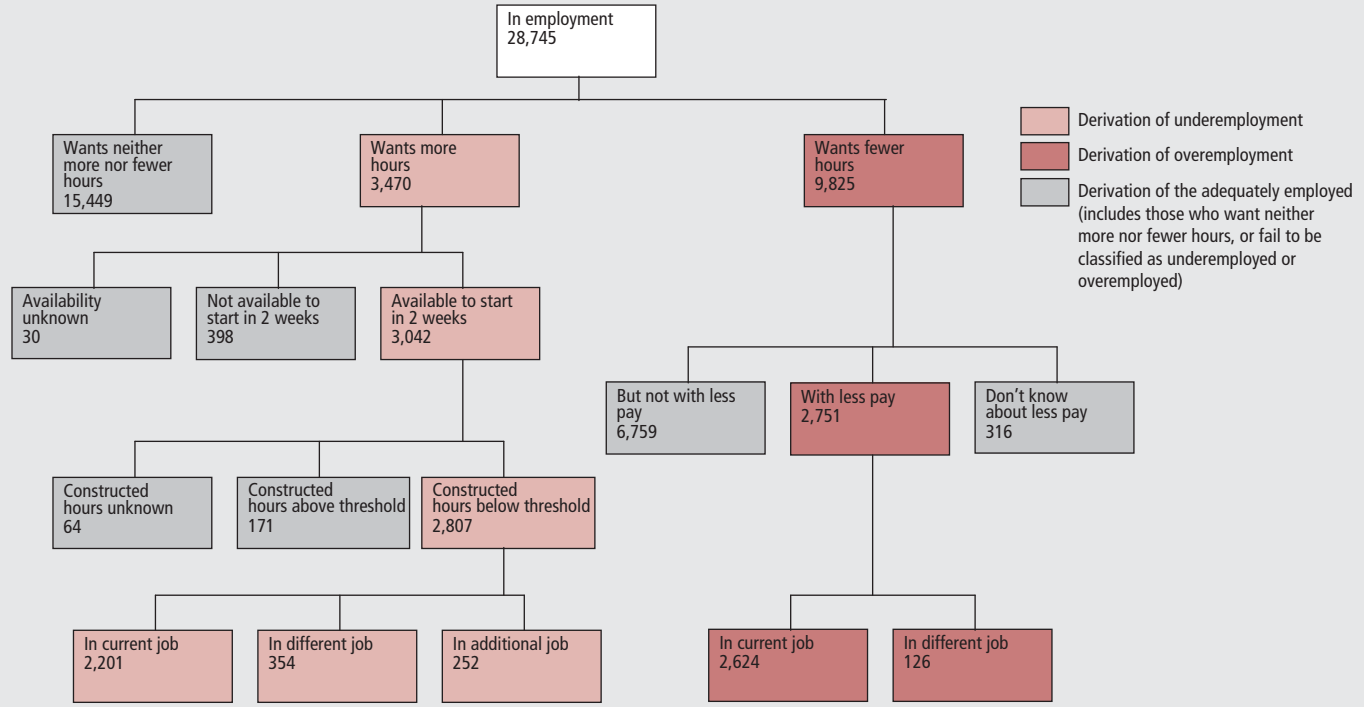
Trends in underemployment and overemployment: 2000-2010

Figure 2 and **Figure 3** show the trends in levels and rates of underemployment and overemployment between Q1 2001 and Q1 2010 (not seasonally adjusted). Underemployment levels declined gradually from the beginning of the decade until 2005, when they began to increase. Overemployment levels, on the other hand, increased gradually from 2000 until 2003, when they began to drop slightly until 2005. There was a small peak in overemployment in Q4 2007, but this was followed by a sharper decline up to Q2 2009. Interestingly, after nearly a decade in which there were more overemployed than underemployed workers, the pattern was reversed in Q1 2009. Since that quarter, there have been slightly more people who were underemployed than overemployed in the UK. These recent developments in both underemployment and overemployment levels are consistent with expectations of labour market changes during a recession.

As the economy contracted, labour demand (hours of work required by employers) decreased. More people would be underemployed as they were working fewer hours than they preferred. Conversely, those who were previously overemployed might see a decrease in

Figure 1
Underemployment and overemployment, Q1 2010[1]

United Kingdom
Thousands, not seasonally adjusted

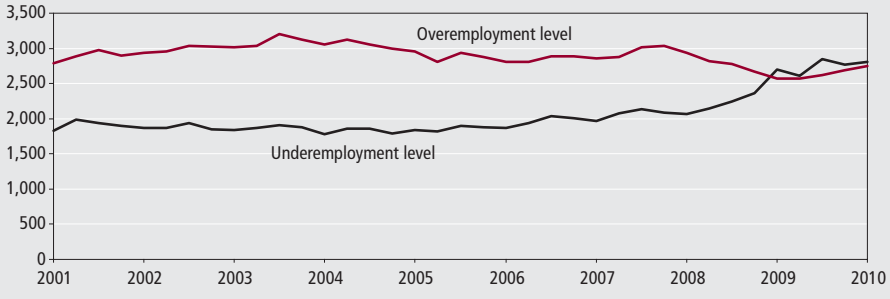


Notes:
1 Numbers do not necessarily add up due to rounding.

Source: Labour Force Survey

Figure 2
Underemployment and overemployment levels, 2001–10[1]

United Kingdom
Thousands, not seasonally adjusted

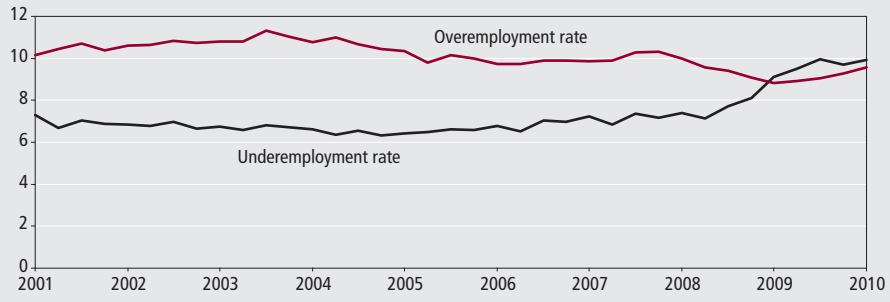


Notes:
1 For each quarter from 2001–10.

Source: Labour Force Survey

Figure 3
Underemployment rates and overemployment rates, 2001–10[1]

United Kingdom
Percentages, not seasonally adjusted



Notes:
1 For each quarter from 2001–10.

Source: Labour Force Survey

their work hours, and thereby would no longer be overemployed. In terms of societal well-being, during and after the recession, an increasing number of people might be experiencing underemployment and its associated adverse outcomes. However, there might be fewer people overemployed, and those who were no longer overemployed might experience an improvement in their work-life balance, and overall physical and mental well-being.

Characteristics of the underemployed and the overemployed

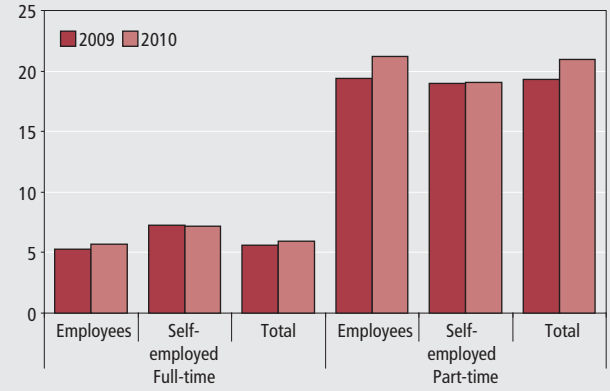
Figure 4a shows the underemployment rates and **Figure 4b** the overemployment rates in Q1 2009 and Q1 2010, by full-time/ part-time and employee/ self-employed status. In Q1 2010, about a quarter of all employees and self-employed people worked part-time (26.7 per cent and 25.7 per cent respectively). The underemployment rate in Q1 2010 was lower for people who classified their job as full-time (5.9 per cent) than for people who classified their job as part-time (20.9 per cent). The pattern was reversed for overemployment, where a greater proportion of full-time workers (11.4 per cent) than part-time workers (4.9 per cent) were overemployed. The greater likelihood for part-time workers to be underemployed,

Figure 4a

Underemployment rates for employees and self-employed by full-time and part-time status[1], Q1 2009 and 2010

United Kingdom

Percentages, not seasonally adjusted



Notes: *Source: Labour Force Survey*

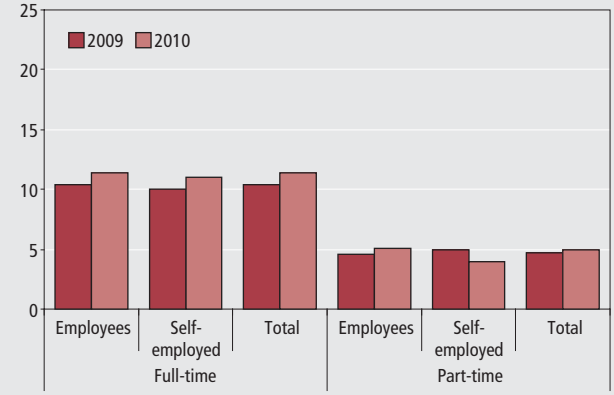
1 Full-time/ part-time and employee/ self-employed status are self-classified on the LFS.

Figure 4b

Overemployment rates for employees and self-employed by full-time and part-time status[1], Q1 2009 and 2010

United Kingdom

Percentages, not seasonally adjusted



Notes: *Source: Labour Force Survey*

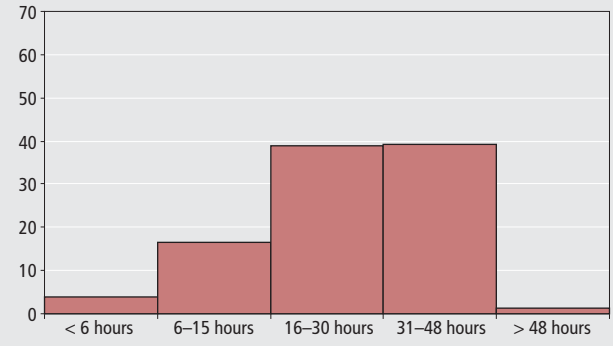
1 Full-time/ part-time and employee/ self-employed status are self-classified on the LFS.

Figure 5a

The distribution of the underemployed in terms of usual weekly hours worked, Q1 2010

United Kingdom

Percentages



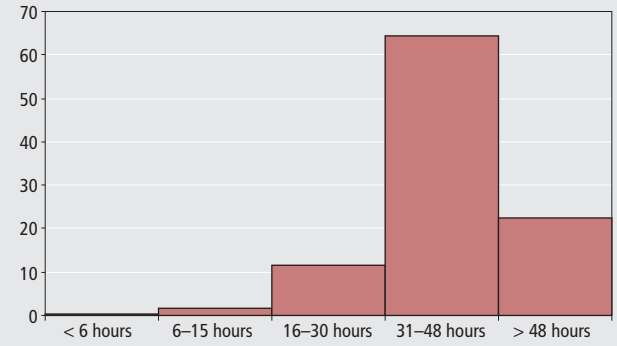
Source: Labour Force Survey

Figure 5b

The distribution of the overemployed in terms of usual weekly hours worked, Q1 2010

United Kingdom

Percentages



Source: Labour Force Survey

and full-time workers to be overemployed, was observed for both employees and self-employed people. However, within the self-employed, underemployment might arise if there was a desire to expand business. Conversely, the self-employed who reported overemployment could avoid overemployment by turning down business. Hence, the factors underlying both underemployment and overemployment for the self-employed workforce can be further investigated.

Over the year from Q1 2009 to Q1 2010, the underemployment rate increased by 1.6 percentage points for part-time workers, and this increase was larger than that for full-time workers (0.3 percentage points). These changes in the underemployment rates might suggest that a number of workers have become underemployed because they had moved from full-time to part-time employment as labour demand contracted. According to ONS's Labour Market statistical bulletin in Q1 2010, 14 per cent of the part-time workforce were working part-time because they could not find a full-time job. The analysis here shows that the underemployment rate among part-time workers was 20.9 per cent. The difference between these two figures suggests that some part-time workers might want to work more hours, but not to the extent of what they would consider as full-time hours.

During the same period, however, the overemployment rate also increased, by 1.0 percentage point for full-time workers, and by 0.3 percentage points for part-time workers.

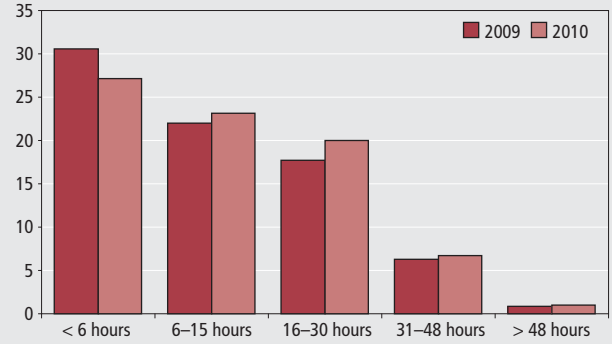
Usual weekly hours

Underemployment and overemployment are examined in greater detail by breaking down these two groups of people in terms of usual weekly hours of work. As shown in **Figure 5a**, of the underemployed in Q1 2010, the majority worked between 16 to 30 hours (39.0 per cent) or 31 to 48 hours (39.1 per cent). Within the overemployed group, shown in **Figure 5b**, the majority (64.3 per cent) worked between 31 to 48 hours or more than 48 hours (22.4 per cent).

The mean usual weekly hours for people who were neither classified as underemployed nor overemployed (the 'adequately employed') was 36.9 hours. In comparison, the underemployed worked fewer hours (26.7 hours), and the overemployed worked more hours (41.6 hours) on an average week.

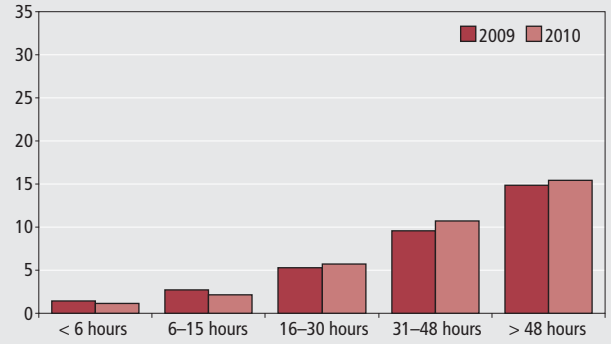
The percentage of underemployed and overemployed people grouped by the number of hours they usually worked in a week are shown in **Figures 6a** and **6b**

Figure 6a
Underemployment rates by usual weekly hours of work, Q1 2009 and 2010
United Kingdom
Percentages, not seasonally adjusted



Source: Labour Force Survey

Figure 6b
Overemployment rates by usual weekly hours of work, Q1 2009 and 2010
United Kingdom
Percentages, not seasonally adjusted



Source: Labour Force Survey

Table 1
Underemployment rates by age, sex and full-time/part-time status, Q1 2010

United Kingdom — Percentages, not seasonally adjusted

	All aged 16 and over	16-17	18-24	25-34	35-49	50-59/64	60/65+
All in employment							
Total	*9.9*	*22.4*	*17.6*	*9.8*	*9.6*	*7.3*	*4.5*
Men	*9.3*	*28.6*	*18.3*	*10.6*	*7.9*	*6.5*	*4.1*
Women	*10.6*	*18.3*	*16.9*	*8.8*	*11.5*	*8.5*	*4.7*
Part-time							
Total	*21.0*	*25.1*	*33.4*	*23.2*	*21.9*	*17.3*	*5.8*
Men	*30.2*	*34.7*	*39.0*	*43.5*	*39.5*	*22.4*	*6.2*
Women	*18.1*	*19.6*	*29.7*	*18.0*	*19.5*	*15.2*	*5.7*
Full-time							
Total	*5.9*	*9.3*	*9.4*	*6.9*	*5.7*	*4.1*	*2.0*
Men	*6.5*	*9.2*	*10.7*	*8.3*	*6.1*	*4.3*	*1.1*
Women	*4.9*	*9.4*	*7.7*	*4.7*	*5.1*	*3.6*	*2.5*

Source: Labour Force Survey

respectively. People who worked fewer than 30 hours a week were more likely to be underemployed and less likely to be overemployed, than those who worked more than 30 hours a week. Generally, as the number of hours worked increases, the likelihood of underemployment decreases, whereas the likelihood of overemployment increases. In Q1 2010, the underemployment rates were 20 per cent or higher for people who were working 30 hours or fewer a week. The underemployment rate was substantially lower for people working 31 to 48 hours or more a week, and was lowest for those who worked more than 48 hours a week.

The situation was reversed for overemployment. In Q1 2010, overemployment rates were lowest for people who worked 15 hours or fewer per week. The overemployment rate increased gradually in line with increasing numbers of hours worked per week. People working the most hours (more than 48 hours per week) reported the highest overemployment rate at 15.4 per cent.

From Q1 2009 to Q1 2010, the underemployment rate decreased by 3.4 percentage points for people who worked fewer than 6 hours a week. However, the majority of the workforce (those who worked between 6 to 48 hours a week) experienced an increase in underemployment in the same period. The largest increase was for those who worked 16 to 30 hours per week (2.4 percentage points). This finding may reflect the tendency for firms to reduce the number of hours available to their employees during this period. That is, workers who used to work a sufficient number of hours might have been asked to work fewer hours, and consequently they had become underemployed. Over the same period, with the exception of those who worked 31 to 48 hours per week (where overemployment rates increased by 1.2 percentage points), there were only minor changes in the overemployment rates for the other usual weekly hours worked categories (all less than 1 percentage point).

Age and sex

In Q1 2010, there were approximately an equal number of men and women who were classified as underemployed (both 1.4 million). **Table 1** shows that the overall underemployment rate for women (10.6 per cent) was higher than for men (9.3 per cent). However, within both full-time and part-time employment categories, men were actually more likely to be underemployed than women (30.2 per cent versus 18.1 per cent for part-time workers, and 6.5 per cent versus 4.9 per cent for full-time workers). This pattern of findings could be at least partly explained by the higher proportion of part-time workers in the female workforce (43.3 per cent) than in the male workforce (12.4 per cent), and the higher proportion of full-time workers in the male workforce (87.6 per cent) than the female workforce (56.7 per cent).

The underemployment rates were higher for people aged under 25 than for other age groups. In Q1 2010, 22.4 per cent of 16- to17-year-olds and 17.6 per cent of 18- to 24-year-olds were underemployed, whereas all other age groups reported underemployment rates at less than 10 per cent. Given their weaker attachment to the labour market, workers above state pension age (65 for men and 60 for women

Table 2
Overemployment rates by age, sex and full-time/part-time status, Q1 2010

United Kingdom — Percentages, not seasonally adjusted

	All aged 16 and over	16-17	18-24	25-34	35-49	50-59/64	60/65+
All in employment							
Total	*9.6*	*2.6*	*3.1*	*7.4*	*10.0*	*14.2*	*11.7*
Men	*8.8*	*1.7*	*2.5*	*5.1*	*9.2*	*14.3*	*12.1*
Women	*10.4*	*3.3*	*3.6*	*10.1*	*10.9*	*14.0*	*11.6*
Part-time							
Total	*4.8*	*2.4*	*1.7*	*4.2*	*4.7*	*6.9*	*7.1*
Men	*3.4*	*1.0*	*1.3*	*0.9*	*2.8*	*6.1*	*6.1*
Women	*5.3*	*3.3*	*1.9*	*5.0*	*4.9*	*7.2*	*7.5*
Full-time							
Total	*11.3*	*4.2*	*3.8*	*8.1*	*11.7*	*16.5*	*20.7*
Men	*9.6*	*4.4*	*3.0*	*5.4*	*9.6*	*15.4*	*21.1*
Women	*14.3*	*3.7*	*4.9*	*12.4*	*15.7*	*18.9*	*20.4*

Source: Labour Force Survey

in Q1 2010) showed the lowest rate of underemployment, at 4.5 per cent.

The higher rates of underemployment in the young were partly due to the higher proportion of part-time workers in those age groups. Specifically, in Q1 2010, 83.4 per cent of 16- to 17-year-olds, and 34.7 per cent of 18- to 24-year-olds worked part-time, compared with 22.6 per cent of all other workers below the state pension age. It is the case, however, that young people working part-time are likely to be working or studying towards a qualification. Underemployment in this group may therefore result due to the lack of hours available which would be compatible with these young people's study or training schedules. In support of this argument, of the underemployed 16- to 17-year-olds in Q1 2010, nearly 80 per cent were working or studying towards a qualification. The corresponding figure for underemployed 18- to 24-year-olds was lower at 32.2 per cent, and lower still at 12.1 per cent for those between 25 years and state pension age who were underemployed.

For young people who were not working or studying towards a qualification, their experience with underemployment might be consistent with the observation that unemployment has been increasing and remained high for this age group in the past decade, with factors such as a lack of qualifications, skills and experience as the main obstacles that prevent this group from obtaining adequate work (Barham et al, 2009). Youth unemployment is of great concern to policy makers due to its long-lasting negative impact over the lifetime (see, for example, Bell and Blanchflower, 2009), and it remains to be seen whether underemployment too would have similarly permanent adverse effects on the future wellbeing of underemployed youths.

A breakdown of underemployment rates by full-time/part-time status shows that of the part-time workers, young people were more likely to be underemployed than those in the other age groups. For full-time workers, the underemployment rate was highest for people below the age of 25, and decreases gradually with increasing age (see Table 1). Although a high proportion of workers above state pension age work part-time (65.8 per cent), the underemployment rate for this group is low (5.8 per cent). The weaker desire of this age group to seek more work hours may be due to their more secure financial circumstances, and as such there would be less motivation for these people to work more hours for financial gains.

Over the year to Q1 2010, the underemployment rate increased slightly across all age groups. The largest increase, by 1.5 percentage points, was seen in the 18 to 24 age group.

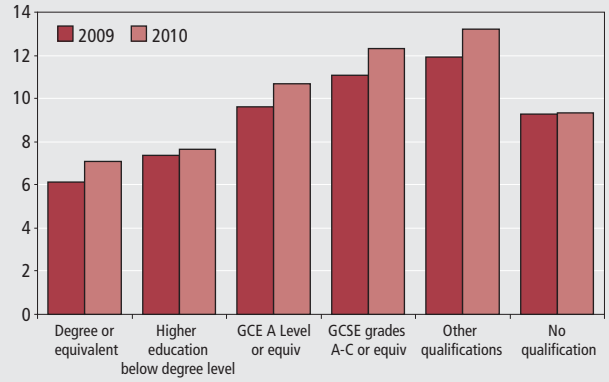
Of those who were overemployed in Q1 2010, 1.35 million were men and 1.4 million were women. As with underemployment, **Table 2** shows that the overall overemployment rate was higher for women (10.4 per cent) than for men (8.8 per cent). Unlike the underemployed group, however, the greater likelihood for women than for men to be overemployed was apparent within both the full-time and part-time workforce. Apart from the 16- to 17-year-old group working full-time, the gender difference in overemployment was apparent in all age groups below 50 years of age regardless of full-time/ part-time work status. The gender difference was most evident in the age range 25-34, with women around twice as likely as men to be overemployed. Similar findings have been obtained in the United States (Golden and Gebreselassie, 2007), and reflect that childrearing remains a predominantly female role in society. That is, compared to men in the same age range, women of childbearing age reported higher levels of overemployment, perhaps because they experience a greater desire to work fewer hours in order to spend more time with their children and family. Notably, the gender difference diminished in the years before retirement age. For this age group, childrearing responsibilities are likely to be low, and hence the overemployment rates were similar between men and women.

While underemployment was more prevalent among younger than older people, the reverse was true for overemployment. Compared with people below 25 years of age, people over 25 were more likely to be overemployed, with the overemployment rate being highest among people nearing their retirement age (see Table 2). Overemployment remains high for workers above the state pension age. A similar age-related pattern was found within both the part-time and full-time workforce, but when examined in this manner, it was clear that full-time workers above state pension age showed the highest overemployment rate (just over a fifth of the people in this subcategory were classified as overemployed).

Like underemployment, the age-related pattern seen in the overemployment rate was partly affected by the proportion of workers in full-time (and part-time) employment in each age group. As overemployment was less likely for part-time workers, the younger population, with their greater proportion of part-time workers, were also less likely to report overemployment as a group. Conversely, because full-time work was more prevalent among workers between 25 and state pension age, the overemployment rate was also higher within this age range. Although workers above state pension age were also characterised by their higher probability of working part-time, this group reported high overemployment, again reflecting their weaker attachment to the labour market.

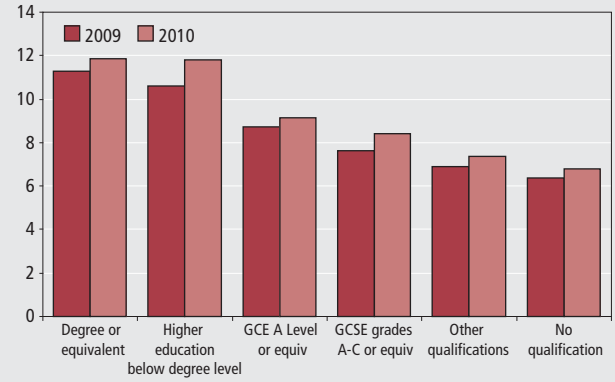
Over the year from Q1 2009 to Q1 2010,

Figure 7a
Underemployment rates by qualification level, Q1 2009 and 2010
United Kingdom
Percentages, not seasonally adjusted



Source: Labour Force Survey

Figure 7b
Overemployment rates by qualification level, Q1 2009 and 2010
United Kingdom
Percentages, not seasonally adjusted



Source: Labour Force Survey

there has been a small increase in the overall overemployment rate, which appears to be in the process of recovering to its pre-recession level. While there has been little change in the overemployment rate among younger workers (16- to 24-year-olds), the remaining three age groups below state pension age (25- to 34-year-olds, 35- to 49-year-olds, and 50 to state pension age) all experienced an increase of 0.7 to 1.0 percentage points in their overemployment rates between Q1 2009 and Q1 2010.

Highest qualification level

People with a degree or equivalent qualification were less likely to be underemployed, and more likely to be overemployed, than other workers. On the other hand, people holding lower levels of qualifications were more likely to be underemployed than other workers with higher or no qualifications, while workers with lower or no qualifications were less likely to be overemployed than other workers (see **Figures 7a** and **7b**).

In Q1 2010, the underemployment rate for people with a degree or equivalent qualification was 7.1 per cent, compared with 11.0 per cent for other workers. This finding may be related to the way that the proportion of people with a degree or equivalent working part-time (19.9 per cent) was lower than that for other workers (29.5 per cent). Those with 'other qualifications' showed the highest level of underemployment (13.2 per cent). It has been shown that a large proportion of people born outside of the UK are categorised in this group of workers holding other qualifications, possibly because of the difficulties in matching foreign qualifications to their UK equivalents (Clancy 2008, Khan 2008). Thus, it might be the case that foreign-born workers are particularly susceptible to underemployment. Finally, workers with no qualifications showed a moderate rate of underemployment (9.3 per cent). For all categories, underemployment increased from Q1 2009 to Q1 2010 (see Figure 7a), with the largest increase observed for people with other qualifications (1.3 percentage points).

As seen in Figure 7b, the overemployment rate was over 10 per cent for people with a degree or equivalent and people who have received higher education below the degree level (both at 11.8 per cent). As with underemployment, there appears to be a linear relationship between qualification level and overemployment (though in the opposite direction here). The lowest rate of overemployment was reported by people holding no qualifications (6.8 per cent). This group also reported a moderate level of underemployment. Thus, it seems that overall, the category of people holding no qualifications might appear to be most satisfied with their number of working hours.

Over the year from Q1 2009 to Q1 2010, all groups regardless of their levels of qualifications reported an increase in overemployment. These increases in overemployment rates, however, were minor; the largest increase (1.2 percentage points) was observed in the group with higher education below the degree level.

Occupation and industry

Results from the previous section fit well with the breakdown of underemployment and overemployment rates by occupation. Specifically, occupation categories that generally do not require high levels of qualifications showed high levels of underemployment (see **Figure 8a**) and those traditionally associated with high levels of qualifications showed high levels of overemployment (see **Figure 8b**).

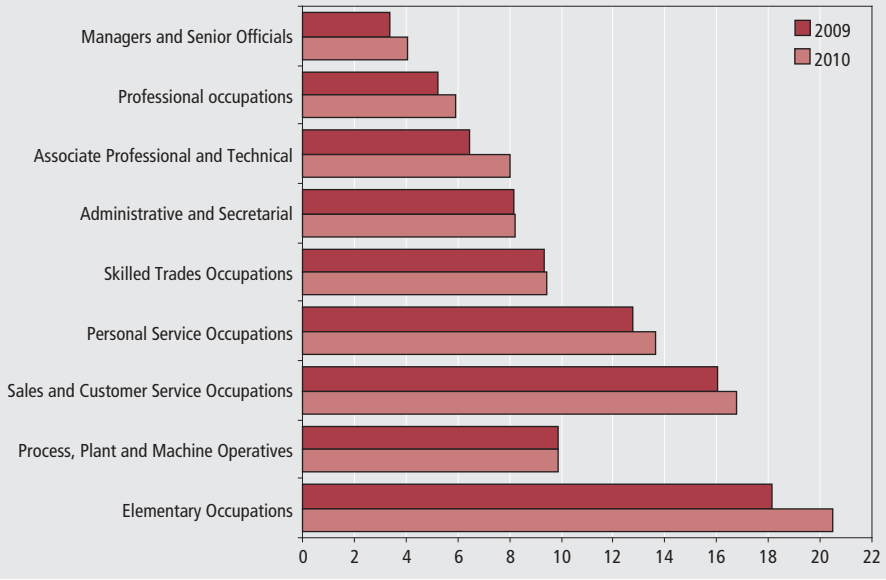
In Q1 2010, the underemployment rate was highest in 'elementary occupations' (20.5 per cent), 'sales and customer service occupations' (16.8 per cent) and 'personal service occupations' (13.6 per cent). These three occupation categories also had the three highest proportions of part-time workers (46.7 per cent, 57.7 per cent and 43.5 per cent respectively). The lowest underemployment rates were found among 'managers and senior officials' (4.1 per cent), and people in 'professional occupations' (5.9 per cent). The association between low-skilled occupations and underemployment has implications on the health and wellbeing of the individuals working in these jobs, as they might more likely experience the negative consequences of underemployment.

A breakdown of overemployment by occupation category shows that occupations requiring higher levels of qualifications were also those where overemployment was most prevalent. In Q1 2010, 'managers and senior officials', and those in 'professional occupations' were more likely to classify themselves as overemployed (at 13.6 per cent and 13.3 per cent respectively). The lowest overemployment rates were found in groups which also showed the highest rates of underemployment, namely 'sales and customer service' (5.7 per cent) and 'elementary occupations' (4.4 per cent).

All occupation groups experienced an

Figure 8a
Underemployment rates by occupation[1]

United Kingdom
Percentages, not seasonally adjusted

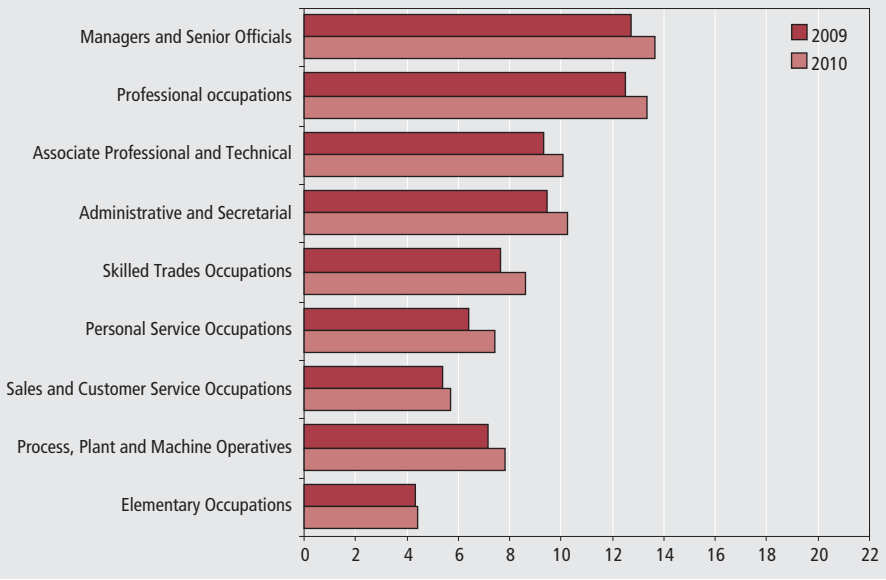


Notes: *Source: Labour Force Survey*

1 Occupation of the respondent's main job.

Figure 8b
Overemployment rates by occupation[1]

United Kingdom
Percentages, not seasonally adjusted



Notes: *Source: Labour Force Survey*

1 Occupation of the respondent's main job.

increase in underemployment over the year to Q1 2010 (see Figure 8a). The largest increase occurred in 'elementary occupations' (2.3 percentage points), followed by the 'associate professional and technical' category (1.5 percentage points). All other occupation groups experienced an increase of less than 1.0 percentage point in the underemployment rate. Similarly, all occupation groups showed a minor increase (all no larger than 1.0 percentage points) in the overemployment rate from Q1 2009 to Q1 2010 (see Figure 8b). These changes in underemployment and overemployment rates across occupations were consistent with the trends in underemployment and overemployment, as shown in Figure 3. There has been a clear increase in the underemployment rate since 2008, although this increase has become smaller in magnitude over the past year (Q1 2009 to Q1 2010). As for the overemployment rate, following an initial drop (starting from Q4 2007), it has been steadily increasing since Q1 2009.

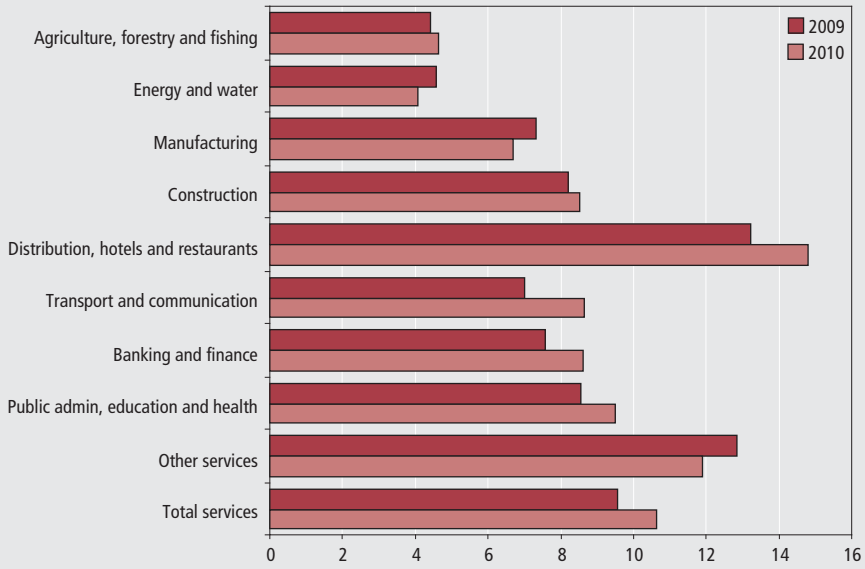
Figure 9a shows that the industry sectors with the two highest rates of underemployment were 'distribution, hotels and restaurants' (14.8 per cent) and 'other services' (11.9 per cent). These industry sectors also had the highest proportions of part-time workers (41.4 percent and 37.8 percent respectively). The lowest underemployment rates were in the 'energy and water' (4.1 per cent) and 'agriculture, forestry and fishing' (4.6 per cent) sectors. These two sectors also had relatively low proportions of part-time workers (7.7 per cent and 15.6 per cent respectively). 'Energy and water', 'manufacturing' and 'other services' all showed small decreases (1.0 percentage point or less) in underemployment in the year to Q1 2010. However, all other industry sectors experienced an increase in the same period, with the largest increase observed in the 'distribution, hotels and restaurants' and 'transport and communication' sectors (both 1.6 percentage points).

Figure 9b shows the overemployment rates across industry sectors. In Q1 2010, the sectors experiencing the highest rates of overemployment were 'energy and water' (11.3 per cent). Unlike underemployment, there was a more complex relationship between the proportion of part-time (or full-time) workers in the industry sector and overemployment. Although the sector with the highest proportion of full-time workers ('energy and water', at 92.3 per cent) also has the highest rate of overemployment, the sector with the next highest proportion of full-time workers ('construction' at 91.3 per cent) only showed a moderate level of overemployment (9.4 per cent). Furthermore, 'banking and finance' showed a high rate of overemployment (10.7 per cent), despite the fact that for this sector, only 77.8 per cent of its workforce were full-time. That said, the sectors with the lowest proportion of full-time workers ('distribution, hotels and restaurants' at 58.6 per cent, and 'other services' at 62.2 per cent) also reported the lowest rates of overemployment (at 7.2 per cent and 6.8 per cent respectively). This finding complemented the association of high underemployment and high proportions of part-time workers found across industry sectors.

As with the analysis on overemployment in terms of occupation categories, all industry sectors showed an increase in overemployment in the year from Q1 2009 to Q1 2010. 'Energy and water' and 'construction' showed the largest increases

Figure 9a
Underemployment rates by industry[1]

United Kingdom
Percentages, not seasonally adjusted

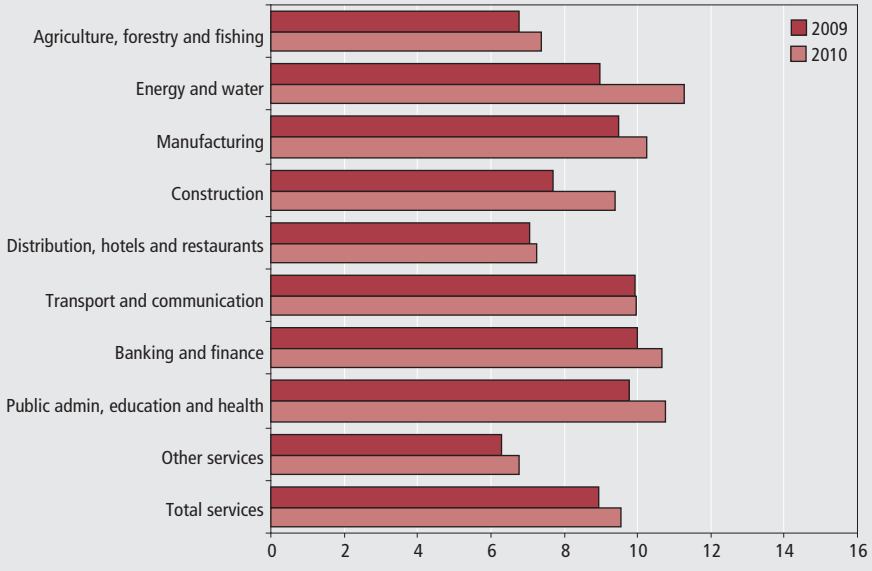


Notes: *Source: Labour Force Survey*

1 Industry of the respondent's main job; Total services = 'distribution, hotels and restaurants' + 'transport and communication' + 'banking and finance' + 'public administration, education and health' + 'other services'.

Figure 9b
Overemployment rates by industry[1]

United Kingdom
Percentages, not seasonally adjusted



Notes: *Source: Labour Force Survey*

1 Industry of the respondent's main job; Total services = 'distribution, hotels and restaurants' + 'transport and communication' + 'banking and finance' + 'public administration, education and health' + 'other services'.

(2.3 and 1.7 percentage points respectively), while the increase in overemployment was smaller in the remaining sectors (all 1.0 percentage point or below).

Region of residence

Figure 10a shows the underemployment rate for regions across the UK. The overall underemployment rate for the UK in Q1 2010 was 9.9 per cent. The underemployment rate for Northern Ireland was below the UK average, at 5.6 per cent. Wales and Scotland were also slightly below the UK average with underemployment rates of 9.0 per cent and 8.9 per cent respectively. The region in England with the highest underemployment rate was Yorkshire and the Humber (11.1 per cent). The Eastern region had the lowest underemployment rate (9.2 per cent) of all English regions. Overall, there was little variation in the underemployment rates across regions of Great Britain.

As seen in **Figure 10b**, the overall overemployment rate for the UK in Q1 2010 was 9.6 per cent. Like underemployment, the overemployment rate for Northern Ireland, at 4.5 per cent, was below the UK average. The overemployment rate in Wales (10.2 per cent) was above the UK average, while it was around the UK average in England (9.7 per cent) and Scotland (9.5 per cent). Similar to underemployment, there was little regional variation in overemployment rates across Great Britain. Of the regions in England, Yorkshire and the Humber reported the highest overemployment rate (10.5 per cent), while the North East reported the lowest overemployment rate (8.6 per cent).

The UK as a whole experienced a small increase (0.8 percentage points) in the underemployment rate in the year to Q1 2010 (see Figure 10). Apart from Wales, where the underemployment rate fell slightly by 0.3 percentage points, every region in the UK showed an increase in underemployment in this period, with the largest increases reported in London (1.9 percentage points) and Yorkshire and the Humber (1.8 percentage points).

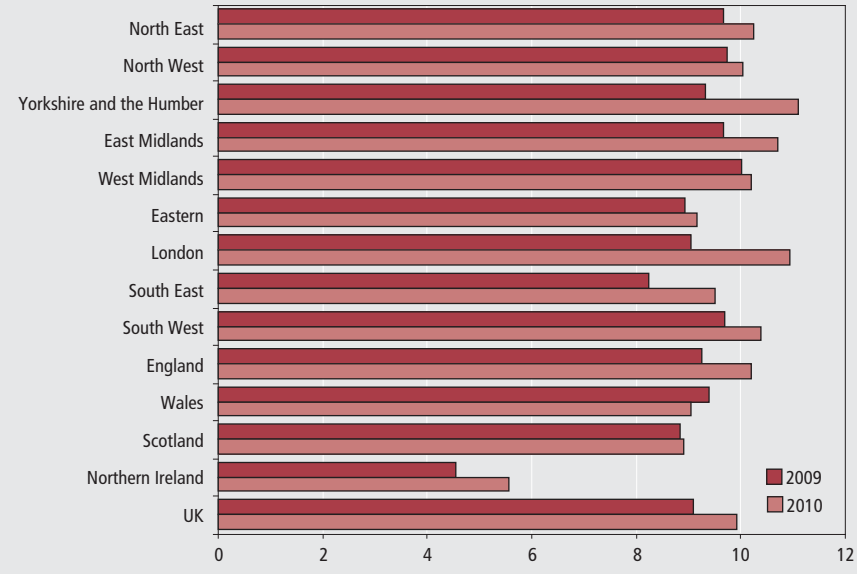
There was also a small rise (0.7 percentage points) in the overemployment rate for the UK between Q1 2009 and Q1 2010. Northern Ireland reported a 1.9 percentage points decrease in the overemployment rate, but Wales, Scotland and England all showed an increase (by 1.4, 1.0 and 0.8 percentage points respectively). Of the regions in England, the largest increase in the overemployment rate was in the Eastern region (by 1.3 percentage points), followed by Yorkshire and the Humber and East Midlands (both by 1.1 percentage points).

Earnings

The LFS does not ask respondents why they preferred to work fewer or more hours. However, wanting more hours is likely to be (at least partly) motivated by a desire for an increase in earnings. On the other hand, those who wanted to work fewer hours for less pay might be, compared with their peers in their occupational group, receiving higher earnings. It is therefore useful to compare the earnings of the underemployed, the overemployed,

Figure 10a
Underemployment rates by region

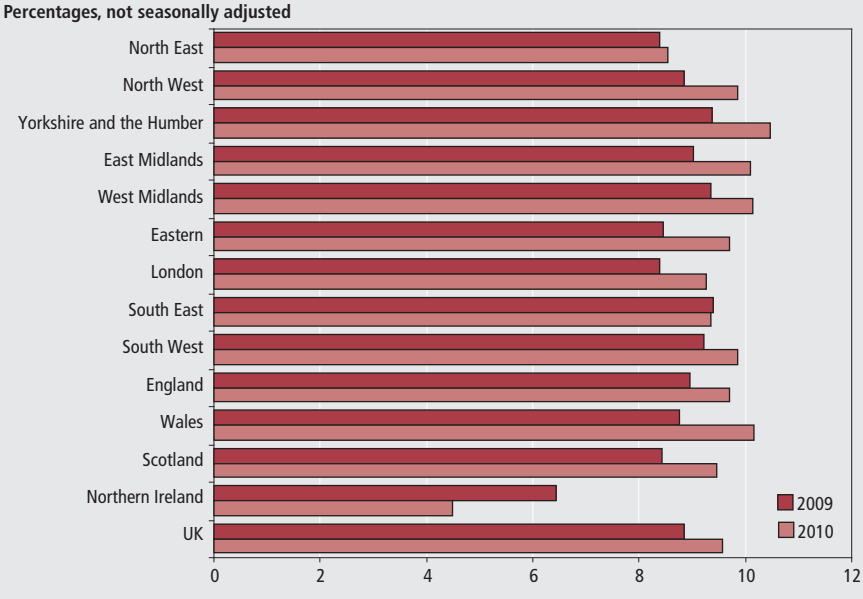
Percentages, not seasonally adjusted



Source: Labour Force Survey

Figure 10b
Overemployment rates by region

Percentages, not seasonally adjusted



Source: Labour Force Survey

and the adequately employed (those who wanted neither more nor fewer hours, or did not meet the classification criteria for underemployment or overemployment, see Box 1). It should be noted here that the Annual Survey of Hours and Earnings (ASHE) is generally preferred to the LFS for earnings information as it is based on company payroll information rather than respondents' answers.

Table 3 shows the average gross weekly and hourly earnings of the underemployed, overemployed and adequately employed in Q1 2010, by occupation group and full-time/part-time status. This analysis covers employees only, as the LFS does not collect information about earnings from people in other types of employment. On average, for all employees regardless of occupation and full-time/part-time status, the underemployed were earning £200 less than the adequately employed per week, whereas the overemployed were earning £140 more than the adequately employed per week. Within the part-time workforce, the underemployed earned £48 less, and the overemployed earned £86 more than the adequately employed per week. For full-time workers, the underemployed were earning £140 less and the overemployed £101 more than the adequately employed per week.

This pattern in the data, with the underemployed earning less and the overemployed earning more than the adequately employed, is evident across most of the occupation categories. However, in some cases, the under-earning of the underemployed was not as apparent (for example, those working part-time in 'sales and customer service occupations', and part-time in 'process, plant and machine operatives'). For those working part-time in 'elementary occupations', the underemployed actually earned slightly more than the adequately employed.

Similarly, in some cases, the overemployed did not earn substantially more than those who were adequately employed (for example, full-time workers in 'sales and customer service occupations' and 'process, plant and machine operatives', and part-time workers in 'administrative and secretarial occupations'). For those working full-time in 'administrative and secretarial occupations' and part-time in 'skilled trades occupations', the overemployed actually earned less than the adequately employed.

When considered in terms of average gross hourly earnings, it is also apparent that generally, the underemployed were earning less, and the overemployed more, than the adequately employed. However, as with the gross weekly earnings, the differences between these three groups were more evident in occupational categories that traditionally require more qualified workers (for example, 'managers and senior officials', 'professional occupations' and 'associate professional and technical' occupations) than those that do not (for example, 'personal service occupations', 'sales and customer service occupations' and 'process, plant and machine operatives').

Conclusion

This article examined trends in underemployment and overemployment between 2001 and 2010. For a large part of this period, overemployment levels were greater than underemployment levels. During the 2008-2009 recession, underemployment began to rise sharply. This was accompanied by a decrease in overemployment. However, since 2009, there appears to be a slowing in the increase in underemployment, and a rebound in overemployment towards pre-recession levels. Despite this, in Q1 2010, there were still more people in the workforce identified as underemployed than overemployed, a pattern that has been observed since Q1 2009.

Table 3

Average gross weekly earnings (in £) and hourly earnings[1] (in £) of the underemployed, overemployed and adequately employed,[2] Q1 2010

United Kingdom — £, not seasonally adjusted

	Total	Managers and Senior Officials	Professional Occupations	Associate Professional and Technical	Administrative and Secretarial	Skilled Trades Occupations	Personal Service Occupations	Sales and Customer Service Occupations	Process, Plant and Machine Operatives	Elementary Occupations
Average gross weekly earnings										
All employees										
Underemployed	245	403	428	374	225	326	175	150	292	152
Overemployed	584	796	812	602	336	514	257	269	391	316
Adequately employed	444	722	677	516	320	425	232	191	378	230
Part-time employees										
Underemployed	139	270	216	195	156	115	135	110	152	111
Overemployed	273	407	448	391	195	145	181	132	237	170
Adequately employed	187	360	350	299	191	157	151	112	156	106
Full-time employees										
Underemployed	388	490	568	467	347	388	260	268	369	283
Overemployed	629	808	844	647	374	539	297	303	399	348
Adequately employed	528	752	740	563	388	441	287	299	398	317
Average gross hourly earnings (all employees)										
Underemployed	9	14	15	12	9	9	8	7	9	8
Overemployed	15	20	21	16	10	12	8	7	9	8
Adequately employed	12	19	19	14	10	10	8	7	9	7

Notes: *Source: Labour Force Survey*

1 Average gross weekly and hourly earnings for employees only. Those with gross weekly and hourly earnings of £0, and with hourly earnings of £100 or above were excluded from the analysis.
2 The adequately employed were those who did not meet the criteria given in Box 1 to be classified as underemployed or overemployed.

There were many clear differences in the characteristics of the underemployed and overemployed. Specifically, if underemployment was prevalent in a particular subgroup, overemployment tended to be less common in that subgroup and vice versa. To summarise the findings, underemployment was more prevalent in the part-time than full-time workforce and in those whose usual weekly hours were fewer than 30 hours a week. Compared to their older counterparts, younger people, particularly 16 to 17 year-old males, were more likely to be underemployed. In both the part-time and full-time workforce, men were more likely than women to be underemployed. Underemployment was also more common in people with lower levels of qualifications, people working in the 'distribution, hotels and restaurants' industry, and employed in 'elementary' occupations. Due to their insufficient hours, the underemployed also earned less income than those who were adequately employed or overemployed. The disparity in earnings between the underemployed and adequately employed was more evident in roles requiring higher qualifications (for example, 'managers and senior officials' and 'professional occupations').

In contrast, overemployment was more prevalent in the full-time, rather the part-time workforce. Overemployed people were also more likely to work more than 30 hours in their usual working week. Older people, in comparison to younger people, were more likely to be overemployed. Regardless of part-time/full-time work status, women were more likely than men to be overemployed. Those holding higher, rather than lower (or no) qualifications were more likely to be overemployed. It follows that overemployment was also more common in occupations which are traditionally associated with a highly qualified workforce (for example, 'managers and senior officials', 'professional occupations'). Generally, earnings of the overemployed were clearly greater than those of the adequately employed, although this was not necessarily the case in some occupations (for example, 'full-time employees in administrative and secretarial occupations').

Compared to the pre-recession period between 2001 and 2007, there was a decrease in overemployment and an increase in underemployment during the 2008-09 recession. Although the LFS does not collect data regarding individuals' job satisfaction and other indices of general well-being, on the basis of past research, it is possible to envisage how changes in underemployment and overemployment rates impacted the general well-being of the workers. Specifically, increasing underemployment implies that more people would be subjected to the detrimental effects of underemployment. Conversely, decreasing overemployment suggests that fewer people would be adversely affected by the stress of working more hours than desired.

It is notable that the findings produced here on the characteristics of the underemployed and the overemployed mirrored those for the UK (Simic, 2002) and the US (Golden and Gebreselassie, 2007) for 2001. This implies that the characteristics associated with both of these groups may be relatively stable over time. The changes in the prevalence of underemployment and overemployment around 2008-2009 therefore suggest that more of the younger, the less qualified, and the part-time workers in lower-paid occupations were now experiencing

underemployment and its associated negative effects on well-being. On the other hand, fewer of the older, the more qualified, and the full-time workers in better-paid occupations were experiencing overemployment. The well-being of these individuals as a whole, would likely to have improved.

It has been observed that although the 2008-09 recession originated in the financial sector, job cuts eventually occurred most extensively among the young and in low-skilled, low-paid occupations (Muriel and Sibieta, 2009). This article has shown that underemployment is also more prevalent within these groups. Both of these findings imply that as the economy contracted, the income levels of the young and of people in low-skilled, low-paid occupations decreased at a more rapid rate than others in the working population, thus creating a larger income inequality within the society. Additionally, from a well-being perspective, the economic downturn would also have had different effects for groups on either ends of the socio-economic spectrum. Compared to the pre-recession period, more workers, particularly those who are less qualified and in lower-paid occupations, are now experiencing underemployment and its associated negative consequences on well-being. Concurrently, there has been a decrease in overemployment, which is traditionally linked with more qualified workers in better-paid jobs. Thus, it is likely that fewer individuals in this group are now experiencing overemployment and its possible adverse effects on physical and mental health. Taken together, the 2008-09 recession might have widened inequality within the population, not only in economic terms, but also in terms of societal well-being.

CONTACT

elmr@ons.gov.uk

REFERENCES

Artazcoz L, Cortès I, Escribà-Agüir V, Cascant L and Villegas R (2009) 'Understanding the relationship of long working hours with health status and health-related behaviours', *Journal of Epidemiology and Community Health* 63, pp 521-527

Clancy G (2008) 'Employment of foreign workers in the United Kingdom: 1997 to 2008', *Economic and Labour Markey Review*, Office for National Statistics, Vol 2, No7, July 2008

Dooley D, Prause J and Ham-Rowbottom K A (2000) 'Underemployment and depression: Longitudinal relationships', *Journal of Health and Social Behavior* 41, pp 421-436

Friedland D S and Price R H (2003) 'Underemployment: Consequences for the health and well-being of workers', *American Journal of Community Psychology* 32, pp 33-45

Golden L and Gebreselassie T (2007) 'Overemployment mismatches: The preference for fewer work hours', *Monthly Labor Review* April, pp 18-37

Golden L and Wiens-Tuers B (2008) 'Overtime work and wellbeing at home', *Review of Social Economy* 66, pp 25-29

Khan. K (2008) 'Employment of Foreign Workers: Focus on Earnings', Office for National Statistics, at: www.statistics.gov.uk/cci/article.asp?ID=2072

Major V S, Klein K J and Ehrhart M G (2002) 'Work time, work interference with family, and psychological distress', *Journal of Applied Psychology* 87, pp 427-436

McLean C, Carmona C, Francis S, Wohlgemuth C and Mulvihill C (2005) 'Worklessness and health - What do we know about the casual relationship? Evidence review', 1st ed. *Health Development Agency*, London

Muriel A and Sibieta L (2009) 'Living standards during previous recessions', *Institute of Fiscal Studies (IFS)* Briefing Note BN 85

Prause J and Dooley D (1997) 'Effect of underemployment on school-leavers' self esteem', *Journal of Adolescence* 20, pp 243-60

Shah H and Marks N (2004) 'A well-being manifesto for a flourishing society', *New Economic Foundation*, London

Simic M (2002) 'Overemployment and underemployment in the UK', *Labour Market Trends* August, pp 399-414.

Sokejima S and Kagamimori S (1998) 'Working hours as a risk factor for acute myocardial infarction in Japan: Casecontrol study', *British Medical Journal* 317, pp 775-780.

Sparks K, Cooper C, Fried Y and Shirom A (1997) 'The effects of hours of work on health: A meta-analytic review', *Journal of Occupational and Organizational Psychology* 70, pp 391-408

Spurgeon A (2003) 'Working time: Its impact on safety and health', *International Labour Organization (ILO)*, Geneva

Walling A and Clancy G (2010) 'Underemployment in the UK labour market', *Economic & Labour Market Review* 4, pp 16-24

Wilkins R (2007) 'The consequences of underemployment for the underemployed', *Journal of Industrial Relations* 49, pp 247-275.

ARTICLE

Explaining the difference between unemployment and the claimant count

Gareth Clancy and Peter Stam
Office for National Statistics

SUMMARY

Unemployment and the claimant count are both important measures of spare labour capacity in the UK economy. However, they each record subtly different aspects of the non–utilisation of labour. Unemployment estimates are based on a person's self–classification as being 'out of work, but 'currently and actively seeking to work' in the Labour Force Survey (LFS), while the claimant count is a count of the number of people who claim unemployment related benefits (the majority of whom claim Jobseeker's allowance (JSA)). This article examines the reasons that the two measures provide different estimates, and presents analysis on the groups of people that make up the gap between unemployment and the claimant count. The article finds that the differences in definitions contribute to this gap, but there are also other reasons for the changing size of the gap.

Using headline statistics, unemployment derived from the Labour Force Survey (LFS) has been consistently higher than the claimant count measure of the number of people claiming unemployment–related benefits. There is a strong positive correlation between the two measures; that is they tend to show the same broad trends, rising and falling together across the economic cycle. However, since the recession in the early 1990s this relationship has not been as evident. This is shown in **Figure 1**, where the two series have diverged since 1994. Furthermore, a number of new and interesting relationships across different demographic groups are now present. In the past year these relationships have become ever more important as the gap (the difference between the levels of unemployment and claimant count) has changed.

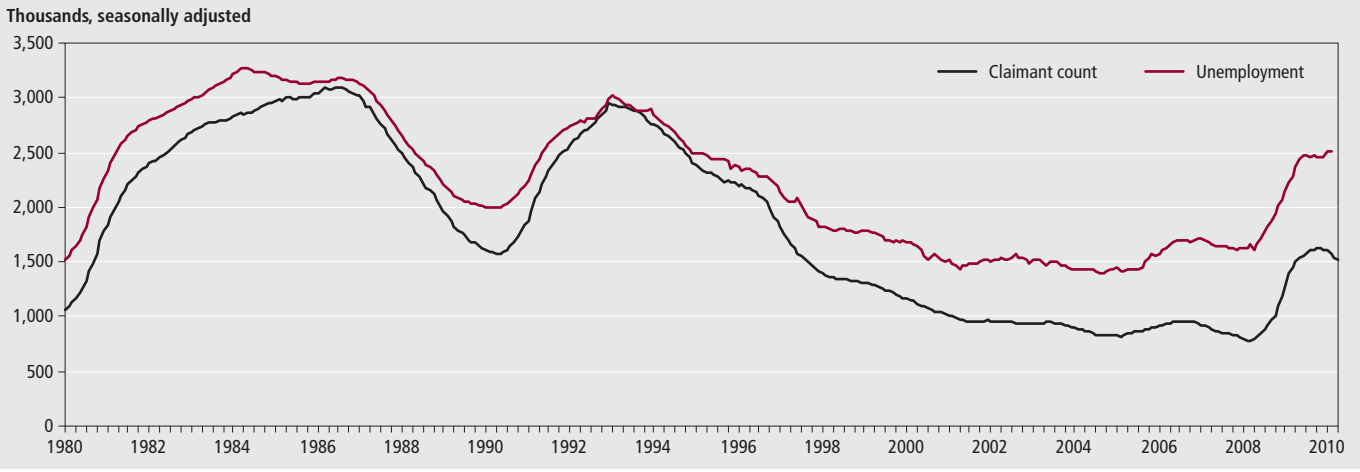
ONS publishes a regular comparison of this difference in the Labour Market Overview (ONS (2010)), alongside the monthly Labour Market statistical bulletin. This article presents the definitions of the two statistical series, and provides comparisons using consistent time periods for broadly comparable age groups (unemployment levels for people aged 18–59/64 years and the claimant count for people aged 18 years and over, see **Box 1**). ONS have also published an article (Clancy and Ker (2010)) which presented differences between unemployment and the claimant count by duration. Morris and Costello (2010) have analysed the differences between the two series for Wales, with a specific focus on providing guidance when looking at short term changes in unemployment.

Figure 1 shows the strong correlation mentioned previously, and the development of the gap between the two series. The size of the gap has fluctuated considerably over the period presented, both converging and diverging over time. During the 1980s and 1990s the gap between the two measures tended to narrow as unemployment and claimant count peaked, and widen as they reached a trough. It is noticeable that in 2009–10, even though both measures have increased, the gap has not narrowed in the same way as previously.

In order to understand the reasons for any differences between the two measures, the definitions of unemployment and the claimant count need to be considered. Thorough definitions are provided in **Box 2** but the main differences between the two definitions can be summarised as:

- the headline statistics tend to cover slightly different age groups
- people who are unemployed are not necessarily eligible for Jobseeker's Allowance (JSA), or may choose not to claim even when they are eligible (their own or partner's financial circumstances can influence this)
- people who are eligible for JSA may not fit the definition of unemployment (for example, it is possible to be employed or inactive while claiming JSA)

Figure 1
Unemployment[1] and the claimant count,[2] 1980 to 2010



Notes:

Source: Labour Force Survey and Jobcentre Plus administrative system

1 Unemployment estimates are for people aged 16 years and over. This is consistent with the headline figures in the Labour Market statistic bulletin. Full time series data are available from January 1971.
2 Claimant count figures are provided for people aged 18 years and over. This is consistent with the headline figures produced for the Labour Market statistical bulletin. Full time series data are available from January 1971.

Box 1
Presentation of unemployment and claimant count data in this article

Estimates used in this article are not always placed on a comparable basis, for presentational purposes, or because not all series have the required time periods. To make the two series comparable unemployment levels are restricted to those people aged between 18 and State Pension Age (SPA) (and are therefore not consistent with the International Labour Organisation (ILO) definition). Claimant count figures are presented for people aged 18 and over (in line with official statistics). This is because people aged 16, 17 and over SPA are not commonly represented in the claimant count.

The time periods presented in figures throughout the article can differ for presentational purposes. The availability of consistent, or seasonally adjusted data also influenced the choice of time periods. Footnotes for each figure explain the time periods available.

This article does not comment on the implementation or effect of policy, which will have affected the relationship between unemployment and the claimant count. Initiatives like the New Deal, and changes to the JSA system will have provided individuals with different choices when interacting with the labour market.

Figure 1 shows the unemployment and claimant count levels using the age groups provided in the headline statistics. This figure therefore includes the difference arising from the 16 to 17 age group. Although there are a notable number of 16 and 17 year olds who classify themselves as unemployed (close to 200,000), normally the number of people aged 16 or 17 years in the claimant count is very small. For this reason, presenting the two series on an aged 18 and over basis brings the two series closer together, but placing them both on an aged 16 and over basis does not.

The headline statistics also differ in terms of their treatment of people over the state pension age (SPA). People may still consider themselves unemployed in the LFS, but they are more likely to draw upon pension entitlements as opposed to unemployment benefits in this age group.

The final definitional difference between unemployment and the claimant count is related to the different time periods they cover. The LFS unemployment figures are compiled for a three month rolling period, for example the unemployment estimate published in May 2010 refers to the three month period January to March 2010. The claimant count figures published at the same time were based on an extract from the administrative database for the month of April 2010. In order to compare like with like, it is necessary to either: choose one month from the LFS (and introduce greater instability into that estimate); or take a three month average of the claimant count, as was done in **Figure 2** (and lose the advantage of more recent data available from the claimant count).

Unemployment and claimant count quarterly changes

Figure 2 shows that, for most of the period presented the quarterly changes are similar, demonstrating how the two series are generally correlated over time. Since unemployment has been greater than the claimant count between 1998 and 2010, where quarterly changes in unemployment were greater than that of the claimant count, this means that the gap between the two increased. Where the claimant count quarterly change is above that of unemployment, the gap reduced.

Examining the size of the difference

Despite the difference in age groups, a great deal of analytical insight can be found from examining the headline statistics as they are published. As demonstrated in Figure 1, the two series have converged and diverged in the last thirty years. Up until 1998 this pattern of convergence and divergence appeared to be strongly associated with the economic circumstances prevalent in the UK economy. In the early 1980s, the UK economy experienced an economic recession, as it did again in the early 1990s. In both periods the difference between unemployment and the claimant count grew. Following each recession the difference reduced in the mid–1980s and mid–1990s.

Box 2

Definitions of unemployment and the claimant count

Unemployment

The official estimates of unemployment for the UK are provided by the Office for National Statistics. These are produced from the Labour Force Survey (LFS) according to the International Labour Organisation (ILO) definition of unemployment. This states that a person is unemployed if they:

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

Each respondent's status is determined by their responses to a number of questions about their labour market activity. Only those people whose answers indicate that they satisfy these conditions are included in the UK unemployment estimates, which are published monthly in the Labour Market statistical bulletin.

Claimant count

The Claimant count is a measure of the number of people claiming unemployment related benefits: Jobseeker's Allowance or National Insurance Credits (hereafter collectively referred to as 'JSA' or the claimant count). It is taken from the Jobcentre Plus administrative systems. Although these are commonly referred to as 'unemployment related benefits' there are circumstances where a person is not unemployed.

Differences between the claimant count and unemployment estimates can occur because it is possible to be unemployed, but not claim JSA:

- people who are unemployed may not be eligible to claim – to be eligible for contribution based JSA they must have made a minimum National Insurance contribution across the previous two years. To be eligible for income based (means tested) JSA they should not receive more than a particular level of income
- a person's income or savings may be too high. Alternatively, they may be in a married or non–married relationship, or a Civil Partnership and their partner earns more than a certain level of income or works more than 24 hours a week meaning they may not be eligible for JSA
- in most cases JSA claimants will be aged between 18 and state pension age – as unemployed people over the state pension age will normally choose to claim pension payments rather than JSA. In contrast unemployment estimates include all people aged 16 years and over
- full–time study can make someone ineligible for JSA – but they can be classified as unemployed
- some people may be unemployed, but claiming an out–of–work benefit other than JSA
- finally, those who do satisfy the eligibility criteria will not necessarily choose to claim unemployment benefits

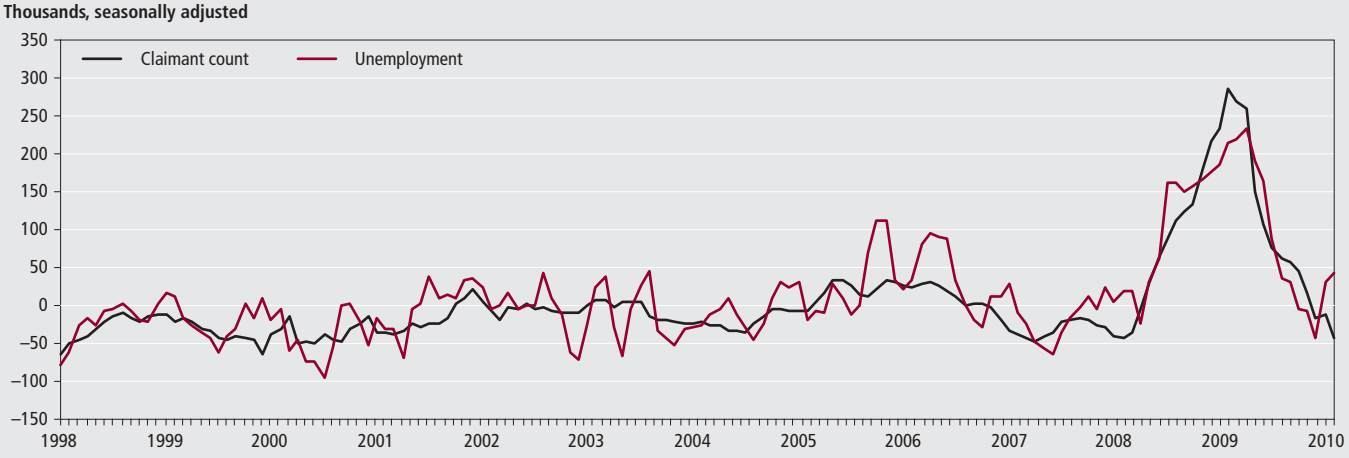
It is also possible to claim JSA, but not be counted as unemployed:

- if a person satisfies certain maximum income conditions they may be eligible to claim JSA while working for up to 16 hours per week. They are therefore employed, according to the ILO definition
- if a person has undertaken insufficient job search they may be classified as inactive, rather than unemployed
- it is also possible that a person may work full–time and claim JSA fraudulently

These differences mean that unemployment and the claimant count cannot be used inter–changeably and it is important to be clear which statistic is being discussed.

Figure 2

Quarterly change in unemployment[1] and claimant count,[2] 1998 to 2010



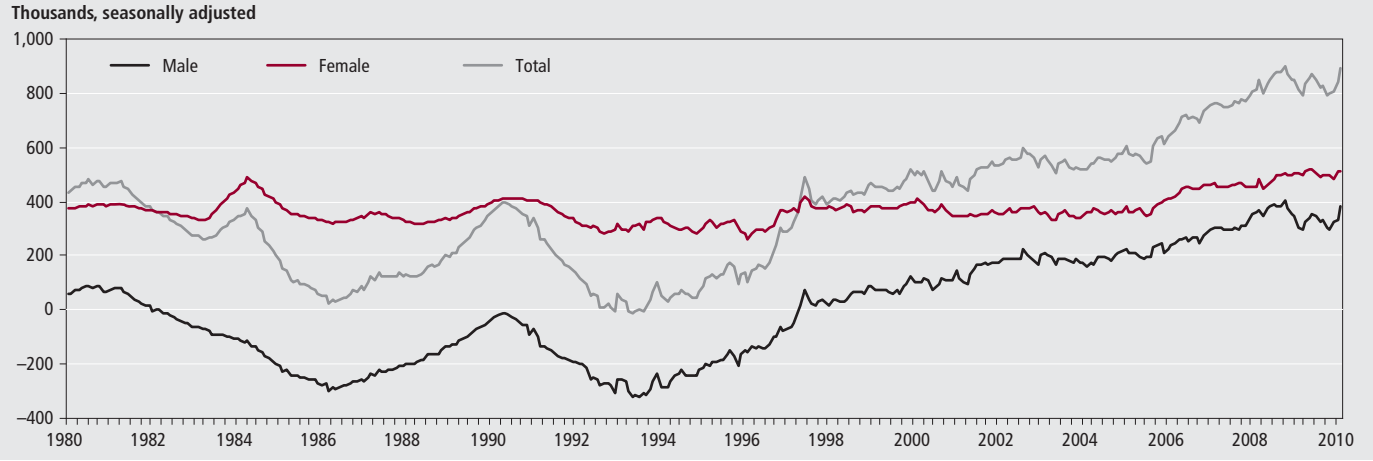
Notes:

Source: Labour Force Survey and Jobcentre Plus administrative system

1 Unemployment estimates are for people aged between 18 years and state pension age. These figures are not consistent with the headline figures produced for the Labour Market statistical bulletin. Data on this basis are available from July 1992.

2 Claimant count figures are provided for people aged 18 years and over. This is consistent with the headline figures produced for the Labour Market statistical bulletin. Full time series data are available from January 1971.

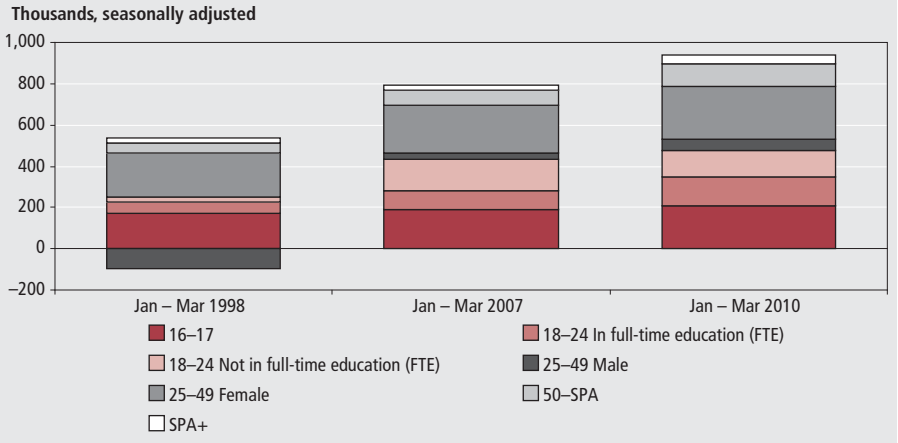
Figure 3
Difference between headline unemployment[1] and headline claimant count[2] by sex (unemployment minus claimant count), 1980 to 2010



Notes: *Source: Labour Force Survey and Jobcentre Plus administrative system*

1 Unemployment estimates are for people aged between 16 years and state pension age. These figures are not consistent with the headline figures produced for the Labour Market Statistical Bulletin. Full time series data are available from January 1971.
2 Claimant Count figures are provided for people aged 18 years and over. This is consistent with the headline figures produced for the Labour Market Statistical Bulletin. Full time series data are available from January 1971.

Figure 4
Difference between unemployment levels and the claimant count by age, sex, and full–time education



Notes: *Source: Labour Force Survey and Jobcentre Plus administrative system*

1 This figure assumes that people aged 18-24 in full-time education, and those over state pension age are not eligible to claim JSA.
2 The three periods were chosen to capture the changes in the gap during the recent periods of economic growth in 1998 and 2007, and post 2008/09 recession.

Prior to the six quarters of economic contraction between Q2 2008 and Q3 2009, the UK economy had experienced over a decade of sustained economic growth. It is notable that in this period of economic growth the gap between unemployment and the claimant count grew (see **Figure 3**). By referring back to Figure 1 it can be surmised that the size of the difference was caused by the claimant count falling by more than unemployment levels.

Differences by sex

Figure 3 identifies the contributions that men and women have made to the gap. The strong correlation between the total difference series and the 'Male' series is determined by the fact that men form a large proportion of unemployment (62 per cent in Jan-Mar 2010) and the claimant count (72 per cent in April 2010).

The 'Male' series highlights how the relationship between the two series has changed significantly over the period presented. During the late–80s and mid–90s the number of men claiming JSA exceeded the number declaring themselves unemployed in the LFS. This suggests that at the time there were a number of men claiming unemployment benefit who were either inactive or employed.

Figure 3 shows that up until 2006 the difference in unemployment and claimant count did not vary as much for women as it did for men. In fact the difference for women was close to 400,000 for most of the period 1980 to 2006. This positive gap suggests that throughout the period there were more unemployed women than there were in the claimant count. Furthermore, in the early and late 1990s there were short periods where the total difference was almost entirely made up by women (because the difference between men who were unemployed and men who were on the claimant count was zero). This indicates there was almost exactly the same number of men declaring themselves unemployed as there was in the claimant count.

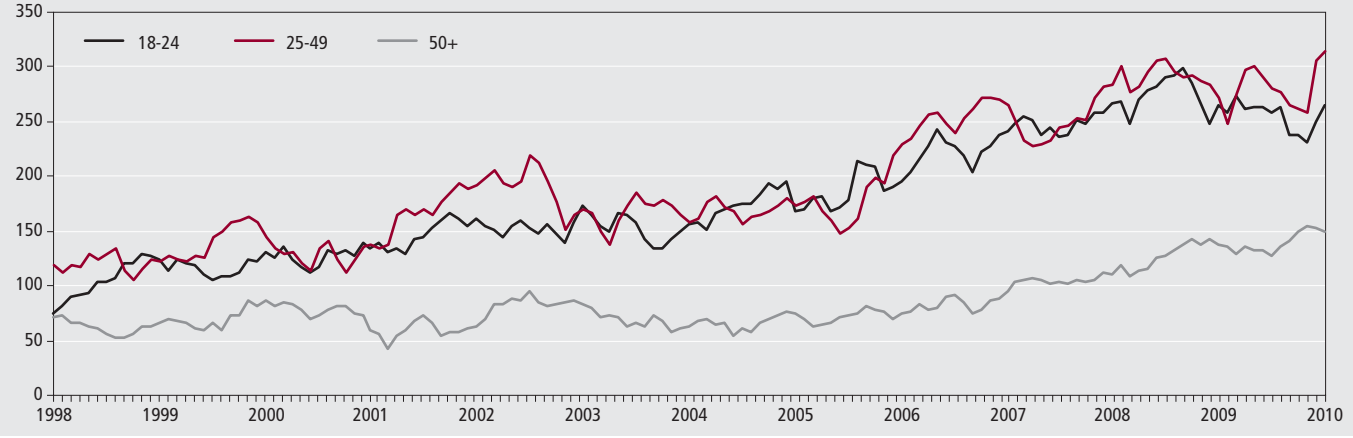
Differences by age

The differences are explored more fully in **Figure 4**, which shows that people aged 16 and 17 years comprised a large proportion of the difference between unemployment and the claimant count in 1998. In the more recent periods presented, other areas have grown to make the younger age group form a smaller proportion of the difference.

It can also be seen in Figure 4 that in 1998 there were more men aged 25–49 in the claimant count than who declared themselves unemployed. This is shown by the negative contribution to the difference, which suggests that some men in the claimant count were either inactive or employed. In the two later periods the

Figure 5
Difference between unemployment[1] and claimant count[2] levels by age, 1998 to 2010

Thousands, seasonally adjusted



Notes:

Source: Labour Force Survey and Jobcentre Plus administrative system

1 Unemployment estimates are for people aged 18 years and over. These figures are not consistent with the headline figures produced for the Labour Market Statistical Bulletin. Data on this basis are available from July 1992.
2 Claimant Count figures are provided for people aged 18 years and over, consistent with the headline figures produced for the Labour Market Statistical Bulletin. Full time series data are available from January 1971.

difference for this group has become positive, changing this group from a net reducer of the gap to a net contributor to the gap.

Women aged 25–49 have consistently formed the largest part of the gap in terms of levels (comprising around 34 per cent of the gap in 1998). This fits with the fact that women represent a small proportion of the claimant count, and also that their eligibility to claim is often affected by their partner's income. The groups that have grown the most (in percentage terms) between 1998 and 2010 are people aged 18–24 (both in and not in full–time education) and men aged 25–49. The 'in full–time education' group has been influenced by increases in the number of students in the UK over the twelve years presented.

In addition to benefits designed to maintain a person's attachment to the labour market (like JSA) there are a number of other benefits provided by Government, which are not related to job seeking. These benefits can be described as 'inactive benefits', because they do not require economic activity, and include benefits for people who are sick or disabled as well as benefits related to children. The importance of these benefits is that claimants may be classified as unemployed according to their LFS responses, but because they do not claim JSA they are only included in unemployment. The magnitude of this can be demonstrated using the LFS, which shows that of everybody who stated they were claiming any type of benefit in January to March 2010, 42 per cent were claiming a benefit not related to job seeking (or an 'inactive benefit').

Figure 5 presents the difference between the claimant count and unemployment levels for three age bands. Between 1998 and 2004 the gap grew for people aged 18–24 and 25–49. The gap for the youngest age group (18–24) grew, from around 80,000 to 165,000, meaning that there were more unemployed people than those in the claimant count. This corresponded with growth from 110,000 to 185,000 for people aged 25–49. In contrast, over the same period the gap for people aged between 50 and the SPA was comparatively stable, showing a small fall from 80,000 to 65,000.

From 2004 the gaps for each of the three age groups experienced noticeable growth. Between 2004 and 2010 the gap increased for people aged 18–24, reaching 266,000 for the three month period January to March 2010. This demonstrated an increase in the number of unemployed people in relation to the number of people in the claimant count. For the same three month period, people aged 25–49 contributed 315,000 – the highest of the three age groups presented. The gap also increased for people aged over 50 between 2004 and 2010. In January to March 2010 there were 150,000 more unemployed people than appeared in the claimant count.

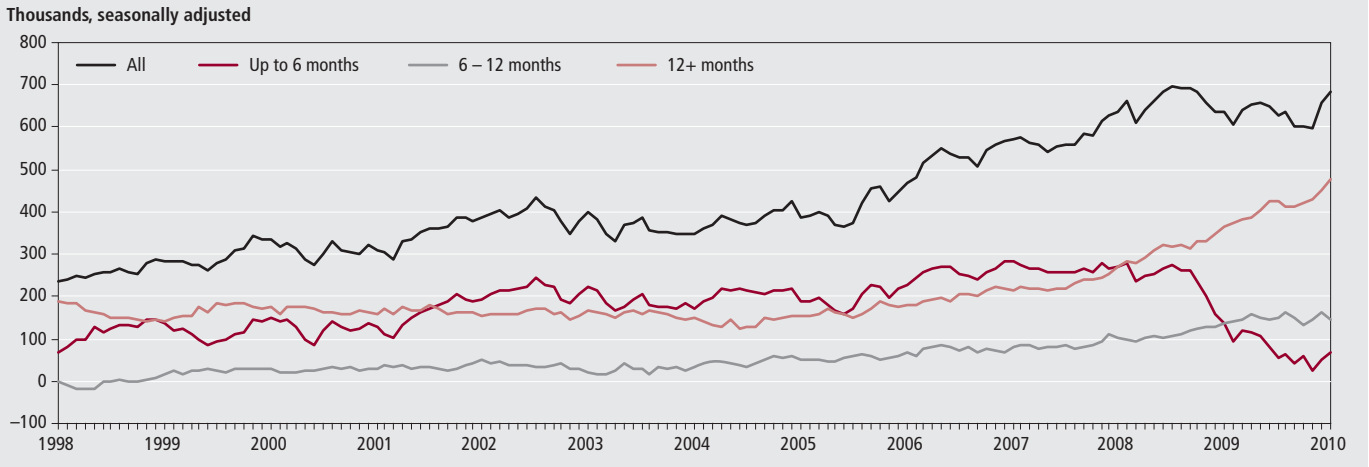
The reasons for these changes are related to the changes shown in Figure 4. For example, the changes in the 25–49 age group are driven by the contribution to the gap made by men, because the contribution made by women aged 25–49 is relatively stable (see Figure 3 and Figure 4). Looking at the 18–24 age group, Figure 4 showed that the contribution made by young people in full–time education grew over the period. There were also more unemployed people aged 18-24 who were not in full–time education than there were people aged 18–24 on the claimant count in 2010, than in 1998. However, the contribution made by this group to the gap was larger in 2007.

Impact of migration

During the past decade the number of foreign born and foreign nationals entering the UK labour market has increased (see Fix et al, 2009). Most recently the inflow of migrants has been driven by countries that acceded to the European Union in 2004, commonly known as the A8 countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia). Different eligibility criteria for benefits apply to migrants from different parts of the world. However, in general migrants are more restricted in their access to unemployment benefits than citizens of the UK. This means that although in their responses in the LFS classify them as unemployed, a proportion of migrants are either not eligible for or do not claim JSA, and therefore increase the gap between the two measures. The extent to which this takes place is shown by the fact that according to the LFS, in January to March 2010, 45 per cent of unemployed people born in the UK claimed unemployment related benefits, whereas only 29 per cent of people born outside the UK claimed unemployment related benefits. Since A8 migrants to the UK have been predominantly young men (Drinkwater, Eade and Garapich, 2009), this will have

Figure 6

Difference between headline unemployment[1] and headline claimant count[2] by duration (unemployment minus claimant count), 1998 to 2010



Notes: *Source: Labour Force Survey and Jobcentre Plus administrative system*

1 Unemployment estimates are for people aged between 18 years and state pension age. These figures are not consistent with the headline figures produced for the Labour Market Statistical Bulletin. Data on this consistent basis are available from July 1992.

2 Claimant count figures are provided for people aged 18 years and over, consistent with the headline figures produced for the Labour Market Statistical Bulletin. Full time series data are available from January 1971.

contributed to the increases shown in Figures 3 and 4 for these groups.

Differences according to duration

Figure 6 shows how these factors influence the difference between the two series. Between 1998 and 2005 the gap between the two series was predominantly caused by the 'up to 6 months' and '12+ months' categories. From 2005 onwards, the differences between the number of unemployed people in the '6 to 12 months' and '12+ months' categories, and their respective counterparts in the claimant count increased. At the end of 2008 the difference for the 'up to 6 months' category began to fall back towards 50,000 showing that the numbers of people unemployed and in the claimant count were 'more equal' in this group. At the same time the longest duration group (12+ months) became the main group driving the gap between the two series. This '12+ months' series shows that fewer people have been in the claimant count for long periods relative to the numbers of people who have been classified as unemployed.

As set out in Clancy and Ker (2010), differences appear between the two series because being classified as unemployed or included in the claimant count can change over time. For example, it is only possible to claim some types of unemployment benefits continuously for a fixed period. With regards to unemployment, respondents in the LFS may report a duration of unemployment based on their total time out of work, rather than the time they have been 'ready and available' to work according to the ILO definition of unemployment. In addition, as stated earlier in this article, unemployed people who claim benefits that are not related to unemployment increase the gap between the claimant count and the unemployment estimates. This is particularly relevant to people who experience longer durations of unemployment, since some 'inactive' benefits are claimed as a result of long-term sickness or disability.

People beginning and ending JSA claims (inflows and outflows)

Figure 7 shows the net flows of people onto the claimant count register between 1989 and 2010. Periods where the series is positive depict the times when there were more people joining the claimant count than ending their claim period. The negative areas show where the number of people leaving the claimant count exceeded the number of people joining.

The period between 1992 and 2007 depicts a time period where the net flows were predominantly negative (more people leaving than joining the claimant count). The two large positive net flows in the early 1990s and between 2008 and 2009 are of interest because of the different path of the gap in these two periods. In the early 1990s a gap did appear between unemployment and the claimant count (unemployment being higher than the claimant count), but during the period 1990 to 1992 the gap converged again (see Figure 1). In the more recent economic downturn the gap between the two series was already established and has not shown any signs of reducing yet.

Figure 7 also provides an insight into 'short-term claimants', since by definition the people who have joined the claimant count have been there less than 6 months. The recent positive area in Figure 7 corresponds with the fall in the 'up to 6 months' series presented in Figure 6, suggesting that the reduction in this series was caused by the increase of inflows into the claimant count.

Conclusion

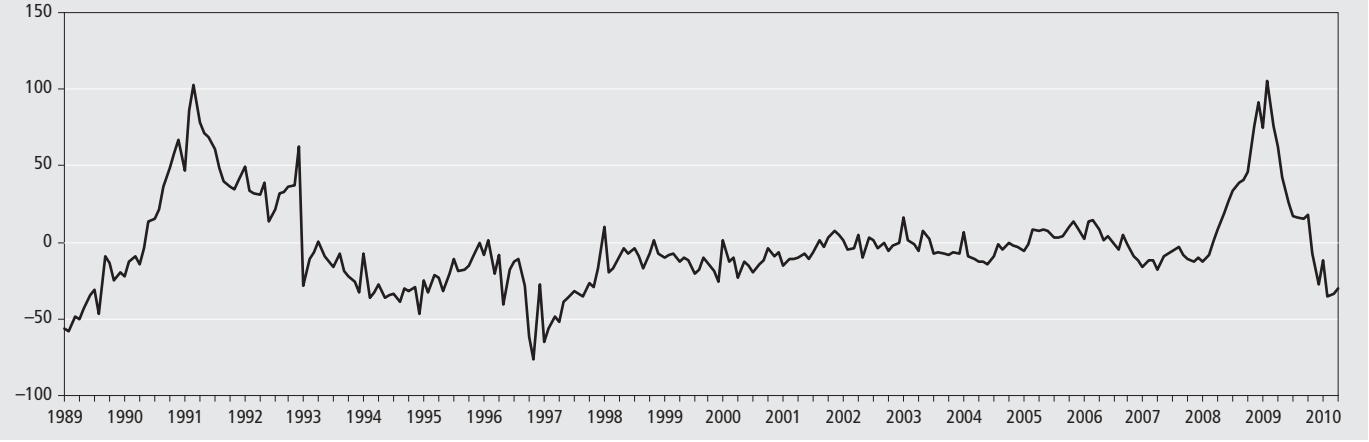
During the last decade new dynamics have appeared between unemployment and the claimant count. This article has shown how unemployment statistics produced from the LFS and the claimant count can be used to identify particular groups that have affected this change.

The most obvious reason for the gap is the differences in definitions: where one group of people are included in unemployment, but not the claimant count. The 16 and 17 year old group is one example of this (another being people above State Pension Age). A more subtle, but important difference is the timing of the two sources, with unemployment being produced on a rolling quarterly basis, and the claimant count on a monthly basis.

Figure 4 showed that since 1998 there have been a number of changes in particular demographic groups which have affected the size of the difference. Men aged 25–49 have become positive net contributors to

Figure 7
Net flows claimant count,[1] 1989 to 2010

Thousands, seasonally adjusted



Note: *Source: Jobcentre Plus administrative system*

1 Claimant count figures are provided for people aged 18 years and over, consistent with the headline figures produced for the Labour Market Statistical Bulletin. Data on the flows into and out of the Claimant Count are available from November 1988.

the difference, whereas previously they reduced the size of the gap. Also, the difference between unemployment and the claimant count has grown noticeably for people aged 18–24; both for those in full–time education and those not in full–time education. However, women aged 25–49 have continued to be the group who have contributed the most to the gap. The difference for each of these groups will be as a result of both increases in the numbers of JSA claimants who are not unemployed (inactive or employed), but also an increase in the number of unemployed people who do not claim JSA.

Since 2008 the increase in unemployment levels has introduced a new dynamic to the gap. There are now more long–term unemployed than there are long–term claimants. This fits with both eligibility to remain in the claimant count and the likely self–reporting bias introduced by people recalling their time out of work when responding to the LFS rather than their period of unemployment.

In this article the headline statistics for both unemployment and the claimant count have been used to show how factors outside of definitional differences have contributed to the changing size of the gap between the two series. Different growth rates for unemployment in relation to the claimant count by sex, age and length of time (duration) in either state have all been shown to be important.

ACKNOWLEDGEMENTS

The authors would like to thank Jessica Coleman and Daniel Ker for their assistance in producing the article, and Bob Watson and Simon Wood for the comments they provided.

CONTACT

elmr@ons.gov.uk

REFERENCES

Clancy G and Ker D (2010) 'Labour Force Survey unemployment and benefits durations' *Economic & Labour Market Review*, vol 4, no 04, pp 20–31.

Drinkwater S, Eade J and Garapich M (2009) 'Poles Apart? EU enlargement and the labour market outcomes of immigrants in the UK', *International Migration* , 47 (1), 161-90.

Fix M, Papademetriou D, Batalova J, Terrazas A, Lin S and Mittelstadt M (2009) 'Migration and the Global Recession', Migration Policy Institute.

Morris J and Costello J (2010) 'Differences between Claimant Count and Unemployment'. Available from: www.wales.gov.uk/statistics.

ONS (2010). *Labour Market Overview: May 2010*. Available from: www.statistics.gov.uk/downloads/theme_labour/LMS_QandA.pdf

ARTICLE

The changing face of public sector employment 1999–2009

David Matthews
Office for National Statistics

SUMMARY

This article presents an analysis of public sector employment (PSE) and makes comparisons with the private sector, using data from the Labour Force Survey[1] and Annual Survey of Hours and Earnings[2]. It looks at the nature of employment in the public sector before discussing the characteristics that differentiate people employed in both the public and private sector, comparing proportions of public and private sector workers in different groups: by sex, age, ethnicity, disability, working pattern, education, occupation and earnings. This article serves as an update to the 2007 Economic and Labour Market Review (ELMR) article 'Characteristics of public sector workers' (Machin and Millard 2007).

Public sector employment

Over the past decade the Office for National Statistics (ONS) has led a cross–departmental programme that sought to improve the quality of public sector employment estimates. This work stemmed from an increased demand for robust quality estimates of employment in the public sector. Several government reviews had clearly identified the need for improvements within this area as a policy imperative, including the Atkinson Review of Measurement of Government Output[3], the Allsop Review of Statistics for Economic Policymaking[4] and the ONS's Employment and Jobs Review[5].

In response, ONS made significant improvements to the coverage, timeliness and accuracy of public sector employment estimates. In March 2005 improved estimates were published. For example, for the first time quarterly estimates of public sector employment were made available on a headcount and full-time equivalent basis. Also, standard definitions for sources of public sector employment were agreed and a new Quarterly Public Sector Employment Survey (QPSES) was established. In July 2005, ONS published the first of what is now a regular quarterly release, 'Public Sector Employment statistical bulletin'[6] and provided quarterly estimates three months after the period to which they referred, compared with a year or more prior to this point in time.

Developments have continued. As part of the Q3 2009 Public Sector Employment statistical bulletin[7] ONS published estimates of regional public sector employment based on returns from public sector organisations rather than using the Labour Force Survey (LFS) as a proxy. This change marked a substantial improvement to the survey's outputs and met increased user needs for estimates of this type.

This article is presented in four parts. First, there is a brief discussion to provide context with regards to measuring and (re)defining the public sector. Second, an overview of public sector employment is presented in which public sector employment is analysed by sector classification, industry, region and then in comparison to the private sector. Third, the paper shifts focus, through use of the Labour Force Survey, to look at the characteristics of public sector workers in comparison to their counterparts in the private sector, by sex, age, ethnicity, disability status, working pattern, education, occupation and earnings. Finally a synthesis is provided together with pointers to further research that may be undertaken to improve understanding of public sector employment in the UK.

Measuring and (re)defining the public sector

PSE statistics are derived from a range of sources. The primary source is the QPSES (Quarterly Public Sector Employment Survey). The QPSES comprises three separate data collections; the home Civil Service, Local Governments in England and Wales and public corporations and Non-Departmental Public Bodies (NDPBs) in

Table 1
External sources for public sector employment estimates

Employment	Geographic coverage	Source
Central government		
HM Forces	UK	Ministry of Defence (MoD): Defence Analytical Services and Advice (DASA)
National Health Service	England	Information Centre for Health and Social Care (IC)
	Wales	Welsh Assembly Government (WAG)
	Scotland	Scottish Government
	Northern Ireland	Quarterly Employment Survey (QES): Department of Enterprise Trade and Investment Northern Ireland (DETINI)
Other central government	England and Wales	Home Office (National Probation Service and Police Service Strength)
	NI	QES: Department of Enterprise Trade and Investment Northern Ireland (DETINI)
Local government		
Local authorities	Scotland	Joint Staffing Watch: Scottish Government
	Northern Ireland	QES: Department of Enterprise Trade and Investment Northern Ireland (DETINI)
Police (including civilians)	England and Wales	Home Office
	Scotland	Joint Staffing Watch: Scottish Government
	Northern Ireland	Department of Enterprise Trade and Investment Northern Ireland (DETINI)
Public corporations		
	Northern Ireland	Department of Enterprise Trade and Investment Northern Ireland (DETINI)

Source: Office for National Statistics

Table 2
Public sector financial intermediation (SIC division 65) headcount, 1999–2009

United Kingdom		Numbers, not seasonally adjusted
Period	Headcount	Full-time equivalent
2008 Q1[1,2]	9,300	8,700
2008 Q2	9,400	8,800
2008 Q3[3]	10,700	10,100
2008 Q4[4,5]	238,800	217,800
2009 Q1	241,500	219,500
2009 Q2	235,500	214,900
2009 Q3	230,800	209,600
2009 Q4	220,100	200,100

Notes: *Source: Public Sector Employment*

1 Bank of England classified as a public financial corporation on 7 February 2008 from its inception (1946).
2 Northern Rock classified as a public financial corporation from 9 October 2007.
3 Bradford and Bingley plc classified as a public financial corporation from 26 September 2008.
4 Lloyds Banking Group classified as a public financial corporation from 13 October 2008.
5 Royal Bank of Scotland Group classified as a public financial corporation from 13 October 2008.

Great Britain. The survey(s) aims to achieve a complete census of the relevant sectors.

So that estimates of total PSE can be made it is necessary for further information to be gathered from external sources (**Table 1**). These are collected from respondents on a quarterly basis.

The variables collected from each contributor are the number of permanent and temporary/casual employees in full and part-time jobs by gender. Information is required on both a headcount and full-time equivalent basis and data are requested in line with agreed standard definitions. Consistent time-series are available from the Office for National Statistics website back to 1999 on a seasonally adjusted basis (www.statistics.gov.uk/statbase/tsdtables1.asp?vlnk=pse).

The public sector comprises central government, local government and public corporations, as in the UK National Accounts. The ONS is responsible for the UK National Accounts[8], which provide an internationally comparable accounting framework.

All institutional units operating within the UK economy are classified to an institutional sector and all transactions between the sectors of the economy are categorised. Work on the classification of entities to sectors and of economic transactions is a key input in the production of National Accounts and employment figures alike.

Changes to the classification of individual institutional units can have a noticeable effect on employment statistics at a sector level. Among the most significant reclassifications to take place recently were the transfers of major financial providers such as the Bank of England[9], Northern Rock[10], Bradford and Bingley[11], the Royal Bank of Scotland Group[12 13] and Lloyds Banking Group[12 13] from the private to the public sector.

Table 2, provides a time-series demonstrating the full impact of the reclassification of financial corporations to the public sector (based on Standard Industrial Classification 2003 division 65 (financial intermediation)).

The total effect of these reclassifications was noticeable in both overall public sector employment estimates as well as the regional statistics. For instance, a comparison of first and fourth quarter PSE estimates for 2008 shows that employment within public corporations increased by 230,000 (64 per cent) and 'other public sector' by 242,000 (33 per cent). At a regional level the effect of the reclassification was most pronounced in the South East (54,000 increase; 8.3 per cent), London (48,000 increase; 6.7 per cent) and Scotland (47,000 increase; 8.2 per cent).

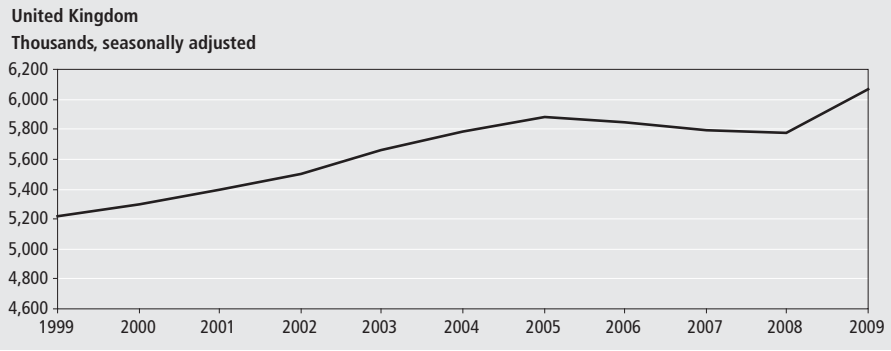
The changing face of the public sector, 1999–2009

The public sector has changed markedly over the past 10 years. Even prior to the reclassification of financial organisations, the number of employees in the public sector was increasing. **Figure 1** shows year–on–year growth between 1999-2005, then a three year slowdown and finally a rapid spurt, largely as a consequence of reclassification. In total, there are now more than 6 million people employed in the public sector compared to about 5.2 million ten years previously (a 16 per cent increase).

Figure 2 details the actual annual changes in employment that have taken place in the public sector over the past 10 years. It shows that growth was fairly consistent on an annual basis between 2000 and 2005 (approximately 100,000 per year), before a period of slight decline, mainly due to a contraction in employment in central government, before a sharp rise in employment, in 2008/9, (293,000 in the year) predominantly as a result of the large-scale bank reclassification[13].

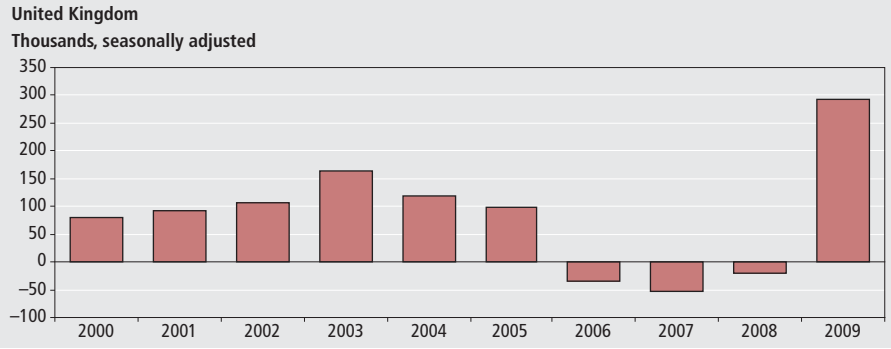
By removing the banks from estimates of public sector employment, growth is still apparent over the 10 year period, albeit not so dramatic. **Figure 3** clearly shows an upward trend in employment, a 12 per cent increase, between 1999 and 2009. The principal difference in estimates

Figure 1
UK public sector employment headcount, 1999–2009



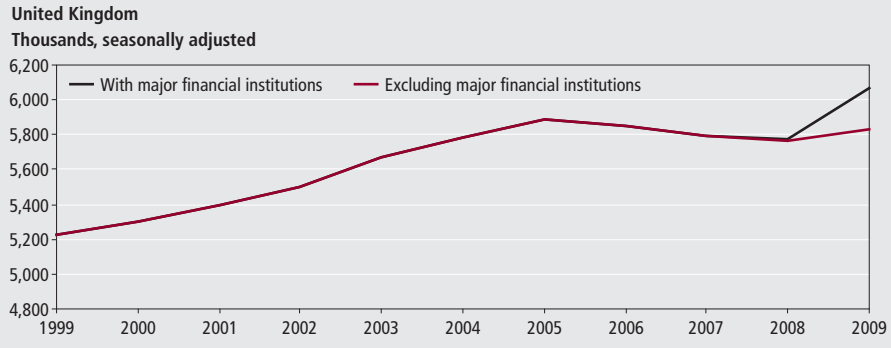
Source: Public Sector Employment

Figure 2
UK annual changes in public sector employment headcount, 1999–2009



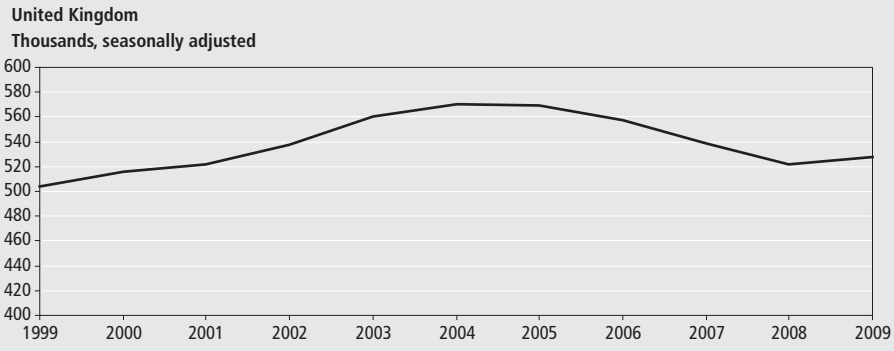
Source: Public Sector Employment

Figure 3
UK public sector employment headcount including and excluding the major financial institutions, 1999–2009



Source: Public Sector Employment

Figure 4
UK Civil Service employment headcount, 1999–2009



Source: Public Sector Employment

of public sector employment, when the major financial institutions classified to the public sector are removed for analysis purposes, is that public sector employment peaked in 2005, in contrast to 2009 when they are included. If the banks had not been reclassified, public sector employment in the UK would not have passed 6 million.

Public sector employment by sector classification

When disaggregated by sector, different patterns of growth are evident. Between 1999 and 2009, central government employment (including employment in the NHS which increased by 366,000) increased by 454,000 (22 per cent), local government by 176,000 (6.4 per cent), and largely due to reclassifications, public corporations by 219,000 (61 per cent).

Figure 4 shows Civil Service employment for the selected decade. Following a period of growth and then steady decline, Civil Service employment in 2009 was 4.8 per cent higher than in 1999. Levels of Civil Service employment throughout the decade have remained constant at around 10 per cent of all public sector employment.

Public sector employment by industry

Public sector employment can also be broken down by industry based on the 2003 Standard Industrial Classification (SIC 2003). The largest increase over the decade 1999–2009 was in the National Health Service (NHS) where headcount grew by 366,000, representing growth of 30 per cent. Employment in the NHS has fluctuated throughout the last ten years with decreases in employment being recorded for the period 2005–2007; however it has predominantly increased, on average by 37,000 per annum. Recent publications of public sector employment estimates have indicated that the NHS is continuing to grow, increasing by 68,000 (4.5 per cent) in the year to Q2 2009.

Other areas of growth over the ten year period include the police (67,000; 30 per cent); 'other public sector' covering a wide range of activities including leisure centres, catering, industrial cleaning, accountancy, call centres, architecture engineering and the nationalised banks (221,000; 30 per cent); education (276,000; 24 per cent) and public administration (38,000; 3.2 per cent). However, in construction (-62,000; -53 per cent); 'other health and social work' (-40,000; -10 per cent) and HM Forces (-21,000; -10 per cent) there have been marked declines in employment.

Table 3
Public sector employment: by region and country of workplace[1,2,3]

United Kingdom — Headcount, thousands

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008[4]	2009[4]
North West	590	607	648	663	671	680	688	678	684	670	699
North East	239	235	234	251	254	253	268	263	263	284	290
Yorkshire and the Humber	437	443	456	439	471	510	492	494	473	504	538
West Midlands	429	438	430	456	468	464	485	494	492	489	507
East Midlands	317	319	313	323	331	358	359	372	355	369	385
East	410	416	429	430	446	479	484	463	453	440	459
London	715	713	686	725	722	725	745	761	769	713	764
South East	625	627	641	643	648	676	695	690	677	652	687
South West	428	429	454	461	481	475	499	509	498	487	518
England	4,191	4,228	4,292	4,390	4,492	4,621	4,714	4,725	4,665	4,609	4,847
Wales	290	287	300	292	311	311	302	304	314	328	341
Scotland [5]	529	531	533	540	551	565	576	584	580	576	614
Great Britain	5,009	5,046	5,125	5,222	5,354	5,496	5,593	5,613	5,559	5,513	5,801
Northern Ireland [6]	197	199	201	204	209	214	219	221	221	224	229

Notes: *Source: Labour Force Survey (1999-2007); returns from public sector organisations (2008-2009)*

1 Annual figures relate to June Q2 except 1999 which relates to December Q4.
2 Estimates are based on where people are employed.
3 Northern Rock classified to the public sector from 9 October 2007. Bradford and Bingley classified to public sector from 26 September 2008. Royal Bank of Scotland Group and Lloyds Banking Group classified to the public sector from 13 October 2008.
4 Figures for 2008 and 2009 have not been seasonally adjusted.
5 Estimates of PSE for Scotland are supplied by Scottish Government and were published as part of the ONS article 'Regional analysis of public sector employment' published in Economic and Labour Market Review; September 2009.
6 Estimates of PSE for Northern Ireland for 2008 and 2009 will differ from those published by DETINI. The ONS figures include HM Forces personnel.

Regional public sector employment

As part of the third quarter Public Sector Employment Statistical Bulletin (published on 16 December 2009) the first regional estimates of employment based on returns from public sector organisations were provided by ONS. These estimates superseded previous estimates of regional employment derived via the Labour Force Survey (LFS). LFS estimates were based on four–quarter rolling averages to reduce the effect of sampling variability. Presenting the results in this manner, however, dampened the effect of sudden changes in employment. The most recent collecting frame is much more sensitive to changes of this kind.

Table 3 shows that in all areas of the UK public sector employment increased in the ten years to 2009. By English region, the largest increases in employment were in North West (109,000; 18 per cent), Yorkshire and the Humber (101,000; 23 per cent) and the South West (90,000; 21 per cent).

London is the region with the largest number of employees (764,000), followed by the North West (699,000), the South East (687,000) and Scotland (614,000).

England (656,000; 16 per cent), Scotland (85,000; 16 per cent) and Wales (51,000; 18 per cent) all showed an increase in public sector employment in the period 1999–2009. This contributed to an increase in public sector employment for Great Britain (792,000; 16 per cent). Public sector employment in Northern Ireland for the period 1999-2009 increased by the same proportion (32,000; 16 per cent).

A more comprehensive article detailing public sector employment by region will be published by ONS in 2010.

Public and private sector employment

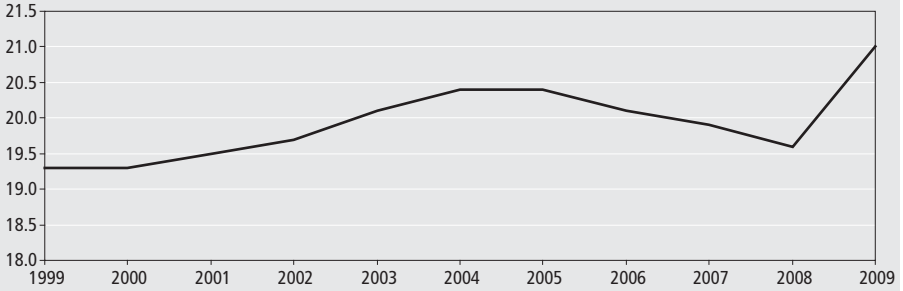
Private sector employment totals are derived as the difference between Labour Force Survey employment estimates for the whole economy and public sector employment estimates collected directly from public sector organisations. The Labour Force Survey is ONS's preferred source for estimates of employment levels for the whole economy, because it has comprehensive coverage of the UK and is conducted on a regular frequency, using a rolling sample, thus making it a good monitor of change.

Public sector employment as a proportion of total employment rose from 19.3 per cent in 1999 to a peak of 21.0 per cent in 2009 (**Figure 5**). The large increase in the proportion of individuals employed in the public sector between 2008 and 2009 is a result of the reclassification of the banks from the private to the public sector. However, it should also be noted that both sectors have shown an increase in employment over the last 10 years; the public sector by 16 per cent and the private sector by 4.2 per cent.

In the last year, largely as a result of the reclassification of the major financial institutions, public sector employment has continued to grow (293,000; 5.1 per cent), whereas private sector employment has declined (-934,000; -3.9 per cent). This has largely been driven by a decrease in total employment for the United Kingdom

Figure 5
Public sector employment headcount as a proportion of all in employment 1999–2009

United Kingdom
Per cent, seasonally adjusted



Source: Public Sector Employment

Table 4
Proportions employed within the public and private sectors: by sex[1]

United Kingdom — Per cent

	Men		Women	
	Public	Private	Public	Private
1999	36.3	59.1	63.7	40.9
2000	36.6	59.1	63.4	40.9
2001	35.3	59.2	64.7	40.8
2002	35.4	59.4	64.6	40.6
2003	35.1	59.4	64.9	40.6
2004	34.5	59.7	65.5	40.3
2005	35.2	59.6	64.8	40.4
2006	34.9	59.5	65.1	40.5
2007	34.4	59.6	65.6	40.4
2008	34.7	59.4	65.3	40.6
2009	34.5	58.9	65.5	41.1

Notes: Source: Labour Force Survey

1 Annual figures relate to December (Q4).

Table 5
Proportions of men and women employed within the public and private sectors[1]

United Kingdom — Per cent

	Men[1]		Women[1]		All[2]	
	Public	Private	Public	Private	Public	Private
1999	14.0	86.0	29.1	70.9	19.3	80.7
2000	14.5	85.5	29.7	70.3	19.3	80.7
2001	13.8	86.2	29.9	70.1	19.5	80.5
2002	13.9	86.1	30.2	69.8	19.7	80.3
2003	14.3	85.7	31.1	68.9	20.1	79.9
2004	14.2	85.8	31.9	68.1	20.4	79.6
2005	14.8	85.2	32.0	68.0	20.4	79.6
2006	14.2	85.8	31.2	68.8	20.1	79.9
2007	14.0	86.0	31.4	68.6	19.9	80.1
2008	14.5	85.5	31.9	68.1	19.6	80.4
2009	15.1	84.9	32.7	67.3	21.0	79.0

Notes: Source: Labour Force Survey and returns from public sector organisations

1 Annual figures relate to December (Q4).
2 Annual figures relate to June (Q2)..

(-641,000; -2.2 per cent) as the country went into recession.

Employees in the public and private sectors

Whilst estimates based on returns from public sector organisations are now the preferred source of official UK statistics on trends in public sector employment, this source only provides limited information on the characteristics of employees. For this the Labour Force Survey (LFS) offers a much richer data set. The LFS is a large household survey carried out continuously across the UK, sampling about 60,000 households. The LFS provides the UK's primary measure of the number of people in employment as a whole and characteristics of public sector employees can be drawn from this; however, as already mentioned, it is not the ONS's preferred measure of the total number of employees in the public sector.

There are several drawbacks. LFS public/private sector and industry classifications are made on the basis of survey respondents' views about the organisations for which they work. As a consequence, reporting error is endemic. For example, university staff and GPs often state that they are part of the public sector, whereas according to the National Accounts such personnel should be counted as part of the private sector. As such, for the purposes of this analysis LFS estimates have therefore been adjusted to match more closely National Accounts definitions.

Self-designation of this kind suggests that LFS estimates of public sector employment are around one million higher than those collected directly from public sector employers. A more detailed synopsis of the limitations of the LFS for providing estimates of public sector employment is included in Machin and Millard (2007).

Sex

Table 4 compares the percentages of male and female workers in the public and private sectors from 1999 to 2009. The table highlights that there are almost twice as many women (66 per cent in 2009) as men (35 per cent) working in the public sector; whereas in the private sector men provide the greater proportion at 59 per cent compared to 41 per cent for women. These patterns appear reasonably consistent over the decade.

When these estimates are aligned with the most recent estimates of public sector employment for the UK (2009) it indicates that just over 2 million public sector employees are men and approximately 4 million public sector employees are women.

The proportion of women employed in the public sector as a percentage of the total female workforce has also increased over time (**Table 5**). In 1999, 29 per cent of women were employed in the public sector and 71 per cent in the private sector, compared to 33 per cent in the public sector and 67 per cent in the private sector in 2009, a 4 percentage points change. This is in contrast to men whereby the proportion employed in each sector has remained fairly static over the same 10 year period (14 per cent in the public sector and 86 per cent in the private sector in 1999 compared with 15 per cent in the public sector and 85 per cent in the private sector in 2009).

Age

Table 6 highlights that 70 per cent of those working in the public sector in 2009 are over 35 years of age, compared with 61 per cent of those working in the private sector. There is relatively little difference in the proportions aged 26 to 35 (21 per cent and 22 per cent respectively) while the proportion of public sector workers who are aged under 25 is much lower than in the private sector (8.6 per cent compared with 17 per cent). There is a slight tendency for more private sector employees to continue to work beyond the age of 65.

Since 1999, there have been increases in the proportions of workers aged over 35 years, in both the public and private sectors, especially for those aged 56 years and over. The proportions aged under 25 have changed little, while there has been a decline in both the public and private sectors in the proportions aged 25 to 34 years.

Ethnicity

Table 7 details the percentages of those employed within the public and private sectors that belong to different ethnic groups. For both the public and private sectors in 2009, 9 per cent of employees were from non–white ethnic groups.

The earliest period for which a

Table 6
Proportions employed within the public and private sectors: by age[1]

United Kingdom — Per cent

	16-25	26-35	36-45	46-55	56-65	66+	All ages
Public							
1999	8.5	24.5	30.0	26.8	9.6	0.6	100
2000	8.6	23.8	29.9	27.0	10.2	0.6	100
2001	8.4	22.5	30.4	27.3	10.6	0.8	100
2002	8.8	21.9	30.3	27.3	10.9	0.7	100
2003	9.2	22.3	29.7	26.2	11.8	0.8	100
2004	8.8	21.6	30.7	26.1	12.0	0.7	100
2005	8.6	21.5	29.9	26.1	13.0	0.8	100
2006	8.5	20.4	29.7	27.1	13.4	0.9	100
2007	8.1	20.4	29.9	27.2	13.5	0.8	100
2008	8.6	20.9	28.3	27.1	14.1	1.1	100
2009	8.6	21.1	27.9	27.7	13.6	1.2	100
Private							
1999	18.8	26.3	23.4	20.4	9.5	1.6	100
2000	18.2	26.0	24.1	20.2	10.0	1.5	100
2001	18.7	25.1	24.3	20.2	10.2	1.5	100
2002	18.5	24.4	24.6	20.2	10.6	1.6	100
2003	18.8	23.1	25.2	19.7	11.6	1.7	100
2004	19.2	22.6	24.8	19.6	12.0	1.8	100
2005	18.6	22.5	25.0	19.7	12.2	1.9	100
2006	18.9	22.2	24.8	19.6	12.5	2.0	100
2007	18.9	22.0	24.5	19.9	12.7	2.0	100
2008	18.4	21.8	24.7	20.3	12.6	2.1	100
2009	17.4	21.9	24.6	21.0	12.8	2.3	100

Notes: *Source: Labour Force Survey and returns from public sector organisations*

1 Annual figures relate to December (Q4).

Table 7
Proportions employed within the public and private sectors: by ethnicity[1,2]

United Kingdom — Per cent

	White	Mixed	Asian	Black	Chinese	Other	Total non-white	All ages
Public								
1999	..	..	..	..	..	..	..	100
2000	..	..	..	..	..	..	..	100
2001	94.0	0.5	2.6	2.2	0.1	0.5	5.9	100
2002	93.8	0.4	2.8	2.2	0.2	0.6	6.2	100
2003	92.9	0.5	3.0	2.6	0.2	0.9	7.1	100
2004	92.8	0.7	3.1	2.4	0.3	0.8	7.2	100
2005	92.4	0.6	3.3	2.3	0.3	1.1	7.5	100
2006	91.9	0.6	3.0	2.8	0.3	1.3	8.0	100
2007	92.1	0.6	3.2	2.7	0.3	1.0	7.9	100
2008	91.1	0.7	3.8	2.9	0.2	1.3	8.9	100
2009	91.3	0.7	4.1	2.4	0.3	1.1	8.6	100
Private								
1999	..	..	..	..	..	..	..	100
2000	..	..	..	..	..	..	..	100
2001	94.1	0.5	3.1	1.6	0.3	0.5	5.9	100
2002	93.5	0.5	3.4	1.5	0.4	0.6	6.4	100
2003	93.3	0.6	3.3	1.6	0.4	0.8	6.7	100
2004	92.8	0.6	3.5	1.7	0.4	0.9	7.1	100
2005	92.4	0.6	3.7	1.7	0.4	1.1	7.6	100
2006	91.6	0.6	4.1	1.9	0.4	1.4	8.4	100
2007	91.2	0.7	4.2	2.0	0.5	1.4	8.8	100
2008	90.5	0.7	4.7	2.0	0.6	1.5	9.4	100
2009	90.5	0.8	4.7	2.1	0.5	1.4	9.4	100

Notes: *Source: Labour Force Survey*

1 This table uses the National Statistics standard classification of ethnic groups consistent with that used for the 2001 Census of Population. Data for periods prior to this used the old classification. No comparison should be made between the two classifications, because not only are the categories different but the questions and coding of answers underlying the data are also very different.
2 Annual figures relate to December Q4.

breakdown by ethnicity is available on a consistent basis from the LFS is 2001. Since this time, there has been a slight increase (2.7 percentage points) in the proportion of employees in non–white ethnic groups within the public sector, from 5.9 per cent to 8.6 per cent, mainly those of Asian origin. This trend is also mirrored in the private sector (from 5.9 to 9.4 per cent).

Disability

In 2009, 15 per cent of employees within the public sector had a long-term disability compared to 13 per cent in the private sector (**Table 8**). Although change over the 10 year period for both sectors is slight, there would appear to be a greater upward trend in the proportion of people in the public sector (15 per cent) compared to the private sector (13 per cent) that have a long-term disability in comparison to the proportion of long-term disabled in 1999 (12 per cent for both the private and public sectors).

Working pattern

The majority of employees within both the public and private sectors worked full time in 2009 (71 per cent in the public sector, compared with 74 per cent in the private sector) (**Table 9**). Over the past 2 years, since the start of the recession in the UK, the proportion of individuals working part-time has increased in the private sector (1.6 percentage points) whereas in the public sector it has remained about the same (0.1 per cent decrease).

Education

There is a stark difference between the highest educational qualification of people employed in the public sector compared to the private sector. In general, individuals in the public sector are more highly qualified than their private sector counterparts (88 per cent of individuals in the public sector have qualifications equivalent to GCSE grades A-C, compared to 79 per cent in the private sector). At the higher end, whereas 38 per cent of public sector workers have a degree or equivalent qualification, only 23 per cent of private sector workers have obtained this level of educational attainment. Educational attainment, for employees in the private sector, peaks at 'GCE A Level or equivalent' (25 per cent). 8 per cent of private sector workers have no qualifications compared to only 4 per cent of public sector employees.

Occupation

Nearly two-thirds (64 per cent) of the public sector workforce is comprised

Table 8
Proportions employed within the public and private sectors: by disability[1,2]

United Kingdom Per cent

	Long-term disabled[1]		Not long-term disabled	
	Public	Private	Public	Private
1999	11.9	11.6	88.1	88.4
2000	11.7	11.8	88.3	88.2
2001	12.7	12.1	87.3	87.9
2002	13.9	12.9	86.1	87.1
2003	12.9	12.8	87.1	87.2
2004	13.8	13.1	86.2	86.9
2005	13.8	13.0	86.2	87.0
2006	14.1	12.7	85.9	87.3
2007	14.1	12.7	85.9	87.3
2008	14.6	12.8	85.4	87.2
2009	14.6	12.8	85.4	87.2

Notes: Source: Labour Force Survey

1 People with a health problem or disability that is expected to last for more than a year.
2 Annual figures relate to December Q4.

Table 9
Proportions employed within the public and private sectors: by full and part-time status[1,2]

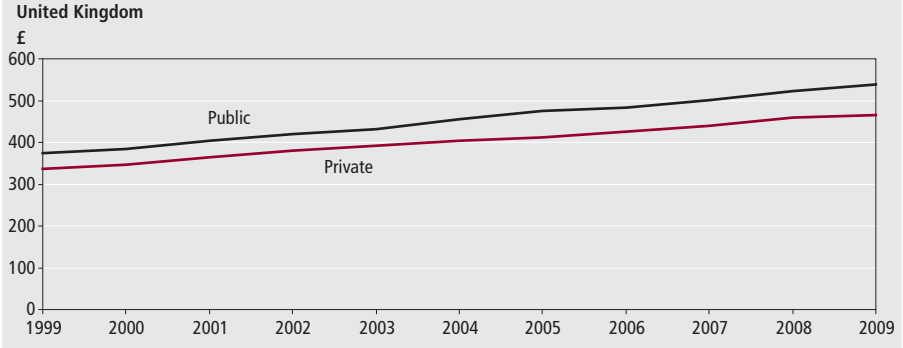
United Kingdom Per cent

	Full-time		Part-time	
	Public	Private	Public	Private
1999	69.9	76.2	30.1	23.8
2000	69.6	76.1	30.4	23.9
2001	69.2	76.3	30.8	23.7
2002	70.0	75.8	30.0	24.2
2003	69.8	75.4	30.2	24.6
2004	70.1	75.8	29.9	24.2
2005	71.2	75.9	28.8	24.1
2006	70.5	75.5	29.5	24.5
2007	70.4	75.8	29.6	24.2
2008	70.8	75.3	29.2	24.7
2009	70.5	74.2	29.5	25.8

Notes: Source: Labour Force Survey

1 Annual figures relate to December Q4.
2 Full and part–time employment is self–classified by respondent in the Labour Force Survey.

Figure 6
Median gross weekly earnings for full-time employees 1999–2009



Source: Annual Survey of Hours and Earnings

of those working within 'professional' (23 per cent; for example doctors and secondary education teachers), 'associate professional and technical' (24 per cent; for example nurses), and 'administrative and secretarial' occupations (17 per cent). In stark contrast, half as many (32 per cent) private sector workers are in these occupations ('professional' (11 per cent), 'associate professional and technical' (12 per cent) and 'administrative and secretarial' (11 per cent)).

There are further clear differences between the occupations of public sector and private sector employees. For example, while only 5 per cent of public sector employees are in 'skilled trades', 'sales and customer service', and 'process plant and machine operative' occupations, 31 per cent of private sector workers belong to these occupations.

Of those in the public sector, 8 per cent are employed as 'managers and senior officials' compared with 18 per cent of individuals working in the private sector.

Earnings

Since 1999, private sector pay has trended below public sector pay (**Figure 6**). The median gross weekly pay of full–time employees in the public sector, according to the Annual Survey of Hours and Earnings (ASHE)[2], was £539 in 2009, up 44 per cent from £375 in 1999. For the private sector the comparable figure was £465, up 38 per cent from £336 in 1999, 6 percentage points lower.

For full–time employees (based on hourly pay excluding overtime) the gender pay comparison decreased from 14 per cent in 1999 to 12 per cent in 2009 in the public sector, compared to a decrease of 1 percentage point in the private sector from 22 per cent to 21 per cent. For part–time employees, the gender pay difference in the public sector was 18 per cent, up substantially from 6.9 per cent in 1999, compared to 0.4 per cent in the private sector, a change from the negative gender pay gap in 1999 of -2.2 per cent. For all employees, the public sector saw a decrease in the gender pay difference to 21 per cent in 2009 from 27 per cent in 1999, while the gender pay comparison for the private sector decreased by only 3 percentage points to 29 per cent, down from 32 per cent in 1999 (**Table 10**).

Conclusions

The purpose of this article has been to expose the changing face of the public sector over the period 1999 to 2009. Within this decade the public sector has changed markedly and recent developments, such as the classification of major banks to the public sector, have accentuated this change. As a result, public sector employment as a proportion of total employment has risen from 19.3 per cent in 1999 to a peak of 21.0 per cent in 2009.

Over the ten year period, growth has been most marked in central government (454,000; 22 per cent) at a sector classification level driven by the NHS (366,000; 30 per cent) which dominates growth on an industrial basis.

Table 10
Gender pay comparison, 1999–2009

United Kingdom	Per cent, based on median hourly pay excluding overtime		
	Full-time	Part-time	All
Public			
1999	*14*	*6.9*	*27*
2009	*12*	*18*	*21*
Private			
1999	*22*	*–2.2*	*32*
2009	*21*	*0.4*	*29*

Source: Annual Survey of Hours and Earnings

ONS are now able to produce detailed regional estimates of public sector employment based on data returned from public sector organisations. These data have highlighted that, in 2009, London is the region with the largest number of employees (764,000), followed by the North West (699,000), the South East (687,000) and Scotland (614,000).

Despite the limitations of the Labour Force Survey (LFS) as an estimator of public sector employment in the UK, the LFS is still useful as a source for important structural information about both the public and private sector workforces. One of the most striking differences between the public and private sectors relates to male and female employment. Almost twice as many women (66 per cent in 2009) as men (35 per cent) work in the public sector; whereas in the private sector men make up the greater proportion of the workforce (59 per cent compared to 41 per cent for women).

While this analysis is informative it does not take account of a range of factors that may have an impact on the characteristics of employees in the public and private sectors and what drives choices with regards to individuals' choices of sector of employment. Ongoing longitudinal work will continue to show change over time.

Notes

1 Labour Force Survey: www.statistics.gov.uk/StatBase/Product.asp?vlnk=4756
2 Annual Survey of Hours and Earnings: www.statistics.gov.uk/StatBase/Product.asp?vlnk=15313
3 Atkinson Review of Measurement of Government Output: www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/final_report.asp
4 Allsop Review of Statistics for Economic Policymaking: www.hm-treasury.gov.uk/press_32_04.htm
5 ONS Employment and Jobs Review: www.statistics.gov.uk/STATBASE/Product.asp?vlnk=11948
6 Public Sector Employment Statistical Bulletin: www.statistics.gov.uk/StatBase/Product.asp?vlnk=13615
7 Public Sector Employment Statistical Bulletin, Quarter 3: www.statistics.gov.uk/pdfdir/pse1209.pdf
8 UK National Accounts: www.statistics.gov.uk/StatBase/Product.asp?vlnk=818
9 Classification of Bank of England: www.statistics.gov.uk/cci/article.asp?id=1939
10 Classification of Northern Rock: www.statistics.gov.uk/CCI/article.asp?ID=1938
11 Classification of Bradford and Bingley: www.statistics.gov.uk/pdfdir/cbb1108.pdf
12 Classification of Royal Bank of Scotland Group plc and Lloyds Banking Group plc: www.statistics.gov.uk/pdfdir/crbslbg0209.pdf
13 Public sector interventions in the financial crisis: www.statistics.gov.uk/CCI/article.asp?ID=2301

CONTACT

elmr@ons.gov.uk

REFERENCES

Machin A and Millard B (2007) 'Characteristics of public sector workers', *Economic and Labour Market Review*, (May), pp 46–55, available at: www.statistics.gov.uk/cci/article.asp?id=1801

ARTICLE

Andrew Barnard
Office for National Statistics

The effects of taxes and benefits on household income, 2008/09

SUMMARY

This article looks at how taxes and benefits affect the income of households in the UK. It provides estimates of household incomes, including the average amount of taxes that households paid, and also the value of benefits that they received in 2008/09, a period when the UK economy was in recession. The analysis highlights that the level of inequality, as measured by the Gini coefficient, fell slightly between 2007/08 and 2008/09 for retired households, but for non-retired households it was almost unchanged. This analysis is published annually and has been undertaken each year for over 30 years.

Appendix 1 (additional tables) and Appendix 2 (Methodology and Definitions) are available on the web version of this article at: www.statistics.gov.uk/cci/article.asp?ID=2440

Additional ONS analysis of the effect of the recession on households' incomes will be published in August 2010, as part of a wider investigation of the recession.

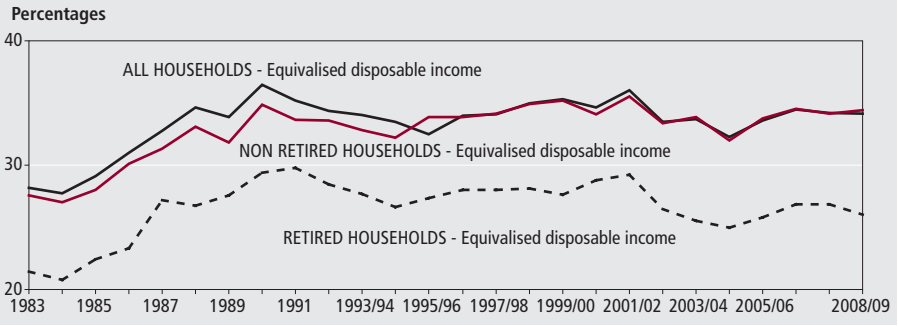
Taxes and benefits affect the incomes of households. Generally speaking, households with the highest incomes pay more in taxes than they receive in benefits. The reverse is true for those with lower incomes – these households tend to receive more in benefits than they pay in taxes. Taxes and benefits therefore tend to decrease the inequality of income.

The effect of taxes and benefits on income inequality can be seen by their effect on the Gini coefficient, which can take values from 0 to 100 per cent where higher values indicate greater inequality. In 2008/09, before taxes and benefits, the level of inequality as measured by the Gini coefficient was 52 per cent. The addition of cash benefits decreased the level of inequality to 38 per cent, a fall of 14 percentage points. After direct taxes are taken into account the level of inequality fell a further 4 percentage points to 34 per cent. However, when indirect taxes are then subtracted from households' incomes the level rose back to 38 per cent. Therefore, in 2008/09 the overall effect of taxes and benefits is that they reduced inequality by 14 percentage points. Of this decrease, cash benefits played the largest part. For details of how the Gini coefficient is calculated see Appendix 2, paragraph 53.

When the entire household population is considered, inequality of disposable income was almost unchanged between 2007/08 and 2008/09, as shown in **Figure 1**. For non-retired households (who make up almost three-quarters of all households), the situation was similar – inequality was almost unchanged. However, the inequality of retired households fell slightly, from 27 to 26 per cent. This estimate will be subject to a degree of sampling variability. The fall was primarily driven by changes to the household characteristics of retired households. In particular, there were proportionally more one-adult retired households in 2008/09, and these households were located toward the bottom of the income distribution (but crucially not at the extreme bottom of the distribution). Due to the effect of equivalisation, this had the effect of increasing the average retired equivalised household income, especially for households at the bottom of the income distribution (for more details about equivalisation, see Appendix 2, paragraph 48). This has an equalising effect on the level of income inequality.

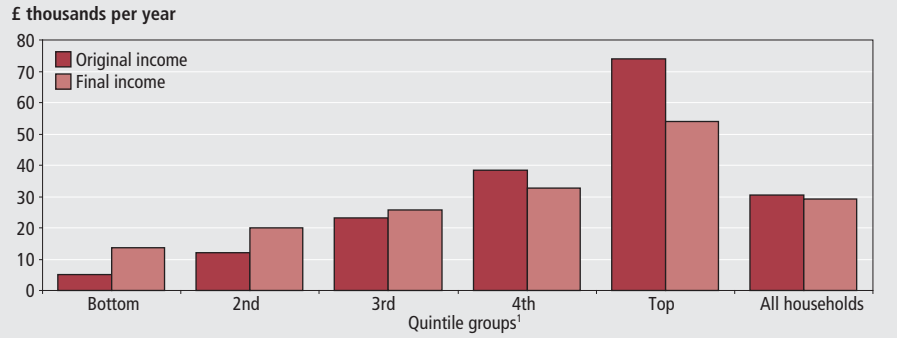
In 2008/09, the average *original* income (before taxes and benefits) received by households was £30,500 per year. This income came from sources such as earnings, occupational pensions and investments. The bottom fifth of households received an average income of £5,000 per year. On the other hand, the top fifth of households received an average of £73,800 per year from these sources, approximately 15 times as much. After taking account of all taxes and benefits, the average *final* income of household was £29,100. The top fifth had an average final income of £53,900 per year, now only four times the size of the income for the bottom fifth of households (£13,600 per year). The difference between original income and final income, broken

Figure 1
Gini coefficients 1983 to 2008/09



Source: Office for National Statistics

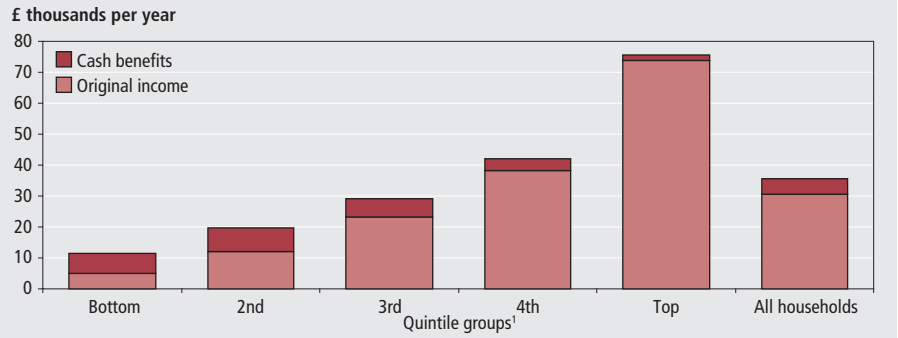
Figure 2
Original income and Final income by quintile groups for ALL households, 2008/09



Note: *Source: Office for National Statistics*

1 Households are ranked throughout by their grossed equivalised disposable incomes.

Figure 3
Gross Income by quintile groups for ALL households, 2008/09



Note: *Source: Office for National Statistics*

1 Households are ranked throughout by their grossed equivalised disposable incomes.

down by quintiles, is also shown graphically in **Figure 2**.

As already mentioned, cash benefits (such as Jobseeker's Allowance and the retirement pension) play the largest part in reducing inequality. **Figure 3** shows the extent to which cash benefits increased incomes, from the bottom fifth to the top fifth of households. It can be seen that the majority of cash benefits go to households with incomes below average. When cash benefits are added to a household's original income it forms their *gross* income. In 2008/09 the average cash benefits received by households was £5,000 per year, or 14 per cent of the average gross income. This proportion was almost unchanged on the estimate for 2007/08.

Disposable income is defined as gross income minus direct taxes. All direct taxes (income tax, employees' National Insurance contributions and council tax and Northern Ireland rates), except for council tax and Northern Ireland rates, take a larger proportion of income from those with higher incomes. This means that direct taxes are said to be *progressive*. Therefore, direct taxes also contribute to reducing the level of inequality, although not to the same extent as cash benefits.

Indirect taxes (taxes on final goods and services, such as Value Added Tax (VAT), and intermediate taxes, such as employers' National Insurance contributions) have the opposite effect to direct taxes, as they take a higher proportion of income from those with lower incomes, that is, they are *regressive*. While households higher up the income distribution pay more indirect tax in absolute terms, they pay a lower proportion of their income in indirect tax. However, recent analysis by Carrera (2010) found that there are a number of additional issues that should be considered when analysing indirect taxes. For example, the analysis demonstrates that indirect taxes can be progressive if expenditure is used to rank households (rather than income).

In 2008/09, households paid an average of £4,700 per year in indirect taxes, or 13 per cent of their gross income, down from 14 per cent in 2007/08. The fall in the proportion of indirect taxes paid was primarily driven by a decrease in stamp duty payments. This was caused by the downturn in the housing market over the period and the introduction in September 2008 of an exemption from stamp duty for house purchases of less than £175,000. Secondly, there was a fall in the amount of VAT paid, caused in part by the reduction in the rate of VAT from 17.5 per cent to 15 per cent which came into effect in December 2008.

Households also receive benefits in kind from services provided free or at subsidised prices by government, such as health and education services. The amount of benefits in kind which households receive falls gradually as income increases, indicating that they also lead to a reduction in inequality. Changes to the methodology implemented for this analysis mean that comparisons of benefits in kind received in 2008/09 with previous years are not possible. However, all other estimates remain comparable.

Changes to the analysis

The following changes have been introduced to this year's publication:

- Additional analysis, based on household tenure type and Government Office Region have been provided
- Tables based on the modified-OECD equivalisation scale have been added (Tables 3, 14, 14A, 16 and 18). These tables are prefixed by 'OECD'

- The methodology used for the calculation of the in kind benefit from education and the National Health Service (NHS) have been updated. These estimates are now based on more up-to-date data on the per-unit cost of these services to the Government. In particular, the NHS method is now more closely based on that presented in Cardarelli et al (1999)

Concepts and Sources

This analysis looks at how taxes and benefits affect the distribution of income. **Diagram 1** shows the five stages in the redistribution of income used in this analysis:

1. Household members receive income from employment, occupational pensions, investments and from other non-government sources
2. Households receive income from cash benefits
3. Households pay direct taxes
4. Indirect taxes are paid via expenditure
5. Households receive a benefit from services (benefits in kind).

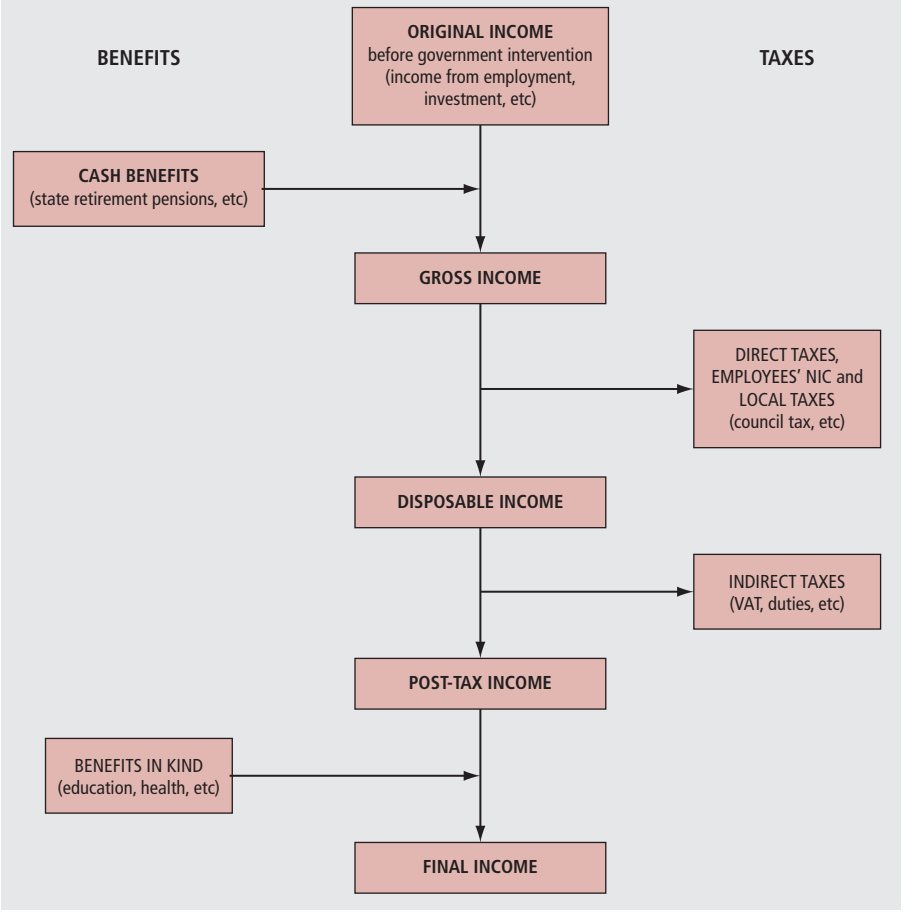
The analysis allocates taxes and benefits that can reasonably be attributed to households. Therefore, some government revenue and expenditure is not allocated, such as revenue from corporation tax and expenditure on defence and public order. There are three main criteria for including taxes and benefits in the analysis:

1. The tax or benefit should clearly affect people who live in private households
2. There should be a clear conceptual basis for allocation to particular households
3. Finally, there must be data available to enable allocation.

In this study, some £365 billion of taxes and compulsory social contributions have been allocated to households. This is equivalent to 55 per cent of general government expenditure, which totalled £658 billion in 2008. Similarly, £342 billion of cash benefits and benefits in kind have been allocated to households, making up 52 per cent of general government expenditure. These proportions are broadly the same to those in recent years' analyses.

The estimated values of taxes and benefits reflect the methodology used in this study. They are based on assumptions about which taxes and benefits should be covered and to whom they should apply. Where it is practical, the methodology used is similar to that used in previous years.

Diagram 1
Stages of redistribution



Source: Office for National Statistics

However, there have been some changes in the underlying surveys and improvements made to the methodology. For this reason, one should be cautious about making direct comparisons with earlier years. Comparisons with previous years are also affected by sampling error (for more details see Appendix 2, paragraph 57). This is especially true for estimates which are based on sub-samples such as the results for decile or quintile groups, or particular types of household. Time series are presented for some of the more robust measures, and these include Gini coefficients and other measures of inequality.

Unit of analysis

The unit of analysis used in this study is the household. The households are ranked by their equivalised disposable income, which the analysis uses as a proxy for standard of living. Equivalisation is a process that adjusts households' incomes to take account of their size and composition, to recognise that this affects the demand on resources. For example, a couple with a child would need a higher income than a childless couple for the two households to achieve the same standard of living. The equivalence scale used in this analysis is the *McClements scale* (before housing costs are deducted). In the earlier example, a childless couple's (unequivalised) income of £10,000 is treated as equivalent to an (unequivalised) income of £12,300 for a couple with a ten year old child. Households with the same equivalised income do not necessarily have the same standard of living where other characteristics are different. For example, households which own their homes outright would be in a better position than identical households with the same income which had to pay rent or mortgage payments. Equivalisation does not adjust for these differences. Additionally, following consultation from users, tables based on the modified-OECD equivalisation scale have been produced. These can be found in Appendix 1, and are prefixed by 'OECD'. Further details of how this publication is planning to move from using the McClements to OECD equivalisation scales can be found in Anyaegbu (2010).

Equivalised income is used only to rank the households and most monetary values shown in the analysis are not equivalised. Once the households have been ranked, the distribution is split into five or ten equally sized groups – that is quintile groups

Table 1
Summary of the effects of taxes and benefits by quintile groups on ALL households,[1] 2008/09

	Quintile groups of ALL households[1]						Ratio
	Bottom	2nd	3rd	4th	Top	All households	top/bottom quintile
Income, taxes and benefits per household (£ per year)[2]							
Original income	4 970	12 020	23 305	38 321	73 810	30 485	15
plus cash benefits	6 431	7 602	5 787	3 609	1 805	5 047	0
Gross income	11 401	19 622	29 092	41 930	75 615	35 532	7
less direct taxes[3] and employees' NIC	1 270	2 523	5 046	8 798	18 255	7 178	14
Disposable income	10 130	17 099	24 047	33 133	57 360	28 354	6
less indirect taxes	2 862	3 592	4 316	5 579	7 354	4 741	3
Post-tax income	7 269	13 507	19 731	27 553	50 006	23 613	7
plus benefits in kind	6 315	6 411	5 969	5 000	3 870	5 513	1
Final income	13 584	19 918	25 699	32 553	53 876	29 126	4

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 All the tables in Part 1 of this article show unequivalised income. Equivalised income has only been used in the ranking process to produce the quintile groups (and to produce the percentage shares and Gini coefficients).
3 These are income tax (which is after deducting tax credits and tax relief at source on life assurance premiums), council tax and Northern Ireland rates but after deducting discounts, council tax benefits and rates rebates.

Table 2
Percentage shares of household income and Gini coefficients,[1] 2008/09

	Percentage shares of equivalised income for ALL households[2]			
	Original income	Gross income	Disposable income	Post-tax income
Quintile group[2]				
Bottom	3	7	7	6
2nd	7	11	12	12
3rd	14	16	16	16
4th	24	23	22	22
Top	51	44	42	44
All households	100	100	100	100
Decile group[2]				
Bottom	1	3	3	2
Top	33	28	27	28
Gini coefficient (per cent)	52	38	34	38

Notes: *Source: Office for National Statistics*

1 This is a measure of the dispersion of each definition of income (see Appendix 2, paragraph 51).
2 Households are ranked by equivalised disposable income.

or decile groups. The bottom quintile (or decile) group is that with the lowest equivalised disposable incomes, while the top quintile (or decile) is that with the highest.

Data sources

The main data source for this analysis is the Living Costs and Food Survey (LCF), formally known as the Expenditure and Food Survey. The LCF covers about 5,800 households in the UK each year. It only covers private households – people living in hotels, lodging houses and in institutions, such as old people's homes, are excluded. The LCF is used for this analysis because as well as collecting data on household income, it also collects expenditure data which are used here to estimate payment of indirect taxes. The LCF data is weighted using 2001 Census data, for further details please refer to Appendix 2, paragraph 5.

There is known to be a degree of under-reporting in the LCF for some benefits. For example, when compared to administrative data from HM Revenue and Customs (HMRC), the LCF estimate of total tax credit payments is only around two-thirds of the HMRC figure. Further details of the concepts and methodology used are given in Appendix 2.

The results of the analysis are reported in three sections; for all households, non-retired households and retired households. Retired households have distinct income and expenditure patterns, compared with their non-retired counterparts, and therefore taxes and benefits affect the two groups in different ways. By presenting the results separately for non-retired and retired households it is then possible to investigate how the tax and benefit system redistributes income both between, and within, the two groups.

Results for all households

Overall effect

Taken as a whole, the tax and benefit system leads to income being shared more equally between households. Original income (income from earnings, occupational pensions and investments) varies considerably between households. Those in the top quintile group have an average original income of £73,800 per year compared with £5,000 for the bottom group (**Table 1**).

The extent of inequality in this measure of income can be seen by looking at the proportion of total original income received by groups of households in different parts of the income distribution. At this stage, the richest fifth of households (those in the top quintile group) receive 51 per cent of all original income (**Table 2**). This compares with only 3 per cent for households in the bottom fifth.

Adding cash benefits to original income gives gross income. In contrast to original income, the amount received from cash benefits is higher for households lower down the income distribution than for those at the top. However, the largest cash benefits were received by households in the second quintile group, £7,600 per year compared with £6,400 for households in the bottom group. This is largely because more retired households are located in the second quintile group, compared with the bottom group, and therefore the average amount received in retirement pension is higher in the second group. Nevertheless, the overall effect of cash benefits is that they reduce the inequality of income.

Direct taxes

Direct taxes include income tax, National Insurance contributions (NICs) and council tax or Northern Ireland rates. Households with higher incomes pay both higher amounts of direct tax and higher proportions of their income in direct tax with the top quintile group paying an average of £18,300 per household per year in direct taxes. In contrast, the direct tax bill for households in the bottom quintile group is around £1,300 per year. As a result, direct taxes also reduce inequality of income, that is, they are progressive. For all direct taxes, the top two quintile groups pay 75 per cent

Table 3
Taxes as a percentage of gross income, disposable income and expenditure for ALL households by quintile groups,[1] 2008/09

	Quintile groups of ALL households[1]					All households
	Bottom	2nd	3rd	4th	Top	
(a) Direct and indirect taxes as a percentage of gross income						
Direct taxes						
Income tax[2]	3.4	5.6	9.4	12.6	17.2	12.7
Employees' NIC	1.6	3.0	4.4	5.5	5.0	4.6
Council tax & Northern Ireland rates[3]	6.2	4.2	3.6	2.9	1.9	2.9
All direct taxes	*11.1*	*12.9*	*17.3*	*21.0*	*24.1*	*20.2*
Indirect taxes						
VAT	9.6	7.3	6.1	5.7	4.4	5.6
Duty on alcohol	1.4	1.1	0.8	0.8	0.6	0.8
Duty on tobacco	2.6	1.6	1.1	0.7	0.3	0.8
Duty on hydrocarbon oils & vehicle excise duty	2.8	2.2	2.0	1.9	1.2	1.7
Other indirect taxes	8.7	6.1	4.9	4.2	3.2	4.4
All indirect taxes	*25.1*	*18.3*	*14.8*	*13.3*	*9.7*	*13.3*
All taxes	*36.2*	*31.2*	*32.2*	*34.3*	*33.9*	*33.5*
(b) Indirect taxes as a percentage of disposable income						
VAT	10.8	8.4	7.4	7.2	5.8	7.0
Duty on alcohol	1.6	1.2	1.0	1.1	0.9	1.0
Duty on tobacco	2.9	1.9	1.3	0.9	0.4	1.0
Duty on hydrocarbon oils & vehicle excise duty	3.2	2.6	2.4	2.4	1.6	2.2
Other indirect taxes	9.8	7.0	5.9	5.3	4.2	5.5
All indirect taxes	*28.2*	*21.0*	*17.9*	*16.8*	*12.8*	*16.7*
(c) Indirect taxes as a percentage of expenditure[4]						
VAT	7.3	7.7	7.1	7.2	6.8	7.2
Duty on alcohol	1.1	1.1	1.0	1.1	1.0	1.0
Duty on tobacco	2.0	1.7	1.3	0.9	0.5	1.1
Duty on hydrocarbon oils & vehicle excise duty	2.1	2.4	2.3	2.4	1.9	2.2
Other indirect taxes	6.7	6.4	5.7	5.3	4.9	5.5
All indirect taxes	*19.2*	*19.3*	*17.5*	*16.9*	*15.2*	*17.0*

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 After deducting tax credits and tax relief at source on life assurance premiums.
3 After deducting discounts, council tax benefits and rates rebates.
4 Calculated to be consistent with disposable income. See paragraph 34 of Appendix 2 for the definition of expenditure.

of the total, while the bottom two quintile groups together pay 11 per cent.

However, while direct taxes are progressive when taken as a whole, some direct taxes are progressive, whereas others are regressive. Households at the lower end of the income distribution pay smaller amounts of income tax and employees' National Insurance Contributions (NICs) compared with higher income households. This is because these taxes are not paid at all on the first part of income and higher rates of income tax are paid on higher incomes. Therefore, income tax is progressive. On the other hand, although the proportion of gross income paid in NICs rises with income, it does so only until the fourth quintile group. In 2008/09, employees' NICs were levied at 11 per cent on weekly earnings from £105 to £770 and at 1 per cent above this. Many people in households in the top quintile group will have a significant part of their earnings taxed at this lower rate and hence they will contribute less, as a proportion of their income. As a result, NICs are progressive only up until the fourth quintile group. **Table 3** shows the size of the direct and indirect taxes paid by each quintile group.

In contrast, council tax (and domestic rates in Northern Ireland) is regressive, even after taking into account council tax benefits and rates rebates. Although households in the lower part of the income distribution pay smaller absolute amounts - average net payments by the bottom fifth of households are half those of the top fifth - when expressed as a proportion of gross income, the burden decreases as income rises. Council tax in Great Britain and domestic rates in Northern Ireland represent 6 per cent of gross income for those in the bottom fifth but only 2 per cent for those in the top fifth.

Indirect taxes

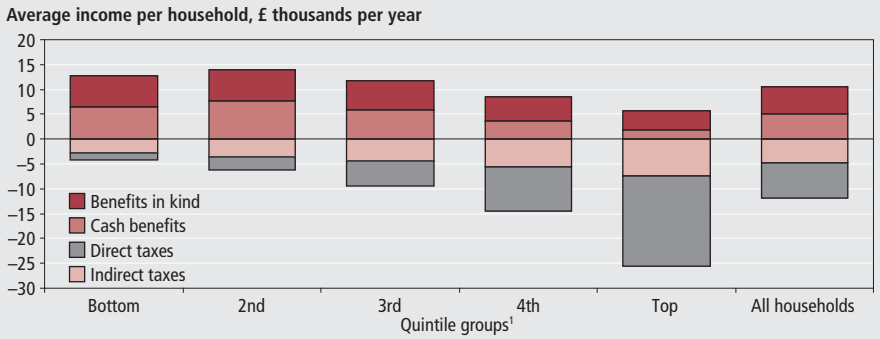
Indirect taxes are taxes that are paid on items of expenditure, such as VAT, duties on alcohol and tobacco and duties on fuels. Therefore, the amount of indirect tax each household pays is determined by their expenditure rather than their income. While the payment of indirect taxes can be expressed as a percentage of gross income in the same way as for direct taxes, this can be potentially misleading. This is because some households have an annual expenditure that exceeds their annual income, particularly those towards the bottom of the income distribution. For these households, their expenditure is not being funded entirely from income. It is possible that, for these households, expenditure is a better indicator of standard of living than income. Therefore, payment of indirect taxes is also presented as a percentage of expenditure.

Carrera (2010) presented some of the most common alternative methods that were used to fund expenditure in households where their expenditure was at least twice the level of their disposable income. For these households the most common source of funds was savings, followed by credit/store cards and then loans. This may be due to a number of reasons. For example, the bottom decile in particular includes some groups who have, or report, very little income (for example people not currently in employment and some self-employed people). For some people this spell of very low income may only be temporary and, during this period, they may continue with previous patterns of spending. Secondly, some types of one-off receipts are not included as income in this analysis, for example, inheritance and severance payments. Finally, the income and expenditure data are measured in different ways in the LCF, and either could be affected by measurement errors of different kinds (see Appendix 2, paragraph 6).

In cash terms (see **Table 14A**) the top fifth of households pay three times as much indirect tax as the bottom fifth. This simply reflects higher expenditure by higher income households. The only indirect taxes where average payments do not vary much across the income distribution are duties on tobacco, television licences and the tax element of the National Lottery.

To give a more complete picture of the impact of indirect taxes, they are shown in **Table 3** separately as a proportion of gross income, disposable income and expenditure. Direct taxes are also shown as a proportion of gross income so that the

Figure 4
Summary of the effects of taxes and benefits on ALL households, 2008/09



Note: *Source: Office for National Statistics*

1 Households are ranked throughout by their grossed equivalised disposable incomes.

Table 4
Summary of household characteristics of quintile groups of ALL households,[1] 2008/09

	Quintile groups of ALL households[1]					
	Bottom	2nd	3rd	4th	Top	All households
Number of individuals per household						
Children[2]	*0.6*	*0.6*	*0.5*	*0.5*	*0.3*	*0.5*
Adults	*1.7*	*1.8*	*1.9*	*2.0*	*1.9*	*1.8*
Men	*0.7*	*0.8*	*0.9*	*1.0*	*1.0*	*0.9*
Women	*0.9*	*1.0*	*1.0*	*1.0*	*0.9*	*0.9*
People	2.3	2.4	2.4	2.4	2.2	2.3
People in full-time education	0.6	0.5	0.5	0.4	0.3	0.5
Economically active people	0.7	0.8	1.3	1.5	1.7	1.2
Retired people	0.5	0.6	0.5	0.3	0.2	0.4
Household type (percentages)						
Retired	38	41	29	16	7	26
Non-retired						
1 adult without children	16	10	13	16	22	15
2 adults without children	9	12	17	27	40	21
1 adult with children[3]	11	7	5	3	1	5
2 adults with children	15	17	22	22	19	19
3 or more adults[4]	10	13	14	17	11	13
All household types	100	100	100	100	100	100

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 Children are defined as people aged under 16 or aged between 16 and 18, unmarried and receiving non-advanced further education.
3 This group is smaller than the category of 'one parent families' (sometimes used in publications) because some of these families will be contained in the larger household types.
4 With or without children.

impact of direct and indirect taxes can be compared.

When expressed as a percentage of expenditure, the proportion paid in indirect tax tends to be lower for households at the top of the distribution compared with those lower down (15 per cent for the top quintile compared with 19 per cent for the bottom quintile). The higher percentage of expenditure by low income groups on tobacco (2.0 per cent of total expenditure for the bottom quintile group compared with 0.5 per cent for the top quintile group) and on the 'other indirect taxes' which include television licences, stamp duty on house purchases and the Camelot National Lottery Fund (6.7 per cent compared with 4.9 per cent, respectively) accounts for part of this difference.

On the other hand, the impact of indirect taxes, as a proportion of gross or disposable income, declines much more sharply as income rises. This is because those in higher income groups tend to channel a larger proportion of their income into places which do not attract indirect taxes, such as savings and mortgage payments. For this reason, and those already mentioned regarding high expenditure households, indirect taxes expressed as a proportion of income appear more regressive than when expressed as a proportion of expenditure.

The final stage in the redistribution process is the addition of benefits received in kind (as opposed to those received in cash), such as those from state education and the health service. Households in the bottom quintile group receive the equivalent of around £6,300 per year from all benefits in kind, compared with £3,900 received by the top fifth (see **Figure 4**). These are described in more detail later in the analysis. Estimates of final income therefore include receipt of all benefits and payment of all taxes. After redistribution through taxes and benefits, the share of income received by the bottom quintile group increased from 3 per cent for original income to 6 per cent for post-tax income. The share of income received by the top quintile group fell from 51 per cent to 44 per cent.

Characteristics of households

Some types of household are more likely to be located in one part of the income distribution than another and hence it is possible to provide analysis of how different household characteristics may affect households' incomes. Information about the characteristics of households in the different income groups is shown in **Table 4**. Household size does not vary much across the income distribution, with an average of between 2.2 and 2.4 people per household in each quintile group in 2008/09. There are fewer children in the upper part of the income distribution. Men are slightly more likely to be in the upper part of the distribution while women are spread more evenly across the distribution. Higher income groups also contain more economically active people, the top fifth of households have two and a half times as many economically active people as the bottom fifth.

Of those households in the top quintile group, 62 per cent are one or two adult non-retired households without children. In fact, childless two adult non-retired households make up 40 per cent of the total households in the top quintile group. For two adult households with children, the position in the income distribution

Figure 5
Gini coefficients[1] 1983 to 2008/09

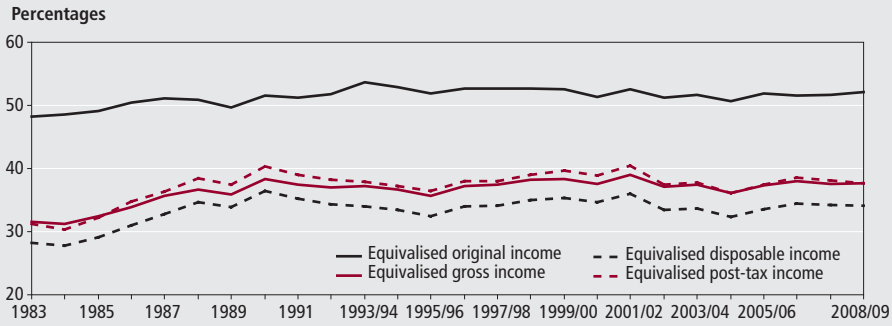
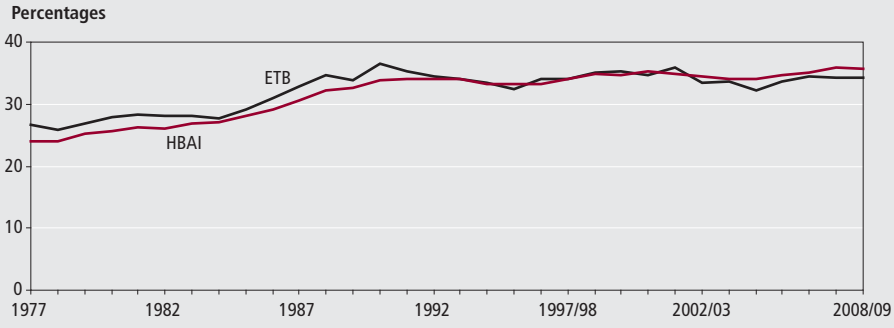


Figure 6
Gini coefficients[1] from the Effects of Taxes and Benefits (ETB) analysis (disposable income) and Households Below Average Income (HBAI) (BHC[2] income)



Notes (Figures 5 and 6): *Source: Office for National Statistics and Department for Work and Pensions*

1 See technical note 5 for an explanation of the Gini coefficient.
2 Before housing costs.

tends to vary according to the number of children. Households with more children, unless there is a corresponding increase in income, will have lower equivalised incomes to reflect the additional demand on resources. Non-retired households with one adult and one or more children are concentrated in the lower groups. Whereas these households make up 5 per cent of all households, they constitute 11 per cent of the bottom group and only 1 per cent of the top group.

Retired households are over-represented at the lower end of the income distribution. Although 26 per cent of all households are retired, these households make up 38 and 41 per cent of the bottom and second from bottom quintile groups, respectively, but only 7 per cent of the top group.

Changes in inequality over time

Figure 5 shows how the Gini coefficients for the various measures of income have changed since 1983. As with other estimates presented here, they are subject to sampling error and some caution is needed particularly in the interpretation of year-to-year changes. However, by looking at data over several years it is possible to see some underlying trends.

As shown in Figure 5, the Gini coefficient for disposable income was unchanged between 2007/08 and 2008/09, at 34 per cent, having fallen only slightly between 2006/07 and 2007/08. In fact, the level of inequality in 2008/09 was approximately the same as 10 (1998/99-2008/09) and 15 year (1993/94-2008/09) averages.

Inequality was almost unchanged between 2006/07 and 2008/09 because there was very little change in average disposable incomes, especially at the top and bottom of the income distribution, over this period. Incomes were unchanged at the top of the distribution because of the lower than average growth in income from wages and salaries, and self-employment for these households. For households at the bottom of the distribution, who get the majority of their income from cash benefits, these benefits also remained almost unchanged on average.

This followed a period between 2004/05 and 2006/07 when there was a slight increase in inequality, due to increased inequality of original income. It was due in part to the faster rate of growth of wages and salaries and investment income in the upper part of the distribution compared with the low.

The growth in inequality between 2004/05 and 2006/07 followed a period between 2001/02 and 2004/05 when income inequality was falling. Over this period there was a slight fall in inequality of original income due to faster growth in income from earnings and self-employment income at the bottom end of the income distribution. Policy changes such as the increases in the national minimum wage, increases in tax credit payments, and the increase in National Insurance contributions in 2003/04 would also have resulted in small reductions in inequality of disposable and post-tax income during this period.

Inequality of disposable income increased in the late 1980s and late 1990s during periods of faster growth in income from employment, and fell in the early 1990s during a period of slower growth in employment income. Households which typically benefit the most during periods of growth in employment income are those in the middle and upper part of the income distribution. This is due to the much higher proportion of economically active adults in higher quintile households compared with households in the lower part of the income distribution.

The Department for Work and Pensions (DWP) publishes analysis each year of the income distribution in their publication *Households Below Average Income (HBAI)*, based on data from the Family Resources Survey. Due to HBAI being based on a different survey, and some conceptual differences (for example, the use of the OECD equivalisation scale), HBAI estimates will differ slightly. However, the underlying trends are similar, as shown in **Figure 6**.

Additional analysis

Analyses of two additional household groups have been provided in this publication for the first time, based on:

1. Housing tenure type (**Tables 28** and **29**)
2. Government Office Region (**Tables 30** and **31**)

The results by housing tenure show the very large differences in the levels of income that exist between these groups. For example, households that own their residence with a mortgage (or rental purchase) had an average disposable income of £39,000 per year, almost one and a half times the all

household average. This income was mainly derived from wages and salaries, and self-employment income as these households had many more economically active people than the average for all households (1.8 economically active people per household compared with 1.2). This is in contrast with households that own their residence outright, who on average had a disposable income of £24,800 per year, slightly less than the all household average. In contrast to the households with a mortgage, households that owned their residence outright also had substantial income from occupational pensions, and the retirement pension, owing to the large number of retired people in this group.

Table 30 presents the average incomes, taxes and benefits by Government Office Region. The differences between regions are less pronounced than for those between the different housing tenure groups. However, households in the South East and London, received an average of £38,100 and £37,300 per year, respectively, in original income, approximately £8,000 per year more than the all household average. Also, these households received a larger than average amount in cash benefits, mainly due to much larger than average housing benefit.

Results for non-retired households

This section looks at the effect of taxes and benefits on the income of non-retired households. It examines how the characteristics of non-retired households affect the receipt of benefits and payment of taxes (for a definition of retired and non-retired households refer to Appendix 2, paragraph 9).

Overall effect

As for all households, the tax and benefit systems lead to income being shared more equally between non-retired households. Before taxes and benefits, there is less inequality of non-retired households' income, as shown in **Table 5**, than for all households, as shown in Table 2. However, after the process of redistribution, inequality of post-tax income (as measured, for example, by the Gini coefficient) is very similar to that for all households. The effect of taxes and benefits is therefore smaller for non-retired households than for all households, and a summary is shown in **Table 6**.

Characteristics of non-retired households

There is more variation in the size of non-retired households, compared with households in total. The average non-retired household size tends to decrease as income increases. This fall is largely accounted for by the decrease in the average number of children in each household from 1.0 in the bottom quintile group to 0.3 in the top.

Original income

The average original income for non-retired households is £38,200 per year. As mentioned above, inequality of original income is lower for non-retired households than for all households. For example, the ratio of the average original incomes for the top and bottom quintiles is 11 to one, compared with 15 to one for all households.

The original income of non-retired households shows a relatively strong relationship to the number of economically active people they contain. On average, households in the top three quintile groups contain almost twice as many economically active people as those in the lowest group.

Cash benefits

Table 7 gives a summary of the cash benefits that each non-retired quintile group receives. There are two types of cash benefits: contributory benefits which are paid from the National Insurance Fund (to which individuals and their employers make contributions while working) and non-contributory benefits. For non-retired households, non-contributory benefits make up nearly three-quarters of all cash benefits on average.

Most non-contributory benefits, particularly income support, tax credits and housing benefit, are income related and so payments are concentrated in the two lowest quintile groups. The presence of some individuals with low incomes in high income households means that some payments are recorded further up the income distribution. Of the total amount of income support, tax credits and housing benefit paid to non-retired households, just over half goes to households in the bottom quintile.

Child benefit is based on the number of children in the household. Levels of child benefit received are also higher at the lower end of the distribution, as these households tend to have more children.

In contrast to non-contributory benefits, a criterion for receipt of contributory benefits is the amount of National Insurance contributions that have been paid by, or on behalf of, the individual. The amounts received from these benefits are also higher in the lower half of the distribution, but to a lesser extent than for non-contributory benefits.

Cash benefits provide 45 per cent of gross income for households in the bottom quintile group, falling to just 2 per cent for households in the top quintile. Their payment results in a significant reduction in income inequality.

Direct and indirect taxes

Tables 8 and **9** show estimates of how much direct and indirect taxes are paid by non-retired households. The patterns are similar to those described for all households. As noted for all households, National Insurance contributions as a proportion of gross income increase from the bottom to the fourth quintile group, but are then lower for the top quintile group of households.

Table 5
Percentage shares of household income and Gini coefficients[1] for NON-RETIRED households, 2008/09

	Percentage shares of equivalised income for NON-RETIRED households[2]			
	Original income	Gross income	Disposable income	Post-tax income
Quintile group[2]				
Bottom	4	6	7	6
2nd	9	11	12	11
3rd	16	16	17	16
4th	24	23	23	23
Top	47	43	42	44
All non-retired households	100	100	100	100
Decile group[2]				
Bottom	1	2	3	2
Top	30	28	26	28
Gini coefficient (per cent)	45	37	34	38

Notes: *Source: Office for National Statistics*

1 This is a measure of the dispersion of each definition of income (see Appendix 2, paragraph 51).
2 Households are ranked by equivalised disposable income.

Table 6

Summary of the effects of taxes and benefits by quintile groups on NON-RETIRED households,[1] 2008/09

	Quintile groups of NON-RETIRED households[1]						Ratio
	Bottom	2nd	3rd	4th	Top	All non-retired households	top/bottom quintile
Income, taxes and benefits per household (£ per year)							
Original income	7 599	20 258	33 678	47 435	81 878	38 170	11
plus cash benefits	6 184	5 446	3 319	1 874	1 256	3 616	0.2
Gross income	13 784	25 704	36 997	49 310	83 134	41 786	6
less direct taxes[2] and employees' NIC	1 561	4 133	7 359	11 262	20 538	8 971	13
Disposable income	12 223	21 571	29 638	38 048	62 596	32 815	5
less indirect taxes	3 496	4 517	5 202	6 327	7 589	5 426	2
Post-tax income	8 727	17 054	24 436	31 720	55 006	27 389	6
plus benefits in kind	7 836	6 912	6 082	4 795	3 744	5 874	0.5
Final income	16 563	23 966	30 518	36 515	58 751	33 263	4
Number of individuals per household							
Children[3]	*1.0*	*0.8*	*0.7*	*0.5*	*0.3*	*0.7*	
Adults	*1.8*	*2.0*	*2.1*	*2.0*	*1.9*	*2.0*	
Men	*0.8*	*1.0*	*1.1*	*1.1*	*1.0*	*1.0*	
Women	*1.0*	*1.0*	*1.0*	*1.0*	*0.9*	*1.0*	
People	2.9	2.8	2.8	2.5	2.2	2.6	
People in full-time education	1.0	0.8	0.6	0.5	0.3	0.6	
Economically active people	1.1	1.5	1.8	1.9	1.8	1.6	
Retired people	0.0	0.1	0.1	0.1	0.1	0.1	

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 These are income tax (which is after deducting tax credits and tax relief at source on life assurance premiums), council tax and Northern Ireland rates but after deducting discounts, council tax benefit and rates rebates.
3 Children are defined as people aged under 16 or aged between 16 and 18, unmarried and receiving non-advanced further education.

Table 7

Cash benefits for NON-RETIRED households by quintile groups,[1] 2008/09

	Quintile groups of NON-RETIRED households[1]					
	Bottom	2nd	3rd	4th	Top	All non-retired households
Average per household (£ per year)						
Contributory						
Retirement pension	175	895	881	688	507	629
Incapacity benefit	599	424	209	126	23	276
Jobseeker's allowance[2]	106	16	9	-	0	26
Other	60	99	148	154	233	139
Total contributory	941	1 433	1 248	968	764	1 071
Non-contributory						
Income support[3]	972	633	278	41	10	387
Tax credits[4]	1 254	786	234	92	33	480
Child benefit	824	693	576	424	288	561
Housing benefit	1 269	805	250	23	20	473
Jobseeker's allowance[5]	159	31	18	10	-	43
Sickness/disablement related	459	837	600	235	82	443
Other	306	226	117	85	59	159
Total non-contributory	5 243	4 012	2 072	907	492	2 545
Total cash benefits	6 184	5 446	3 319	1 874	1 256	3 616
Cash benefits as a percentage of gross income	*45*	*21*	*9*	*4*	*2*	*9*

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 Contribution based.
3 Including pension credit.
4 Child tax credit and working tax credit.
5 Income based.

Benefits in kind

The Government provides a number of goods and services to households that are either free at the time of use or at subsidised prices. These goods and services can be assigned a monetary value and this analysis allocates this value to individual households. The addition of benefits in kind to disposable income results in an estimate of households' final income. The largest two categories for which a value is assigned are health and education services and, in total, six categories are assigned values (in some tables only five categories are presented as transport subsidies are shown as a combination of rail and bus travel subsidies). The value given to these benefits is based on the estimated cost of providing them, which for all households is detailed in **Table 13**. However, the actual value to households may be greater, or smaller, than the cost to the Government of provision. This analysis includes a number of improvements to these estimates, particularly for the value of the NHS and education.

Table 10 gives a summary of the value of benefits in kind for each quintile group for non-retired households. The benefit in kind from education is allocated to a household according to its members' use of state education (Appendix 2, paragraph 38). Households in the lower quintiles receive the highest benefit from education, as shown in Table 10. This is due to the concentration of children in this part of the distribution. In addition, children in households in the higher quintiles are more likely to be attending private schools and an allocation is not made in these cases. Free school meals and welfare milk go predominantly to lower income groups, where children are more likely to have school meals provided free of charge.

The benefit from the health service is estimated according to the age and sex of the household members rather than their actual use of the service, as the LCF does not contain this information (Appendix 2, paragraph 40). The assigned benefit is relatively high for young children, low in later childhood and through the adult years until it begins to rise from late middle age onwards. This benefit is similar in the first four quintiles and lower in the top group, as shown in Table 10. This pattern is a reflection of the demographic composition of households. Studies by Sefton (2002 and 1997) have attempted to allow for variations in use of the health service according to socio-economic characteristics. Due to data limitations this analysis does not take

Table 8

Taxes as a percentage of gross income for NON-RETIRED households by quintile groups,[1] 2008/09

	Quintile groups of NON-RETIRED households[1]					
	Bottom	2nd	3rd	4th	Top	All non-retired households
Percentages						
Direct taxes						
Income tax[2]	4.0	7.8	11.1	14.0	17.9	13.6
Employees' NIC	2.5	4.6	5.8	6.3	5.1	5.3
Council tax & NI rates[3]	4.8	3.7	3.1	2.6	1.8	2.6
All direct taxes	11.3	16.1	19.9	22.8	24.7	21.5
All indirect taxes	25.4	17.6	14.1	12.8	9.1	13.0
All taxes	36.7	33.7	34.0	35.7	33.8	34.5

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 After deducting tax credits and tax relief at source on life assurance premiums.
3 Council tax and Northern Ireland rates after deducting discounts, council tax benefit and rates rebates.

Table 9

Indirect taxes as a percentage of (a) disposable income and (b) household expenditure[1] for NON-RETIRED households by quintile groups,[2] 2008/09

	Quintile groups of NON-RETIRED households[2]					
	Bottom	2nd	3rd	4th	Top	All non-retired households
(a) Percentages of disposable income						
VAT	10.7	8.3	7.2	7.1	5.5	7.0
Duty on alcohol	1.5	1.2	1.0	1.1	0.8	1.0
Duty on tobacco	3.4	1.8	1.3	0.8	0.4	1.1
Duty on hydrocarbon oils & vehicle excise duty	3.2	2.8	2.5	2.4	1.5	2.2
Other indirect taxes	9.8	6.7	5.5	5.2	3.9	5.3
All indirect taxes	28.6	20.9	17.6	16.6	12.1	16.5
(b) Percentages of expenditure[1]						
VAT	7.2	7.4	7.1	7.1	6.7	7.0
Duty on alcohol	1.0	1.1	1.0	1.1	1.0	1.0
Duty on tobacco	2.3	1.6	1.3	0.8	0.5	1.1
Duty on hydrocarbon oils & vehicle excise duty	2.1	2.5	2.5	2.4	1.8	2.2
Other indirect taxes	6.6	6.0	5.4	5.2	4.7	5.3
All indirect taxes	19.1	18.7	17.2	16.6	14.7	16.7

Notes: *Source: Office for National Statistics*

1 Calculated to be consistent with disposable income (see Appendix 2, paragraph 35, for the definition of expenditure).
2 Households are ranked by equivalised disposable income.

Table 10

Benefits in kind for NON-RETIRED households by quintile groups,[1] 2008/09

	Quintile groups of NON-RETIRED households[1]					
	Bottom	2nd	3rd	4th	Top	All non-retired households
Average per household (£ per year)						
Education	5 145	4 073	3 344	2 322	1 497	3 276
National health service	2 438	2 649	2 595	2 320	2 037	2 408
Housing subsidy	47	31	14	7	3	20
Travel subsidies	96	95	113	139	207	130
School meals and welfare milk[2]	110	64	17	6	1	40
All benefits in kind	7 836	6 912	6 082	4 795	3 744	5 874
Benefits in kind as a percentage of post-tax income	*90*	*41*	*25*	*15*	*7*	*21*

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 Welfare Milk scheme has been replaced by Healthy Start vouchers. For 2008/09 Healthy Start data have been imputed based on responses to Welfare Milk question, as it was unchanged in LCF interviews.

account of these variations in the use of the health service.

The benefit given to households for the NHS is estimated to be equivalent to 9 per cent of the average post-tax income for non-retired households, or an average of £2,400 per year.

The housing subsidy, which excludes housing benefit (Appendix 2, paragraph 41), fell in the years leading to 2006/07, as the proportion of households in public sector, housing association and Registered Social Landlord housing has declined. The average value attributed to housing subsidy remained almost unchanged between 2007/08 and 2008/09.

Travel subsidies cover the support payments made to bus and train operating companies. The use of public transport by non-retired households is partly related to the need to travel to work and therefore to the number of economically active people in a household. This results in estimates of these subsidies being higher for households in higher income quintiles. This pattern is also due to London and the South East having higher levels of commuting by public transport together with higher than average household incomes.

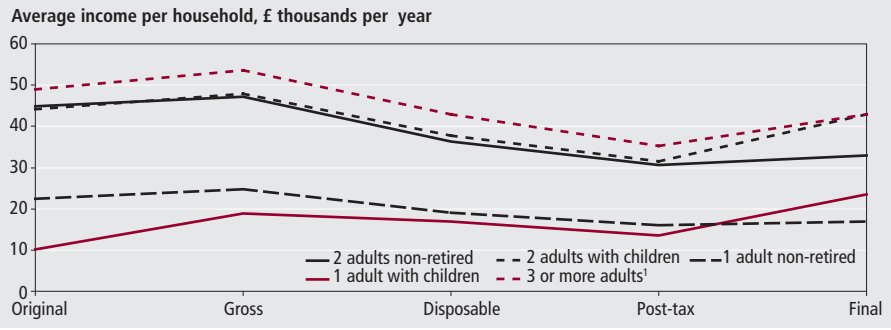
Taken together, the absolute value of these benefits in kind declines as household income increases. The ratio of benefits in kind to post-tax income decreases from 90 per cent for the lowest quintile group to 7 per cent for the highest. This indicates that these benefits contribute to the reduction of inequality.

The effects of taxes and benefits by household type

The tax and benefit systems affect different types of household in different ways reflecting, in part, the number and ages of people within each household type. Of the types of non-retired households shown in **Figure 7**, only those containing one adult and children make significant net gains when comparing original to final income, with average incomes of £23,500 and £10,100 per year, respectively. Households with two adults and three or more children, and households with three or more adults with children are also net beneficiaries, but to a smaller extent.

Original income is strongly related to the number of adults in the household. For two adult households, those with children have broadly similar levels of original income to those without, but they receive more cash benefits such as tax credits and child benefit than those without children. Final incomes are also higher for those with children due

Figure 7
Income stages by non-retired household types, 2008/09



Note: *Source: Office for National Statistics*

1 With or without children.

Table 11
Percentage shares of household income and Gini coefficients[1] for RETIRED households, 2008/09

	Percentage shares of equivalised income for RETIRED households[2]			
	Original income	Gross income	Disposable income	Post-tax income
Quintile group[2]				
Bottom	4	10	10	9
2nd	8	14	14	14
3rd	11	17	17	18
4th	20	22	22	22
Top	57	38	36	37
All households	100	100	100	100
Decile group[2]				
Bottom	2	4	4	3
Top	40	24	22	23
Gini coefficient (per cent)	*62*	*28*	*26*	*29*

Notes: *Source: Office for National Statistics*

1 This is a measure of the dispersion of each definition of income (see Appendix 2, paragraph 53).
2 Households are ranked by equivalised disposable income.

to the value assigned to education services.

For one adult households, original income is much lower for those with children as the adult is less likely to be economically active. Benefits, both in cash and in kind, are significantly higher for those with children.

Results for retired households

In this analysis retired households are those where the income of retired household members accounts for more than half of the household gross income (see Appendix 2, paragraph 9 for the definition of a retired person). These households have quite distinct income and expenditure patterns. The tax and benefit systems affect them in different ways from non-retired households.

Retired households are much more likely to be towards the bottom of the income distribution. Whereas 38 and 41 per cent of the bottom and second quintile groups, respectively, are made up of retired households, these households only make up 7 per cent of the top group.

Among retired households, there is a high degree of inequality in income before taxes and benefits. **Table 11** shows that, before government intervention, the richest fifth of retired households receive 57 per cent of total original income, while the Gini coefficient for this measure of income is 62 per cent. Both these measures are higher (showing more inequality) than equivalent figures for non-retired households. After the impact of taxes and benefits there is a large reduction in inequality. Cash benefits play by far the largest part in bringing about this reduction. Payment of direct taxes makes a further, though much smaller, contribution. Payments of indirect taxes result in an increase in inequality.

Overall, retired households receive an average of £8,800 per year in original income with most of this coming from occupational pensions and investments (**Table 12**). Original income ranges from £1,600 for the bottom quintile group to £25,200 per year for the top. On the other hand, amounts received from cash benefits vary less across the distribution. On average, households in the bottom fifth receive around £7,000 per year from this source, while those in the other quintile groups receive between £8,600 and £10,400 per year. These cash benefits make up large proportions of the gross incomes for the bottom four quintiles ranging from 82 per cent for the bottom quintile group to 54 per cent for the fourth quintile group. The top fifth are much less dependent on cash benefits – these account for only 28 per cent of their gross incomes.

Most retired people will have made contributions to the National Insurance Fund throughout their working lives. Many of the benefits which retired households receive are paid out of this fund in the form of contributory benefits. The most significant of these is the state retirement pension, which on average accounts for just over three-quarters of retired households' cash benefits.

Non-contributory benefits are lowest in the bottom two quintile groups. Housing benefit and disability benefits can sometimes make up a significant proportion of the income of retired households, who as a result will appear higher up the income distribution. However, this does not necessarily mean that they have a higher standard of living. Households receiving housing benefit are likely to have higher housing costs than owner occupiers (who may own their property outright), and similarly the income from disability benefits may be offset by additional costs incurred by the individual due to their illness or disability.

Retired households derive significant benefits from health services. Health benefit is spread fairly evenly between retired households and in 2008/09 was worth an average of £4,300 per year per household. This is almost twice the figure for non-retired households, and increases their post-tax income by 33 per cent. The benefits received by retired households from travel subsidies are mainly for bus travel, particularly in the form of concessionary fares and passes for senior citizens and, since these are not usually means-tested, there is no particular relationship with income.

Overall, retired households are major beneficiaries from redistribution through the tax and benefit system. Retired households with two or more adults have an average original income of £14,000, but a final income of £23,000. The corresponding figures for one adult retired households are £4,700 and £13,100. Among one adult

Table 12
Summary of the effects of taxes and benefits on RETIRED households by quintile groups,[1] 2008/09

	Quintile groups of RETIRED households[1]					
	Bottom	2nd	3rd	4th	Top	All retired households
Income, taxes and benefits per household (£ per year)						
Original income						
Earnings	28	149	311	774	1 238	500
Occupational pensions	1 219	2 869	3 992	6 860	19 276	6 843
Investment income	291	428	521	1 207	4 314	1 352
Other income	34	56	62	180	365	139
Total original income	1 572	3 502	4 886	9 020	25 192	8 835
plus Contributory benefits	5 780	7 063	7 196	7 560	7 472	7 014
Non-contributory benefits	1 175	1 539	2 645	2 862	2 097	2 064
Total cash benefits	6 955	8 602	9 842	10 422	9 569	9 078
Gross income	8 527	12 104	14 728	19 442	34 761	17 912
less Income tax[2]	139	346	530	1 168	3 826	1 202
Employees' NIC	1	5	13	37	66	24
Council tax & Northern Ireland rates[3]	806	769	746	907	1 285	903
Disposable income	7 582	10 985	13 438	17 330	29 584	15 784
less Indirect taxes	1 923	2 244	2 361	2 961	4 554	2 809
Post-tax income	5 659	8 741	11 077	14 369	25 030	12 975
plus National health service	4 281	4 257	4 318	4 375	4 174	4 281
Housing subsidy	11	18	40	25	18	22
Other benefits in kind	205	140	232	203	182	193
Final income	10 155	13 157	15 667	18 972	29 404	17 471
Cash benefits as a percentage of gross income	82	71	67	54	28	51
Retirement pension as a percentage of cash benefits	81	81	72	72	77	76

Notes: *Source: Office for National Statistics*

1 Households are ranked by equivalised disposable income.
2 After deducting tax credits and tax relief at source on life assurance premiums.
3 Council tax and Northern Ireland rates after deducting discounts, council tax benefit and rates rebates.

households, women have a lower original income than men, but after the addition of benefits and the deduction of taxes, the differences are greatly reduced.

ACKNOWLEDGEMENTS

The author gratefully acknowledges the considerable work done for this study by Sonia Carrera, Grace Anyaegbu and Nathan Thomas.

REFERENCES

Anyaegbu G (2010) 'Using the OECD equivalence scale in taxes and benefits analysis' Economic & Labour Market Review, Vol 4, No. 1, January, Office for National Statistics

Cardarelli R, Sefton J and Kotlikoff L (1999) 'Generational accounting in the UK' NIESR Discussion Paper. Available at: www.niesr.ac.uk/pubs/dps/dp147.pdf

Carrera S (2010) 'An expenditure-based analysis of the redistribution of household income' Economic & Labour Market Review, Vol 4, No. 3, March, Office for National Statistics.

Department for Work and Pensions (2010), Households Below Average Income, an analysis of the income distribution 1994/95 – 2008/09, Department for Work and Pensions.

Muriel A and Sibieta L (2009) 'Living Standards During Previous Recessions', The Institute for Fiscal Studies Briefing Note No. 85.

ARTICLE

SOC2010: revision of the Standard Occupational Classification

Peter Elias and Margaret Birch
Institute for Employment Research, University of Warwick

SUMMARY

This article describes the revision of the Standard Occupational Classification from its 2000 to its 2010 version (SOC2010).

It details the revision process, outlines the major areas of change and illustrates the impact of these changes on national estimates of employment by occupation. Given that the revision of a classification introduces potential discontinuities in the interpretation of occupational information over time, the final section discusses ways in which such discontinuities can be minimised.

Key points

- In June 2010 the Office for National Statistics (ONS) published as two volumes a new edition of the Standard Occupational Classification (SOC2010). This is the second revision of the classification first introduced in 1990 (SOC90) and revised in 2000 (SOC2000).
- The revised classification was developed by ONS in collaboration with experts in occupational classification from the Institute for Employment Research (IER) at the University of Warwick. It results from consultations with, and advice from, a wide variety of users and producers of occupational statistics, including employer associations, professional bodies, trades unions, training organisations, academics and national and local government departments and agencies.
- The revised classification addresses a major problem evident within UK occupational statistics – the high proportion of occupations classified to Major Group 1 'Managers and senior officials' compared with most other European countries and the USA. Close examination of the main tasks and duties performed in a range of occupations classified to this major group in SOC2000 and redefinition of key managerial functions within the Standard Occupational Classification, led to the reallocation of numerous job titles from SOC2010 Major Group 1 to other major groups, reducing the size of this major group from 19 per cent to 12.8 per cent of male employment and from 10.8 per cent to 6.3 per cent for female employment (Labour Force Survey (LFS), Q1 2007).
- The classification is updated and improved in a number of areas, including information and communication technology occupations; health-related occupations; leisure and travel related jobs; culture, the arts and sports occupations and the care sector.
- Nursing occupations have been reclassified from Major Group 3 (Associate professional and technical occupations) to Major Group 2 (Professional occupations). This reflects the growing proportion of nurses with a degree level education following the raising of entry requirements.
- To improve alignment with the recently revised International Standard Classification of Occupations (ISCO08), a number of supervisory unit groups have been added to the classification.
- The new classification will be used to code occupational details provided in the forthcoming Census of Population. By 2012 most other sources of occupational information (for example, registration statistics, national surveys and job vacancy details) will make use of SOC2010.

Introduction

A classification of occupations provides a framework for describing the kind of work that people do. By organising jobs into groups that reflect the typical skills and expertise required to perform them well, occupational classifications enable analysts to measure skill-based changes in the labour market, match jobs to the skills of workers and/or provide relevant advice to job seekers. To achieve these objectives, a classification must be both up-to-date and have a clear, meaningful structure appropriate for the uses to which it will be put.

Jobs are not static entities. Innovation and the introduction of new technologies, changes in the organisation of work, revisions to occupational training and qualification requirements, together with shifts in demand for different types of goods and services and the ways in which these are met – all impact on the nature of occupations. To measure and monitor such changes, analysts need to record occupational information within a stable framework. However, as change progresses, there is also a need to adjust the classification from time to time, ensuring that the classification reflects new areas of work and associated training and qualification requirements.

The Office for National Statistics (ONS) has adopted a ten year cycle for the revision of the UK national occupational classification. While the conceptual basis of the UK national occupational classification has remained unchanged since 1990[1], the 2010 Standard Occupational Classification is now the second revision. Previous articles have described the introduction of the Standard Occupational Classification in 1990 (Thomas and Elias, 1989) and its revision in 2000 (Elias *et al*, 2000). This article presents a summary of the main changes that have been made to the 2000 version of the Standard Occupational Classification[2] (referred to as SOC2000), redefining the national standard as the 2010 version of the Standard Occupational Classification (referred to as SOC2010).

The main areas of change involve:

- the introduction of a stricter definition of managers
- the reallocation of most nursing occupations from Major Group 3 to Major Group 2
- a reclassification of occupations associated with information technologies; and
- further alignment with the 2008 revision of the International Standard Classification of Occupations (ISCO08), specifically via the introduction of a limited number of supervisory unit groups

Details of these changes are given in the following sections, with the final section specifically addressing issues of maintaining continuity alongside the need for change.

The redefinition of managers

Relative to many other countries, a significantly higher proportion of the working population in the UK is classified via SOC2000 as managers[3]. An international comparison of occupational structures based on information collected from 25 European countries and the USA in 2003 (European Commission, 2004) indicated that the proportions of employment in ISCO88 Major Group 1 in nearly all EU countries and the US show a deviation from the EU average of +/– 2.5 percentage points[4]. However, the UK and Ireland[5] stand out by showing a deviation of +6 percentage points from the EU average. It is unlikely that this reflects major differences in the organisation and structure of work in the UK and most probably relates to the use of the job title 'manager' and associated classification methods and procedures in SOC2000.

Closer examination of EU Labour Force Survey statistics shows that the problem is located within ISCO Sub major Group 12 'Corporate Managers', a category which corresponds reasonably well with SOC2000 Sub major Group 11 'Corporate Managers'. This problem was noted during the process of revising SOC90 to create SOC2000.

A number of SOC90 job titles which were indexed to SOC90 Sub major Group 11 were repositioned, particularly job titles using the word 'executive' or 'administrator' which were reallocated to Major Groups 3 or 4 of SOC2000. However, another change was also implemented during the development of SOC2000 which countered the effect of repositioning these job titles. With a few exceptions, all job titles with the word 'manager' in the title were allocated to Major Group 1. This rule was adopted to simplify the allocation of job titles within the (then) developing National Statistics Socio–economic Classification. The net effect of these changes was to reduce the size of Major Group 1 as defined via the previous classification (SOC90) from 19 per cent of male employment in 1996/97 to 18 per cent when defined in SOC2000, and from 12 per cent to 8 per cent for females (ONS, 2000a).

In developing SOC2010 this issue has been readdressed. The fact that UK statistical practice in this area is still at odds with the major countries elsewhere in the EU and the US suggests that to take no action is not an option, in that it would ultimately diminish the perceived value within the global community of official occupational information from the UK. Analysts and policy makers frequently make use of occupational information at this broad aggregate level. A lack of national comparability at this highly visible level could give rise to misleading interpretation of national statistical evidence.

Defining managers

In discussion with occupational experts from other countries[6] it was apparent that a more stringent approach is taken with the use of the job title 'manager' (or its equivalent in other languages). The title 'manager', qualified in some way, is frequently used in the UK to denote what would be regarded as supervisory or administrative positions in many other countries. Furthermore, the title is often used in the UK to denote the management of a set of activities that constitute a narrowly-defined role, rather than the broader and more strategic managerial functions that characterise managerial functions in other countries.

The SOC review team approached this issue first by examining more closely the definition of corporate managers as described in SOC2000 and in the International Standard Classification of Occupations (ISCO08)[7].

The international definition of managers stresses the role of the manager as one for which the key tasks are 'planning, organising, directing, controlling and coordinating resources (financial, administrative, human and technical)'. The UK definition uses phrases such as 'organise and coordinate', which has led to a broad and flexible interpretation of the managerial role.

To effect a definition of the managerial role which accords more closely with the broader, more strategic definition as used in ISCO 88, the definition of managers within SOC2000 Major Group 1 was changed from its current definition:

> 'This major group covers occupations whose main tasks consist of the direction and coordination of the functioning of organisations and businesses, including internal departments and sections, often with the help of subordinate managers and supervisors.'

to the following definition:

> 'This major group covers occupations whose tasks consist of planning, directing and coordinating resources to achieve the efficient functioning of organisations and businesses.'

This revised definition focuses upon the role of manager as one which is associated specifically with control over resources (planning, directing and coordinating) at the enterprise or organisational level and makes more explicit the strategic elements of the job rather than the day-to-day tasks. Where the job title 'manager' is used yet the job description does not indicate significant responsibilities for strategic control over resources (financial, material or human), consideration was given to the reallocation of such job titles and their associated task descriptions to alternative major groups. This required a careful examination of the mechanisms (index rules, guidance notes, coding procedures, and so on) by which such job titles and descriptions could be identified and excluded from Major Group 1.

Evidence to support the reclassification of managers

Two major sources of information were used to assist with the redefinition of managers in SOC2010: text responses to questions about the kind of work people do from the Labour Force Surveys (2002–07)[8] and a sub sample of information from the 2001 Census of Population. Suitably anonymised individual records from these sources provided just over 280,000 and 223,000 job titles respectively. Despite slight differences in the questions and the later timing of the Labour Force Surveys, both sources show fairly similar proportions of job titles classified to Major Group 1 (18.6 per cent and 10.7 per cent for males and females respectively in the Labour Force Surveys compared with 18 per cent and 10.5 per cent in the Census of Population).

All jobs classified within each unit group of Major Group 1 of SOC 2000 were analysed in detail, noting the text descriptions of the main tasks. This revealed that there is a number of commonly occurring job titles where the tasks were associated primarily with the organisation of a limited set of related duties, but did not constitute 'planning, directing and coordinating resources to achieve the efficient functioning of organisations and businesses'. Foremost among such job titles is the term 'project manager'. Inspection of the text responses to the question 'What did you mainly do in your job?' revealed that many people who gave their job title as 'project manager' were engaged in technical work or construction activities. Typical responses would be 'Implement software changes in companies', 'coordinating building projects', 'manage internet connections', 'updating health and safety contract for clients' 'supervise a team helping people with mental health problems get houses' and 'mainly giving IT support'.

The coding index to SOC2000 instructs coders to classify the text 'project manager' to a range of unit groups in Major Group 1, from 1121 Production, works and maintenance managers to 1185 Residential and day care managers. Analysis of job titles in the composite Labour Force Survey file indicated that there were 1,753 cases (0.6 per cent of all jobs) where the words 'project manager' or 'projects manager' appeared in the job title. Of these, 93 per cent had been coded to Sub major Group 11 Corporate Managers, predominantly to unit groups 1136 Information and communication technology managers, 1121 Production, works and maintenance managers and 1122 Managers in construction.

Job titles containing the words 'project(s) manager' accounted for more than 5 per cent of all the job titles classified to sub major group 11 in the composite Labour Force Survey file. We note also that 11 per cent of job titles containing the words 'project(s) manager' were not coded to SOC2000 by Labour Force Survey coders, indicating the difficulty of coding this ambiguous job title in the absence of any additional information. Job titles containing the words 'project(s) manager' and coded in SOC2000 to Major Group 1 were repositioned in SOC2010 to unit groups within Major Group 2, as shown in **Table 1**. Note that most of the SOC2010 unit groups listed in this table are newly created, some to facilitate this repositioning of 'project managers' (for example 2424 Business and financial project management professionals; 2436 Construction project managers and related professionals).

In addition to the repositioning of 'project managers' in SOC2010, a number of other job titles were investigated in detail to determine whether or not they should be reclassified. Where the job title appears with no additional qualifying information, it is coded within SOC2000 as shown in parentheses. These are listed as follows, together with the associated SOC2000 unit group(s) to which they were allocated:

- Administration manager (1152)
- Accounts manager (1152)
- Account manager (1132, 1134, 1135, 1151)
- Sales manager (1132)
- Office manager (1152)
- Payroll manager (1152)
- Practice manager (1152)
- Business manager (various – depends on sector of activity)
- Business development manager (various – depends on sector of activity)

Table 2 provides information from the Labour Force Survey showing, for each of these job titles, the percentage of job holders with a degree, the percentage with supervisory responsibilities, the percentage stating in their task descriptions that they had some degree of control across the establishment at which they worked and the extent of their control over resources. Based upon the information shown in this table, further case–by–case investigations were carried out for all jobs classified within the unit groups where these job titles are currently positioned. Index entries were

Table 1
Re–coding of 'project manager' titles

SOC2000	SOC2010	Index entry
1121	2424	Manager, projects
1121	2129	Manager, project (manufacturing)
1122	2436	Manager, projects (building and contracting)
1113	2424	Manager, project (local government)
1134	2473	Manager, projects (advertising)
1136	2135	Manager, project, development, software
1136	2134	Manager, project, IT
1136	2134	Manager, project (computing)
1136	2134	Manager, project (telecommunications)
1137	2119	Manager, project (research and development)
1151	2424	Manager, project (financial services)
1184	2424	Manager, project (social services)
1185	2424	Manager, project (social services: residential)
1239	2424	Manager, project (publishing)

Source: SOC2000 and SOC2010

Table 2
Specific managerial job titles: qualifications, supervision, degree of control over establishment and resources

Specific job title	Number of cases	Has a degree? (per cent)	Responsible for supervising other people? (per cent)	Has some control over establishment? (per cent)	Control over resources? (per cent)			
					High	Medium	Low	Not stated
Administration manager	258	*7.4*	*80.1*	*6.6*	*25.2*	*32.2*	*38.4*	*4.3*
Accounts manager	361	*16.3*	*62.8*	*0.3*	*3.9*	*25.5*	*67.0*	*3.6*
Account manager	412	*26.9*	*44.8*	*1.7*	*2.4*	*16.7*	*77.4*	*3.4*
Sales manager	1,012	*13.9*	*74.2*	*5.0*	*8.5*	*34.5*	*54.2*	*2.8*
Office manager	903	*11.0*	*77.8*	*5.5*	*37.9*	*21.9*	*36.0*	*4.2*
Payroll manager	73	*9.6*	*82.2*	*1.4*	*4.1*	*43.8*	*52.1*	*
Practice manager	218	*16.1*	*90.4*	*42.7*	*61.0*	*16.5*	*16.5*	*6.0*
Business manager	223	*35.0*	*82.0*	*16.6*	*18.4*	*26.9*	*42.6*	*12.1*
Business development manager	269	*34.6*	*55.0*	*4.5*	*3.3*	*11.9*	*75.1*	*9.7*
Total	3,729	*17.2*	*71.3*	*7.2*	*18.9*	*25.5*	*51.1*	*4.6*

Note:
* indicates that the number in the cell fell below threshold for reporting.

Source: Labour Force Survey composite file 2003-07

Table 3
The redefinition of certain SOC2000 managerial occupation in SOC2010

SOC2000		Repositioned in SOC2010 to:		
1121	Production works and maintenance managers (N=782)	1121	Production managers and directors in manufacturing	81%
		2129	Engineering professionals n.e.c.	7%
		5	SKILLED TRADES OCCUPATIONS	6%
1122	Managers in construction (N=659)	1122	Production managers and directors in construction	72%
		2436	Construction project managers and related professionals	23%
		5319	Construction and building trades n.e.c.	3%
1131	Financial managers and chartered secretaries (N=438)	1131	Financial managers and directors	74%
		2424	Business and financial project management professionals	5%
		2429	Business, research and administrative professionals n.e.c.	5%
		3538	Financial accounts managers	12%
1132	Marketing and sales managers (N=1,101)	1132	Marketing and sales directors	33%
		2424	Business and financial project management professionals	4%
		3545	Sales accounts and business development managers	59%
1136	Information and communication technology managers (N=607)	1136	Information technology and telecommunications directors	31%
		2133	IT specialist managers	43%
		2134	IT project and programme managers	22%
1151	Financial institution managers (N=413)	1150	Financial institution managers and directors	47%
		2424	Business and financial project management professionals	12%
		3533	Insurance underwriters	3%
		3538	Financial accounts managers	20%
		4123	Bank and post office clerks	13%
1152	Office managers (N=587)	3538	Financial accounts managers	14%
		4161	Office managers	65%
		7220	Customer service managers and supervisors	3%
1163	Retail and wholesale managers (N=944)	1190	Managers and directors in retail and wholesale	87%
		7130	Sales supervisors	10%

Source: Labour Force Survey January–March 2007 (recoded data file)

modified as appropriate to move specific job titles to Major Groups 2, 3, 4, 5 and 7.

Measuring the impact of change in the definition of managerial occupations

To gain an indication of the effect of these changes on the composition of Major Group 1, one complete quarter of the Labour Force Survey (January to March 2007) was recoded, reallocating job titles to other unit groups as appropriate. **Table 3** shows, for the eight unit groups in SOC2000 most significantly affected by these changes, the unit groups to which job titles are now repositioned in SOC2010.

The reallocation of nursing occupations

Nursing occupations have previously been classified as 'Associate Professional' occupations. Investigations concluded during the development of SOC2000 showed that only a small proportion of nurses held a high level qualification (university degree or equivalent). This situation has changed significantly over the last ten years. While it is still possible to enter nursing without a degree–level qualification, increasingly it is the case that entry into a nursing occupation is via a degree–level route. Between 1993/94 and 2006/07, the Labour Force Survey

Table 4
The redefinition of IT and telecommunications occupations in SOC2010

SOC 2000		SOC 2010	
Major Group 1			
1136	Information and Communication Technology Managers	1136	Information technology and telecommunications Directors
Major Group 2			
213	Information and communication technology professionals	213	Information Technology and Telecommunications Professionals
2131	IT Strategy and Planning Professionals	2133	IT specialist managers
2132	Software Professional	2134	IT project and programme managers
		2135	IT Business analysts, architects and systems designers
		2136	Programmers and software development professionals
		2137	Web design and development professionals
		2139	Information technology and telecommunication professionals n.e.c.
Major Group 3			
313	IT Service Delivery Occupations	313	Information Technology Technicians
3131	IT Operations Technicians	3131	IT operations technicians
3132	IT User Support Technicians	3132	IT user support technicians

Source: SOC2000 and SOC2010

Table 5
Correspondence between ISCO08 supervisory unit groups and SOC2010 supervisory unit groups

ISCO08 unit groups		SOC 2010 unit groups	
3121	Mining supervisors	Not defined	
3341	Office supervisors	Office managers	4161
		Administrative and office supervisors	4162
3122	Manufacturing supervisors	Skilled metal and electrical trades supervisors	5250
3123	Construction supervisors	Construction and building trades supervisors	5330
5151	Cleaning and housekeeping supervisors in offices, hotels and other establishments	Cleaning and Housekeeping managers and supervisors	6240
5222	Shop supervisors	Sales supervisors	7130
		Customer service managers and supervisors	7220

Source: ISCO08 and SOC2010

indicates that the proportion of young nurses (26–35 years old) with a degree-level qualification rose from 4 per cent to 32 per cent. In liaison with the professional body for nursing (Royal College of Nursing) the decision was made to reallocate nursing occupations from Major Group 3 in SOC2000 to Major Group 2 in SOC2010.

The reclassification of occupations associated with information technologies

Occupations associated with information technology (IT) and telecommunications have been subject to rapid change over the past ten years, with significant growth in web-based communications, a sharp increase in web transactions (for example, advertising, buying, selling) and the application of IT through virtually all sectors of the economy. However, there remains a problem of heterogeneity in the use of job titles in the sector, first noted in the development of SOC2000. In consultation with the lead industry body in this area (e-skills UK), certain changes have been made to the structure of minor group 213 (Information Technology and Telecommunications Professionals). The changes are as shown in **Table 4**.

The main areas of occupational redefinition are located in Minor Group 213 now termed 'Information Technology and Telecommunications Professionals'. None of the unit groups in this SOC2010 Minor Group shares the same unit group number with SOC2000, indicating that there is no direct correspondence between the unit groups. The Minor Group now holds six unit groups, demonstrating the diversity of job types that is developing in this area.

The introduction of a limited number of supervisory unit groups

The 2008 revision to the International Standard Classification of Occupations (ISCO08) introduces a limited number of supervisory unit groups. These have been defined in areas of work where the role of the supervisor is distinct and is generally regarded as a separate occupational area from the type of work that is being supervised. Where possible, corresponding supervisory categories have been incorporated within SOC2010. This was not possible for the category 'Mining supervisors' (the resulting unit group would be below the limit of statistical data release for most data sources) and the category 'Manufacturing supervisors' was considered too broadly defined.

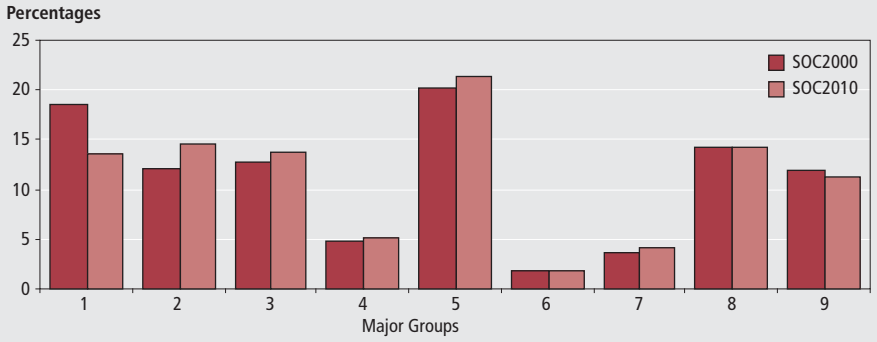
Table 5 shows the correspondence between the new ISCO08 categories and their counterparts in SOC2010.

The overall impact of reclassification from SOC2000 to SOC2010

To gain some indication of the way in which this revision of the Standard Occupational Classification impacts upon the interpretation of trends in occupational structure of employment in the UK, the 1996/97 winter quarter of the Labour Force Survey was recoded from SOC2000 to SOC2010, comparing this information with similarly recoded data for the 2007 January/March Quarter of the Labour Force Survey.

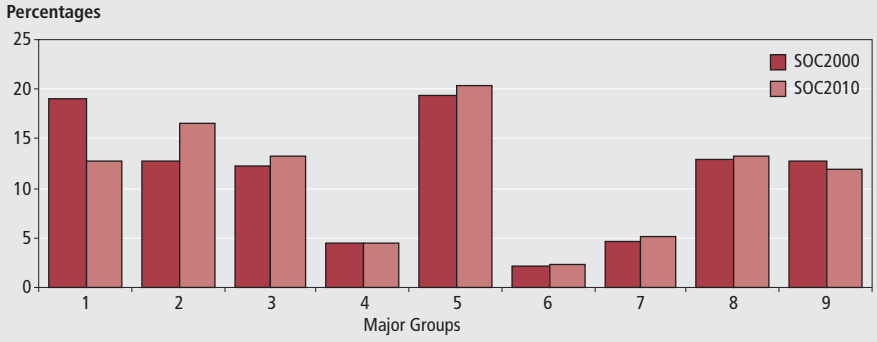
Figure 1 (**a** and **b**) and **Figure 2** (**a** and **b**) show the overall impact of these changes at the level of Major Groups of the Standard Occupational Classification. Examining first the effect on male employment, the reclassification of managerial occupations stands out as the single most important change, reducing the size of male employment in Major Group 1 as recorded in the first quarter of 2007 from 19.0 per cent of all employment to 12.8 per cent.

Figure 1a
Percentage distribution of male employment in Dec 1996–Feb 1997, SOC2000 and SOC2010



Source: Labour Force Survey (unweighted data)

Figure 1b
Percentage distribution of male employment in Jan–Mar 2007, SOC2000 and SOC2010



Source: Labour Force Survey (unweighted data)

The reclassification of the winter quarter 1996/97 Labour Force Survey shows a similar effect, with the share of male employment in this Major Group falling from 18.5 to a 13.6 per cent. Corresponding rises take place in Major Groups 2, 3 and 5 in both periods. Comparing the changes recorded between 1996/97 and 2007 by the two classifications shows that the modest growth over this decade in both Major Groups 1 and 2 by SOC2000 now become a decline in the occupational share held by Major Group 1 of SOC2010 and a corresponding increase in the share of employment in SOC2010 Major Group 2. This arises because of the significant growth which took place in this ten year period in those occupations which are now reallocated from Major Group 1 of SOC2000 to Major Group 2 of SOC2010.

Figures 2a and 2b show similar information for female employment. Again, a fall in the share of employment classified to Major Group 1 is recorded, though the decline is not as great as is shown for males. The reclassification of nursing occupations from Major Group 3 to Major Group 2 also has significant impact at this level of aggregation, with the share of female employment in SOC2000 Major Group 3 (as measured in the first quarter of 2007) falling from 14.0 per cent to 10.2 per cent.

At the level of sub major groups, of which there are 25 in SOC2000 and SOC2010, there is a high degree of correspondence between these groups as defined in both classifications for nine out of 25 groups (>95 per cent correspondence) and a reasonable degree of correspondence (85–95 per cent) for 11 out of 25 sub major groups. In five sub major groups the correspondence between the classification drops below 85 per cent. More detailed analysis of the correspondence between the classifications at the sub major group level is shown in **Table 6**.

Managing change and continuity

There is a tension between the need for continuity in the application and use of an occupational classification, thereby providing a stable framework for analysis of trends, and the need for revision of the classification, ensuring the classification is sufficiently up-to-date in terms of its definition, interpretation and use. With each successive revision of the Standard Occupational Classification, in 2000 and now for 2010, the broad structure of the classification at the major (single digit) and sub major (two digit) group levels has remained virtually unchanged. However, for SOC2010 this masks a major change that has been implemented to achieve comparability with managerial occupations at this broad level in other countries. Also, the upgrading of nursing occupations from major group 3 to 2 creates another significant discontinuity at the major group level.

This section considers various methods which could help both producers and users of statistical information to understand the impact of these discontinuities at various levels of aggregation as statistical sources gradually adopt SOC2010. These are:

- historical dual-coding of specific data sets
- continuous dual-coding of specific data sets
- 'index' coding

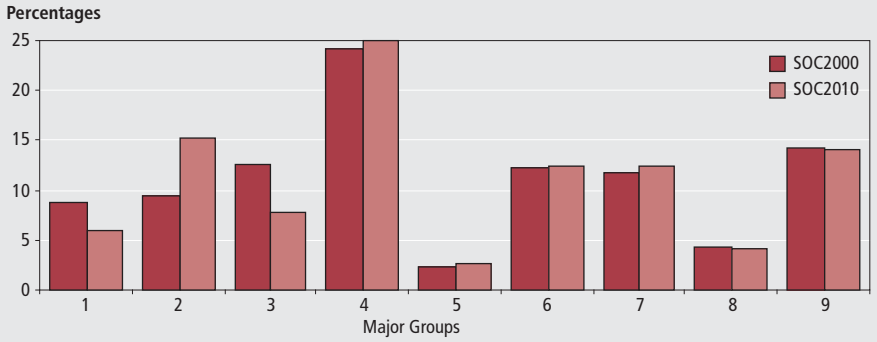
Examples of each of these, together with an evaluation of their costs and benefits, are considered in the following sub-sections.

Historical dual coding of specific data sets

This is the most common approach to the problems posed by the introduction of a new classification. A number of historical data sets are recoded from the old to the new classification. Analysis of the dual-coded data reveals the impact of reclassification on the size and structure of the occupationally classified data.

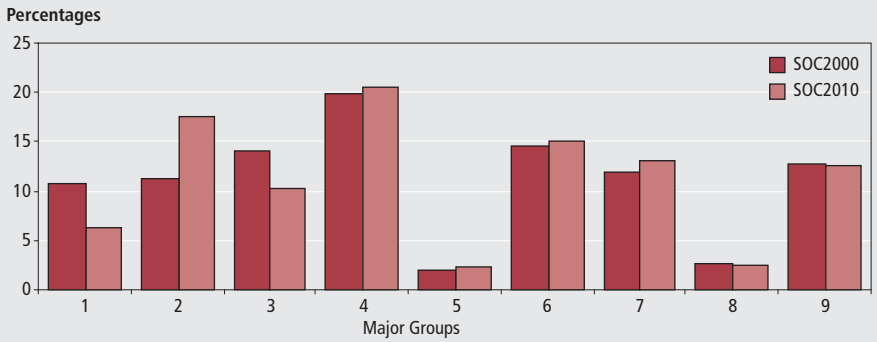
In the process of developing SOC2010, three data sets were recoded from SOC2000 to SOC2010. These are: the December–February quarter of the Labour Force Survey, 1996/97; the January–March quarter of the Labour Force Survey 2007 and the 1 per cent sample of the 2001 Census of Population for England and Wales. Figure 1 and 2 showed how such information can be used graphically to portray the major effects of reclassification. The same information can also be used to generate detailed matrices (for example, cross–classifications of occupational data by the old and new classifications at various levels of aggregation of the classification and by gender) which can be used to transpose a vector of data classified by the old classification to the new classification. Such techniques are only useful if there is a fairly stable relationship between the old and the new classifications at the level of aggregation for which converted information is required. This is not usually a sustainable assumption over a long time period.

Figure 2a
Percentage distribution of female employment in Dec 1996–Feb 1997, SOC2000 and SOC2010



Source: Labour Force Survey (unweighted data)

Figure 2b
Percentage distribution of female employment in Jan–Mar 2007, SOC2000 and SOC2010



Source: Labour Force Survey (unweighted data)

Continuous dual-coding of specific data sets

Modern coding techniques employ coding software which attempts to match a job description (usually a text description of a job title) to a relevant index entry to which an occupational code has been assigned. This software can produce both 'old' and 'new' codes during the coding process. Thus, a single coding process generates information that allows the producer of occupational statistics to supply information tabulated according to either the old or the new classifications. This raises questions about the length of time for which such dual–coded statistical information should be available to users and may inhibit users from switching from the old to the new classification.

Index coding

Index coding provides a compromise between these two methods. It is continuous, in that a code is generated from the coding process that allows the statistical producer to output both the new and the old classifications. A unique and permanent index code becomes part of the output stream from the coding process and is preserved for future use. A 'look-up' table relates the index code to the current classification. The producer can decide for how long information will be made available via both the old and the new classification. It has the added advantage that, if the classification changes again in the future, a revised look-up table can be used to reprocess earlier data from the index code to the latest version of the classification.

Index coding was attempted in a partial sense with the 'component codes' used for the 1991 Census of Population. However, these codes did not reference the underlying index entry that had yielded a specific occupational code from the job title. If all job titles have a unique reference code, reclassification of existing data to a new classification becomes a fairly trivial task. This technique has the added advantage that it provides a framework for 'dynamic updating' of the index to the classification. Users can see how new index entries are placed within the classification.

Coder unfamiliarity with the index codes can be minimised by using the first four digits of the latest version of the classification as reference digits, followed by two alphanumeric characters to generate a unique index reference code[9] . However, with each successive revision of the classification, the initial four digits will have less relevance.

Summary of the advantages and disadvantages of various methods dealing with continuity

Table 7 outlines the advantages and disadvantages associated with each specific method.

Notes

1. OPCS (1990a, 1990b).
2. ONS (2000a, 2000b).
3. Major Group 1 is defined as 'managers' in both SOC2000 and the 1988 International Standard Classification of Occupations (ISCO 88).
4. Cyprus, Italy and Romania deviate by approximately –2.6 percentage points. Similar tabulations received by the IER from Eurostat for 2006 show the same pattern.
5. Ireland uses an occupational classification based on the UK Standard Occupational Classification. For the 2006 Census of Population the version used was based on SOC90.
6. Discussion were held with occupational experts from Germany, Netherlands, USA, Norway at the European Social Survey Quality Enhancement Workshop, Mannheim, 27 September 2008 and with experts from a wide range of countries at the Harmonisation Workshop, Council of European Social Survey Data Archives, Paris 3 April 2008.
7. ISCO88, the 1988 version of the International Standard Classification of Occupations is currently being revised and will be published shortly as ISCO08: www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm.
8. The Labour Force Survey files from which job title and related information was extracted were: October–December 2002; September–November 2003; April–June 2004; October–December 2005; January–March 2007.
9. Thus allowing over 700 job titles to share the same four digit code.

CONTACT

elmr@ons.gov.uk

REFERENCES

Elias P, McKnight A, Davies R and Kinshott G (2000) 'The revision of the Standard Occupational Classification from its 1990 version to SOC2000', *Labour Market Trends*, pp. 563-572.

Table 6
Correspondence between SOC2010 and SOC2000 at level of sub major groups

		Correspondence with SOC2000 sub major group (per cent)		
	SOC2010 sub major group	Same	Other* (SOC2000 sub major group)	
11	Corporate managers and directors	*99*		
12	Other managers and proprietors	*90*	*10 (11)*	
21	Science, research, engineering and technology professionals	*67*	*21 (11)*	*5 (23)*
22	Health professionals	*27*	*71 (32)*	
23	Teaching and educational professionals	*98*		
24	Business, media and public service professionals	*64*	*19 (11)*	*7 (34)*
31	Science, engineering and technology associate professionals	*91*	*3 (21)*	*4 (81)*
32	Health and social care associate professionals	*91*	*4 (24)*	
33	Protective service occupations	*93*	*5 (11)*	
34	Culture, media and sports occupations	*97*		
35	Business and public service associate professionals	*68*	*24 (11)*	*5 (41)*
41	Administrative occupations	*88*	*9 (11)*	
42	Secretarial and related occupations	*92*	*5 (41)*	
51	Skilled agricultural and related trades	*99*		
52	Skilled metal, electrical and electronic trades	*94*		
53	Skilled construction and building trades	*94*	*4 (81)*	
54	Textiles, printing and other skilled trades	*85*	*10 (12)*	
61	Caring personal service occupations	*97*		
62	Leisure, travel and related personal service occupations	*90*	*3 (12)*	*6 (92)*
71	Sales occupations	*96*	*2 (11)*	
72	Customer service occupations	*67*	*19 (41)*	*14 (11)*
81	Process, plant and machine operatives	*91*	*8 (91)*	
82	Transport and mobile machine drivers and operatives	*98*		
91	Elementary trades and related occupations	*96*		
92	Elementary administration and service occupations	*87*	*13 (91)*	

Note:

Source: Labour Force Survey, Jan–Mar 2007

* only reported if > 2%.

Table 7
Advantages and disadvantages of various methods for dealing with discontinuities arising from classification change

Method	Advantages	Disadvantages
Historical dual-coding of specific data sets	■ Relatively easy to produce ■ Gives clear indication of changes arising from introduction of new classification	■ If used to convert data for other time periods, or from other sources, it may give rise to misleading and inaccurate estimates
Continuous dual-coding of specific data sets	■ Simple to introduce	■ May be confusing for coders and statistical users ■ May discourage users from adopting the new classification
Index coding	■ Relatively simple to introduce ■ Gives structure to index and allows users to see where changes are made ■ Allows for dynamic index updating ■ 'Future proofs' the data against further classification changes	■ Data need to be reprocessed at micro-data level to produce new classification ■ Index codes themselves are initially meaningless beyond four digits and become progressively difficult to interpret with successive revisions to the classification

Source: SOC2000 and SOC2010

European Commission (2004) 'Employment in Europe. Recent Trends and prospects', Luxembourg: Office for Official Publications of the European Communities.

Office for National Statistics (2010a) 'Standard Occupational Classification 2010 Volume 1: Structure and Descriptions of Unit Groups', Basingstoke: Palgrave Macmillan.

Office for National Statistics (2010b) 'Standard Occupational Classification 2010 Volume 2: The Coding Index', Basingstoke: Palgrave Macmillan.

Office for National Statistics (2000a) 'Standard Occupational Classification 2000 Volume 1: Structure and Definition of the Unit Groups', London: The Stationery Office.

Office for National Statistics (2000b) 'Standard Occupational Classification 2000 Volume 2: Index', London: The Stationery Office.

Office of Population Censuses and Surveys (1990a) 'Standard Occupational Classification Volume 1', London: The Stationery Office.

Office of Population Censuses and Surveys (1990b) 'Standard Occupational Classification Volume 2'. London: The Stationery Office.

Thomas R and Elias P (1989). 'The development of the Standard Occupational Classification', *Population Trends* 55 Spring 1989.

ARTICLE

Measures of economic activity and their implications for societal well–being

Blessing Chiripanhura
Office for National Statistics

SUMMARY

Gross Domestic Product (GDP) is the most commonly used measure of a country's economic activity. GDP, however, has limitations as a measure of society's well–being and of people's material living standards. This article presents alternative measures of economic activity that may be more suitable indicators of society's well–being. The article explains how the different measures are calculated and the additional insights they offer.

Introduction

GDP is the most widely used measure of national income but it has often been criticised for being a poor indicator of a society's well–being despite it not being designed for this purpose.[1] this is because it does not measure some activities inside the production boundary[2] well, and that it excludes some welfare determinants outside the production boundary (see Allin (2007) for a discussion of these criticisms). The Commission on the Measurement of Economic Performance and Social Progress (CMEPSP) noted that 'it (GDP) has often been treated as if it were a measure of economic well–being. Conflating the two (GDP and economic wellbeing) can lead to misleading indications about how well–off people are.' (CMEPSP, 2009: 13).

These perceived limitations have prompted widespread interest in developing alternative measures which better measure society's well–being. Four main approaches have emerged:

- **Corrected GDP**, which involves adding and subtracting terms that have the same structure as GDP (monetary aggregates) computed as quantities valued at market prices (or imputed where market prices are not available)
- **Gross National Happiness**, which attempts to define quality of life in more holistic and psychological terms than GDP (Brooks, 2008)
- **The Capabilities Approach**, which provides a framework developing indicators of well–being. (Sen, 1979, 1985 and 1999); and
- **Synthetic indicators**, which are typically constructed as weighted averages of summary measures of social performance in various domains, for example Index of Sustainable Economic Welfare (Jackson et al, 1997).

This article concentrates on the first of these approaches. It builds on CMEPSP's (2009:13) conclusion that material living standards are one of eight dimensions of well–being[3] and that these are 'more closely associated with measures of net national income, real household income and consumption (than GDP)'. This article will be complemented by another article (Thomas, 2010) that outlines ONS's plans for work on measuring societal wellbeing in all its dimensions.

The structure of the article is as follows: the next section examines GDP and three alternative measures of national income, adjusting for the consumption of fixed capital and net factor income from abroad. The following section explores disposable income and consumption as indicators of material wellbeing. Both sections highlight the insights which the measures offer into material well-being. The last two sections examine other limitations of national income as a measure of welfare and draw conclusions.

Four measures of national income

Four main measures of national income are considered. The framework for calculating them is outlined in **Box 1**. The values differ

Box 1

Frameworks for measuring national income

Gross Domestic Product (GDP)

Calculated to internationally agreed standards, GDP is an aggregate measure of production equal to:

- the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs)
- the sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services; or
- the sum of primary incomes distributed by resident producer units

Net Domestic Product (NDP)

	Gross Domestic Product
less	Consumption of fixed capital
equals	Net Domestic Product

Gross National Income (GNI)

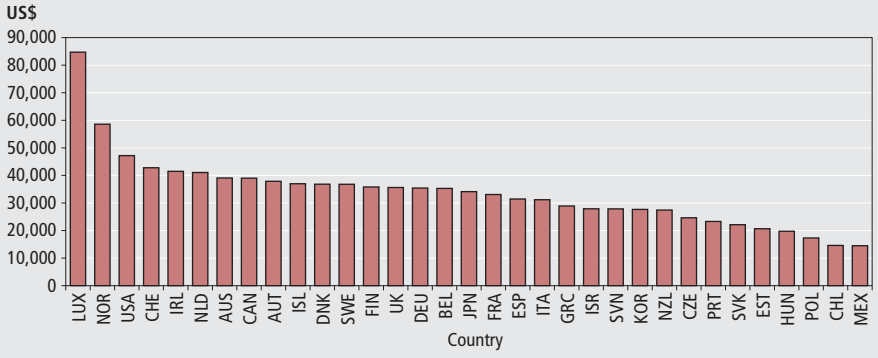
	Gross Domestic Product (GDP)
less	net taxes on production and imports
less	compensation of employees and property income payable to the rest of the world
plus	the corresponding items receivable from the rest of the world
equals	Gross National Income

Net National Income (NNI)

	Gross Domestic Product
less	Consumption of fixed capital
plus	Net factor income from abroad (NFIA)
equals	Net National Income

Figure 1

GDP per capita in OECD countries, 2008[1]



Note:

1 US$ current prices and PPPs.

Source: OECD Annual National Accounts, 2010

across OECD countries and may provide different insights into well–being.

Gross Domestic Product

Calculated to internationally agreed standards, GDP is an aggregate measure of production of goods and services in an economy. **Figure 1** shows GDP per head for OECD countries in 2008. The UK is ranked 14th amongst OECD countries, with GDP per head of $35,600 roughly 40 per cent of top ranked Luxembourg and broadly the same as Germany and France.

Volume income measures (frequently referred to as 'real' measures) are preferable to nominal measures as they show changes in quantities alone rather than changes in quantities and prices shown in nominal measures. Similarly, per head measures (those divided by population) are better indicators of material well–being than aggregate measures. To allow international comparisons, figures for individual countries have to be converted into a common currency, typically US dollars, using an appropriate exchange rate. Because market exchange rates do not properly adjust for the difference in price levels between two countries and therefore do not provide a true comparison of the volume of goods and services produced per head, statisticians and economists use Purchasing Power Parities (PPPs). These are the rates of currency conversion that equalise the purchasing power of different currencies by eliminating the differences in price levels between countries[4].

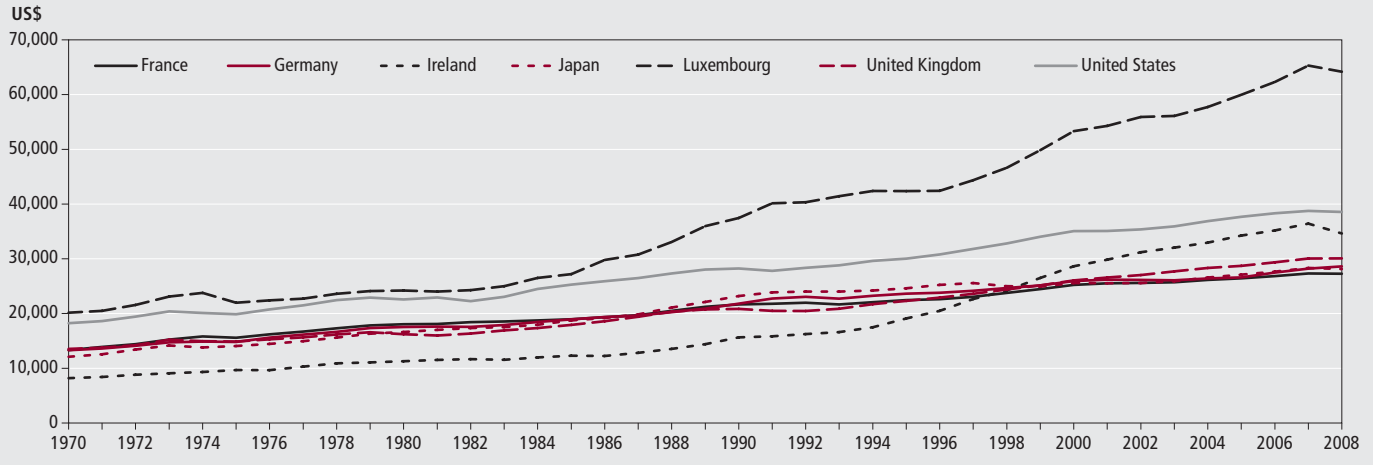
Figure 2 shows the evolution of volume GDP per head for the UK, Germany, France, Luxembourg, the USA, Ireland and Japan since 1970[5]. Over the period, the rankings of most countries changed little, with growth in France, the USA, Germany, the UK and Japan averaging around two per cent. However, that of Luxembourg accelerated from around 1982, and Ireland's from 1994, giving them an overall rate of nearly three per cent and four per cent per annum respectively. Despite the upward trend depicted in the figure, work by Easterlin (1995) and others suggests that this has not been associated with any increase in subjective well–being measures.

Accounting for consumption of fixed capital – Net Domestic Product (NDP)

One limitation of GDP as a measure of well-being is that no deduction has been made for the 'wear and tear' of machinery, buildings and other capital products used in the production process - referred to in National Accounts as consumption of fixed capital[6]. In general, the more resources that are devoted to replenishing a nation's capital stock, the fewer resources are available for consumption in the short–run. Subtracting the consumption of fixed capital from GDP gives NDP, which may be a superior measure of material well–being as it more accurately describes the new wealth created during the period.

Figure 3 shows NDP per head for OECD countries in 2008. This measure of material wellbeing increases the UK rank amongst OECD countries to 11th (from 14th using GDP per head). However, the UK does not reduce the gap when compared to top ranking Luxembourg. The higher ranking reflects the UK having one of the lowest rates of capital consumption in the OECD, at 10.8 per cent. Only Luxembourg, Ireland and Mexico have lower rates. In contrast, Japan devoted over one–fifth of

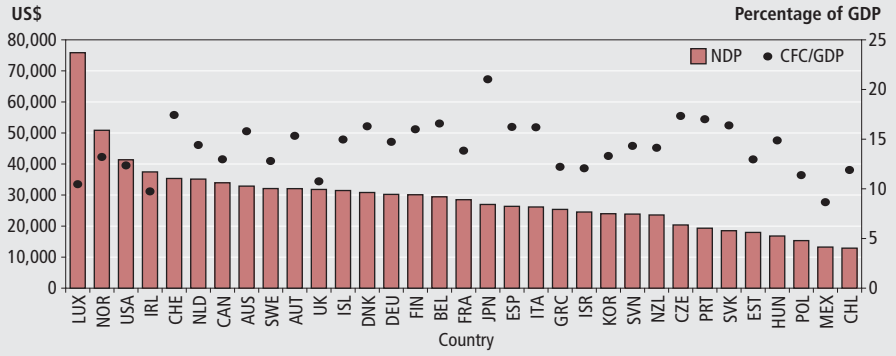
Figure 2
Volume GDP per capita in selected countries, 1970–2008[1]



Note:
1 2000 constant PPPs.

Source: OECD Annual National Accounts, 2010

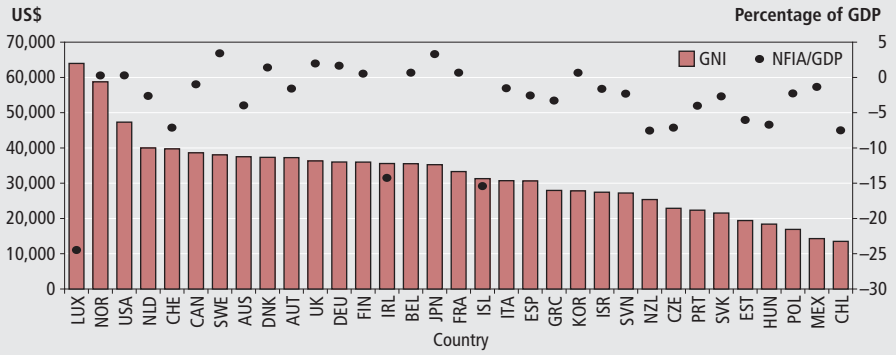
Figure 3
Net domestic product per capita in OECD countries, 2008[1]



Note:
1 US$ current prices and PPPs.

Source: OECD Annual National Accounts, 2010

Figure 4
GNI per capita in OECD countries, 2008[1]



Note:
1 US$ current prices and PPPs.

Source: OECD Annual National Accounts, 2010

its output to replacing fixed capital used up in the production process, the highest rate among OECD countries. Lower rates of consumption of fixed capital may be give indication of an industrial structure with a lower capital stock (such as the UK which has shifted from a manufacturing to a service–based economy), or it may indicate that a country had fairly new capital stocks whose rate of depreciation is lower.

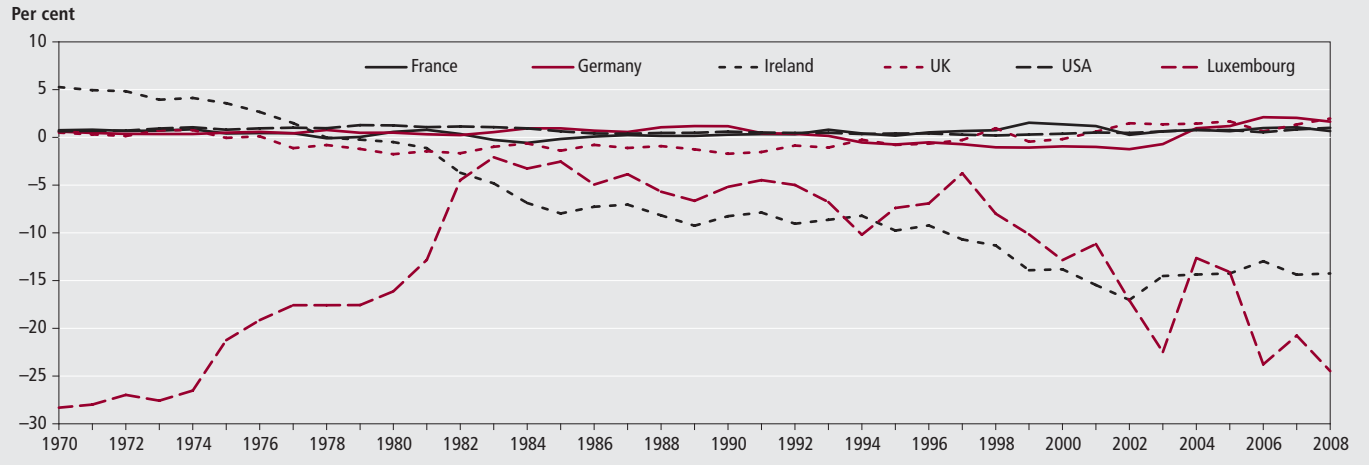
Caution should be applied when comparing rates of capital consumption between countries because of differences in the assumptions about service lives, mortality functions, and depreciation patterns used in calculating capital consumption by different national statistical institutions[7]. Further, some items are given different accounting treatments in different countries, most notably in the United States where, for example, spending on military equipment such as tanks, fighter–bombers and warships, is recorded as investment whilst it is recorded as current expenditure in other countries. This investment generates additional consumption of fixed capital in the USA[8]. The difficulties associated with internationally comparable and timely estimation of annual consumption of fixed capital figures is the main reason for the continued use of gross figures.

Accounting for international income flows – Gross National Income (GNI)

The 'Domestic' in GDP indicates that activity is measured within the economic territory of the country concerned. GNI, formerly known as Gross National Product, reflects cross-border ownership of economic assets of nationals of the particular country. In particular, adding to GDP the income received from abroad by one country's resident units[9] and deducting the income created by production in the country but transferred to units residing abroad gives GNI. The net of income received from abroad and income transferred to units residing abroad is called net factor income from abroad (NFIA).

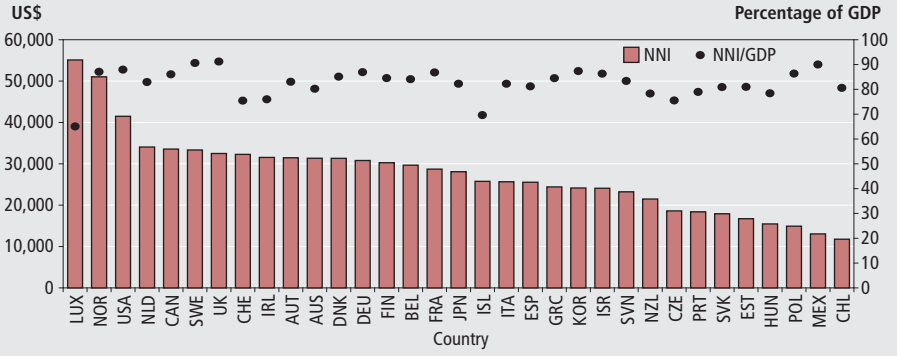
GNI is a theoretically better measure of a society's welfare than GDP since it not only indicates production in the economy, but also how much of that production, in addition to resources owned by nationals of

Figure 5
Net factor income from abroad as a percentage of GDP in six OECD countries, 1970–2008



Source: OECD Annual National Accounts, 2010

Figure 6
Net national income in OECD countries, 2008[1]



Note:
1 US$ current prices and PPPs.

Source: OECD Annual National Accounts, 2010

a country abroad, is available to nationals of that country. However, it is difficult to measure remittance flows between countries, especially where they are undertaken outside of the formal financial system. Ranking OECD countries using 2008 GNI per head (**Figure 4**) produces a similar order as produced using NDP per head: Luxembourg is ranked first, the UK 11th, and Chile is ranked last. Although the relative ranking of the UK amongst OECD does not change, the divergence between the UK and Luxembourg does fall, reflecting the large net outflow of NFIA from Luxembourg.

For most countries, NFIA is a small proportion of GDP but for Ireland and Iceland, net outflow is around 15 per cent of GDP, and nearly a quarter of Luxembourg's. One of the reasons why NFIA is relatively high for Luxembourg is because of the earnings of workers who work in Luxembourg but live in neighbouring countries. The workers' earnings must be subtracted from Luxembourg's GDP to obtain its GNI. In the case of Ireland, substantial investment from foreign companies has increased the amount of output produced and hence GDP, but the profits from those companies are largely sent back to their home countries, reducing the income available to Irish residents. Irish remittances from abroad have also fallen with the decline in emigration. For the UK, GNI is around two per cent higher than GDP due to net inflow of NFIA. This indicates more income available for UK residents than is produced in the country.

The influence of NFIA can further be understood by analysing it over time in six countries as illustrated in **Figure 5**. The figure highlights that the ratio has been relatively stable for France, Germany, the UK and the US but has changed markedly for Luxembourg and Ireland. Up until 1979, Ireland was a net recipient of factor income from abroad but since then it has increasingly been sending some of its GDP to the rest of the world in the form of net factor income, just like Luxembourg. This highlights that although foreign direct investment can raise a country's GDP and GNI, this does not consistently translate into additional income for the residents of that country.

Accounting for international income flows and consumption of fixed capital – Net National Income (NNI)

The combined adjustment for the consumption of fixed capital and net factor income from abroad in GDP produces NNI. This shows the net value of income obtained from resources owned by nationals of a country and thus, in theory, is a better indicator of material well-being than both GDP and GNI.

Figure 6 shows NNI for OECD countries in 2008. The figure illustrates that using NNI as a measure of society's material wellbeing further narrows the gap between the UK and Luxembourg. In fact, the gap between Luxembourg and other countries in general declines as the national income measures change from GDP to NNI because of Luxembourg's net outflow of factor income. The UK is ranked 7th in this comparison (from 11th when comparing GNI, and 14th when comparing GDP). The ratio of NNI to GDP shows that just under two-thirds of Luxembourg's GDP represents new wealth for its residents. In contrast, this figure is 91 per cent for the UK.

Income and consumption indicators

A common limitation of the aggregates above as measures of well–being is that they are all measures of national income. CMEPSP (2009: 13) argues that, 'while it is informative to track the performance of economies as a whole, trends in citizens'

Box 2

Measuring household income and consumption in National Accounts

In National Accounts, the three main measures of household income and consumption are:

- household disposable income
- household final consumption expenditure
- household actual consumption expenditure

Household Disposal Income

	Total household income
less	payments of income tax and other taxes, social contributions and other current transfers
equals	Household disposable income

Household adjusted disposable income

	Household disposable income
plus	the value of the social transfers in kind receivable by households
less	the value of the social transfers in kind payable by households
equals	Household adjusted disposable income

Household final consumption expenditure

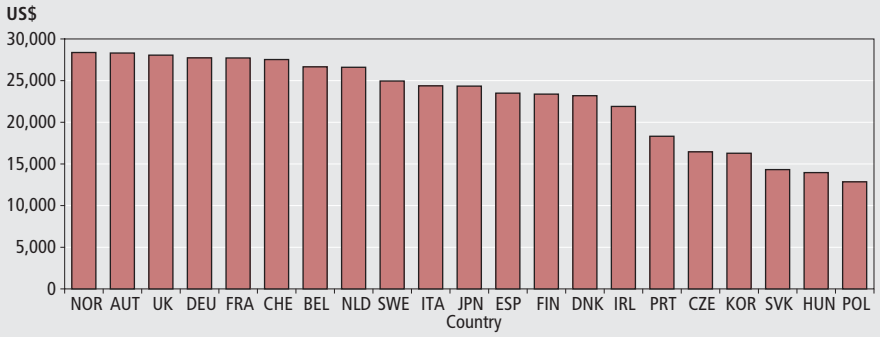
It consists of the expenditure, including imputed expenditure, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant.

Household actual consumption expenditure

The value of the consumption goods and services acquired by households, whether by purchase in general, or by transfer from government units or NPISH's, and used by them for the satisfaction of their needs and wants; it is derived from their final consumption expenditure by adding the value of social transfers in kind receivable.

Figure 7

Household adjusted disposable income per capita in OECD countries, 2007[1]



Note:

1 US$ current prices and PPPs.

Source: OECD Annual National Accounts, 2010

material living standards are better followed through measures of household income and consumption'.

Households have the choice of improving current welfare by allocating more resources to consumption, or improving future welfare by increasing savings and wealth accumulation. These welfare decisions are not reflected in GDP per head analysis. This section analyses the implications of disposable income and consumption expenditure on well–being. **Box 2** outlines the three main measures of household income and consumption in National Accounts.

Household disposable income

Total household income is the sum of the earnings of the employed and self–employed, property income, interest and dividends, gross operating surplus, pensions, social security benefits (other than pensions), miscellaneous transfers and insurance claims received[10]. Subtracting payments of income tax and other taxes, social contributions, property income expenditures, other current transfers and insurance premiums paid from total household income gives Household Disposable Income. This provides a measure of both the present and future consumption possibilities available to households.

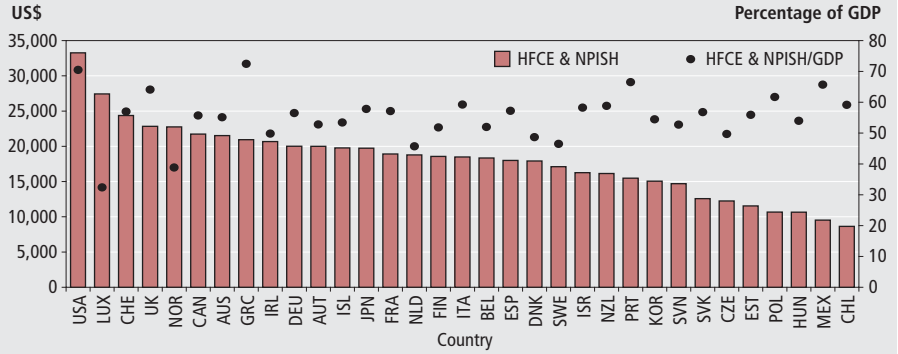
Figure 7 shows household disposable income for a selection of OECD countries. It shows household adjusted disposable income per head in 2007[11]. The figure shows that using household adjusted disposable income as a measure of societal wellbeing places the UK third amongst this sample of 21 countries, only slightly behind Norway which is top of the rankings.

Supposing that higher disposable income increases consumption possibilities, and that higher consumption indicates higher welfare, then Norway had the highest welfare, followed by Austria and the UK. However, people receive satisfaction from consumption of goods and services, not income. Disposable income is not all spent on consumption, and as income increases a declining proportion is allocated to consumption. Income can also be saved, adding to wealth, and representing potential consumption postponed to the future. Given differences in saving rates and wealth across countries, consumption differs too, hence disposable income analysis may not fully indicate the material well–being of a country (see section on income versus wealth). For further analysis of disposable income, savings and consumption in the UK, refer to Davies, Fender and Williams (2010). The following section analyses household consumption expenditure as a measure of wellbeing.

Household final consumption expenditure

Household final consumption expenditure consists of the expenditure (including imputed expenditure) incurred by resident households on individual consumption of goods and services, including those

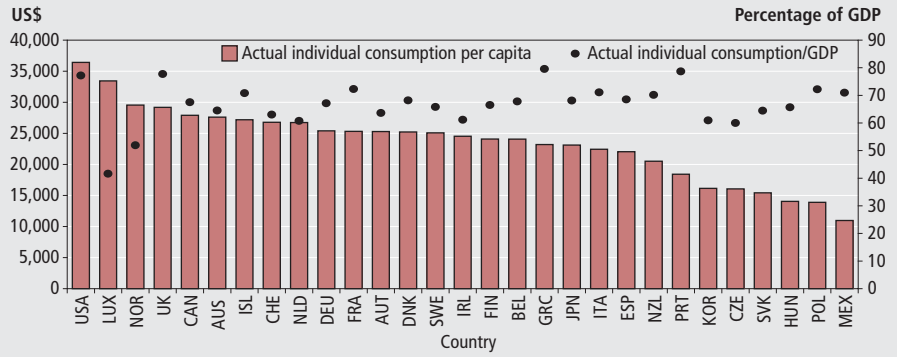
Figure 8
Household final consumption expenditure (including NPISH) in OECD countries, 2008[1]



Note: *Source: OECD Annual National Accounts, 2010*

1 US$ current prices and PPPs.

Figure 9
Actual consumption expenditure in OECD countries, 2008[1]



Note: *Source: OECD Annual National Accounts, 2010*

1 US$ current prices and PPPs.

sold at non–market prices. This covers all purchases made by consumers: food, clothing, housing services (rents), energy, durable goods (notably cars), spending on health, on leisure and on miscellaneous services. Consumption expenditure does not, however, include households' purchases of dwellings, which are counted as household gross fixed capital formation (GFCF). The 'consumption' variable is in contrast to 'GFCF', with consumption intended to designate purchases that are consumed (in the sense of 'used up' or 'destroyed') during the period, while GFCF refers to purchases intended to be used for future production.

Figure 8 shows household final consumption expenditure (including NPISH) per head in OECD countries in 2008. By this measure, the USA has the highest household final consumption expenditure per capita amongst OECD countries, spending around 50 per cent more per annum than the UK. However, the UK has the 4th highest final consumption expenditure, reflecting the relatively low rate of saving amongst households. But this may indicate lower resources for expenditure in the future. Figure 8 also shows that Greece and the USA had the highest allocation of GDP to consumption, whilst the UK ranked fifth. The lowest ratios were for Norway and Luxembourg. Thus, while Luxembourg had the highest GDP per head, it devoted the lowest share of its GDP to consumption activities.

Household actual final consumption expenditure

Actual final consumption expenditure of households is the value of the goods and services acquired by households, whether by purchase in general or transfer from government units or NPISHs, which is used in order to satisfy needs and wants. It is derived from adding the value of social transfers in kind receivable to household final consumption expenditure. **Figure 9** shows household actual final consumption expenditure in the OECD in 2008. The UK remains 4th under this measure but the gap when compared to the USA narrows to only 25 per cent, indicating the greater influence of the state upon household budgets in the UK. The balance between current and future consumption as indicated by saving as a proportion of income may help to indicate the sustainability of current consumption expenditure and provides additional insight regarding expenditure and well–being.

Some countries have larger government spending than others, and this spending contributes to household consumption expenditure to varying degrees. The difference between Figures 8 and 9 represents government consumption expenditure. The growth in final consumption expenditure in France and Germany between 1970 and 1982 was driven by growth in government consumption expenditure which averaged 13.3 per cent for France and 12.1 per cent for Germany. Government consumption expenditure for the UK and the USA grew by an average of 10.7 per cent and above 9 per cent respectively. Between 1983 and 2008, average government consumption growth in all four countries was not very different, ranging from 4 per cent for Germany to about 6 per cent for the UK. Since the government contribution to household consumption (for example through the provision of health and education services and social transfers) has implications for the welfare of society, the following section examines actual household consumption expenditure, which is household final expenditure plus government expenditure on households.

Other limitations of national income as a measure of welfare

There are a number of limitations of national income as a measure of welfare that affect all of the above measures. These limitations will be considered in turn.

Quality changes

Typically, the quality of goods and services produced in the economy improves over time, and yet such quality improvements are not fully captured in national income. It may be argued that quality improvements are captured in the price, but this does not apply to all goods. An example is ICT hardware whose quality has improved greatly over time but the price of hardware has been declining due to competition and technological advances. Hedonic methods are used to capture some of these quality changes but they are not applied to all goods[12]. Quality improvements enhance the quality of life, but such enhancement is missed in measured national income. Furthermore, product quality differs

between nations in ways that are not captured by merely comparing national income statistics.

Non–market output

As noted in the introduction, national income is the total market value of production in a country's economy during a year. But there are several productive activities that contribute to a society's welfare that do not have an explicit market value. First is the measurement of government output, which is inside the production boundary but where there are valuation issues; the second is household production which is outside the production boundary.

Government output

Because there is often no market for the goods and services that government produces, government output has traditionally been valued at cost rather than at market prices. In the UK, government expenditure accounts for nearly 17 per cent of GDP[13]. Work undertaken by the UK Centre for the Measurement of Government Activity (UKCeMGA) within ONS to improve the measurement of public service output, following the Atkinson Review (2005), is estimated to have produced a 3.8 per cent cumulative addition to measures of government output between 1995 and 2005 (Pont, 2008). Other OECD countries have begun to adopt direct measures in measuring government output.

Household production

Whilst quality changes and government output may be measured imperfectly in the National Accounts, non–market production in the household (for example, meal preparation, cleaning, laundry, and child care) are not included at all. Therefore, when these activities are, because of greater labour force participation, shifted to the market – as restaurant meals and semi–prepared meals, cleaning and laundry services, and day care – the change in the value of production is overstated due to the decline in non-market (household) production[14]. Another missing component of well–being is the valuation of leisure time. 'Full' income (consisting of household income, household production, and leisure) more accurately indicates societal well–being.

Defensive expenditures

A common criticism of GDP is the idea of 'defensive' or 'regrettable' expenditures. This is the idea that military spending or expenditures on repairing the damage caused by a flood does not improve society's well–being. The concept of defensive expenditures is vague as it is not clear what should be counted as a defensive expenditure. For example, expenditure on food and drink is, in part, a defence against hunger and thirst.

Income versus wealth

The income measures discussed above are all flow concepts (measured per period). Also important for well–being are stock concepts including net wealth (consisting of physical, financial, property and private pension wealth), as well as environmental resources, human capital and social capital that are not measured in the main National Accounts. Daffin (2009) analyses the UK's wealth composition and distribution in detail. Generally, wealth, like income, is unequally distributed within and between countries, and such inequality is passed down through generations. Since wealth indicates the possible long term material well-being of households, lower current wealth stock may be indicative of lower long-term material well-being. The valuation of stocks of natural resources, as featured in Recommendation 2 of the CMEPSP Report (2009), is being addressed at United Nations level. The United Nations Statistical Commission is working towards elevating the 'Handbook of National Accounting: Integrated Environmental and Economic Accounting' (SEEA) to an international statistical standard to sit alongside the System of National Accounts. The revised SEEA will be the statistical standard for environmental–economic accounting. It will provide an internationally agreed set of concepts and definitions, including the accounting rules for physical and monetary asset accounts including: sub-soil assets, water, forest, aquatic and land. The first volume is currently being edited, and the proposed contents are readily available. ONS has already done some work on the valuation of oil and gas reserves.

Inequality and distributional issues

Societal well–being also contains an implication of social justice and is thus concerned with the distributional issues that society faces. However, per head income analysis (an average measure) can be a misleading image of the representative resident's well–being if the distribution of income is very unequal. This is often the case. As such, the analysis of well–being may best be undertaken at consumption unit level (usually the household, adjusted for size and composition) so as to incorporate economies of scale advantages that are assumed away in per head analysis. Emphasis of consumption over income allows for a more disaggregated analysis by grouping households according to specific characteristics in combination with median analysis. Consumption unit analysis reduces the average income required to maintain a given standard of living. Although household income can be adjusted for size (called 'equivalising'), there is no consensus on the nature and structure of intra-household resource receipt and distribution, and how this changes with size. Further, even though 'equivalised' income reflects the sharing of consumption goods, it 'does not allow broader assessment of the consequences of living with others' (Boarini et al, 2006: 21). One suggestion is to use median rather than mean analysis, but deriving the median in a National Accounts context is challenging given the complex derivation of National Accounts indicators.

The income approach to measuring GDP, alternatively known as Gross Domestic Income, allows for the analysis of distributional issues by examining the shares of wages, rents and profits in Net Domestic Income (that is, Gross Domestic Income *less* Consumption of Fixed Capital). The analysis can be carried out by decile or by quintile (Atkinson and Voitchovsky, 2008), and gives insights not discernible from GDP per head. The CMEPSP Report (2009) shows that the evolution of wage shares differs between low and top earners. The report notes that the wage share for the UK rose by one and half per cent between 1954 and 1964, but the share of the bottom half declined by two per cent. The overall wage share in 2006 was the same as in 1954, but the share for the bottom half was four per cent lower. **Table 1** shows wage share changes by quintile between 1980 and 2000 for 22 OECD countries. It is adopted from the CMEPSP Report (2009), Table 3, Page 119.

The figures in Table 1 are based on household surveys hence they are not directly comparable to figures from annual National Accounts. However, they show that the wage share of the bottom quintile declined in Austria, Germany, Japan, Mexico, Turkey and the USA. The share of the top quintile declined in Austria, Japan, Mexico and Turkey. The bottom quintile's share increased markedly in Greece, Ireland, Norway and the UK. The top quintile's share increased markedly too in Belgium, Finland, Greece, Ireland, Spain and Sweden. These inter-quintile dynamics

Table 1
Trend in real household income by quintiles

Per cent

	Average annual change mid–1980s to mid–1990s					Average annual change mid–1990s to mid–2000s				
	Bottom quintile	Middle three quintiles	Top quintile	Median	Mean	Bottom quintile	Middle three quintiles	Top quintile	Median	Mean
Australia	..	..	..	..	..	2.4	2.0	1.9	2.2	2.0
Austria[1]	2.5	2.7	2.8	2.8	2.7	–2.1	–0.5	–0.4	–0.6	–0.6
Belgium[1]	1.2	0.5	1.2	0.4	0.8	1.4	1.3	1.7	1.2	1.5
Canada	0.3	–0.2	–0.1	–0.2	–0.1	0.2	1.2	2.1	1.1	1.4
Czech Republic	..	..	..	..	..	0.4	0.6	0.7	0.5	0.6
Denmark	1.3	0.9	0.8	0.9	0.9	0.6	0.9	1.5	0.9	1.1
Finland	0.9	0.9	1.0	0.8	1.2	1.6	2.5	4.6	2.5	2.9
France	1.0	0.5	–0.1	0.5	0.3	0.9	0.7	1.0	0.8	0.8
Germany	0.4	1.4	1.6	1.2	1.4	–0.3	0.5	1.3	0.6	0.7
Greece	0.3	0.1	0.1	0.3	0.1	3.6	3.0	2.7	2.9	2.9
Hungary	..	..	..	..	..	0.9	1.2	1.0	1.1	1.1
Ireland[1]	4.0	3.0	2.9	3.2	3.1	5.2	7.7	5.4	8.2	6.6
Italy	–1.3	0.5	1.5	0.6	0.8	2.2	1.0	1.6	1.0	1.3
Japan	0.8	1.8	2.1	1.8	1.9	–1.4	–1.0	–1.3	–1.0	–1.1
Luxembourg	2.3	2.5	3.0	2.4	2.7	1.5	1.5	1.7	1.5	1.6
Mexico	0.7	1.2	3.8	1.1	2.6	–0.1	–0.1	–0.6	–0.2	–0.4
Netherlands	1.1	2.7	3.9	2.8	3.0	1.8	2.0	1.4	2.0	1.8
New Zealand	–1.1	–0.5	1.6	–0.6	0.3	1.1	2.2	1.6	2.3	1.9
Norway	–0.3	0.3	1.0	0.4	0.5	4.4	3.9	5.1	3.8	4.3
Portugal[1]	5.7	6.5	8.7	6.2	7.3	5.0	4.1	4.4	4.2	4.3
Spain[1]	4.4	3.2	2.4	3.2	3.0	5.2	5.1	5.0	5.5	5.1
Sweden	0.5	0.9	1.2	0.9	0.9	1.4	2.2	2.8	2.2	2.3
Turkey	–0.6	–0.7	1.4	–0.8	0.4	–1.1	–0.5	–3.2	–0.3	–1.9
United Kingdom	0.7	2.0	4.3	1.9	2.8	2.4	2.1	1.5	2.1	1.9
United States	1.2	1.0	1.9	1.0	1.4	–0.2	0.5	1.1	0.4	0.7
OECD-22[2]	1.2	1.4	2.1	1.4	1.7	1.5	1.8	1.9	1.9	1.8
OECD-20[3]	1.3	1.5	2.1	1.5	1.7	1.7	2.0	2.2	2.1	2.1

Notes:

Source: OECD (2008a) Growing Unequal? Paris

1 Changes over the period mid-1990s to around 2000 for Austria, the Czech Republic, Belgium, Ireland, Portugal and Spain (where 2005 data, based on EU-SILC), are not deemed to be comparable with those for earlier years.
2 OECD-22 refers to the simple average for all countries with data spanning the entire period (i.e. excluding Australia, the Czech Republic and Hungary, as well as Iceland, Korea, Poland, the Slovak Republic and Switzerland).
3 OECD-20 refers to all countries mentioned above except Mexico and Turkey. Income flows have been deflated with each country's consumer price index.

have important implications on wellbeing which cannot be inferred from headline GDP figures. Growth in the annual average income indicates growth in resource endowments, which may be associated with improving standards of living; the reverse is also true.

Well–being is multi–dimensional

Wellbeing is a multi–dimensional concept and it may be challenging to represent this in a single indicator if indeed there is a need for this. Well–being includes good health and longevity, freedom to access and acquire educational training, quality of social relations, economic security and freedom from poverty, good environment, and personal safety, among other qualities. Exploring this aspect of societal well–being leads into the other approaches listed above. These are being explored further, and will be reported on in a forthcoming article (Thomas, 2010).

Conclusions

This article has presented different measures of income and consumption. Bearing in mind the caveats about the international comparability of measures and the inability of national income to fully capture material well–being, it has shown that using different National Accounts indicators to represent countries' material well–being may produce rankings that are dependent on the indicator used. If GDP per head is used, the UK would be ranked 14th among OECD countries. Its GDP per head would be nearly 40 per cent that of Luxembourg. Using NDP per head, the UK would, as with GNI per head, be ranked 11th among OECD countries, higher than Iceland, Denmark and Finland that rank higher using GDP per head. Using NNI per head, the UK would be ranked 7th among OECD countries and this would be close to seventy per cent that of Luxembourg. The UK would be ranked 3rd if a sample of OECD countries were ranked on the basis of disposable household income per head. Using household final consumption expenditure (including NPISH) per head, the UK would be ranked 4th, slightly over two–thirds that of the USA with the highest. Finally, using household actual final consumption expenditure per head to rank OECD countries, the UK would be ranked 4th again, but with consumption that is about eighty per cent that of the USA with the highest.

The different rankings for OECD countries resulting from, among other things, their levels of consumption of fixed capital, net foreign income from abroad, and tax and saving policies, means that their materials well-being cannot be represented by any one headline National income measure. Given the other weaknesses of national income that have been discussed, it emerges that it is necessary to give prominence to some National Accounts indicators other than GDP when considering material wellbeing. Such prominence will likely help reduce the emphasis on GDP as a measure of society's material well–being. Yet still, more work is necessary to produce plausible and generally acceptable measures of societal wellbeing, recognising that overall well–being is a multi–dimensional concept.

Notes

1. See for example Vanoli, 2005 for a discussion of the development of National Accounts.

2. The production boundary delimits what activities are to be included or excluded from the measure of economic production.
3. The other dimensions are Health; Education; Personal activities including work; Political voice and governance; Social connections and relationships; Environment (present and future conditions); and Insecurity of an economic as well as a physical nature.
4. Further details can be found in the Eurostat–OECD Methodological manual on purchasing power parities.
5. The base year for prices is 2000.
6. Technically, consumption of fixed capital is the 'decline in the current value of the assets used by producers during an accounting period, as a result of physical deterioration, normal obsolescence and accidental damage' (ONS, 1998). This differs from the concept of depreciation as recorded in business accounts or as allowed for taxation purposes as it is calculated on a current cost rather than historic cost basis.
7. In the UK, annual estimates of the consumption of fixed capital are obtained using the perpetual inventory model (PIM). For structures and buildings, the straight line method is used whilst for plant and machinery the proportion of the value of the asset (at the beginning of each year) method is used.
8. This is included in the estimation of the value added of government, and thus in GDP. The result is to raise 'statistically' the level of United States GDP by around 0.6 per cent. This difference should disappear since the new SNA has adopted the method applied in the United States.
9. Resident unit refers to individuals, households and institutions that have a centre of economic interest in the economic territory of a country.
10. Some OECD countries (including the UK) also include the income of non–profit institutions serving households (NPISHs). The justification for this treatment is that because these institutions are largely financed by households and because their purpose is to serve households, their accounts can be assimilated to those of households. Moreover, the NPISHs constitute a small sector, and their inclusion in the household account makes little difference to the final result. In practice, this means that international comparisons will have to compare 'households plus NPISHs' rather than the household sector alone.
11. The data are from the OECD website. 2007 data are used because they are available for more countries than 2008 data.
12. The hedonic method is a regression technique used to estimate the prices of qualities or attributes of goods and services that are not observable in the market. It is based on the idea that the prices of different goods and services on sale on the market are functions of certain measurable characteristics such as size, weight, power, speed, etc and so regression methods can be used to estimate by how much the price varies in relation to each of the characteristics.
13. Calculation based on data from the UK's Blue Book of National Accounts, 2009.
14. In early editions of his best-selling textbook, Economics, the late Paul Samuelson gave his favourite example of this pitfall in GDP accounting. Samuelson pointed out that if a man married his maid (and stopped paying her), then, all else equal, GDP would fall.

ACKNOWLEDGEMENTS

The author would like to thank Tim Andrews, Barry Williams, Valerie Fender, Geoff Bright, Stephen Hicks, Richard Jones and Paul Allin for their contributions to this article.

CONTACT

elmr@ons.gov.uk

REFERENCES

Allin P (2007) 'Measuring societal wellbeing', *Economic and Labour Market Review*, Vol 1, No 10, pp 46-52

Atkinson A and Voitchovsky S (2008) '*The distribution of top earnings in the UK since the Second World War*', University of Oxford

Atkinson Review: Final Report (2005) *Measurement of government output and productivity for National Accounts*. Palgrave Macmillan, Basingstoke.

Boarini R, Johansson Å and Mira d'Ercole M (2006), 'Alternative measures of well–being', *OECD Economics Department Working Papers*, No. 476

Brooks A (2008) '*Gross National Happiness: Why happiness matters for America—and how we cangGet more of it'* ,New York, Basic Books.

CMEPSP Report (2009) 'Report by the Commission on the Measurement of Economic Performance and Social Progress', CMEPSP, Paris

Daffin (ed)(2009) 'Wealth in Great Britain: Main results from the Wealth Assets Survey 2006/08', Office for National Statistics

Davies, C, Fender V and Williams B (2010) 'Recent developments in the household saving ratio', *Economic and Labour Market Review*, Vol 4, No 5, pp 16-24.

Easterlin R A (1995) 'Will raising the incomes of all increase the happiness of all?' *Journal of Economic Behaviour and Organisation*, Vol 27, No 1, pp 35-47

Eurostat (2001) 'Handbook on price and volume measures in National Accounts'. Eurostat, Luxembourg

Jackson T, Marks N, Ralls J and Stymne S (1997). '*Sustainable economic welfare in the UK 1950-1996*'. London and Guildford: New Economics Foundation and Centre for Environmental Strategy (University of Surrey)

Jones F, Annan D, and Shah S (2009) 'The redistribution of household income 1977 to 2006/07', *Economic and Labour Market Review*, Vol, 3, No 1, pp 31-43

Pont M (2008) 'Improvements to the measurement of government output in the National Accounts', *Economic and Labour Market Review*, Vol 2, No 2, pp 17-22

Sen A (1979) 'Utilitarianism and welfarism', *The Journal of Philosophy*, LXXVI (1979), 463-489

Sen A (1985) '*Commodities and capabilities*'. Oxford: Oxford University Press

Sen A (1999) '*Development as freedom*'. New York: Knopf

Thomas J (2010) 'There is more to life than GDP, but how can we measure it?' *Economic and Labour Market Review*, forthcoming

Vanoli A (2005) '*A History of National Accounting*', IOS Press, Amsterdam

APPENDIX

Table A1
Data (in US$ current prices and PPPs)

US$

Country	Code	GDP	NDP	GNI	NNI	NFIA/GDP (Per cent)	HFCE & NPISH	Household actual individual consumption	2007 Household adjusted disposable income
Australia	AUS	39,056	32,888	37,507	31,339	*–3.97*	21,527	27,614	..
Austria	AUT	37,858	32,051	37,256	31,449	*–1.59*	19,992	25,291	28,314
Belgium	BEL	35,288	29,441	35,523	29,676	*0.67*	18,339	24,074	26,649
Canada	CAN	39,014	33,954	38,632	33,572	*–0.98*	21,730	27,899	..
Switzerland	CHE	42,783	35,324	39,735	32,276	*–7.12*	24,374	26,775	27,524
Chile	CHL	14,614	12,876	13,517	11,779	*–7.50*	8,646	..	..
Czech Rep	CZE	24,631	20,362	22,875	18,607	*–7.13*	12,245	16,059	16,457
Germany	DEU	35,432	30,214	36,017	30,799	*1.65*	20,013	25,406	27,730
Denmark	DNK	36,808	30,813	37,323	31,327	*1.40*	17,912	25,226	23,190
Spain	ESP	31,455	26,350	30,648	25,542	*–2.57*	17,998	22,037	23,492
Estonia	EST	20,648	17,971	19,402	16,726	*–6.03*	11,547	..	..
Finland	FIN	35,809	30,081	35,995	30,268	*0.52*	18,562	24,075	23,375
France	FRA	33,090	28,509	33,309	28,729	*0.66*	18,905	25,311	27,719
Greece	GRC	28,896	25,367	27,947	24,418	*–3.29*	20,938	23,189	..
Hungary	HUN	19,732	16,798	18,407	15,473	*–6.71*	10,654	14,054	13,959
Ireland	IRL	41,493	37,451	35,581	31,539	*–14.25*	20,671	24,537	21,904
Iceland	ISL	36,994	31,459	31,291	25,756	*–15.42*	19,767	27,193	..
Israel	ISR	27902	24,536	27,448	24,082	*–1.63*	16,255	..	..
Italy	ITA	31,195	26,143	30,713	25,661	*–1.55*	18,486	22,443	24,369
Japan	JPN	34,132	26,954	35,258	28,080	*3.30*	19,732	23,116	24,343
Korea	KOR	27,658	23,979	27,839	24,160	*0.65*	15,061	16,140	16,288
Luxembourg	LUX	84,713	75,846	63,978	55,112	*–24.48*	27,431	33,438	..
Mexico	MEX	14,501	13,246	14,305	13,050	*–1.35*	9,527	10,977	..
Netherlands	NLD	41,063	35,145	39,983	34,065	*–2.63*	18,775	26,740	26,596
Norway	NOR	58,599	50,861	58,756	51,019	*0.27*	22,749	29,548	28,377
New Zealand	NZL	27,444	23,565	25,374	21,495	*–7.54*	16,148	20,509	..
Poland	POL	17,294	15,327	16,900	14,933	*–2.28*	10,669	13,894	12,856
Portugal	PRT	23,283	19,324	22,345	18,387	*–4.03*	15,485	18,417	18,317
Slovak Rep	SVK	22,141	18,513	21,545	17,917	*–2.69*	12,577	15,423	14,315
Slovenia	SVN	27,864	23,873	27,220	23,230	*–2.31*	14,692	..	..
Sweden	SWE	36,790	32,080	38,045	33,335	*3.41*	17,107	25,084	24,957
United Kingdom	UK	35,620	31,791	36,320	32,492	*1.97*	22,834	29,176	28,052
United States	USA	47,186	41,357	47,320	41,491	*0.28*	33,264	36,421	..

Source: OECD Annual National Accounts, 2010

ARTICLE

Gaganan Awano and Mark Franklin
Office for National Statistics

Jonathan Haskel and Zafeira Kastrinaki
Imperial College, London

Measuring investment in intangible assets in the UK: results from a new survey

SUMMARY

This article presents results of the Investment in Intangible Asset (IIA) Survey launched by ONS in October 2009. It is a new and unique survey of firms in the UK, drawn from the business register to represent the market sector of the economy. The survey is aimed at measuring investment of firms in six categories of intangible assets, these are: employer funded training, software, research and development (R&D), reputation and branding, design, and business process improvement. The survey also set out to measure the life lengths of investments in each asset. The results show the overall level of intangible asset spending in the UK is considerable. The article explores the incidence, expenditure levels and life lengths of these assets.

Introduction

To complement recent macro work on intangible assets (Haskel et al, 2009), this article reports on a new micro survey of intangible asset **spending** and **life lengths**. In October 2009, ONS surveyed 2,004[1] UK private sector firms with ten or more employees, in the production and service sectors of the economy, drawn from the UK business register. Known as the Investment in Intangible Assets (IIA) Survey, it is a voluntary postal survey undertaken as part of the National Endowment for Science Technology and the Arts (NESTA) Innovation Index[2] and conducted by the Office for National Statistics (ONS). Responses from 838 firms were obtained, a 42 per cent response rate which is considered high for a voluntary survey. Weights were calculated from the UK business register to generate population estimates to include firms with less than ten employees which were not surveyed. More details on the survey methodology can be found in the **Appendix**.

There are three main innovative features of the survey. First, as well as asking about R&D spending, it also surveys a wider range of spending on intangibles: training, software, branding, design and business process. Second, since much spending on intangibles is in–house, it specifically asks firms about both purchased and in–house spending. Third, to estimate depreciation rates for intangibles, firms were asked about the length of time they expected to benefit from such spending.

This work is distinctive from other surveys, the bulk of which do not ask for all intangibles, but just one, such as R&D or design. Thus it is possible to examine hypotheses such as those in Grilliches (1990), who conjectures that other innovation spending, not counted as R&D, is likely important, especially for small firms. The main survey that does touch on intangibles is (various versions of) the Community Innovation Survey (CIS). However, that survey does not ask about all intangible categories (business processes for example), does not ask specifically about in–house (such as staff costs, associated costs including office facilities, overheads and so on) and purchased expenditure, a distinction that is found to be very important, and does not look at life lengths. Indeed, on the issue of life lengths, the only survey the authors are aware of is that of the Israeli Statistics Bureau (Peleg 2008a, 2008b). Thus it is believed that this survey provides some innovative micro information both to inform at the micro level and to check against the estimates used at the macro level[3].

There are two main sets of findings, concerning intangible spending and life lengths.

Intangible spending: incidence and amount

The main findings here are as follows:

- the incidence of non–R&D intangible spending is much more widespread than R&D spending. Eight per cent of UK firms spend on R&D, all of whom

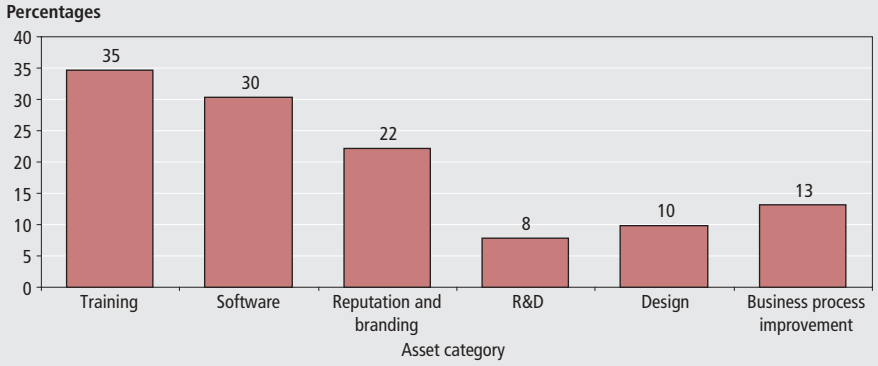
Table 1
Survey response rate by firm size

Firm size	Usable response rate[1] (per cent)	Positive response (per cent)
10-99	*47*	*50*
100-499	*48*	*68*
500-4999	*33*	*80*
5000+	*21*	*76*
Total	*42*	*58*

Note: *Source: Authors' calculation*

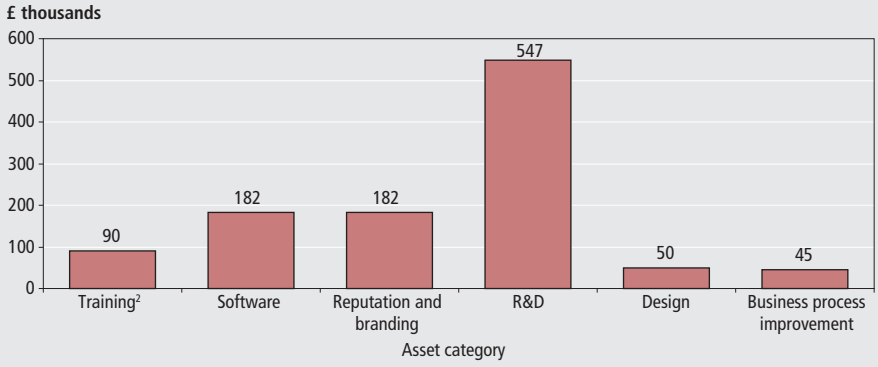
1 Usable response rate is the ratio of responses per size band divided by size band in the sample while positive response is the ratio of positive spending in one or more intangible assets divided by the total number of firms replied (per size band). Data are not weighted.

Figure 1
Percentage of firms conducting intangible activity by asset category



Source: Authors' calculation

Figure 2
Average expenditure by asset category[1]



Notes: *Source: Authors' calculation*

1 Conditional on positive spending on that particular asset.
2 Training includes imputed costs of employee time during training.

also spend on non–R&D intangible assets. But 50 per cent of UK firms spend on non-R&D assets

- the incidence of both non–R&D and R&D intangible spending is more common among large and older firms. But non–R&D spending is much more common in services relative to manufacturing, especially in financial services. Thus much of the incidence of innovation spending in the service sector, a major part of the economy, is not captured in the R&D statistics
- the overall level of intangible spending is considerable, around £39bn in this survey, of which software is about £11bn, branding £10bn, R&D £10bn, training £7bn and design and business process improvement £1bn each. In–house spending is, on average 55 per cent of this and purchased 45 per cent. Spending as a fraction of turnover (spending intensity) is particularly high in financial services and somewhat weakly higher in small firms
- taking into account differences in definition and timing, these micro numbers compare quite closely with the numbers used in a recent macro study for the UK Innovation Index (Haskel et al, 2009) for training, software, R&D and branding. The micro numbers here are much lower than those in the macro data for design and business process engineering. This may have to do with sampling (for example according to the Design Council, 85 per cent of designers are in small firms outside the IIA sample) or the recession or inaccuracy of the assumptions upon which the macro numbers are based, all of which needs investigation in future work

Life lengths

The survey asked firms to report 'on average, how long the business expects to benefit from a typical investment in' each of the assets. The main findings are:

- average benefit lives for all intangibles were over 1 year, supporting the idea that intangible investment brings long–lived benefits. Indeed lowest of the 95 per cent confidence intervals for all assets were over 2 years, except for branding which was 1.9 years
- R&D had the longest average benefit life of 4.6 years; the average of the others was 3.2 years

Results

Discussion of response rates

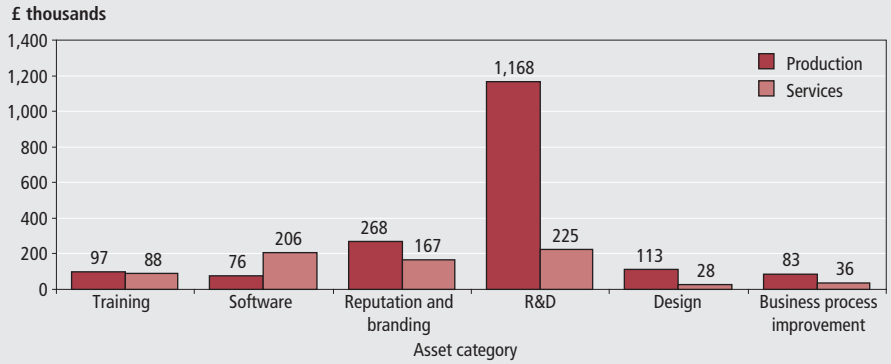
Table 1 summarises the breakdown of the sample response rate by employment size bands. Higher response rates were obtained from smaller firms than for large firms. The total response rate for the survey at the close of the response period in January 2010 was 42 per cent. When analysing respondents who answered positively to spending in any of the intangible asset categories, an inverse trend was observed, that is relatively more of the larger firms who responded to the survey report spending on intangible assets than smaller firms. Overall 58 per cent of the total respondents had positive spending on one or more category of intangible assets.

All subsequent data are weighted to reflect the characteristics of the population from which the sample was drawn and the pattern of responses received. Note that, although the survey sample excludes firms with fewer than 10 employees, the population estimates for expenditure scale up to the whole population, using employment weights.

Incidence of expenditure by asset

Figure 1 shows the incidence of each category of intangible activity; that is, the weighted fraction of firms reporting

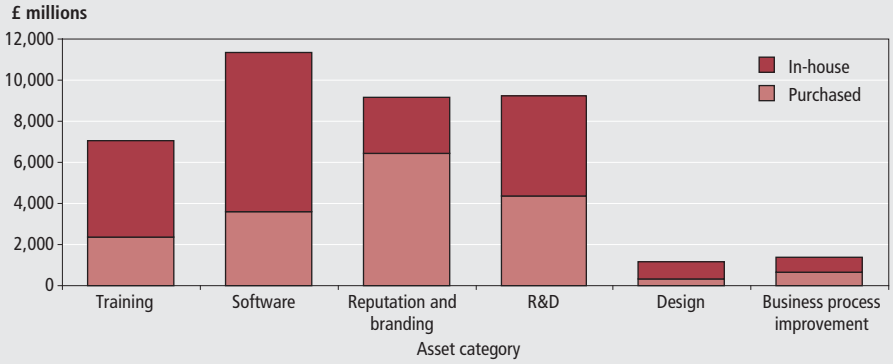
Figure 3
Average expenditure by broad sector[1]



Note: *Source: Authors' calculation*

1 Conditional on positive spending on that particular asset.

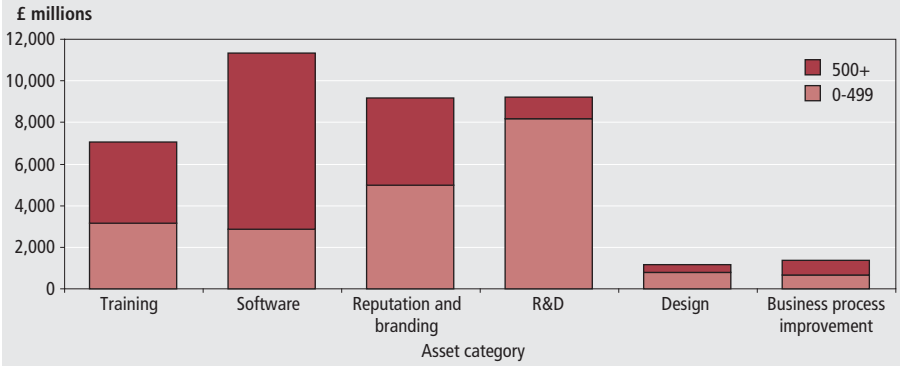
Figure 4
Total expenditure by category[1]



Note: *Source: Authors' calculation*

1 Weighted to give estimates of UK totals.

Figure 5
Weighted total expenditure by asset category and broad size class



Source: Authors' calculation

positive intangible spending for each of the six assets. In other words, the percentage of firms saying 'yes' to total (internal plus external) intangible investment by asset category, weighted to be representative of the UK population of firms with 10 or more employees. Not surprisingly, employer funded training has the highest incidence, with just under 35 per cent of respondents reporting some training activity in the last year[4]. R&D had the lowest incidence at around 8 per cent.

This figure confirms that non–R&D intangible spending is much more widespread than R&D spending. In weighted terms, around 50 per cent of firms are active in one or more category of intangible asset including R&D, and almost the same percentage are active in one or more category excluding R&D. That is to say, only a tiny fraction of firms are found to be exclusively active in R&D. Put another way, almost all firms who are active in R&D are also active in one or more other category of intangible asset but the converse is not true. The survey results suggest that 42 per cent of firms are not active in R&D but are active in one or more other category of intangible spending.

Average expenditure by asset for firms undertaking positive spending in that asset

This section looks at average spending on each asset *conditional on reporting positive spending*. There are large differences in the average expenditure on each asset category. **Figure 2** shows that R&D has by far the largest average level of expenditure followed by reputation and branding and then software, while average spending on training, design, and business process improvement are relatively smaller.

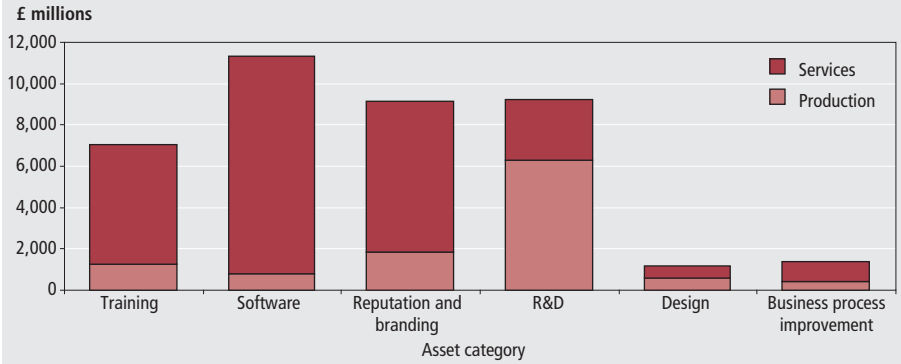
In **Figure 3**, the broad industry split reveals that except for software, firms in the production sector exhibit larger average spending on all other asset categories than firms in the services sector. Average expenditure naturally correlates with the size of the firm. However, the average size of firms in the production and service sectors is almost identical in terms of employment, so this finding would suggest that investment in intangibles – with the exception of software – is more intensive, relative to the size of the firm as measured by employment, in the production sector.

Expenditure levels

Figure 4 brings together the data on incidence and average expenditure to show weighted overall spending levels by asset category, broken down into purchased and in–house expenditure. Taking all expenditure together, the survey results suggest that software is the largest category, with total scaled expenditure estimated at a little over £11bn. Total expenditure on R&D and on reputation and branding are both estimated at around £9bn, with training expenditure estimated at around £7bn[5]. The remaining categories of design and business process improvement are both estimated at around £1bn.

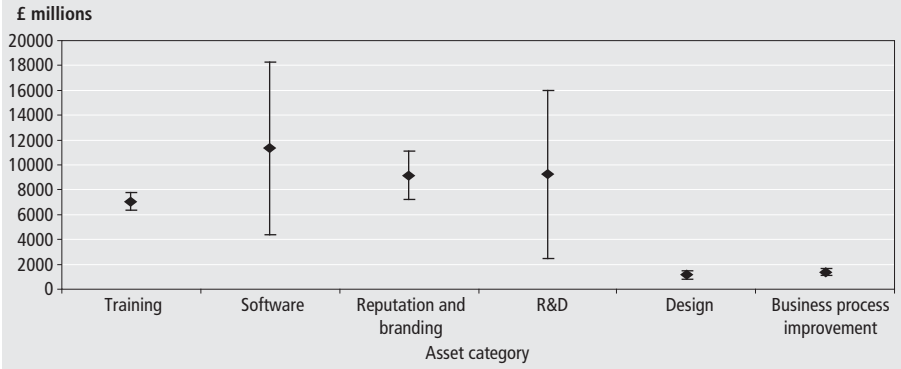
Thus the survey results confirm that while R&D is an important component of intangible investment and a source of innovation, it is not the only component. Moreover, the distribution of R&D expenditure differs markedly from the distribution of other categories of intangible investment.

Figure 6
Total expenditure by broad sector



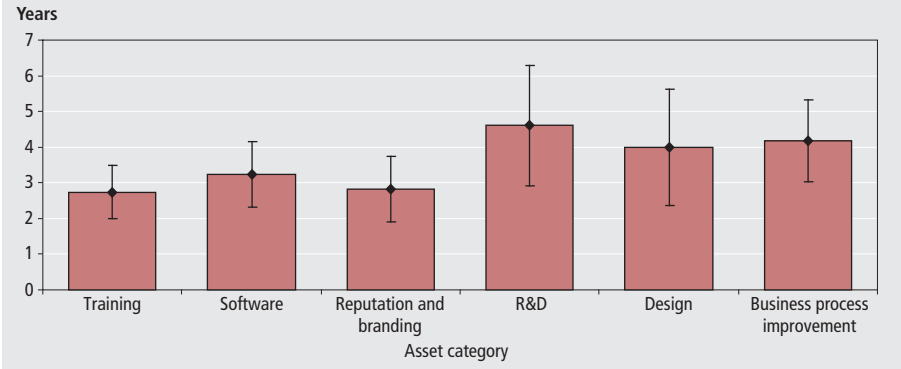
Source: Authors' calculation

Figure 7
Total expenditure by category– 95 percent confidence intervals



Source: Authors' calculation

Figure 8
Average benefit lives with confidence intervals by asset[1]



Note: *Source: Authors' calculation*

1 Weighed by a–weights (see Appendix).

Figure 4 also shows that in–house investment is an important component in all categories, and especially so for design, software and training. The split between in–house investment and purchased investment is around 50:50 for R&D and business process improvement. Only in the reputation and branding category is in–house investment significantly less than half of the total. Taking all six categories of intangibles together, the survey results give an estimate for total investment of around £39bn, of which around 55 per cent is in–house and around 45 per cent purchased from outside the firm.

Figure 5 shows total expenditure broken down by broad size band. In the population as a whole, employment is split roughly 60:40 between the two categories of 0-499 and 500+. For investment in software and, to a lesser extent, training, there is a bias towards larger firms, whereas R&D and design show a bias towards smaller firms on this categorisation. Taking all intangibles together, the survey results suggest that intangible investment per employee is a little greater in larger firms than in smaller firms.

The expenditure split by broad sector is shown in **Figure 6**. The interesting feature of this analysis is not that expenditure is generally higher in the service sector – which accounts for around 80 per cent of firms in the population, and a similar share of gross value added. But rather that expenditure on R&D and design is higher in the production sector.

Given the particular characteristics of R&D highlighted by this survey, it is not surprising that the survey results suggest that the breakdown between in–house and purchased spending differs across the broad sectors. The overall share of in–house investment is significantly higher among firms in services than those in the production sector, and there are some marked differences across individual asset categories, although some of these may be due to small sample sizes.

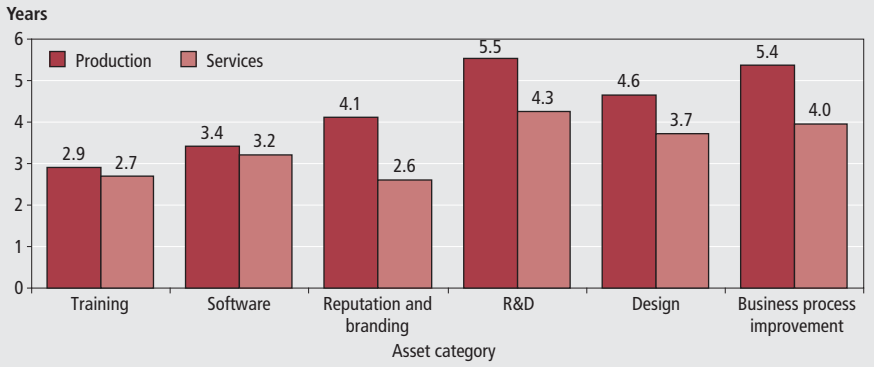
Figure 7 shows illustrative 95 percent confidence intervals[6] for total expenditure on each category of intangible asset. It can be seen that confidence intervals around the expenditure estimates vary widely across the different categories. The range of the estimates is relatively narrow for design, training and business process improvement, somewhat wider for reputation and branding, and wider still for software and R&D. Other things equal, the larger the sample size, the narrower the proportionate confidence intervals. Thus we would expect proportionately wider confidence intervals for expenditure sub–aggregates, such as in–house and purchased components of expenditure.

Life lengths of intangible assets

As well as the magnitude of expenditure, the survey was designed to capture information on the life length of a typical investment in each category of intangible asset. Such information is useful both in forming a judgement as to whether investment in intangibles can be viewed as investment in the context of the national accounts (for which there is a de facto cut–off period of one year) and also in the practical implementation of growth accounting, which requires estimates to be made on depreciation rates of each class of asset.

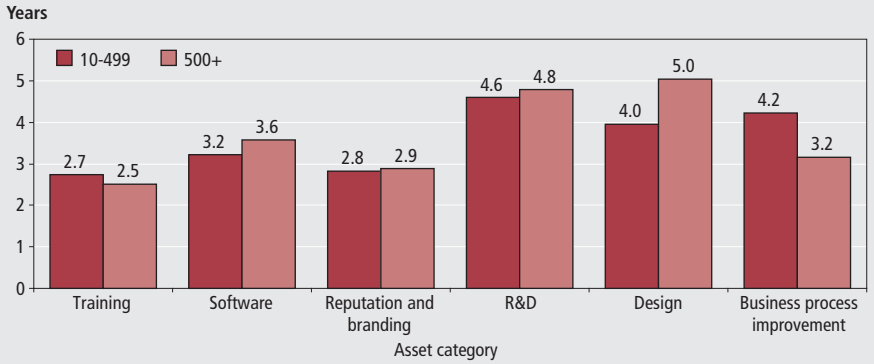
The survey results for weighted average benefit lives of each asset category are shown in **Figure 8**. All are comfortably greater than one year, and range from

Figure 9
Average benefit lives by broad sector



Source: Authors' calculation

Figure 10
Average benefit lives by broad size class



Source: Authors' calculation

2.75 years for training and reputation and branding, to around 4.5 years for R&D. This quite strongly supports the case for capitalising intangible assets.

Confidence intervals around the benefit life estimates are also shown in Figure 8. The methodology here varies slightly from that used to estimate confidence intervals for expenditure in that it depends on the number of respondents providing estimates of benefit lives in each category[7]. This, alongside the distribution of the underlying data, is a factor in the fairly wide range for design, where the number of observations on benefit lives reflects the low incidence of this category.

The broad sector split **(Figure 9)** shows the production sector having longer life lengths in all asset categories compared to the services sector. Significant variations however are in R&D, reputation and branding and business process improvement, where production sector benefit lives exceed those in the services sector by more than one year.

By contrast, analysing average benefit lives by broad size class shows no clear pattern **(Figure 10)**. For four categories of intangibles – training, software, reputation and branding and R&D – there is little difference in reported benefit lives between small and larger firms. Larger firms report longer benefit lives (by around a year) for design, whereas the reverse is true for business process improvement.

Notes

1. This sample size is small compared with other business surveys. Accordingly, care should be taken in drawing inferences from the survey results.
2. NESTA has been tasked in the Government White Paper Innovation Nation to create an index that measuresm innovation in the UK and informs innovation policy.
3. See Haskel et al, 2009
4. Our expectation that training would be more prevalent than some other categories was a factor in designing the survey questionnaire with the training questions first.
5. Training is off–the–job training. Note also that in this section the population refers to all firms, including those with fewer than 10 employees.
6. Estimated confidence intervals are based on the distribution of survey responses in each cell or set of cells in the sample frame (see Appendix for more details).
7. Population estimates of expenditure implicitly assume zero expenditure for respondents who do not engage in intangible investment. However, it would clearly be inappropriate to assume that benefit lives for such respondents were zero, so the population estimate and confidence intervals around that estimate depend only on positive responses.

ACKNOWLEDGEMENT

This work is an important component of NESTA's innovation index project and carried out by a team at ONS and Imperial Business School. We thank all who have supported and contributed to the project especially the survey respondents. All errors are the responsibility of the authors.

The full report (Investing in Innovation: Findings from the UK Investment in Intangible Asset Survey) can be found in the NESTA website at http://nesta.org.uk

REFERENCES

Camus D (editor) (2007) 'ONS Productivity Handbook: A Statistical Overview and Guide', Office for National Statistics. Available at: www.ons.gov.uk/about-statistics/user-guidance/productivity-handbook/index.html

Grilliches Z (1990) 'Patent Statistics as Economic Indicators: A Survey', *Journal of Economic Literature*, Vol. 28, pp.1661–1707

Haskel J (2009) 'Innovation, knowledge spending and productivity growth in the UK', Interim report for NESTA Innovation Index project, NESTA, November 2009.

Peleg S (2008a) 'Service lives of R&D', Central Bureau of Statistics, Israel

Peleg S (2008b) 'Examples of surveys on service lives of R&D', OECD Task Force on R&D and Other Intellectual Property Products.

Robson S and Kenchatt M (2010) 'First findings from the UK Innovation Survey 2009', *Economic and Labour Market Review*, Vol. 4 No. 3 March 2010.

Wallis, Gavin (2009), 'Capital Services Growth in the UK: 1950-2006', *Oxford Bulletin of Economics and Statistics*, Vol. 71, No. 6.

Whittard D, Franklin M, Stam P and Clayton T (2009) 'Testing an extended R&D survey: Interviews with firms on innovation investment and depreciation', NESTA Innovation Index Working Paper, April 2009.

APPENDIX

Methods Explained

The Investment in Intangible Assets (IIA) Survey was a voluntary postal survey funded by the National Endowment for Science Technology and the Arts (NESTA) and conducted by the Office for National Statistics (ONS).

The Investment in Intangible Assets (IIA) Survey is part of a wider Innovation Index work by NESTA. This survey is a contribution of the ONS\Imperial College stream of the Innovation Index work. Further details of NESTA's Innovation Index can be found at: http://nestainnovation.ning.com/

The Investment in Intangible Assets (IIA) Survey sampled 2,004 UK firms. It was a voluntary survey and was conducted by means of a postal questionnaire. The questionnaire and micro data can be found at the ONS Virtual Microdata Laboratory (VML). Details of the VML can be found at : www.ons.gov.uk/about/who-we-are/our-services/vml/index.html

Coverage and sampling

The survey covered firms with ten or more employees in sections B to N of the Standard Industry Classification (SIC) 2007.

The sample was drawn from the ONS Inter–departmental Business Register (IDBR). Sampling was adjusted to reduce the sample weight on construction, utilities and Sections G (Distribution), H (Transport) and I (Accommodation) of the service sector. This follows UK Innovation Survey findings of below average levels of innovation in these sectors. By contrast, the sample selection mildly over-sampled engineering-based manufacturing, Section J (Information and Communication) and Section K (Financial and insurance activities).

Weighting

The 'a' weights are computed as N(no. in population) / n(no. of respondents) for each cell of the sample frame. The 'a' weights should be used for all weighted aggregates except expenditure. For expenditure, aggregates should use the product of the 'a' and 'g' weights. The g–weights are based on the relationship between the characteristic of interest and supplementary information (called auxiliary data) and are also known as model weights.The 'g' weights use employment as the auxiliary variable, and use a clustering based on optimising the correlation between clustered employment and a synthetic variable which is the sum of all expenditure across categories.

Confidence intervals

The method of computing confidence intervals varies slightly according to the variable in question. Here we outline the method in the case of expenditure estimates.

Define: $\hat{Y}$ the population estimate of the expenditure variable Y for which the confidence interval is to be computed.

$R_j = Sum(ay)_j \,/\, Sum(ax)_j$ – the ratio of a-weighted expenditure to a–weighted employment in each j–cell.

Compute: $\hat{S}_a^2 = \sum (y - R_j * x)^2 / (n_a - 1)$ for each a–cell

$Var(\hat{Y}_a) = N_a^2 * (1 - n_a / N_a) * \hat{S}_a^2 / n_a$ for each a–cell

Then: $Var(\hat{Y}) = \sum Var(\hat{Y}_a)$ population variance estimate

And: $SE(\hat{Y}) = \sqrt{Var(\hat{Y})}$ population standard error estimate

The 95 per cent confidence intervals are then +/-1.96 standard errors around the population estimate.

ARTICLE

Developments in Services Producer Price Indices

Kat Pegler, Tracy Jones and Chris Jenkins
Office for National Statistics

SUMMARY

This article focuses on the development of price statistics in the service sector, in particular the work being done by the Office for National Statistics (ONS) to develop the Services Producer Price Indices (SPPIs) and the current plans for expanding the coverage of these indices.

Introduction

The service sector[1] plays an important role in the UK economy, with services (including those provided by government) accounting for approximately 75 per cent of UK Gross Domestic Product (GDP) (ONS, 2009a). Given the importance of this sector, users of economic statistics both within government and the wider community require comprehensive coverage of the service sector, particularly in the area of prices.

The Services Producer Price Indices (SPPIs) are primarily a suite of individual price indices that provide information on price change for a limited range of service industries. Each SPPI captures quarterly changes in the price received for services provided by UK businesses to other UK businesses and government. These individual price indices are also aggregated together to create an aggregate SPPI with limited coverage **(Figure 1)**; this aggregate SPPI is not representative of the service sector as a whole due to the current limitations in coverage.

Why are services important?

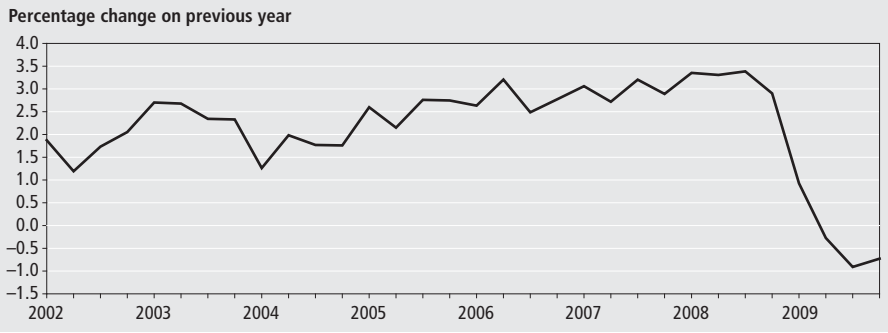
The importance of the service sector has increased greatly over the last few decades as a result of an increase in its share of the economy. Service industries now dominate the UK economy, accounting for around three–quarters of UK Gross Domestic Product (GDP); this compares with two-thirds as recently as 1995 **(Figure 2)**.

As the service sector has grown, so has the demand for statistics in this area. SPPIs are one of a number of statistics produced by ONS and were developed to monitor price changes in what has long been the largest sector of the economy. One of their key uses is for deflation in the National Accounts where SPPIs are required to remove the effect of price changes in order to convert current price values to volumes. The SPPIs are used as deflators for the Index of Services and the quarterly measurement of Gross Domestic Product. The indices are also required by HM Treasury and the Bank of England to help monitor inflation in the economy by providing an indicator of upstream inflationary pressure. A key use of SPPIs is in the escalation of commercial contracts and they are also used for international comparison and monitoring.

History of the SPPIs

The Office for National Statistics (ONS) began development of a prototype price index for the service sector in the early 1990s. These initial price indices, known collectively as the Corporate Services Price Index (CSPI) as they collected prices for corporate services (those services purchased by businesses from other businesses), were developed as an extension of the well established Producer Price Index (PPI) for manufactured goods. The initial efforts concentrated on the collection of price data for a small number of relatively straightforward service industries where price collection methods used were very similar to those already in place for the PPI. This data was collected on a voluntary basis and covered just five industries with

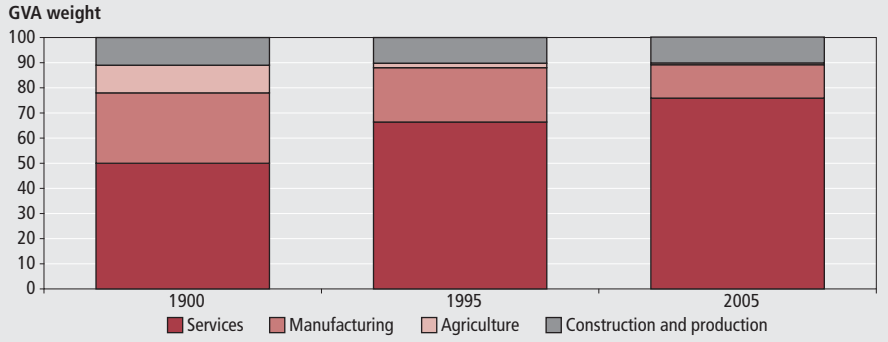
Figure 1
Aggregate SPPI[1]



Note: *Source: Services Producer Price Indices*

1 The aggregate SPPI is an aggregate of the individual industry level SPPIs produced and does not provide full coverage of the service sector.

Figure 2
Breakdown of UK gross value added (GVA) by sector



Source: ONS 2000a, 2000b, 2009b

approximately 150 companies providing data (Price, 1996).

In 1995, ONS established a dedicated team to take forward development of service sector prices. This development of the SPPIs was part-funded by the European Community, with the development of service sector prices also gaining momentum across Europe. With this extra resource in place, the number of indices developed and published gradually increased to 12 in 1998 (Skipper, 1998), with 22 industrial level indices being available in early 2000.

In November 2006, ONS changed the name of the CSPI to the Services Producer Price Indices (SPPIs). Since the development of price indices for the service sector had become more widespread across the international statistical community, this change brought the UK price index in line with equivalent series in other countries.

Since the initial development in the early 1990s, the SPPIs were classified as experimental statistics. The SPPIs were assessed as National Statistics by the UK Statistics Authority during the autumn of 2009. The published assessment report (UK Statistics Authority, 2009) determined that the SPPIs could be designated as a new National Statistics product subject to the implementation of a number of requirements which The Authority deemed essential to improve SPPI compliance with the Code of Practice for Official Statistics. A brief summary of the work carried out to meet these requirements include:

- clarification of the limited coverage of the SPPIs in published documents. The SPPI statistical bulletin and other published SPPI documents have been updated to ensure users are aware that the aggregate SPPI does not cover all services but is just an aggregate of the 32 component industrial industries published in the SPPI statistical bulletin
- the SPPI pages of the ONS website have been reviewed and updated to ensure SPPI metadata is more accessible. An SPPI mailbox has also been set up to allow users to provide comments regarding the website or the data (sppi@ons.gov.uk)
- full details of SPPI developments are being publicised, including a proposed work plan for ONS to become compliant with the European Short–Term Statistics regulation. This article covers these plans in detail and will be made available in their own right on the SPPI pages of the ONS website
- a detailed quality matrix for the current SPPI industries has been published on the SPPI pages of the ONS website that covers the methods used and metadata associated with each of the industrial SPPIs currently published by ONS

Following this, on 10 May 2010, the UK Statistics Authority Assessment Team accredited the SPPIs as a new National Statistic. The UK Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs
- are well explained and readily accessible
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

Issues with service price development

Since development of the SPPIs commenced, progress towards achieving comprehensive service sector coverage has been intermittent, partly due to funding issues, but in the main due to difficulties in the development of price indices for services. Most of these difficulties are not only experienced by ONS but also by National Statistics Institutes (NSIs) within the international statistical community and centre on difficulties in the measurement of service prices and the lack of supplementary information required to construct a price index.

The ultimate objective of any price index is to show changes in the price of a commodity or service at constant quality. The most appropriate method for measuring price change in such indices is to collect price data for well–specified, repeated products with observable transactions. This ideal lends itself particularly well to the manufacturing industry where there is a consistency in the product being produced allowing

like–for–like comparisons in one period to the next. For example, monitoring the price of a loaf of bread over time is relatively straightforward as the specification (or more importantly quality) of a loaf of bread (such as weight and ingredients) is unlikely to change. This allows for the accurate measurement of price change over time as the quality of the product remains fixed.

However, for the service sector (and a handful of manufacturing industries) this method of measuring price change is often difficult to follow (Skipper, 1998). Many outputs provided by service industries are often unique and one-off in their nature. For instance, a set of architectural drawings for a building will only ever be designed once to the precise specifications of the customer. As a result, trying to obtain comparable prices for this service in subsequent periods is difficult as the exact same service will never be repeated. Furthermore, a number of service products are inherently difficult to measure due to the intangible nature of the service on offer. For example, the services offered by the legal industry such as legal advice and representation can be difficult to identify for the purposes of collecting price data. Even when the measurement of service prices is achieved there can be underlying quality issues which are particularly difficult to identify and measure. For example, if the price of a service can be accurately measured on the basis of the cost of time spent in service provision, a periodic adjustment will usually be required to account for any productivity gains which potentially offer an increased service for the same hourly rate.

As a result of these difficulties a number of different pricing methods have been developed by ONS and the international statistical community for use when it is not possible to directly observe repeated prices. In developing such price collection methods, a balance between what is conceptually desirable from the price index and what is achievable (in terms of resources available to the NSI and the industry that will potentially provide the information) needs to be struck. **Table 1** summarises each of the pricing methods that have been developed for collecting prices in the service sector. The selection of the most appropriate method will depend on the pricing practice used within the target industry and the availability of this data from potential respondents.

In addition to the difficulties experienced in defining and collecting prices for the service sector, there is also a lack of supplementary data such as turnover at a detailed product level classification to help in the calculation of a price index (Sova et al, 2007).

The lack of a detailed product level classification for services is apparent in the 2008 revision of the Classification of Products by Activity (CPA) (Sova et al, 2007). This classification contains 124 pages, 72 of which are dedicated to manufactured goods and just 31 pages to the service sector (excluding other industries such as wholesale and construction). This is despite the fact that the service sector is over five times larger than the size of the manufacturing sector of the UK economy. This lack of detail is an issue that needs to be overcome at an early stage of development for a service price index and the method adopted by ONS is to develop its own service product classification in consultation with the industry. This method uses a recognised classification such as the Standard Industrial Classification (SIC) or CPA as a starting point and disaggregates each industry into a product level structure that groups similar services together. Other NSIs will tend to adopt a similar approach which can mean that below the aggregated industry level, international comparison of SPPIs is difficult.

A regular source of turnover data at a sufficient level of detail is needed to calculate weighting patterns for the price indices. As such a source is not available for the service sector as a whole, estimates of product level turnover are either collected directly when new price quotes are recruited to the SPPI, or as part of a dedicated turnover survey. This dedicated turnover survey, which is carried out every five years, is used solely to support the SPPI, and is therefore carried out on a relatively small scale, covering only those industries for which an SPPI is already produced.

For the manufacturing sector, the equivalent supplementary data is collected using the annual ProdCom survey. This survey (**Prod**uction **Com**munautaire, which is French for 'Community Production') is a statutory EU requirement and the detailed product level turnover collected is used to produce national estimates of the production of goods. This source of data provides the manufacturing price indices (PPIs) with product level turnover with which to calculate product weighting patterns, a detailed product level classification structure, known as the ProdCom Product List, to disaggregate each manufacturing industry and supplementary information to help in the development of a sampling frame. Despite numerous attempts (by various NSIs) to begin such a collection for the service sector, there is still no such tool available and there are no firm plans in place to begin the development of one; the difficulties in defining products for SPPIs are mirrored in turnover survey development.

The ONS Inter-Departmental Business Register (IDBR) is an effective sampling frame for many of the surveys carried out

Table 1
Potential methods for collecting price data

Unit of price measurement	Type of price information	Pricing method	Description
Clearly specified service	Price observed	Direct use of prices of repeated services	Uses real transaction prices of the same service prices over time. Also includes prices of repeated contracts
		Unit value method	Estimates price using aggregate value and quantity data.
	Price estimated using relative observed prices	Component pricing method	Price calculated as the sum of the prices of a number of independent output components
		Percentage fee method	Estimates the price where a company bases the price of a service on a percentage of an asset value, good or service that the service is connected to for example real estate
	Virtual prices	Model pricing method	This method uses expert opinion to estimate a model price based on an actual transaction. The respondent provides an initial price for an actual service transaction and then estimates the exact same transaction in future periods even though in reality the service is not offered again.
Time spent providing services	Price observed or estimated	Time–based methods	Measures the price of the time spent in the provision of the service and not the price of the service itself. Used in industries where the cost of the service corresponds directly or predominantly to the time in service provision for example legal services

Source: Office for National Statistics

by ONS. However, it includes insufficient detail to act as a sampling frame for price indices, as it is not possible to specify the individual goods or services produced by each company from the register. To overcome this issue in the manufacturing PPIs, ONS uses its ProdCom sample as a sampling frame but since there is no such sampling frame available for the service sector, the sample for the SPPIs is drawn directly from the IDBR. This can prove to be inefficient as there is no evidence to confirm that those potential companies selected actually produce the service in question. Again, supplementary investigation is required in the development of price indices for the service sector to ensure any sample is fit for purpose.

Despite these difficulties, international experience has shown that it is possible to make progress in the development of accurate price indices for the most difficult service industries and good progress has been made, not just in the UK, but across the international statistical community. Practical solutions to the difficulties encountered have been developed on a collaborative basis between NSIs, along with help from organisations such as Eurostat, (the statistical office for the European Union) and the Organisation for Economic Co-operation and Development (OECD). There are a number of international resources available to help with such developments and these include the International Monetary Fund (IMF) Producer Price Index manual, the Eurostat/OECD methodological guide for developing SPPIs and a dedicated service sector working group known as the Voorburg Group. This working group, named after the city in which the first meeting was held, meets annually in response to a request from the United Nations Statistical Office (UNSO) (as it was then known) for assistance in developing service statistics. Further details on the work of the Voorburg group can be found via the dedicated website at http://stds.statcan.ca/english/voorburg/. Eurostat have also set up an annual SPPI task force for the development of specific industrial SPPIs and have a dedicated website for member states to share development experiences and best practice.

The ONS SPPIs – providing metadata and assessing quality

ONS currently publishes 32 individual SPPIs. These individual indices measure changes in the prices received by UK businesses for services provided to other UK businesses and, in total, represent approximately 52 per cent of this business–to–business activity. In addition to these industry level indices, two aggregate indices are also published. These indices represent the overall inflation of the services measured and are simply an aggregate of the individual industry level indices. The aggregate indices are calculated on both a net sector basis (including transactions between business services and all other sectors apart from business services) and a gross sector basis (including all business service transactions).

As discussed earlier, depending upon the nature of a particular industry and the way in which companies within that industry price for their services, different pricing methods may be used to monitor price change and, as a result, each individual industry level SPPI may vary in the way it is calculated. In addition to this, the individual indices may also differ in the source used to collect prices. The main source of price data used to calculate SPPIs is a quarterly questionnaire which is sent out to a fixed panel sample of companies. However, for some service industries, a source of price data may already be collected by a third party. Where such data is collected by a reliable source and can be deemed as sufficient quality, it may be used to calculate the price index as an alternative to sending out questionnaires to companies. Using this third party data not only reduces the amount of resource required by ONS to process the questionnaires but it also reduces the amount of burden placed on respondents by questionnaires. Currently, the SPPIs utilise regulatory data such as that collected by the Office for Communications (OfCom) in the SPPI for business telecommunications and industry data such as that collected by the Investment Property Databank (IPD) in the property rentals SPPI.

Whilst many aspects of SPPI methodology are well communicated in various documents such as the Triennial Review (ONS, 2009c) and the SPPI Summary Quality Review (ONS, 2009d), these documents tend to summarise the methodology used across all indices but do not attempt to highlight the differences between the industry-level indices. In order to make users aware of these differences in price collection and pricing methods and also to highlight any limitations in terms of coverage or conceptual issues, a quality matrix has been put together and can be accessed via the ONS website at www.statistics.gov.uk/CCI/article.asp?ID=2417. For each individual index, this matrix includes information on the price collection method used, the number of quotes received and the number of respondents that provide these quotes.

Expanding coverage

The need for more comprehensive industrial coverage of service sector prices is a key requirement of users of the data in the UK. In addition to this, there is also a statutory requirement to supply quarterly price data on selected service industries to Eurostat as part of the European Short Term Statistics (STS) Regulation (number 1165/98) published on 19 May 1998. Initially, this regulation covered service statistics by turnover and employment variables only, however on 6 July 2005, the regulation was amended (number 1158/2005) to include output prices for a number of service industries. STS indicators facilitate decision-making and are tools for formulating and monitoring the economic and monetary policy of the European Union and the euro area. ONS currently supplies the majority of SPPIs required for this regulation, but needs to develop indices for a further ten industries to become fully compliant.

To attempt to take forward this expansion of the SPPIs and therefore meet the needs of customers in both the UK and Europe, funding was made available to set up a development team to investigate collecting prices in additional industries. The team was recruited at the beginning of 2009 and has since begun the research and development of price collection for ten industries. The choice of industries to develop was determined in consultation with key stakeholders and since the priorities of these stakeholders matches closely with the requirements of Eurostat, this development will also ensure that ONS is compliant with the STS regulation.

If successful, the development of new price indices (whether for manufacturing or service sector) can take up to two years before an index is ready for dissemination and depends largely upon the complexity of the industry and the availability of auxiliary information such as turnover data for the industry in question. In most cases, such developments follow a framework that has been recommended internationally in the Producer Price Index Manual (Chapter 1, Appendix 1.1, paragraph 1.282–1.384). **Table 2** summarises the development framework for price indices that has been adapted for use in the development of ONS SPPIs and the suggested activities involved at each stage of the development.

Table 2
Framework for the development of Service Price Indices

Development stage	Objectives	Approximate timescale
1. Initial industry research	This stage of development identifies the conceptual requirements and development scope for the new SPPI and will include reviewing any similar developments carried out by other National Statistics Institutes (NSIs).	1 – 2 months
2. Industry consultation	The purpose of this stage is to gain a better understanding of the industry being developed. This will include consultation with industry experts and trade associations to try and identify the most suitable method of monitoring prices in the industry and the draft development of a product level aggregation structure for the industry. A key objective in this stage is to try and identify a source of data that could potentially be used to calculate a suitable price index.	2 – 3 months
3. Development and testing of data collection instrument	With a product level aggregation structure and method of price collection identified in the previous stage, this next stage will focus on the development and testing of questionnaires to collect the price data. This will be an iterative process with draft questionnaires being tested in the field with potential respondents and updated taking account of feedback. Further work will also take place to develop the methodology and systems required to process any new price data and calculate the price index.	4 – 6 months
4. Recruitment phase	This stage is where the new questionnaires are sent out to potential respondents to 'recruit' price data to the SPPI. The recruitment will cover a calendar quarter with data being processed and validated to ensure any price data being returned is suitable for use in the final price index. Prior to the despatch of the recruitment questionnaire, a suitable sample of potential respondents will be designed.	3 months
5. Pilot data collection	Having collected this initial price data during the recruitment phase, the draft SPPI will now continue with regular quarterly data collection whereby respondents from the recruitment phase will be asked to provide quarterly updates for the price data they provided. It is recommended that at least four quarters worth of data is collected to assess the suitability and quality of the data being returned. At the end of this stage, a decision will be made on the suitability of the new SPPI for publication. The new SPPI will either be published as a development index or further work will be required to improve any deficiencies.	12 months

Source: Office for National Statistics

Table 3
Summary of development progress for phase one industries

Industry	Development progress
Cargo handling	Initial recruitment questionnaires were despatched for this industry in March 2010. During the research of this industry it was identified that potential respondents would be able to provide actual prices for repeatable transactions. Therefore the price method being used is direct use of repeated prices (see Table 1).
Legal Services	Previous attempts to develop a price index for legal services by ONS had been unsuccessful due to the difficulty in collecting regular price data. The current research and development has identified that data collection based on time-based methods (see Table 1) can potentially be used. Questionnaires have been developed and tested with potential respondents and final versions were despatched in March 2010 to commence initial recruitment of data.
Accountancy	As with legal services, previous attempts to develop a price index in this industry had proved unsuccessful. Following consultation with the industry it has been identified that two methods of price collection may be suitable in the accountancy industry. The first will be the direct use of repeated prices and this will be used for smaller respondents (those with less than 100 employees). For the larger respondents (those with more than 100 employees) the consultation showed that the only price method that would potentially be suitable is a time-based method (see Table 1). Questionnaires have been developed and tested based on these two methods and were despatched in March 2010.
Architecture and Engineering	The development of these industries has shown similar results to that for legal services. In consultation with the industry it has been identified that the only potential method for the collection of price data is through the use of a time based method. Questionnaires have been developed and tested and were despatched in March 2010.
Air Freight Transport	ONS, along with colleagues from other National Statistics Institutes in Europe, has identified a potential source of third-party data which could be used to calculate a price index in this industry using a unit value method of price calculation (see Table 1). An initial sub-set of data was purchased late in 2009 and is being tested by ONS to determine its suitability. Following this testing, further work may be required to resolve any quality issues. If the draft index is deemed unsuitable, a contingency will be to collect price data via the standard method of questionnaires.

Source: Office for National Statistics

Using this framework, the SPPI development project has been planned over a three year period (Financial Year (FY) 2009/10 to FY 2011/12) and has been split into two phases of development, each consisting of the development of indices for five industries. Phase one of this project, which commenced in April 2009, covers the development of: cargo handling; legal activities; accountancy services; architecture and engineering and air freight transport. The progress of this work and the methods used can be seen in **Table 3** and, as shown in the table, initial recruitment of companies and collection of price data has now began.

The second phase of development, which coincides with the data collection of phase one industries, will follow a similar approach as defined by the framework above and commenced in March 2010. During this phase of the project, indices will be developed for: business and management consultancy; storage and warehousing; data processing; computer programming and advertising creation.

A detailed work plan for the remainder of the SPPI development project (from March 2010 onwards) is provided in **Table 4**. Assuming the development progresses to timetable, phase one industries will be ready for initial dissemination in May 2011 (either via a web article or as supplementary development indices in the SPPI statistical bulletin), with the industries being developed in phase two following in May 2012. Once ONS is content with their quality (this will include assessing the quality of data being returned, comparisons of the calculated price indices with other data sources and discussions with customers and industry experts) they will be published as part of the regular quarterly SPPI statistical bulletin and weighted into the aggregate SPPI.

Forthcoming plans for service sector prices

In addition to the plans to develop new price indices to improve the industrial coverage of the SPPIs, ONS is currently planning the next SPPI turnover survey, to collect updated product-level turnover in respect of 2010 with which the SPPI weighting structure can be updated. The most recent SPPI turnover survey was undertaken in 2006 (with a reference period of 2005) and saw questionnaires sent to some 5,000 businesses covering 25 separate service industries. The initial plan for the 2010 SPPI Turnover Survey is to expand both the sample size and the number of industries included. The majority of the additional industries to be included in the 2010 survey will be those in which ONS is

Table 4
Work plan for the SPPI development project (March 2010 onwards)

Development	Description of task	Provisional Timeframe
Phase 1	**1. Recruitment of initial quarter (Q1 2010) price data for phase 1 industries** Including the dispatch of questionnaires, data collection, data processing/validation and quality assurance of methods	March 2010 to June 2010
Development of price indices for: Accountancy; Legal services; Air freight; Architecture & Engineering; Cargo Handling.	**2. Pilot quarterly data collection for new industries (recommended four quarters data collection)** Regular quarterly collection of updated price data from respondents recruited in Q1. Including the quality assurance and validation of data being received along with any further developments to rectify problems or issue.	June 2010 to April 2011
	3. Initial dissemination of new industrial price indices Decision on most appropriate method to be decided. Potentially new industrial SPPIs will be published in the form of an article covering the development, methods, results and quality. Consultation with users to take place.	April to May 2011
	4. Continued quarterly data collection and publication Regular quarterly data collection for new industries and publication of data as supplementary tables in quarterly SPPI statistical Bulletin. Quality assessment of new industrial SPPIs will continue. New SPPIs will be weighted into the aggregate SPPI series once quality of data has been assured.	April 2011 onwards
Phase 2	**1. Initial research of new industries** Including researching methods used by other National Statistics Institutes and defining the conceptual requirements of the industrial SPPI and identifying suitable price collection methods for testing.	March to April 2010
Development of price indices for: Computer programming; Data processing; Advertising creation; Business & management consultancy; Storage & Warehousing.	**2. Development of data collection questionnaire** Design of initial data collection questionnaire for iterative testing within each industry. This stage will also include methodological work to design and select a sample of respondents for the live data collection, quality assure and test the methods to be used in the index calculation and develop the computer system for data processing/validation.	May 2010 to February 2011
	3. Recruitment of initial quarter (Q1 2011) price data for phase 1 industries Including the dispatch of questionnaires, data collection, data processing/validation and quality assurance of methods	March 2011 to June 2011
	4. Pilot quarterly data collection for new industries (recommended four quarters data collection) Regular quarterly collection of updated price data from respondents recruited in Q1. Including the quality assurance and validation of data being received along with any further developments to rectify problems or issue.	June 2011 to April 2012
	5. Initial dissemination of new industrial price indices Decision on most appropriate method to be decided. Potentially new industrial SPPIs will be published in the form of an article covering the development, methods, results and quality. Consultation with users to take place.	April to May 2012
	6. Continued quarterly data collection and publication Regular quarterly data collection for new industries and publication of data as supplementary tables in quarterly SPPI statistical Bulletin. Quality assessment of new industrial SPPIs will continue. New SPPIs will be weighted into the aggregate SPPI series once quality of data has been assured.	April 2012 onwards

Source: Office for National Statistics

Table 5
High level plan for the 2010 SPPI turnover survey

Date	Task
April 2010	Project start up including agreeing the scope and coverage of the 2010 SPPI turnover survey.
May - December 2010	Development of turnover questionnaires. This will include the review and development of product level structures for each industry to be included along with testing each of the questionnaires with the industry.
December 2010 – April 2011	Development of methodology and IM systems to process the 2010 SPPI turnover data (including validation rules, weighting and estimation). Sample design and selection in readiness for the despatch of questionnaires.
June – October 2011	Data collection - this will include the despatch of questionnaires (end April 2011) to collect turnover (in respect of 2010), data validation and processing.
October – December 2011	Quality assurance of data and preparation for re-calculating SPPI product level weights using the 2010 turnover. Article detailing the 2010 Turnover Survey results to be published.

Source: Office for National Statistics

also developing new price indices. However, further investigation will be carried out to try and identify service industries outside the above SPPI development to include in the 2010 Turnover survey.

A project to take forward the 2010 SPPI turnover began April 2010. An initial high–level plan for the survey is shown in **Table 5** (subject to change).

Conclusion

The aim of this article was to highlight the difficulties associated with the development of price indices for the service sector and to publicise the progress and methods being used by both the Office for National Statistics and other National Statistics Institutes across the international statistical community. Fundamental to price index development is the need to strike a balance between what the price index is conceptually required to measure and the availability of data or methods to meet these needs. For the service sector, striking this balance can be difficult, largely due to the nature of many service industries and the lack of availability of the supplementary data required to assist with the calculation of price indices. As a result of these difficulties, progress towards the comprehensive coverage of this sector has been intermittent, despite the clear importance of the sector to the UK economy.

This article has also provided an overview of the SPPIs currently published by ONS, and the work being carried out to expand coverage of the SPPIs into new industries. Further articles will be published to document the progress of this development work to ensure that all users are kept up to

date with the progress being made. Firm dates and the proposed format for the first publication of these newly developed indices will also be publicised when they are available.

Note

1 The service sector covers sections G to S of the Standard Industrial Classification (SIC).

CONTACT

Chris Jenkins
christopher.jenkins@ons.gov.uk
01633 455474

Tracy Jones
tracy.jones@ons.gov.uk
01633 456571)

REFERENCES

ONS (2000a) United Kingdom National Accounts: The Blue Book at www.statistics.gov.uk/downloads/theme_economy/BB_2000.pdf

ONS (2000b) United Kingdom Economic Accounts, No. 32, Q3 2000 at www.statistics.gov.uk/downloads/theme_economy/UKEA_Q3_2000.pdf

ONS (2009a) United Kingdom National Accounts: The Blue Book at www.statistics.gov.uk/downloads/theme_economy/BB09.pdf

ONS (2009b) United Kingdom Economic Accounts, No. 68, Q3 2009 at www.statistics.gov.uk /downloads/theme_economy/UKEA_09q3.pdf

ONS (2009C) Report on the Triennial Review of the Producer and Trade Price Indices and the Service Producer Price Indices Surveys at www.statistics.gov.uk/articles/ppi/PPI-Triennial-Review-Report-2009.pdf

ONS (2009d) Summary Quality Report for Services Producer Price Indices at www.ons.gov.uk/about-statistics/methodology-and-quality/quality/qual-info-economic-social-and-bus-stats/quality-reports-for-business-statistics/summary-quality-report-for-services-producer-price-indices.pdf

Price J (1996) 'Producer Prices for Services: Development of a New Price Index', *Economic Trends* 513 pp 14-18

Skipper H (1998) 'Development of the Corporate Services Price Index: A review of progress', *Economic Trends* 538 pp 25-31

Sova M, Wood J and Richardson I (20070 'Challenges in the estimation and quality assessment of services producer price indices. *Statistics in Transition* 8 (3) pp 519-524

UK Statistics Authority (2009) 'Assessment of Services Producer Price Indices produced by the Office for National Statistics', *Assessment Report 25* at www.statisticsauthority.gov.uk/assessment/assessment-reports/index.html

ARTICLE

Services Producer Price Indices – First quarter 2010

Simon Woodsford
Office for National Statistics

SUMMARY

The services producer price indices (SPPI) replaced the former corporate services price index (CSPI). The SPPI's are primarily a suite of individual price indices that provide information on price change for a limited range of service industries. Each SPPI captures quarterly changes in the price received for services provided by UK businesses to other UK businesses and Government. These individual price indices are also aggregated together to create an 'aggregate' SPPI with limited coverage. This aggregate SPPI is not representative of the whole service sector.

This article shows the effects some industries are having on the aggregate SPPI. The data produced are used internally by the Office for National Statistics as a deflator for the Index of Services and the quarterly measurement of gross domestic product. The index is also used by HM Treasury and the Bank of England to help monitor inflation in the economy.

In May 2010 the UK Statistics Authority Assessment team accredited the SPPI as a new National Statistics. Therefore, this will be the last SPPI article published in *Economic & Labour Market Review*.

Prices of business–to–business services rose 0.8 per cent in the 12 months to the first quarter of 2010. This is based on a comparison of the change in the aggregate services producer price index on the net sector basis.

Figure 1 shows how the percentage change for the aggregate SPPI (net sector) compares with the producer price index (PPI) for all manufactured goods (net sector) and the retail price index (RPI).

The aggregate SPPI results, on both gross and net sector bases, are shown in **Table 1**. In the first quarter of 2010, the aggregate SPPI (net sector) rose 0.5 per cent from the previous quarter.

Figure 2 depicts the aggregate SPPI annual percentage change for both the net and gross sector time series. The 12 month net aggregate SPPI rose 0.8 per cent in the first quarter of 2010, compared with a fall of 0.5 per cent in the fourth quarter of 2009.

The gross aggregate SPPI rose 1.2 per cent in the first quarter, compared with a rise of 0.2 per cent in the previous quarter.

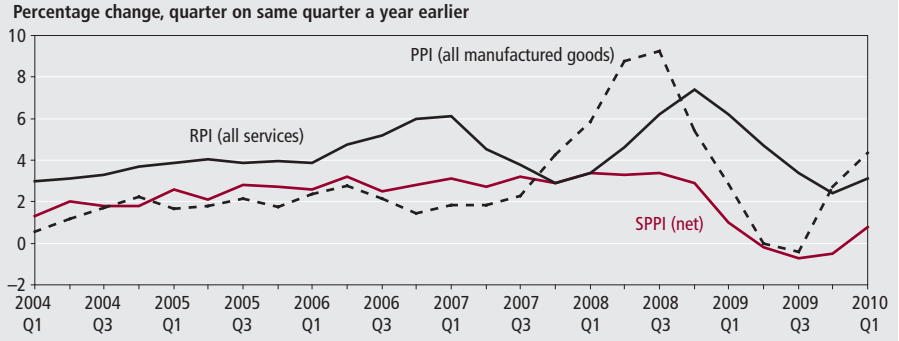
Industry–specific indices

Tables available on the ONS website contain the data for the 31 industries for which indices of services producer prices are currently available. The weights for each industry index are shown at both gross and net sector levels. The largest upward effects to the net sector aggregate SPPI over the past 12 months came from advertising placement and freight forwarding. Freight forwarding also had the largest upward effect on the aggregate SPPI (net sector) quarter on quarter percentage change.

Other notable upward contributions came from maintenance of motor vehicles and sewerage services as reported by the Office of Water Services (Ofwat).

These upward movements were partially

Figure 1
Aggregate SPPI compared with the PPI and RPI(services)



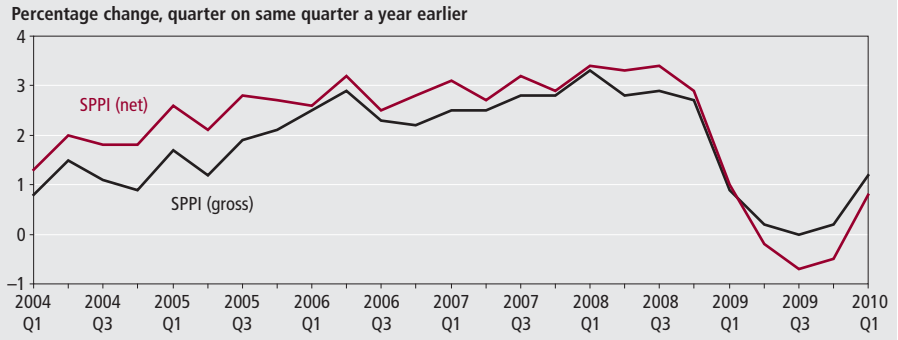
Source: Services Producer Price Indices

Table 1
Top–level SPPI results

	SPPI quarterly index values, 2005=100		Percentage change, quarter on same quarter a year earlier	
	Gross sector	Net sector	Gross sector	Net sector
2000 Q1	91.6	89.3	*-0.9*	1.0
2000 Q2	91.4	89.4	*-0.1*	1.4
2000 Q3	91.5	89.7	*0.4*	1.8
2000 Q4	91.6	90.0	*0.4*	1.6
2001 Q1	92.1	90.8	*0.5*	1.7
2001 Q2	93.6	92.2	*2.4*	3.1
2001 Q3	94.0	92.3	*2.7*	2.9
2001 Q4	94.2	92.5	*2.8*	2.8
2002 Q1	94.3	92.5	*2.4*	1.9
2002 Q2	95.2	93.3	*1.7*	1.2
2002 Q3	95.9	93.9	*2.0*	1.7
2002 Q4	96.1	94.4	*2.0*	2.1
2003 Q1	96.4	95.0	*2.2*	2.7
2003 Q2	97.1	95.8	*2.0*	2.7
2003 Q3	97.4	96.1	*1.6*	2.3
2003 Q4	97.9	96.6	*1.9*	2.3
2004 Q1	97.2	96.2	*0.8*	1.3
2004 Q2	98.6	97.7	*1.5*	2.0
2004 Q3	98.5	97.8	*1.1*	1.8
2004 Q4	98.8	98.3	*0.9*	1.8
2005 Q1	98.9	98.7	*1.7*	2.6
2005 Q2	99.8	99.8	*1.2*	2.1
2005 Q3	100.4	100.5	*1.9*	2.8
2005 Q4	100.9	101.0	*2.1*	2.7
2006 Q1	101.4	101.3	*2.5*	2.6
2006 Q2	102.7	103.0	*2.9*	3.2
2006 Q3	102.7	103.0	*2.3*	2.5
2006 Q4	103.1	103.8	*2.2*	2.8
2007 Q1	103.9	104.4	*2.5*	3.1
2007 Q2	105.3	105.8	*2.5*	2.7
2007 Q3	105.6	106.3	*2.8*	3.2
2007 Q4	106.0	106.8	*2.8*	2.9
2008 Q1	107.3	107.9	*3.3*	3.4
2008 Q2	108.3	109.3	*2.8*	3.3
2008 Q3	108.7	109.9	*2.9*	3.4
2008 Q4	108.9	109.9	*2.7*	*2.9*
2009 Q1	108.3	109.0	*0.9*	*1.0*
2009 Q2	108.5	109.1	*0.2*	*-0.2*
2009 Q3	108.7	109.1	*0.0*	*-0.7*
2009 Q4	109.1	109.4	*0.2*	*-0.5*
2010 Q1	109.6	109.9	*1.2*	*0.8*

Source: Services Producer Price Indices

Figure 2
Aggregate SPPI



Source: Services Producer Price Indices

offset by downward contributions, especially from property rentals, construction plant hire and business telecoms.

Next results

The next set of SPPI results will be published on 25 August 2010 on the National Statistics website at: www.statistics.gov.uk/sppi

Further information

All SPPI tables and articles on the methodology and impact of rebasing the SPPI and the re-development of an index for business telecommunications (together with more general information on the SPPI) are available at: www.statistics.gov.uk/sppi

A Summary Quality Report for the SPPI can be found at: www.ons.gov.uk/about-statistics/methodology-and-quality/quality/qual-info-economic-social-and-bus-stats/quality-reports-for-business-statistics/summary-quality-report-for-services-producer-price-indices.pdf

The assessment of SPPI and the letter of confirmation as National Statistics can be found at: www.statisticsauthority.gov.uk/assessment/assessment-reports/index.html

CONTACT

elmr@ons.gsi.gov.uk

TECHNICAL NOTE

1. The SPPI replaced the former corporate services price index (CSPI). The SPPIs are primarily a suite of individual price indices that provide information on price change for a limited range of service industries. Each SPPI captures quarterly changes in the price received for services provided by UK businesses to other UK businesses and Government. These individual price indices are also aggregated together to create an 'aggregate' SPPI with limited coverage. This aggregate SPPI is not representative of the whole service sector.

2. Index numbers shown in this Statistical Bulletin are on a net sector basis. These relate only to transactions between the corporate services sector and other sectors. Detailed tables also contain gross sector indices which include transactions within the corporate services sector.

3. Indices relate to average prices per quarter. The full effect of a price change occurring within a quarter will only be reflected in the index for the following quarter. All index numbers exclude VAT and are not seasonally adjusted.

4. SPPI inflation is the percentage change in the net sector index for the latest quarter compared with the corresponding quarter in the previous year.

5. Grants from the European Commission helped ONS to begin developing the SPPI. Funding of approximately 600,000 euros was awarded between 2002 and 2005. This has now ceased.

6. A number of external data sources are currently used in the compilation of the SPPI. Details of these follow:

   Property rental payments – Investment Property Databank (IPD)
   Business telecommunications – Office of Communications (Ofcom)
   Financial Intermediation (Banks) – Bank of England (BoE)
   Sewerage services – Office of Water Services (Ofwat)
   Business rail fares – Office of Rail Regulation (ORR)
   National post parcels - Parcelforce

7. Following a quality review by ONS in January 2007 a decision was made to withdraw the Banking SPPI from publication. As a result the index has been re-developed and was re-introduced in Q3 2008. Under the re-development, the quality of the data collection and processing has been improved and the number of products included in the index has increased. However, the new index is not regarded as proxy for all Financial Intermediation services within the Standard Industrial Classification (SIC) 65. It has not therefore been included in the aggregate SPPI. The services measured are classified to SIC 65.12/1, and are published as a separate index known as the "SPPI for Financial Intermediation (Banks)".

8. SPPI policy is to show significant revisions, but to suppress minor changes to avoid unnecessary inconvenience to users. Indices for the most recent two quarters are regarded as provisional and can be changed as later data become available. The National Statistics website contains information on the SPPI revisions policy:

   www.statistics.gov.uk/about/methodology_by_theme/revisions_policies/default.asp

9. The complete run of data in the tables of this Statistical Bulletin is also available to view and download in other electronic formats free of charge using the National Statistics Time Series Data website service. Users can download the complete release in a choice of zipped formats or view and download their own selections of individual series. The Time Series Data service can be accessed at:

   www.statistics.gov.uk/statbase/tsdintro.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 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. The old *Economic Trends* tables are no longer being updated with effect from January 2009.

Weblink: www.statistics.gov.uk/elmr/07_10/data_page.asp

	Title	Frequency of update
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[1]	Q
1.14	Private non-financial corporations: secondary distribution of income account and capital account[1]	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 weekly earnings – total pay	M
2.16A	Average weekly earnings – bonus pay	M
2.17	Average weekly earnings – regular pay	M
2.18	Productivity and unit wage costs	M

Weblink: www.statistics.gov.uk/elmr/07_10/data_page.asp

2.19	Regional labour market summary	M
2.20	International comparisons	M
2.21	Labour disputes	M
2.22	Vacancies by size of enterprise	M
2.23	Vacancies by industry	M
2.24	Redundancies: levels and rates	M
2.25	Redundancies: by industry	Q
2.27	Employment levels by country of birth and nationality	M
2.28	Working age employment rates by country of birth and nationality	Q
2.29	Lone parent claimants of Jobseeker's Allowance by age of youngest child	M
2.30	Key out of work benefits	M
2.31	Production industry employee jobs	M
2.32	Public sector employment by industry	Q

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[1]	M
4.04	Indicators of fixed investment in dwellings	M
4.05	Number of property transactions	M
4.06	Change in inventories[1]	Q
4.07	Inventory ratios[1]	Q
4.08	Retail sales, new registrations of cars and credit business	M
4.09	Inland energy consumption: primary fuel input basis[1]	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[1]	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

Weblink: www.statistics.gov.uk/elmr/07_10/data_page.asp

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
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 and unemployment	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:

1 These tables, though still accessible, are no longer being updated.
A Annually
Q Quarterly
M Monthly

More information

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

Contact points

Recorded announcement of latest RPI
01633 456961
rpi@ons.gsi.gov.uk

Labour Market Statistics Helpline
01633 456901
labour.market@ons.gsi.gov.uk

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

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

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

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

For statistical information on

Average Earnings Index (monthly)
01633 819024

Claimant count
01633 456901

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

Earnings
Annual Survey of Hours and Earnings
01633 456120

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

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

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

Economic activity and inactivity
01633 456901

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

Employee jobs by industry
01633 456776

Total workforce hours worked per week
01633 456720
productivity@ons.gsi.gov.uk

Workforce jobs series – short-term estimates
01633 456776
workforce.jobs@ons.gsi.gov.uk

Labour costs
01633 819024

Labour disputes
01633 456721

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

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

New Deal
0114 209 8228

Productivity and unit wage costs
01633 456720

Public sector employment
General enquiries
01633 455889

Source and methodology enquiries
01633 812865

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

Redundancy statistics
01633 456901

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

Skills (Department for Innovation, Universities & Skills)
0870 001 0336

Skill needs surveys and research into skill shortages
0870 001 0336

Small firms (BERR)
Enterprise Directorate
0114 279 4439

Subregional estimates
01633 812038

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

Annual Population Survey, local area statistics
01633 455070

Trade unions (BERR)
Employment relations
020 7215 5934

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

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

Travel-to-Work Areas
Composition and review
01329 813054

Unemployment
01633 456901

Vacancies
Vacancy Survey: total stocks of vacancies
01633 455070

ONS economic and labour market publications

ANNUAL

Financial Statistics Explanatory Handbook

2010 edition. Palgrave Macmillan, ISBN 978-0-230-52583-2. Price £47.50.

www.statistics.gov.uk/StatBase/Product.asp?vlnk=4861

Foreign Direct Investment (MA4)

2009 edition

www.statistics.gov.uk/StatBase/Product.asp?vlnk=9614

Input-Output analyses for the United Kingdom

2006 edition

www.statistics.gov.uk/StatBase/Product.asp?vlnk=7640

Business Enterprise Research and Development

2008 edition

www.statistics.gov.uk/StatBase/Product.asp?vlnk=165

Share Ownership

2008 edition

www.statistics.gov.uk/StatBase/Product.asp?vlnk=930

United Kingdom Balance of Payments (Pink Book)

2009 edition. Palgrave Macmillan, ISBN 978-0-230-57610-0. Price £52.00.

www.statistics.gov.uk/StatBase/Product.asp?vlnk=1140

United Kingdom National Accounts (Blue Book)

2009 edition. Palgrave Macmillan, ISBN 978-0-230-57611-7. Price £52.00.

www.statistics.gov.uk/StatBase/Product.asp?vlnk=1143

Statistical Bulletins

- 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

2009 quarter 4

www.statistics.gov.uk/StatBase/Product.asp?vlnk=242

United Kingdom Economic Accounts

2009 quarter 4. Palgrave Macmillan, ISBN 978-0-230-23488-8. Price £37.50.

www.statistics.gov.uk/StatBase/Product.asp?vlnk=1904

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

2010 quarter 1

www.statistics.gov.uk/StatBase/Product.asp?vlnk=731

Statistical Bulletins

- 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

June 2010. Palgrave Macmillan, ISBN 978-0-230-23602-8. Price £50.00.

www.statistics.gov.uk/StatBase/Product.asp?vlnk=376

Focus on Consumer Price Indices

May 2010

www.statistics.gov.uk/StatBase/Product.asp?vlnk=867

Monthly review of external trade statistics (MM24)

April 2010

www.statistics.gov.uk/StatBase/Product.asp?vlnk=613

Producer Price Indices (MM22)

May 2010

www.statistics.gov.uk/StatBase/Product.asp?vlnk=2208

Statistical Bulletins

- 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

2009 edition. Palgrave Macmillan, ISBN 1-4039-9735-7. Price £40.

www.statistics.gov.uk/StatBase/Product.asp?vlnk=14315

National Accounts Concepts, Sources and Methods

www.statistics.gov.uk/StatBase/Product.asp?vlnk=1144

Sector classification guide (MA23)

www.statistics.gov.uk/StatBase/Product.asp?vlnk=7163

Recent articles

JANUARY 2010

The changing nature of the UK's trade deficits, 1985–2008
Valerie Fender

Implications of the change in female state pension age for labour market statistics
Richard Clegg, Debra Leaker and Katherine Kent

Financial crisis and recession: how ONS has addressed the statistical and analytical challenges
Aileen Simkins, Paul Smith and Martin Brand

The labour market across the UK in the current recession
Jamie Jenkins and Debra Leaker

Using the OECD equivalence scale in taxes and benefits analysis
Grace Anyaegbu

Education productivity
Daniel Ayoubkhani, Allan Baird, Fraser Munro and Richard Wild

Services Producer Price Indices (experimental) – Third quarter 2009
Simon Woodsford

FEBRUARY 2010

Underemployment in the UK labour market
Annette Walling and Gareth Clancy

Labour market gross flows data from the Labour Force Survey
Jamie Jenkins and Mark Chandler

Regional economic indicators: with a focus on differences in sub-regional economic performances
Sebnem Oguz and Jonathan Knight

MARCH 2010

An expenditure–based analysis of the redistribution of household income
Sonia Carrera

First findings from the UK Innovation Survey 2009
Stephanie Robson and Martin Kenchatt

Implementation of SIC 2007 for the Vacancy Survey
Nick Barford, Jonathan Knight and Bob Watson

Understanding the divergence between output and employment in the UK construction industry
Mavis Anagboso and Yonathan van den Brink

Development of construction statistics
Tony Crook and Graham Sharp

Patterns of pay: results of the Annual Survey of Hours and Earnings 1997 to 2009
Ceri Holdsworth

APRIL 2010

Labour Force Survey unemployment and benefits durations
Gareth Clancy and Daniel Ker

Disability, education and training
Melanie Jones

CPI and RPI: the 2010 basket of goods and services
Philip Gooding

Incorporating derivatives data in the National Accounts and Balance of Payments
Paul Cullinane

Civil Service Statistics 2009: A focus on gross annual earnings
David Matthews and Andrew Taylor

Plans for Blue Book 2010
Glenn Everett

Services Producer Price Indices (experimental) – Fourth quarter 2009
Simon Woodsford

MAY 2010

Recent developments in the household saving ratio
Christopher Davies, Valerie Fender and Barry Williams

Comparing different estimates of productivity produced by the Office for National Statistics
Mike G Phelps

Labour productivity measures from the ABI: 1998 to 2007
Katy Long

The economic impact of tourism across regions and nations of the UK
Tullio Buccellato, Dominic Webber, Sean White, Felix Ritchie and Shadia Begum

Regional economic indicators with a focus on gross disposable household income
Sebnem Oguz and Jonathan Knight

JUNE 2010

Disadvantaged groups in the labour market
Ruth Barrett

The UK's international investment position
Damian Whittard and Jawed Khan

Regional gross value added
Bethan West

Labour disputes in 2009
Dominic Hale

The recording of financial intermediation services within sector accounts
Paul Cullinane

Healthcare productivity
Cristina Penaloza

Methods Explained: Real time data
Graeme Chamberlin

Future articles

List is provisional and subject to change.

AUGUST 2010

Special edition: The labour market in the recession