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Economic Trends

Managing Editor: Adèle Rowe
Editor: Paul Dickman

Contents

In Brief

Articles

This month we feature three articles.

Eunice Lau of ONS outlines the ONS's strategy for work on productivity measures. After a short review of the ONS work on productivity to date, the results of a consultation with key users conducted in autumn 2001 are summarised which identify users' priorities and concerns. Next the work programmes to be taken forward by ONS are outlined. These fall into four main areas: service sector, labour input, capital input and utilisation of the Annual Business Inquiry data. Together, they constitute a significant step forward in terms of meeting users' requirements.

Amanda Tuke of ONS discusses the further analyses that have been done on the effects of annual chain-linking on the output measure of GDP. Estimates have been made of the contribution of each individual industry group both to the overall annual chain-linked growth estimates and to the effect of annual chain linking. The results show that fixed base growth estimates give greater weight to Information and Communication technologies than annual chain-linked growth estimates. The analysis was done without the quality and balancing adjustments that were included in the original model.

Matthew Barnes and Ralf Martin of ONS, introduce the ONS Business Data Linking Project. Previous research on UK productivity has nearly all been aggregate in nature. Recent work for the US at plant level has shown that entry and exit of firms have bee found to be important drivers of productivity growth. This has led to the establishment of the Business Data Linking project which aims to bring together users of ONS business micro data within ONS, the wider government and in the academic community to ensure that best practice can be shared. It also aims to ensure that business micro data continue to be developed and to use other business data that are collected by ONS and others to create linked data that may be used to answer a broader array of questions.

Recent economic publications

Quarterly

Consumer Trends: 2001 quarter 4. Available for downloading from the National Statistics website **www.statistics.gov.uk/products/p242.asp**

United Kingdom Economic Accounts: 2001 quarter 4. The Stationery Office, ISBN 0 11 621544 5. Price £26.

UK Trade in Goods analysed in terms of industries (MQ10): 2001 quarter 4. Available for downloading from the National Statistics website **www.statistics.gov.uk/products/p731.asp**

Monthly

Financial Statistics: March 2002. The Stationery Office, ISBN 0 11 621496 1. Price £23.50.

Focus on Consumer Price Indices: February 2002. Available for downloading from the National Statistics website **www.statistics.gov.uk/products/p867.asp**

Monthly Review of External Trade Statistics (MM24): January 2002. Available for downloading from the National Statistics website **www.statistics.gov.uk/products/p613.asp**

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Economic Update - April 2002

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Overview

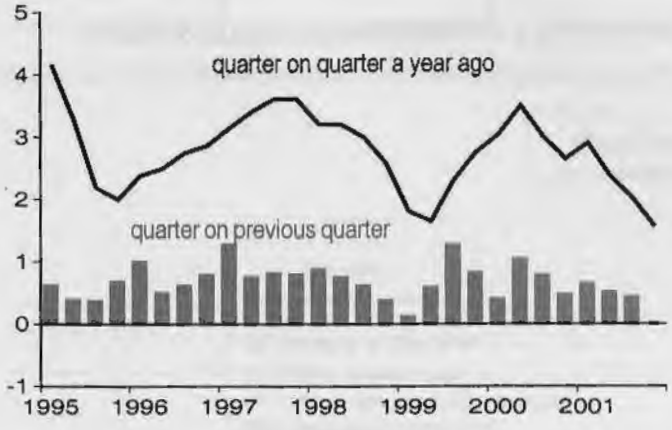
UK GDP growth weakened at the end of 2001 as the global environment continued to deteriorate. The UK manufacturing sector has been in recession for a year, driven strongly by the sharp contraction in the ICT sector but also by ongoing declines in most other industries. While service sector growth has been more robust, it has weakened through 2001. Household demand grew strongly throughout 2001, but has been accompanied by a sharp rise in indebtedness. Investment fell, and this comes against a background of falling measured profits and concerns again about the indebtedness of the company sector. Exports and imports show the largest declines for ten years. Labour market figures show deterioration over the start of 2001, but remain ambiguous about whether a turning point has been reached. Earnings have slowed substantially over 2001. Producer price data show deflation coming into the factory and zero inflation coming out. RPIX remains close to target.

GDP activity

The Office for National Statistics now estimates that GDP did not grow between the third and fourth quarters of 2001, this follows growth of 0.4 per cent between the second and third quarters (figure 1). Growth comparing the fourth quarter of 2002 with a year ago was 1.5 per cent, the lowest figure since the second quarter of 1999.

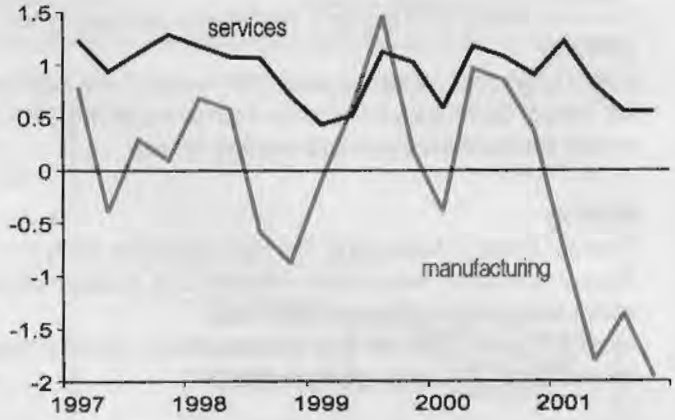
On the output side the weaker GDP is mainly driven by a manufacturing sector that has been in recession throughout 2001, but also by a large decline in mining and quarrying (which includes oil and gas extraction) and slightly slowing services growth throughout the year. From the expenditure perspective, low GDP has been driven by falling investment and falling trade.

Figure 1
Gross Domestic Product
growth



The slowdown in the UK comes alongside a deteriorating global environment. In the third and fourth quarters GDP declined or was weak in the world's three largest economies, Japan, the United States and Germany. From the corporate perspective, increasing numbers of companies have announced profit warnings and redundancies, credit agencies have reported a higher level of debt default, spreads between corporate and government debt are at high levels and over the past year stock markets have seen large falls in value all over the world.

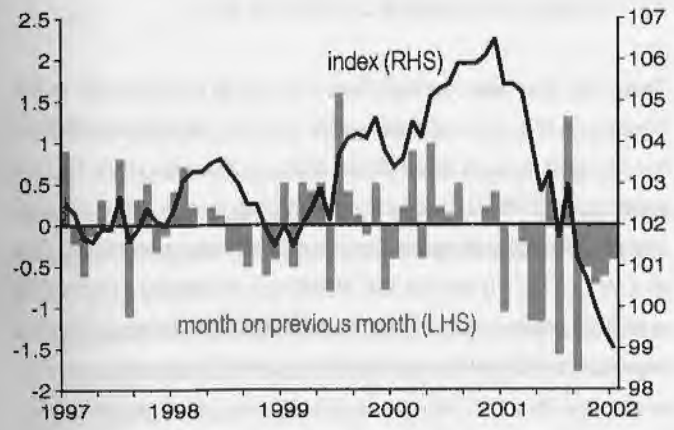
Figure 2
Manufacturing & services
growth, quarter on previous quarter



UK GDP growth has for some time been supported by robust growth in the service sector, but latest figures show this as weakening in 2001. In the fourth quarter services output grew by 0.5 per cent compared with the previous quarter, down from growth of 0.6 per cent in the third quarter, with the quarterly profile on figure 2 showing a gradual slowdown across the year. In the fourth quarter growth compared with the same period a year ago was 3.1 per cent, down from 4.5 per cent in Q1. By industry this slowdown has been driven by a slowdown to the previously very strongly growing 'post and telecommunications services' (from annual growth of 8.7 per cent in the year to the third quarter of 2000 to growth of 4.8 per cent in the year to the fourth quarter of 2001), slightly weakening business activities in the second half of the year, as well as ongoing falls in 'hotels and restaurants' and 'transport and storage'.

As figure 2 also shows, declines to the manufacturing sector continue to dominate. UK manufacturing output fell in each quarter of 2001, and in the fourth quarter output was 5.8 per cent below the level in the fourth quarter of 2000. This annual decline was the largest annual fall since the 1991 recession.

Figure 3
Index of manufacturing



While the decline has been most vigorous in the so-called information and communications technologies sectors (ICT, proxied by the NS series 'electrical and electronic engineering'), which fell by 23.4 per cent in the year to the fourth quarter, it has not been confined to the ICT sector. Particularly vigorous declines in the year to the fourth quarter of 2001 have also been seen in the 'basic metals and metal products' industry (6.7 per cent), 'textiles, leather and clothing' (12.5 per cent) and the 'other manufacturing' category fell by 1.8 per cent. For these industries, the declines in 2001 follow longer periods of falling or only limited growth.

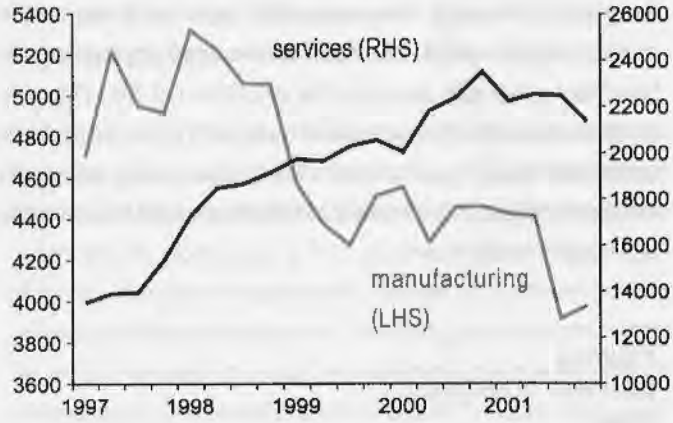
Index of manufacturing figures are now available for January 2002, these show the decline continuing, with an annual fall in the three months to January of 6.2 per cent. Figure 3 shows monthly percentage declines have perhaps moderated over recent months, but the volatility of such figures suggests that such an interpretation should be made with caution. External figures from, for example, the Confederation of British Industry and the Chartered Institute of Purchasing and Supply recorded some improvements, slowdowns in rates of decline into the latest months.

Lastly on output, movements to other series have also been important in the fourth quarter of 2001. The overall deterioration to zero growth in the fourth quarter has also been influenced by particularly weak gas and oil extraction. Here NS figures show a decline of 6.5 per cent between the third and fourth quarters, and a decline of 1.5 per cent from between the fourth quarter of 2000 and the fourth quarter of 2001. On the other hand construction output remains robust with a quarterly increase of 1.8 per cent into the fourth quarter, and an increase of 6.4 per cent compared with the fourth quarter of 2000.

Domestic demand

GDP growth has been supported by vigorous household demand throughout 2001. National Accounts figures for the fourth quarter showed household final consumption expenditure increasing by 0.9 per cent, down a little from growth of 1.1 per cent in the third quarter. Growth compared with the same quarter a year ago was 4.1 per cent (figure 5). Fourth quarter demand again appears to have been supported by ongoing high growth in borrowing. Bank of England data showed quarterly growth of gross consumer credit at 3.9 per cent in the fourth quarter, up on growth of 3.4 per cent in the third quarter. This continues the more general trend of strong growth in consumer demand being accompanied and perhaps to some extent sustained by high levels of borrowing. The Bank of England has recently emphasised how the stock of household debt through bank lending is at an unprecedented rate, and has questioned whether households have become too indebted. For example, credit debt figures as a share of disposable income are at close to double their share in 1994. From this perspective household demand is at least partly dependent on both bank and building societies' willingness to lend and to households continuing to be able to meet the interest payments on previous and new borrowing. Many emphasise that with interest rates low, these debt servicing costs continue to remain relatively low.

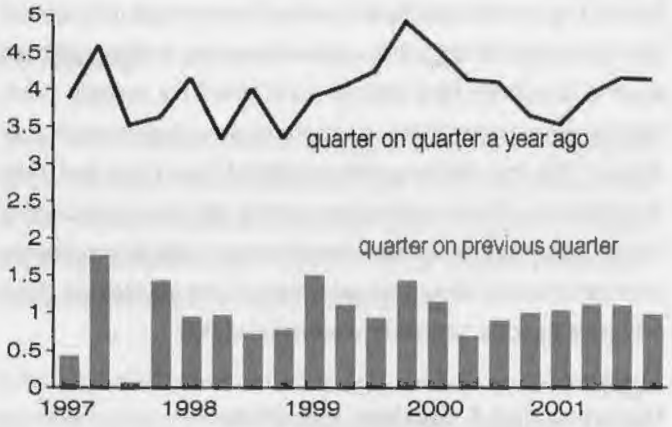
Figure 4
Manufacturing & Services investment
£ billion



Given the possible sensitivity to borrowing and also to trends in the labour market, there is potential for some slowdown to this consumption growth. As seen, National Accounts figures in the fourth quarter show a slight slowdown in growth. In the three months to February retail sales figures showed growth of 0.8 per cent, down from figures that have been consistently above 1.3 per cent in each quarter and the lowest growth rate for a year and a half. Very broadly external information continues to show sales and confidence remaining at a high level.

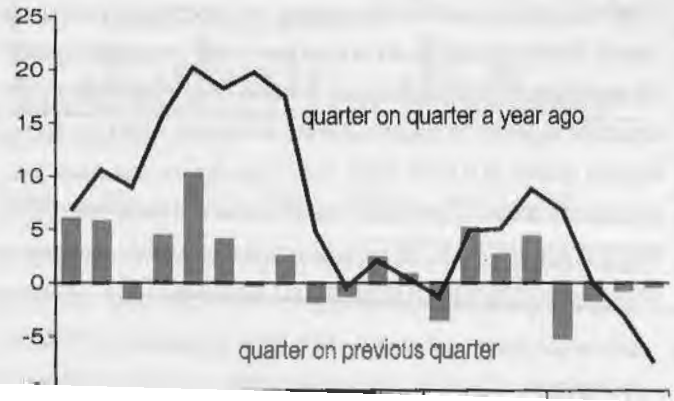
In contrast to household demand, the latest figures suggest business investment is weak. In the year to the fourth quarter of 2001 data showed a fall of 9.2 per cent, the largest fall since the 1990-91 recession. However much of this was due to a particularly high fourth quarter in 2000, and within the year profile of investment spending through the year really suggests that growth has stalled in 2001. Comparing 2001 with 2000 investment spending declined by 1.1 per cent, following growth of 4.4 per cent in 2000.

Figure 5
Household demand
growth



The industry dis-aggregation is also more informative, here following a sharp fall in 2001 quarter one service sector investment is seen to have declined modestly each quarter of 2001 and manufacturing investment to have fallen away quite sharply in the second half of 2001 (figure 4). External indices echo the general weakness, with BCC manufacturing and services figures showing investment intentions slowing quite rapidly and deteriorating further into the fourth quarter, and CBI manufacturing figures with a similar story.

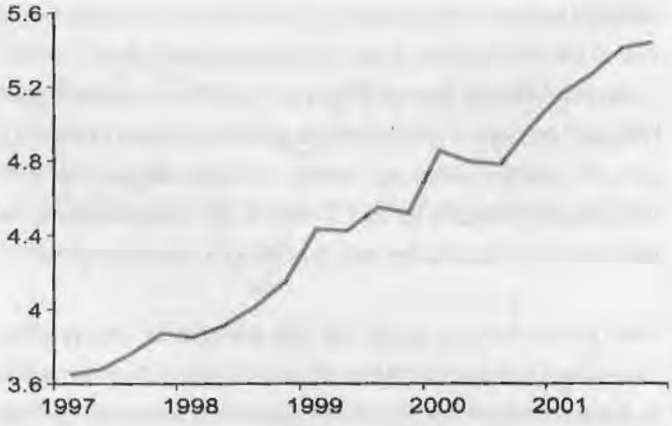
Figure 6
Business investment
growth



The weakening investment comes as profits of companies are in decline, with private non-financial corporations' gross operating surplus (excluding UK continental shelf companies) in the fourth quarter of 2001 standing 1.9 per cent below their level in the same quarter of 2000. Into 2001 as a whole gross operating surplus declined by 0.4 per cent following growth of 5.8 per cent into 2000. This weakening in profits set alongside weaker oil revenues and still high net property income payments has returned the sector to more substantial net borrowing of £11.8 billion in 2001, following the recovery to £3.7 billion in 2000.

There has also been concern over the overall indebtedness of the private non-financial corporate sector (PNFC). The Bank of England has focussed on gross liabilities as a share of corporate profits. Figure 7 shows overall PNFC liabilities excluding equity as a share of gross operating surplus, with figures showing such a measure of indebtedness at a historic high. It may be that investment is faltering as borrowing conditions become more stringent, and companies, as well as financial organisations, review the sustainability of overall indebtedness.

Figure 7
Debt / income ratio



Government output saw quarterly growth of 1.4 per cent into the fourth quarter following a decline of 0.9 per cent in the third. Comparing with the same quarter a year ago growth was 3.0 per cent. This output figure remains considerably weaker than current price government expenditure, which grew by 8.0 per cent in the year to the fourth quarter. Apart from inflation, the figures diverge because present increases in cash expenditure are unlikely to have an immediate impact on government output. Reflecting the ongoing increases to cash expenditure and tax revenues that may be weakening a little, public sector net borrowing figures show that so far in 2001-02 the government surplus is less than it was in the same period of 2000-1. The net repayment in April 2001 – February 2002 was £4.2 billion compared with the repayment of £19.7 billion in the same period of the previous financial year.

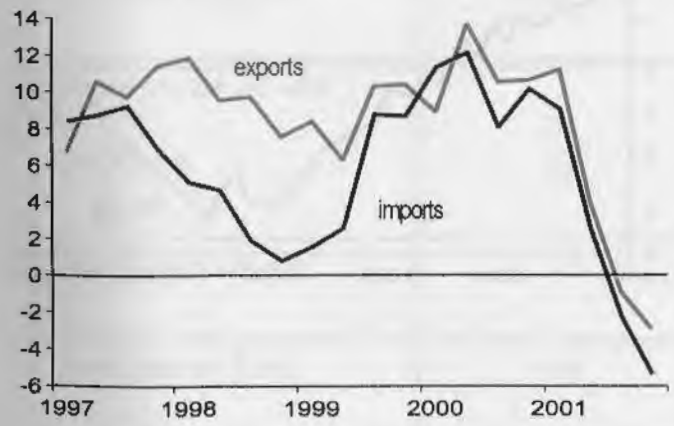
Finally on domestic demand, imports have showed a substantial decline. In the year to the fourth quarter imports fell by 2.6 per cent, the largest annual decline since the 1991 recession (figure 8). The quarterly decline in the fourth quarter at 0.2 per cent was an improvement on the decline of 2.4 per cent in the third quarter, but this was supported by very high and potentially erratic car imports and an increase in service imports due to British tourism overseas. Monthly figures however show some acceleration of decline with a fall in goods imports in the three months to January of 0.9 per cent.

Overseas demand

In line with the global deterioration, UK export growth declined sharply throughout 2001, with sales falling to countries throughout the world.

Chart 8 also shows that in the year to quarter four overall exports declined by 4.9 per cent, this was the largest decline since the 1980-81 recession. As with imports the quarterly decline between the third and fourth quarters was weaker than previous declines, but this was again partly due to potentially erratic movements in the motor vehicles industries. Furthermore latest monthly figures show a resumed quarterly decline of 5.6 per cent in the three months to January.

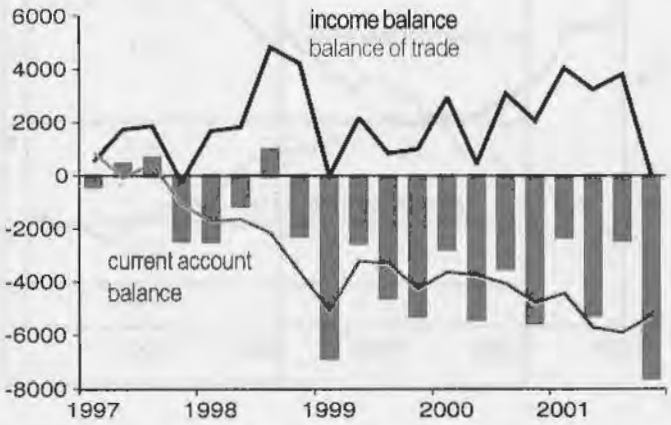
Figure 8
Export & imports
growth, quarter on quarter a year ago



The medium term movements of imports and exports are such that the balance of trade has been on a widening trend since 1997. While the deficit narrowed slightly to £5.3 billion in the fourth quarter from £5.9 billion in the third quarter, between 2001 as a whole and 2000 the deficit widened to £21.3 billion from £16.2 billion. The overall current account deficit saw a marked deterioration to £7.6 billion in the fourth quarter of 2001 as the UK's normally fairly high investment income surplus fell to zero in the fourth quarter following £2.4 billion in the third (figure 9). Over the year the current account remained fairly stable at £17.4 billion following £17.0 billion in 2000, with investment income increases largely offsetting trade decreases.

More generally, the UK balance of payments has been negative in every year since 1985. The International Investment Position, reflecting the cumulative effect of these deficits, shows net financial liabilities of the UK at £93.2 billion at the end of 2001, a relatively large figure historically speaking, although improved on figures of £133.4 billion in 1999.

Figure 9
Balance of payments
£million



Labour Market

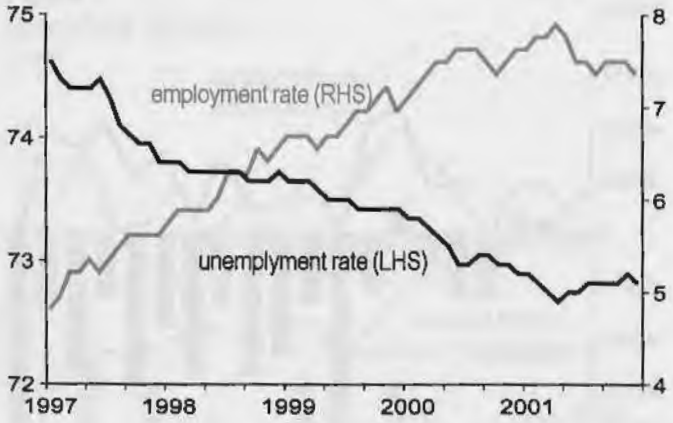
The latest labour market data continues to show very limited growth according to most measures, with some series showing falls.

On employment, the labour force survey figures show continued deterioration in the employment rate, which was 74.5 per cent between Nov-Jan 2002 compared with 74.6 per cent in the previous three month period and the recent peak of 74.8 per cent between May-Jul 2001 (figure 10). There were increases to employment, but these were primarily concentrated in the older age groups; the working age employment count fell by 1,000 between the latest two three month periods, whereas the whole population employment count rose by 23,000. Notably employment in the age group 25-34 has fallen by 260,000 in the year to November 2001-January 2002. Employment estimated by workforce jobs has showed very little growth in employment between the second and fourth quarters, falling from 29, 457 to 29,441 thousand.

On unemployment, the ILO unemployment rates has held at 5.2 per cent in the latest two three-month periods, up from 5.1 per cent in the previous two three-month periods. Conversely, the claimant count rate fell to 3.1 per cent in February 2002, back to the previous low point seen in August and September 2001. Overall the suggestion is that the trend in unemployment rates is for zero growth.

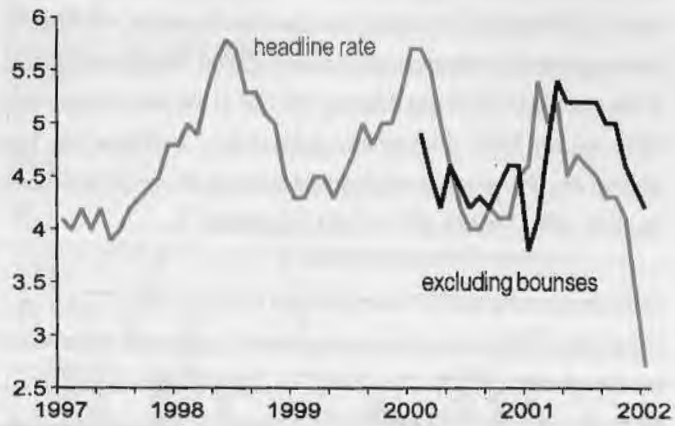
Other labour market figures support a weakening position. Manufacturing employment is declining at its steepest rate since the 1991 recession with services employment also falling very slightly into quarter four (construction employment is holding up the total), hours data recorded a fall into the latest two three-month periods, redundancy data showed a rise over the year, economic inactivity has increased quite markedly across the past year and external sources generally report a deteriorating position.

Figure 10
Labour Force Survey



The average earnings index shows slowing earnings, with the headline rate continuing its sharp slowdown into January to 2.7 per cent from 3.4 per cent in December. The figures excluding bonuses show earnings inflation also weakening (figure 11). While the story in the headline figures is partly due to falling bonuses, particularly in the financial services, the figures excluding bonuses are perhaps indicative of a less 'tight' labour market.

Figure 11
Average earnings index
growth



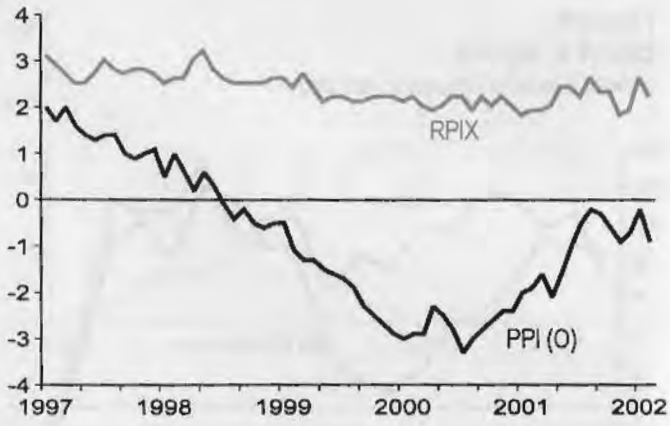
Prices

At the factory gate, output prices show no inflation and input prices show deflation: the headline output price index shows a fall of 0.3 per cent in the year to February and the input price measure a fall of 7.3 per cent. Both figures are influenced. by recent movements to the price of oil, but underlying index numbers across recent months continue to confirm the same overall story. This weak producer price inflation follows perhaps from the deteriorating global conditions, with over-supply becoming a significant phenomenon.

After a rise to 2.6 per cent in January, RPIX fell back to 2.2 per cent in February 2002. Overall the figures continue to suggest inflation is close to the Monetary Policy Committee's target, and the figures for other goods (including for example cars, other durables, clothing and DIY goods), the series perhaps most susceptible to consumer demand pressures has showed a resumed acceleration in the rate of deflation.

Overall then earnings, consumer and producer price pressures remain very subdued by historical standards.

Figure 12
Consumer prices



Forecasts for the UK Economy

A comparison of independent forecasts, March 2002

The tables below are extracted from HM Treasury's "FORECASTS FOR THE UK ECONOMY" and summarise the average and range of independent forecasts for 2002 and 2003, updated monthly.

	Independent Forecasts for 2002		
	Average	Lowest	Highest
GDP growth (per cent)	1.9	0.4	2.7
Inflation rate (Q4: per cent)			
- RPI	2.4	1.3	4.0
- RPI excl MIPs	2.2	1.6	3.1
Unemployment (Q4, mn)	1.06	0.91	1.20
Current Account (£ bn)	-21.6	-30.9	-9.8
PSNB *(2001-02, £ bn)	8.8	-1.6	15.4

	Independent Forecasts for 2003		
	Average	Lowest	Highest
GDP growth (per cent)	2.6	-0.1	3.6
Inflation rate (Q4: per cent)			
- RPI	2.9	2.0	4.3
- RPI excl MIPs	2.4	1.5	3.3
Unemployment (Q4, mn)	1.05	0.66	1.35
Current Account (£ bn)	-23.0	-44.8	-8.0
PSNB* (2002-03, £ bn)	13.6	6.6	22.0

NOTE: "FORECASTS FOR THE UK ECONOMY" gives more detailed forecasts, covering 27 variables and is published monthly by HM Treasury, available on annual subscription, price £75. Subscription enquiries should be addressed to Miss B K Phamber, Public Enquiry Unit, HM Treasury, Room 88/2, Parliament Street, London SW1P 3AG (Tel: 020-7270 4558). It is also available at the Treasury's internet site: http://www.hm-treasury.gov.uk.

* PSNB: Public Sector Net Borrowing.

International Economic Indicators - April 2002

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Overview

The slowdown in the world's major economies is continuing, with Germany, France and Italy posting negative GDP growth in 2001 quarter four and Japan posting negative GDP growth in 2001 quarter three. However, 2001 quarter four saw USA returning to positive GDP growth. Inflationary pressure has increased a little in the major economies although prices at the factory gate are still subdued. Industrial production is the area of main decline, with the severest declines occurring in Japan. Trade and investment are declining, but household demand broadly continues to grow. While unemployment is still rising in major economies, there is a slight moderation in USA and Japan.

EU15

EU GDP growth remained weak, with quarterly growth of 0.3 per cent in the third quarter of 2001, up slightly on the 0.2 per cent growth rate seen in the second quarter.

Demand data shows the main source of the slowdown has been a sharp deterioration in investment compared with the previous year, accompanied by sharp weakening in both exports and imports.

Index of Production data shows the potential source of the slowdown from the output perspective, with the fourth quarter of 2001 showing a contraction of 1.6 per cent from a revised fall of 0.3 per cent in the third quarter. Comparing 2001 quarter four with the same quarter a year ago shows the index falling by 3.3 per cent from a fall of 0.9 per cent in 2001 quarter three. Overall, IOP growth for 2001 was a negative 0.1 per cent, a sharp contrast to growth of 4.8 per cent for 2000.

The fourth quarter of 2001 saw a fall in annual producer prices, down 1.0 per cent, after growing by 0.7 per cent in the third quarter. Growth in consumer prices remained weak, with the rate dropping from 2.5 per cent in the third quarter to 2.0 per cent in the fourth quarter. January figures however show a slight increase in consumer inflation and moderation of producer price falls. These may be due to oil price increases.

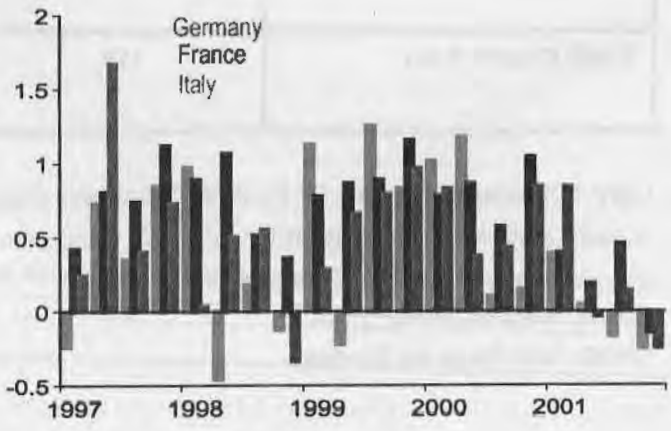
EU employment figures continue to show growth, although at a declining rate. Annual growth for 2001 was 1.2 per cent down from 1.7 per cent in the previous year. Annual growth in the year to the fourth quarter was 0.8 per cent down from 1.1 per cent in 2001 quarter three. The unemployment rate for January 2002 stood at 7.7 per cent, the same as for the previous month. Annual earnings growth continues to hold at 3.4 per cent for both quarters two and three.

Germany

The latest data for Germany shows quarterly GDP growth contracting for the second consecutive quarter (figure 1). Growth fell by 0.3 per cent in the fourth quarter from a fall of 0.2 per cent in the third. All components of GDP are weak, with households and investment making negative contributions of 0.3 per cent and 0.2 per cent to GDP respectively. Retail sales figures echo consumer demand weakness with sales in the fourth quarter of 2001 showing a sharp decline of 2.1 per cent from a decline of 0.7 per cent in the previous quarter. Also, exports which had until now made positive contributions to GDP made a negative contribution of 0.4 per cent. However, government consumption and inventories both supported GDP by making strong positive contributions to GDP growth in the fourth quarter of 0.2 per cent and 0.4 per cent respectively, after both made negative contributions in the previous quarter.

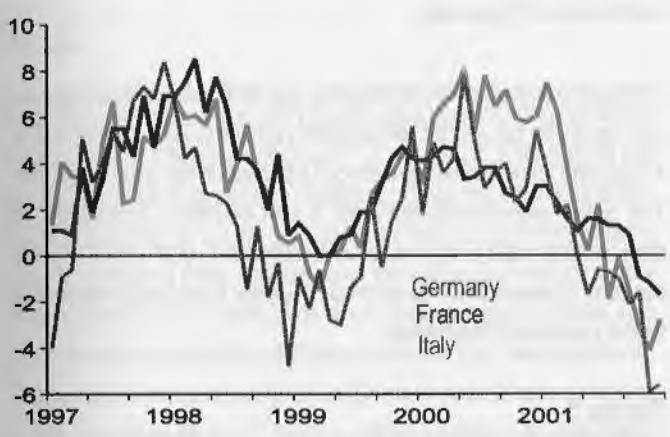
Industrial production, which showed a more modest decline in quarter three, declined sharply in the fourth quarter of 2001, from a negative 0.3 per cent in the third quarter to a negative 2.3 per cent in the fourth quarter.

Figure 1
GDP: Germany, France & Italy
growth, quarter on quarter a year ago



Consumer prices on the other hand strengthened with monthly figures in January 2002 at 2.1 per cent from 1.7 per cent in the previous two months (figure 3). Producer prices fell in January 2002 by 0.1 per cent from a positive 0.1 per cent in December. This is the first time producer prices are negative since September 1999.

Figure 2
IOP Germany, France & Italy
growth, month on month a year ago



The slowdown in output in 2001 appears to be feeding through into the unemployment figures. Unemployment rose to 8.1 per cent in January 2002, a 0.1 per cent increase over last month's figure and up from a recent low of 7.7 per cent in 2001 quarter one (figure 4). Also, employment growth contracted in the fourth quarter of 2001, with annual growth figures for the quarter showing negative growth of 0.2 per cent, the first fall since 1997.

In line with a deteriorating labour market, annual earnings growth weakened further, growing by just 1.1 per cent in the third quarter which, after accounting for inflation in the quarter, implied a fall in real earnings.

France

The latest figures for France show GDP growth negative for the first time since 1996 quarter four. The French economy contracted by 0.1 per cent in 2001 quarter four from a positive 0.5 per cent in the previous quarter (figure 1).

All components of GDP are either weak or negative. Government and investment did not make any contribution to GDP in the quarter. Although the main driver of the particular weakness in the French economy in quarter four is the substantial slowing in household spending, which contributed 0.1 per cent to GDP compared with an 0.6 contribution in the previous quarter. Retail sales figures echoed the weak household demand with a sharp contraction in January of 2.8 per cent up from a negative 0.6 per cent in December. Stockbuilding and exports both made negative contributions to GDP. The position was moderated by a sharp fall in imports of 1.2 per cent from a negative 0.5 per cent in the previous quarter. Trade therefore made a net positive contribution of 0.1 per cent to quarterly GDP.

Having returned to positive growth in 2001 quarter three after two consecutive quarters of negative growth, industrial production again contracted in the fourth quarter of 2001 by 1.5 per cent.

The inflationary position in France has worsened in the latest period with respect to the ECB target. In January 2002, consumer prices were 2.3 per cent up from 1.4 per cent in December (figure 3). Producer prices are also negative in January at 0.1 per cent. This is the first negative growth in producer prices since 1999 quarter three.

The weaker economic activity is also feeding through to the unemployment figures. Quarterly figures show unemployment rose for the second successive quarter and this time by 0.2 percentage points, taking the rate to 8.8 per cent in the fourth quarter of 2001. This rate increased to 9.0 per cent in January 2002 (figure 4). Employment growth also continued its slowdown in the third quarter of 2001, with the annual rate of 1.5 per cent the lowest since the third quarter of 1998.

Reflecting the general slowdown, annual earnings growth remained at 4.2 per cent in the third quarter. However, real wages are still positive despite the rise in inflation.

Figure 3
CPI: Germany, France & Italy
growth, month on month a year ago

Italy

The Italian economy contracted by 0.3 per cent in the fourth quarter of 2001, after posting growth of 0.1 per cent in the previous quarter (figure 1). However, the breakdown of contributors to GDP growth is not available with this latest data to enable an analysis of the determinants of

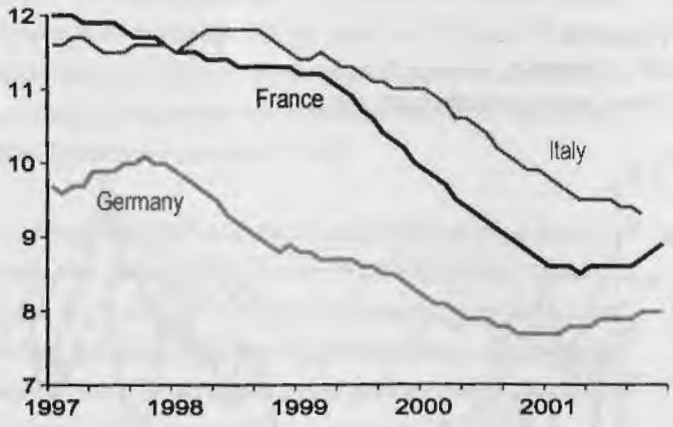
this decline. Up to quarter three however, as with other countries, investment and trade led weakness, with household demand only moderating.

On the output side, as with other countries, this slowdown has been driven by production, with quarterly industrial production in 2001 quarter four falling by 1.8 per cent from a negative 0.5 per cent in the previous quarter. Annual figures show a fall for the fourth quarter of 4.3 per cent from a fall of 1.2 per cent in the previous quarter.

Unlike in Germany and France, where consumer price inflation increased a little, Italy's CPI figures remained stable in January 2002 at 2.4 per cent, the same as in the previous two months (figure 3). Prices at the factory gate are still negative, with producer prices in January falling by 1.2 per cent.

Reflecting the weakening activity, annual growth in employment slowed further, to 1.1 per cent in the fourth quarter of 2001 from 1.8 per cent in quarter three. The rate for 2001 as a whole was, at 2.0 per cent, up slightly on the 1.9 per cent rise recorded in 2000. On the other hand, unemployment was down to 9.4 per cent of the workforce in the third quarter and the rate in October was lower still, at 9.3 per cent (figure 4), but this data is now increasingly out of date.

Figure 4
Unemployment: Germany, France & Italy
percentage of total workforce



Annual earnings growth continues to be weak, with growth in the fourth quarter of 2001 of 1.8 per cent, although this is the second successive quarter of slightly rising earnings growth

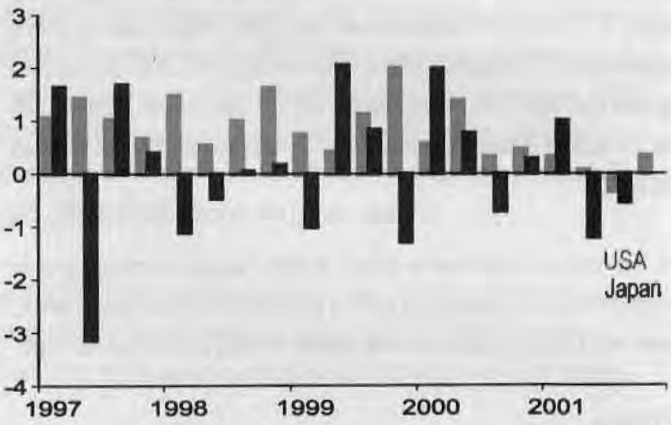
USA

2001 quarter four data show the US economy returning to positive quarterly GDP growth of (revised) 0.3 per cent after negative growth of 0.3 per cent in the third quarter (figure 5). Annual growth for 2001 as a whole was 1.2 per cent compared to 4.1 per cent the previous year.

Household and government spending both supported GDP growth by making positive and increased contributions to the change in quarterly GDP growth of 1.0 per cent and 0.2 per cent respectively, with household spending rebounding strongly from 0.2 per cent in 2001 quarter three. The war on terrorism could partly explain the increased government spending. On the other hand investment, spending continues to decline and made a negative contribution to quarterly GDP growth of 0.3 per cent. Exports also made a negative contribution to quarterly GDP of 0.4 per cent and with an increase in imports, trade made a net negative contribution of 0.1 per cent.

Echoing the consumer demand figures, US retail sales data accelerated very rapidly on the quarter, with quarterly growth in 2001 quarter four of 4.3 per cent compared with growth of 0.6 per cent in the previous quarter. The higher sales have been meet in part by falls in inventories, as stockbuilding made a large negative contribution to quarterly GDP of 0.6 per cent. Cheap finance deals on cars appear to be partly responsible for this increased consumption.

Figure 5
GDP: USA & Japan
growth, quarter on previous quarter



Industrial production in the US has continued to decline, with quarterly growth in 2001 quarter four a negative 1.8 per cent. Quarter on same quarter a year ago growth in 2001 shows industrial production declining by 5.9 per cent in quarter four, the largest decline since 1984 quarter four. Overall, the decline for 2001 was 3.6 per cent, having grown by 4.5 per cent the previous year. Continuing falls in manufacturing output, low capacity utilisation undercutting the incentive for new investment and previous over-investment may be reasons for these sharp declines.

In spite of the spurt of consumer spending, inflationary pressures actually remain subdued. Annual consumer prices slowed from 2.7 per cent in 2001 quarter three to 1.8 in quarter four. Consumer prices were 1.1 percent in January 2002 (figure 6). Producer prices are still negative and increasingly so, with annual figures showing PPI declining by 1.7

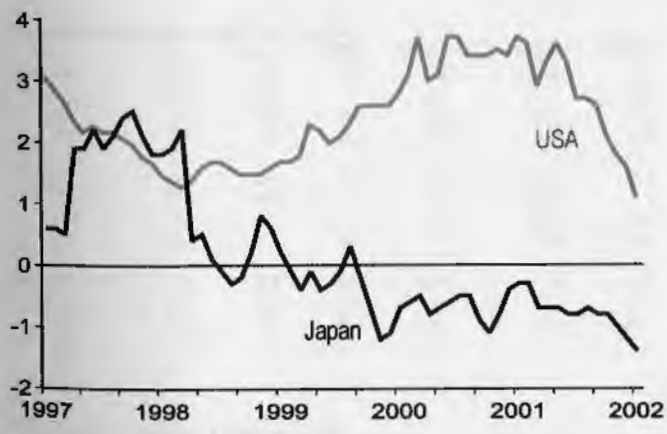
per cent in 2001 quarter four from 0.6 per cent in the previous quarter. Producer prices in January 2002 were a negative 2.3 per cent.

Having declined considerably in the second half of 2001, unemployment figures are showing a slight improvement, with the rate now standing at 5.6 per cent in January 2002 down from 5.8 per cent in December 2001. Earnings growth that had remained subdued for 2001 also increased from 3.4 per cent in the last seven months of the year to 4.2 per cent in January 2002.

Japan

The latest quarter three data show that the Japanese economy contracted by 0.5 per cent following a decline of 1.2 per cent in 2001 quarter two (figure 5). Private consumption made a very large negative contribution to change in GDP of 1.0 per cent as consumers refuse to spend in the face of persistent price deflation and job losses (echoed by a very substantial decline in retail sales). Exports and changes in stock also made negative contributions of 0.3 per cent and 0.1 per cent respectively. The position is moderated slightly by the positive contribution made by investment expenditure of 0.5 per cent from a negative contribution of 0.5 per cent in 2001 quarter two.

Figure 6
CPI: USA & Japan
growth, month on month a year ago



Japanese industrial production remains in sharp decline, although the quarter four data shows that the rate of decline may have slowed a little. The quarterly figures show that the decline eased to a contraction of 2.4 per cent in 2001 quarter four, from a contraction of 4.0 per cent in the previous two quarters. However, the monthly figures still show a contraction in the twelve months to January 2002 of 10.7 per cent from a decline of 13.1 in the previous month. This substantial deterioration may reflect the structure of the Japanese economy. The economy's dependence on the high tech industry make it particularly vulnerable to the vagaries of that industry and with the present downturn in many other economies, it is likely to experience difficulties in its trade position.

Consumer and producer prices continue to fall, continuing the deflation that began in mid-1998 (figure 6). Annual growth figures for 2001 quarter four show that consumer and producer prices declined by 1.0 per cent and 1.5 per cent respectively.

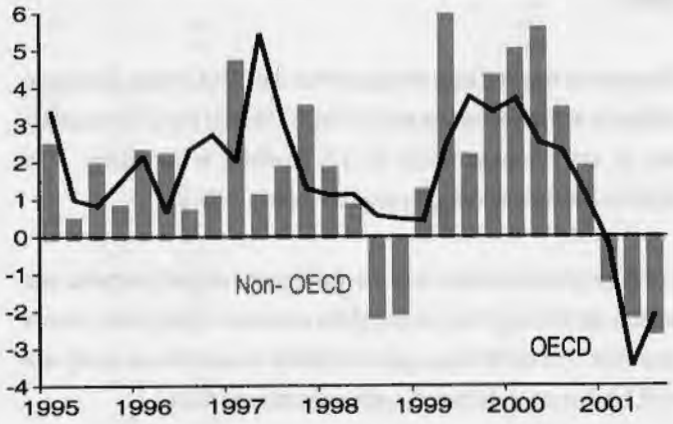
The weakening economy, reflected mainly by deteriorating industrial production and persistent price deflation, has led to severe job loses. However the unemployment rate fell slightly in January 2002 to 5.3 per cent of the workforce from 5.5 per cent in December. Although this rate is still unprecedented since at least before 1960.

Subsequently, earnings growth also contracted considerably with negative annual growth in 2001 quarter four of 0.6 per cent, slightly worse than 2001 quarter three, where earnings fell by 0.4 per cent. The latest monthly figures show a very large decline in earnings of 3.4 per cent in January 2002.

World Trade

With national figures showing deterioration, world trade figures are now showing contraction in global trade, albeit at a lag due to later production of these figures. Total trade in manufactures for 2001 quarter two contracted by 2.7 per cent and total trade in goods contracted by 2.3 per cent compared with contractions of 0.9 per cent and 0.2 per cent respectively in the previous quarter.

Figure 7
OECD & Non - OECD export of manufactures
growth, quarter on previous quarter



A closer look at the breakdown of the total trade figures shows that total export of manufactures contracted by 2.2 per cent in 2001 quarter three, following a decline of 3.2 per cent in the second quarter of 2001. OECD exports of manufactures declined by 2.1 per cent in 2001 quarter three following a significant decline of 3.5 per cent in the previous quarter (figure

7). Export of manufactures by non-OECD countries declined by 2.6 per cent in 2001 quarter three from a decline of 2.2 per cent in the previous quarter (figure 7). Exports of goods also show considerable contraction in 2001 quarter two, with the position showing a slight moderation in 2001 quarter three for both OECD and non-OECD countries.

Imports have also contracted considerably. Total imports of manufactures contracted by 2.2 per cent in 2001 quarter two. OECD imports of both manufactures and goods declined by 1.7 per cent and 1.5 per cent respectively in the third quarter of 2001. Non- OECD imports of manufactures and goods contracted by 1.3 per cent and 1.2 per cent in 2001 quarter two respectively.

On a general note, the slowdown in trade for both OECD and non-OECD countries in recent quarters reflects the weak economic picture in individual economies such as the US economy, the fragility of the Japanese economy and the slowdown in Europe.

Notes

The series presented here are taken from the OECD's Main Economic Indicators and are shown for each of the G7 (except the UK) economies and for the European Union (EU15) countries in aggregate. The definitions and methodologies used conform to SNA 93.

Comparisons of indicators over the same period should be treated with caution, as the length and timing of the economic cycles varies across countries. For world trade, goods includes manufactures, along with food, beverages and tobacco, basic materials and fuels.

Data for EU15, France, Germany, Italy, the USA and Japan are all avaliablle on an SNA93 basis. Cross country comparisons are now more valid.

1 European Union 15

	GDP	PFC	GFC	GFCF	ChgStk[1]	Exports	less Imports	IoP	Sales	CPI	PPI	Earnings	Empl	Unempl
		Contribution to change in GDP												
Percentage change on a year earlier	ILGB	HUDS	HUDT	HUDU	HUDV	HUDW	HUDX	ILGV	ILHP	HYAB	ILAI	ILAR	ILIJ	GADR
1996	1.7	1.2	0.3	0.4	–0.5	1.5	1.2	0.6	0.6	2.5	0.7	3.5	0.5	10.6
1997	2.6	1.3	0.2	0.7	0.1	3.1	2.7	3.9	1.5	2.0	0.9	2.9	1.0	10.4
1998	2.9	1.9	0.3	1.3	0.4	2.1	3.1	3.8	2.8	1.8	–0.4	3.1	1.7	9.8
1999	2.6	2.0	0.4	1.0	–0.2	1.8	2.3	1.8	2.1	1.2	–	2.7	1.7	9.0
2000	3.5	1.8	0.4	1.0	–	4.1	3.7	4.8	2.2	2.5	4.8	3.3	1.7	8.1
2001	..	..	..	..	..	..	..	–0.1	1.4	2.5	1.3	..	1.2	7.6
1999 Q1	2.0	2.1	0.5	0.9	–0.3	0.7	1.9	0.5	2.3	1.2	–1.8	2.8	1.8	9.3
Q2	2.2	1.9	0.4	0.9	–0.2	1.1	1.9	0.6	1.5	1.1	–1.0	1.8	1.7	9.1
Q3	2.7	2.0	0.4	1.0	–0.3	2.1	2.5	2.1	1.9	1.2	0.5	3.6	1.9	8.9
Q4	3.5	2.0	0.5	1.1	–	3.2	3.2	4.1	2.8	1.6	2.4	2.7	1.7	8.6
2000 Q1	3.7	1.9	0.4	1.1	–0.2	3.8	3.2	4.2	2.4	2.1	4.1	3.6	1.6	8.4
Q2	3.9	2.1	0.4	1.2	0.1	4.1	4.0	5.7	2.8	2.3	4.9	3.6	1.8	8.2
Q3	3.3	1.7	0.3	1.0	0.1	4.2	4.0	4.9	2.1	2.7	5.1	2.6	1.6	8.0
Q4	3.0	1.4	0.3	0.9	–0.1	4.2	3.7	4.3	1.6	2.8	5.1	3.5	1.8	7.8
2001 Q1	2.7	1.3	0.4	0.5	–0.2	3.3	2.6	3.8	1.8	2.7	3.3	2.6	1.7	7.6
Q2	1.9	1.3	0.3	0.2	–0.4	1.8	1.2	0.3	1.8	2.9	2.5	3.4	1.1	7.6
Q3	1.7	1.3	0.4	–0.1	–0.3	0.2	–0.3	–0.9	1.2	2.5	0.7	3.4	1.1	7.6
Q4	..	..	..	..	..	..	..	–3.3	0.5	2.0	–1.0	..	0.8	7.6
2002 Q1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2001 Feb	..	..	..	..	..	..	..	4.0	0.9	2.7	3.4	..	..	7.6
Mar	..	..	..	..	..	..	..	2.7	1.8	2.6	2.9	..	..	7.6
Apr	..	..	..	..	..	..	..	0.8	1.8	2.8	2.9	..	..	7.6
May	..	..	..	..	..	..	..	–0.4	0.9	3.2	2.6	..	..	7.6
Jun	..	..	..	..	..	..	..	0.8	2.8	2.9	2.1	..	..	7.6
Jul	..	..	..	..	..	..	..	–1.2	0.9	2.7	1.2	..	..	7.6
Aug	..	..	..	..	..	..	..	–0.3	1.8	2.7	0.9	..	..	7.6
Sep	..	..	..	..	..	..	..	–1.1	0.9	2.3	0.1	..	..	7.6
Oct	..	..	..	..	..	..	..	–2.5	0.9	2.2	–0.7	..	..	7.6
Nov	..	..	..	..	..	..	..	–3.9	0.9	1.9	–1.2	..	..	7.6
Dec	..	..	..	..	..	..	..	–3.6	–	1.9	–1.0	..	..	7.7
2002 Jan	..	..	..	..	..	..	..	..	..	2.3	–0.6	..	..	7.7
Feb	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Percentage change on previous quarter	ILGL	HUDY	HUDZ	HUEA	HUEB	HUEC	HUED	ILHF	ILHZ	ILIT
1999 Q1	0.7	0.7	0.2	0.3	–0.2	0.4	0.6	0.2	0.7	–0.3
Q2	0.6	0.2	–	0.2	–0.1	0.9	0.5	0.7	–0.4	1.1
Q3	1.1	0.6	0.1	0.4	–0.2	1.1	0.9	1.6	1.3	0.9
Q4	1.0	0.5	0.1	0.2	0.4	0.9	1.0	1.4	1.2	0.1
2000 Q1	0.9	0.6	0.1	0.3	–0.3	0.9	0.7	0.4	0.3	–0.4
Q2	0.9	0.4	0.1	0.3	0.2	1.1	1.2	2.1	–	1.2
Q3	0.5	0.2	–	0.2	–0.2	1.2	1.0	0.9	0.6	0.7
Q4	0.6	0.2	0.1	0.1	0.2	0.8	0.8	0.9	0.6	0.3
2001 Q1	0.6	0.5	0.1	–0.1	–0.4	0.1	–0.3	–0.1	0.5	–0.5
Q2	0.2	0.3	0.1	–	–	–0.4	–0.2	–1.3	–	0.7
Q3	0.3	0.2	0.1	–0.1	–0.1	–0.3	–0.5	–0.3	–	0.6
Q4	..	..	..	..	..	..	..	–1.6	–	–
2002 Q1	..	..	..	..	..	..	..	..	..	..

Percentage change on previous month	ILKF	ILKP
2001 Jan	–0.9	0.9
Feb	0.5	–0.9
Mar	–0.5	–
Apr	–1.1	–
May	–0.2	–
Jun	0.3	0.9
Jul	–1.0	–0.9
Aug	1.3	0.9
Sep	–1.0	–0.9
Oct	–1.3	–
Nov	–0.6	0.9
Dec	0.9	–0.9
2002 Jan	..	..

GDP = Gross Domestic Product at constant market prices
PFC = Private Final Consumption at constant market prices
GFC = Government Final Consumption at constant market prices
GFCF = Gross Fixed Capital Formation at constant market prices
ChgStk = Change in Stocks at constant market prices

Sales = Retail Sales Volume
CPI = Consumer Prices, measurement not uniform among countries
PPI = Producer Prices (manufacturing)
Earnings = Average Wage Earnings (manufacturing), definitions of coverage and treatment vary among countries

2 Germany

	GDP	Contribution to change in GDP: PFC	GFC	GFCF	ChgStk	Exports	less Imports	IoP	Sales	CPI	PPI	Earnings	Empl[1]	Unempl
Percentage change on a year earlier	ILFY	HUBW	HUBX	HUBY	HUBZ	HUCA	HUCB	ILGS	ILHM	HVLL	ILAF	ILAO	ILIG	GABD
1996	0.8	0.5	0.4	–0.1	–0.4	1.3	0.8	0.7	–1.1	1.4	–1.2	3.5	–0.4	8.9
1997	1.5	0.4	0.1	0.2	–	2.9	2.0	3.7	–1.7	1.9	1.1	1.5	–0.3	9.9
1998	1.7	0.9	0.2	0.5	0.5	1.7	2.2	4.1	1.0	1.0	–0.4	1.8	1.5	9.3
1999	1.7	1.7	0.3	0.8	–0.4	1.5	2.3	1.6	0.3	0.6	–1.0	2.6	0.8	8.6
2000	3.2	0.9	0.2	0.7	0.3	4.2	3.1	6.2	1.3	1.9	3.4	2.7	0.5	7.9
2001	0.7	0.7	0.3	–1.0	–0.9	1.7	0.1	0.5	–	2.5	2.9	..	0.2	7.9
1999 Q1	0.7	1.8	0.4	0.3	–0.4	0.1	1.6	–0.6	1.4	0.3	–2.4	2.5	1.1	8.8
Q2	1.0	1.7	0.2	0.7	–0.5	0.7	1.9	0.5	–0.6	0.5	–1.7	2.4	0.3	8.7
Q3	2.1	1.7	0.3	1.0	–0.5	2.0	2.5	2.0	–0.4	0.7	–0.7	2.7	1.4	8.6
Q4	3.0	1.5	0.4	1.2	–0.3	3.3	3.0	4.2	0.9	1.0	0.6	3.0	0.7	8.4
2000 Q1	2.9	0.6	0.3	0.9	–0.5	4.3	2.6	5.1	–0.3	1.7	2.3	2.8	0.4	8.1
Q2	4.4	1.7	0.4	0.8	0.3	4.0	2.8	6.7	4.2	1.6	2.6	2.4	0.6	7.9
Q3	3.2	1.1	0.1	0.6	0.4	4.2	3.1	7.1	1.5	2.0	3.7	3.3	0.3	7.8
Q4	2.5	0.4	0.2	0.4	1.1	4.5	4.1	5.8	–0.2	2.4	4.5	2.4	0.5	7.7
2001 Q1	1.8	0.9	0.3	–0.5	–0.2	3.1	1.8	5.8	0.8	2.5	4.8	2.0	0.4	7.7
Q2	0.7	0.7	0.3	–0.8	–0.7	2.4	1.2	1.3	0.1	3.2	4.7	2.0	0.3	7.8
Q3	0.4	0.7	0.3	–1.4	–1.0	1.5	–0.3	–1.2	0.7	2.5	2.6	1.1	0.1	7.9
Q4	–	0.6	0.3	–1.3	–1.5	–	–2.0	–3.4	–1.4	1.8	0.3	..	–0.2	8.0
2002 Q1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2001 Feb	..	..	..	..	..	..	..	6.2	–1.6	2.6	4.7	..	..	7.7
Mar	..	..	..	..	..	..	..	3.7	2.0	2.5	4.9	..	..	7.8
Apr	..	..	..	..	..	..	..	1.4	0.2	2.9	5.0	..	..	7.8
May	..	..	..	..	..	..	..	0.2	–0.5	3.5	4.6	..	..	7.8
Jun	..	..	..	..	..	..	..	2.2	0.7	3.1	4.3	..	..	7.9
Jul	..	..	..	..	..	..	..	–1.9	0.4	2.6	3.1	..	..	7.9
Aug	..	..	..	..	..	..	..	–0.1	0.8	2.6	2.7	..	..	7.9
Sep	..	..	..	..	..	..	..	–1.5	0.9	2.1	1.9	..	..	7.9
Oct	..	..	..	..	..	..	..	–3.2	–1.6	2.0	0.6	..	..	8.0
Nov	..	..	..	..	..	..	..	–4.1	1.3	1.7	0.1	..	..	8.0
Dec	..	..	..	..	..	..	..	–2.8	–4.0	1.7	0.1	..	..	8.0
2002 Jan	..	..	..	..	..	..	..	..	..	2.1	–0.1	..	..	8.1
Feb	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Percentage change on previous quarter	ILGI	HUCC	HUCD	HUCE	HUCF	HUCG	HUCH	ILHC	ILHW				ILIQ	
1999 Q1	1.1	1.1	0.2	0.7	–0.3	0.4	0.8	0.2	0.7				–1.5	
Q2	–0.2	–0.5	–0.1	0.1	–	1.1	0.8	1.0	–2.9				0.7	
Q3	1.3	0.6	0.2	0.5	–0.2	0.9	0.7	1.7	1.3				1.0	
Q4	0.8	0.4	0.1	–0.1	0.2	0.8	0.7	1.2	1.8				0.5	
2000 Q1	1.0	0.1	0.1	0.3	–0.5	1.4	0.4	1.1	–0.4				–1.8	
Q2	1.2	0.6	–	–	0.8	0.8	0.9	2.5	1.5				0.9	
Q3	0.1	–0.1	–0.1	0.3	–0.2	1.1	0.9	2.1	–1.2				0.7	
Q4	0.2	–0.2	0.2	–0.3	1.0	1.1	1.7	–0.1	0.1				0.7	
2001 Q1	0.4	0.6	0.2	–0.5	–1.8	–	–1.8	1.1	0.5				–1.8	
Q2	–	0.4	–	–0.3	0.2	0.1	0.4	–1.8	0.8				0.8	
Q3	–0.2	–0.1	–0.1	–0.3	–0.4	0.2	–0.5	–0.3	–0.7				0.5	
Q4	–0.3	–0.3	0.2	–0.2	0.4	–0.4	–	–2.3	–2.1				0.4	
2002 Q1	..	..	..	..	..	..	..	..	..				..	
Percentage change on previous month								ILKC	ILKM					
2001 Jan								1.3	0.9					
Feb								0.1	–1.6					
Mar								–1.5	1.6					
Apr								–0.9	0.1					
May								–	0.5					
Jun								0.2	–0.5					
Jul								–1.3	–0.6					
Aug								2.0	0.5					
Sep								–1.4	–0.8					
Oct								–1.7	–2.1					
Nov								–1.2	3.3					
Dec								1.7	–5.1					
2002 Jan								..	..					

GDP = Gross Domestic Product at constant market prices
PFC = Private Final Consumption at constant market prices
GFC = Government Final Consumption at constant market prices
GFCF = Gross Fixed Capital Formation at constant market prices
ChgStk = Change in Stocks at constant market prices
Sales = Retail Sales volume
CPI = Consumer Prices measurement not uniform among countries
PPI = Producer Prices (manufacturing)
Earnings = Average Earnings (manufacturing), definitions of coverage and treatment vary among countries

3 France

	Contribution to change in GDP													
	GDP	PFC	GFC	GFCF	ChgStk	Exports	less Imports	IoP	Sales	CPI	PPI[1]	Earnings	Empl[2]	Unempl
Percentage change on a year earlier	ILFZ	HUBK	HUBL	HUBM	HUBN	HUBO	HUBP	ILGT	ILHN	HXAA	ILAG	ILAP	ILIH	GABC
1996	1.1	0.7	0.5	–	–0.6	0.7	0.3	0.9	–0.3	2.0	–2.7	2.6	0.1	11.9
1997	1.9	0.1	0.5	–	0.1	2.8	1.5	3.8	1.1	1.2	–0.6	2.6	0.7	11.8
1998	3.5	2.0	–	1.3	0.8	2.1	2.6	5.3	2.6	0.8	–0.9	2.2	1.5	11.4
1999	3.0	1.7	0.5	1.2	–0.4	1.0	1.0	2.0	2.4	0.5	–1.6	2.5	2.2	10.7
2000	3.6	1.6	0.5	1.2	0.4	3.5	3.8	3.5	0.5	1.7	2.1	5.2	2.6	9.3
2001	2.0	1.6	0.5	0.6	–1.0	0.3	–0.1	0.9	–0.1	1.7	1.5	..	..	8.6
1999 Q1	2.8	1.8	0.3	1.4	–0.1	0.1	0.8	0.7	3.2	0.2	–2.7	2.0	1.9	11.2
Q2	2.5	1.5	0.4	1.1	–0.5	0.4	0.5	0.5	1.9	0.4	–2.3	2.0	2.0	11.0
Q3	2.9	1.7	0.5	1.1	–0.8	1.4	1.0	2.3	2.3	0.5	–1.6	2.7	2.1	10.6
Q4	3.7	1.9	0.6	1.1	–0.2	2.2	1.9	4.4	2.2	1.0	–	3.4	2.4	10.2
2000 Q1	3.7	2.0	0.5	1.1	0.2	3.1	3.1	4.4	2.0	1.5	1.2	5.2	2.5	9.8
Q2	3.7	1.7	0.6	1.2	0.2	3.7	3.7	3.8	1.3	1.5	2.1	5.4	2.7	9.4
Q3	3.4	1.5	0.6	1.2	1.0	3.3	4.2	3.5	0.1	1.9	2.7	5.2	2.6	9.1
Q4	3.3	1.2	0.6	1.4	0.3	4.0	4.1	2.4	–1.3	1.9	2.4	5.0	2.6	8.8
2001 Q1	2.9	1.5	0.5	1.1	–0.7	2.7	2.2	2.3	1.3	1.2	2.5	4.3	2.4	8.6
Q2	2.2	1.4	0.5	0.6	–0.4	1.0	0.9	1.5	–0.4	2.1	1.8	4.2	1.9	8.6
Q3	2.1	1.7	0.5	0.5	–1.1	–0.1	–0.6	1.2	–0.7	1.9	1.1	4.2	1.5	8.6
Q4	0.9	1.6	0.4	0.1	–1.6	–2.2	–2.7	–1.3	–0.8	1.4	0.6	..	..	8.8
2002 Q1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2001 Feb	..	..	..	..	..	..	..	2.3	0.3	1.3	2.6	..	..	8.6
Mar	..	..	..	..	..	..	..	1.6	1.5	1.2	2.4	..	..	8.6
Apr	..	..	..	..	..	..	..	1.1	–0.2	1.8	2.0	..	..	8.5
May	..	..	..	..	..	..	..	1.6	–2.5	2.3	1.8	..	..	8.6
Jun	..	..	..	..	..	..	..	1.6	1.5	2.1	1.7	..	..	8.6
Jul	..	..	..	..	..	..	..	1.3	–0.8	2.1	1.3	..	..	8.6
Aug	..	..	..	..	..	..	..	1.3	–	1.9	1.1	..	..	8.6
Sep	..	..	..	..	..	..	..	0.9	–1.1	1.5	0.8	..	..	8.6
Oct	..	..	..	..	..	..	..	–0.9	–0.9	1.8	0.6	..	..	8.7
Nov	..	..	..	..	..	..	..	–1.2	–0.6	1.2	0.6	..	..	8.8
Dec	..	..	..	..	..	..	..	–1.7	–0.6	1.4	0.4	..	..	8.9
2002 Jan	..	..	..	..	..	..	..	..	–2.8	2.3	–0.1	..	..	9.0
Feb	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Percentage change on previous quarter	ILGJ	HUBQ	HUBR	HUBS	HUBT	HUBU	HUBV	ILHD	ILHX				ILIR	
1999 Q1	0.8	0.2	0.2	0.4	–0.3	0.2	–	–	0.1				0.6	
Q2	0.9	0.6	0.1	0.3	–0.2	0.5	0.4	1.1	–0.2				0.5	
Q3	0.9	0.5	0.1	0.2	–0.5	1.1	0.5	1.3	1.2				0.7	
Q4	1.2	0.6	0.2	0.2	0.8	0.3	0.9	2.0	1.0				0.7	
2000 Q1	0.8	0.3	0.1	0.4	0.1	1.1	1.2	–	–0.1				0.7	
Q2	0.9	0.3	0.2	0.4	–0.2	1.1	1.0	0.5	–0.8				0.7	
Q3	0.6	0.3	0.1	0.3	0.3	0.7	1.1	1.0	–				0.6	
Q4	1.0	0.2	0.2	0.3	0.1	1.0	0.8	0.9	–0.4				0.7	
2001 Q1	0.4	0.7	0.1	0.1	–0.9	–0.2	–0.6	–0.1	2.6				0.6	
Q2	0.2	0.1	0.1	–	0.2	–0.5	–0.3	–0.3	–2.5				0.1	
Q3	0.5	0.6	0.2	0.1	–0.5	–0.4	–0.5	0.7	–0.3				0.2	
Q4	–0.1	0.1	–	–	–0.4	–1.1	–1.2	–1.5	–0.5				..	
2002 Q1	..	..	..	..	..	..	..	..	..				..	
Percentage change on previous month								ILKD	ILKN					
2001 Jan								–	2.8					
Feb								–0.1	–0.7					
Mar								0.1	0.5					
Apr								–0.6	–2.9					
May								0.3	–0.5					
Jun								0.1	2.0					
Jul								0.7	–1.4					
Aug								–	0.7					
Sep								–0.6	–1.4					
Oct								–0.9	–0.3					
Nov								0.3	1.0					
Dec								–0.9	–0.1					
2002 Jan								..	0.6					

GDP = Gross Domestic Product at constant market prices
PFC = Private Final Consumption at constant market prices
GFC = Government Final Consumption at constant market prices
GFCF = Gross Fixed Capital Formation at constant market prices
ChgStk = Change in Stocks at constant market prices
Exports = Exports of goods and services
Sales = Retail Sales volume
CPI = Consumer Prices, measurement not uniform among countries
PPI = Producer Prices (manufacturing)
Earnings = Average Wage Earnings (manufacturing), definitions of coverage and treatment vary among countries
Empl = Total Employment not seasonally adjusted

4 Italy

	GDP	Contribution to change in GDP: PFC	GFC	GFCF	ChgStk	Exports	less Imports	IoP	Sales	CPI	PPI	Earnings	Empl	Unempl
Percentage change on a year earlier	ILGA	HUCI	HUCJ	HUCK	HUCL	HUCM	HUCN	ILGU	ILHO	HYAA	ILAH	ILAQ	ILII	GABE
1996	1.1	0.7	0.2	0.7	–0.7	0.2	–0.1	–1.6	1.2	4.0	1.8	3.1	0.5	11.5
1997	2.0	1.9	–	0.4	0.3	1.7	2.3	3.8	0.9	2.0	1.3	3.6	0.4	11.6
1998	1.8	1.8	0.1	0.8	0.3	1.0	2.2	1.4	1.1	2.0	0.1	2.8	1.2	11.7
1999	1.6	1.4	0.3	0.9	0.4	–	1.3	–	1.1	1.7	–0.2	2.3	1.2	11.2
2000	2.9	1.8	0.3	1.2	–1.0	2.9	2.2	4.1	–0.6	2.5	6.0	2.1	1.9	10.4
2001	1.8	..	..	..	..	..	..	–1.0	–1.2	2.7	1.9	1.7	2.0	..
1999 Q1	1.0	1.9	0.2	0.5	0.4	–1.3	0.8	–1.3	1.3	1.4	–1.8	3.0	1.2	11.4
Q2	1.2	1.2	0.2	0.7	1.2	–0.9	1.1	–2.4	0.3	1.4	–1.4	2.1	1.3	11.3
Q3	1.4	1.3	0.3	1.0	–0.1	0.2	1.3	0.4	0.3	1.7	–	2.3	1.2	11.1
Q4	2.8	1.1	0.3	1.5	–0.1	2.0	2.0	3.2	2.3	2.1	2.2	1.8	1.4	11.0
2000 Q1	3.3	1.4	0.3	1.4	–0.5	2.1	1.3	3.4	–0.6	2.4	4.7	1.9	1.2	10.9
Q2	3.0	2.0	0.3	1.4	–0.3	2.3	2.6	5.7	–0.3	2.6	6.2	2.5	1.5	10.6
Q3	2.6	1.8	0.3	1.3	–1.5	4.0	3.2	3.5	–	2.6	6.7	2.0	2.1	10.2
Q4	2.5	1.8	0.2	0.7	–1.6	3.2	1.8	3.5	–1.3	2.6	6.5	1.9	2.8	9.9
2001 Q1	2.5	1.0	0.2	0.5	–0.6	3.7	2.3	2.5	–0.3	2.9	4.8	2.0	3.1	9.7
Q2	2.1	0.8	0.2	0.2	–1.0	2.4	0.6	–0.8	–1.0	3.0	3.2	1.3	2.1	9.5
Q3	1.8	0.6	0.1	–	1.4	–1.0	–0.8	–1.2	–1.9	2.8	0.9	1.7	1.8	9.4
Q4	0.7	..	..	..	..	..	..	–4.3	–1.6	2.5	–1.0	1.8	1.1	..
2002 Q1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2001 Feb	..	..	..	..	..	..	..	1.8	–	3.0	5.0	2.0	..	9.7
Mar	..	..	..	..	..	..	..	2.2	–	2.8	4.2	2.1	..	9.6
Apr	..	..	..	..	..	..	..	–	–1.0	3.1	4.3	1.6	..	9.5
May	..	..	..	..	..	..	..	–1.7	–1.0	3.0	2.9	1.0	..	9.5
Jun	..	..	..	..	..	..	..	–0.6	–1.0	3.0	2.4	1.1	..	9.5
Jul	..	..	..	..	..	..	..	–0.7	–2.9	2.9	1.3	1.7	..	9.5
Aug	..	..	..	..	..	..	..	–1.0	–	2.8	1.2	1.8	..	9.4
Sep	..	..	..	..	..	..	..	–2.1	–2.9	2.6	0.4	1.7	..	9.4
Oct	..	..	..	..	..	..	..	–1.6	–1.0	2.5	–0.6	1.7	..	9.3
Nov	..	..	..	..	..	..	..	–5.9	–1.9	2.4	–1.3	1.8	..	..
Dec	..	..	..	..	..	..	..	–5.6	–1.9	2.4	–1.3	1.8	..	..
2002 Jan	..	..	..	..	..	..	..	..	..	2.4	–1.2	..	..	..

Percentage change on previous quarter	ILGK	HUCO	HUCP	HUCQ	HUCR	HUCS	HUCT	ILHE	ILHY	ILIS
1999 Q1	0.3	0.5	0.1	0.4	0.2	–0.2	0.6	0.3	1.0	–1.0
Q2	0.7	–0.1	0.1	0.2	0.1	0.4	0.1	–0.5	–	1.2
Q3	0.8	0.4	0.1	0.4	–0.7	0.7	–	2.1	–	1.3
Q4	1.0	0.3	0.1	0.5	0.3	1.1	1.3	1.3	1.3	–0.1
2000 Q1	0.8	0.8	0.1	0.3	–0.2	–0.1	–0.1	0.5	–1.9	–1.2
Q2	0.4	0.5	–	0.2	0.3	0.6	1.3	1.7	0.3	1.5
Q3	0.4	0.2	0.1	0.3	–1.9	2.3	0.6	–0.1	0.3	1.9
Q4	0.8	0.3	–	–0.1	0.3	0.3	–0.1	1.4	–	0.6
2001 Q1	0.9	–	–	0.2	0.7	0.4	0.4	–0.5	–1.0	–0.8
Q2	–	0.3	–	–0.1	–	–0.6	–0.3	–1.7	–0.3	0.5
Q3	0.1	–	–	–	0.4	–1.1	–0.8	–0.5	–0.7	1.6
Q4	–0.3	..	..	..	..	..	..	–1.8	0.3	–0.1
2002 Q1	..	..	..	..	..	..	..	..	..	..

Percentage change on previous month	ILKE	ILKO
2001 Jan	–2.0	–1.0
Feb	–0.2	1.0
Mar	0.4	–1.0
Apr	–2.1	–
May	0.4	–
Jun	0.1	–
Jul	–0.7	–1.0
Aug	0.6	1.0
Sep	–0.9	–1.0
Oct	–0.2	1.0
Nov	–2.6	–
Dec	1.7	–1.0
2002 Jan	..	..

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CPI = Consumer Prices, measurement not uniform among countries
PPI = Producer Prices (manufacturing)
Earnings = Average Wage Earnings (manufacturing), definitions of coverage and treatment vary among countries
Empl = Total Employment not seasonally adjusted

5 USA

	GDP	Contribution to change in GDP: PFC	GFC	GFCF	ChgStk	Exports	less Imports	IoP	Sales	CPI	PPI	Earnings	Empl[1]	Unempl
Percentage change on a year earlier	ILGC	HUDG	HUDH	HUDI	HUDJ	HUDK	HUDL	ILGW	ILHQ	ILAA	ILAJ	ILAS	ILIK	GADO
1996	3.6	2.1	0.1	1.5	–	0.9	1.0	4.6	5.6	2.9	2.3	3.3	1.4	5.4
1997	4.4	2.4	0.3	1.6	0.4	1.4	1.7	7.0	4.9	2.3	0.3	3.2	2.3	4.9
1998	4.3	3.2	0.2	2.0	0.2	0.3	1.6	5.1	7.1	1.6	–1.1	2.5	1.5	4.5
1999	4.1	3.3	0.3	1.6	–0.2	0.4	1.5	3.7	9.0	2.1	1.8	2.9	1.5	4.2
2000	4.1	3.3	0.4	1.4	–0.1	1.1	2.0	4.5	6.5	3.4	4.1	3.6	1.3	4.0
2001	1.2	2.1	0.4	–0.2	–1.2	–0.6	–0.4	–3.6	4.5	2.8	0.7	3.2	–0.2	4.8
1999 Q1	4.0	3.3	0.4	1.8	–0.3	0.1	1.3	3.4	9.6	1.7	–	1.8	1.7	4.3
Q2	3.9	3.3	0.1	1.6	–0.1	0.3	1.4	3.2	8.2	2.2	1.1	2.4	1.4	4.3
Q3	4.0	3.4	0.3	1.6	–0.4	0.6	1.7	3.7	9.7	2.4	2.4	3.7	1.4	4.2
Q4	4.4	3.4	0.4	1.4	0.1	0.5	1.7	4.4	8.5	2.6	3.2	3.6	1.5	4.1
2000 Q1	4.2	3.6	0.3	1.6	–0.6	1.0	2.0	4.8	8.6	3.2	4.6	4.2	1.6	4.0
Q2	5.2	3.3	0.6	1.6	0.5	1.3	2.2	5.9	7.0	3.3	4.4	3.6	1.6	4.0
Q3	4.4	3.3	0.4	1.4	0.1	1.3	2.2	4.8	6.3	3.5	3.9	2.9	1.1	4.1
Q4	2.8	2.8	0.2	1.1	–0.5	0.8	1.8	2.6	4.2	3.4	3.4	3.5	1.0	4.0
2001 Q1	2.5	2.4	0.4	0.6	–0.6	0.5	0.9	–0.4	2.7	3.4	2.1	2.6	0.7	4.2
Q2	1.2	2.2	0.3	–	–1.3	–0.2	–0.1	–3.5	4.0	3.4	2.1	3.2	–0.1	4.5
Q3	0.5	1.6	0.4	–0.5	–1.2	–1.2	–1.2	–4.8	3.4	2.7	0.6	3.4	–0.2	4.8
Q4	0.4	2.1	0.6	–0.8	–1.7	–1.4	–1.4	–5.9	7.7	1.8	–1.7	3.4	–1.0	5.6
2002 Q1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2001 Feb	..	..	..	..	..	..	..	–0.3	2.6	3.6	2.0	2.6	0.7	4.2
Mar	..	..	..	..	..	..	..	–1.3	2.0	2.9	1.2	2.6	0.6	4.3
Apr	..	..	..	..	..	..	..	–2.4	4.4	3.3	2.3	2.6	–0.1	4.5
May	..	..	..	..	..	..	..	–3.4	3.7	3.6	2.6	3.5	0.1	4.4
Jun	..	..	..	..	..	..	..	–4.7	3.9	3.3	1.2	3.4	–0.2	4.6
Jul	..	..	..	..	..	..	..	–4.1	4.3	2.7	0.4	3.4	0.2	4.6
Aug	..	..	..	..	..	..	..	–4.6	4.5	2.7	0.9	3.4	–0.6	4.9
Sep	..	..	..	..	..	..	..	–5.7	1.4	2.6	0.7	3.4	–0.1	5.0
Oct	..	..	..	..	..	..	..	–5.9	9.1	2.1	–1.0	3.4	–0.6	5.4
Nov	..	..	..	..	..	..	..	–6.0	6.9	1.8	–1.6	3.4	–1.0	5.6
Dec	..	..	..	..	..	..	..	–5.8	7.1	1.6	–2.2	3.4	–1.4	5.8
2002 Jan	..	..	..	..	..	..	..	–5.1	5.8	1.1	–2.3	4.2	–1.8	5.6
Feb	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Percentage change on previous quarter	ILGM	HUDM	HUDN	HUDO	HUDP	HUDQ	HUDR	ILHG	ILIA				ILIU	
1999 Q4	2.0	0.9	0.2	0.3	0.6	0.3	0.4	1.5	2.1				0.3	
2000 Q1	0.6	1.0	–0.1	0.6	–0.7	0.3	0.6	1.4	2.6				–0.5	
Q2	1.4	0.6	0.3	0.3	0.5	0.4	0.6	1.7	0.1				1.2	
Q3	0.3	0.7	–0.1	0.1	–0.3	0.3	0.5	0.2	1.3				0.1	
Q4	0.5	0.5	0.1	0.1	–0.1	–0.1	–	–0.7	0.1				0.2	
2001 Q1	0.3	0.5	0.2	0.2	–0.8	–	–0.2	–1.6	1.2				–0.7	
Q2	0.1	0.4	0.1	–0.3	–0.1	–0.4	–0.4	–1.4	1.4				0.4	
Q3	–0.3	0.2	0.1	–0.4	–0.3	–0.6	–0.6	–1.2	0.6				–	
Q4	0.3	1.0	0.2	–0.3	–0.6	–0.4	–0.3	–1.8	4.3				–0.6	
2002 Q1	..	..	..	..	..	..	..	..	..				..	
Percentage change on previous month								ILKG	ILKQ				ILLA	
2001 Jan								–0.9	1.4				–1.2	
Feb								–0.2	–				0.2	
Mar								–0.4	–0.1				0.4	
Apr								–0.6	1.4				–0.1	
May								–0.3	–				–	
Jun								–0.9	0.1				0.6	
Jul								0.1	1.0				0.4	
Aug								–0.3	0.7				–1.1	
Sep								–1.1	–2.6				–	
Oct								–0.6	7.7				–	
Nov								–0.4	–2.6				–0.4	
Dec								–0.3	0.3				–0.1	
2002 Jan								–0.1	0.1				–1.6	

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PPI = Producer Prices (manufacturing)
Earnings = Average Earnings (manufacturing), definitions of coverage and treatment vary among countries
Empl = Total Employment not seasonally adjusted
Unempl = Standardised Unemployment rates: percentage of total workforce

Source: OECD - SNA93

1. Excludes members of armed forces

6 Japan

	Contribution to change in GDP													
	GDP	PFC	GFC	GFCF	ChgStk	Exports	less Imports	IoP[1]	Sales	CPI	PPI	Earnings[2]	Empl	Unempl
Percentage change on a year earlier														
	ILGD	HUCU	HUCV	HUCW	HUCX	HUCY	HUCZ	ILGX	ILHR	ILAB	ILAK	ILAT	ILIL	GADP
1996	3.6	1.3	0.4	2.0	0.3	0.6	1.0	2.2	0.6	0.1	–1.7	2.6	0.5	3.4
1997	1.8	0.5	0.2	0.2	–	1.1	0.1	4.0	–2.1	1.7	0.6	2.8	1.0	3.4
1998	–1.0	0.1	0.3	–1.2	–0.6	–0.2	–0.6	–6.7	–6.0	0.7	–1.3	–0.8	–0.6	4.1
1999	0.7	0.6	0.7	–0.2	–0.3	0.1	0.2	1.0	–2.6	–0.3	–1.4	–0.7	–0.8	4.7
2000	2.2	0.2	0.7	0.9	–0.1	1.3	0.8	5.2	–1.1	–0.7	0.1	1.7	–0.3	4.7
2001	..	..	..	..	..	..	..	–7.0	–1.3	–0.7	–0.9	–	–0.5	5.0
1999 Q1	–1.2	–0.4	0.4	–0.7	–0.6	–0.3	–0.3	–3.7	–4.6	–0.1	–2.2	–0.7	–1.2	4.6
Q2	1.3	1.3	0.8	–0.3	–0.3	–0.1	0.2	0.3	–2.5	–0.3	–1.7	–1.1	–1.1	4.7
Q3	2.1	1.6	0.8	0.1	–0.3	0.3	0.3	2.7	–2.2	–	–1.3	–0.4	–0.7	4.7
Q4	0.6	–	0.7	0.1	–0.2	0.7	0.8	5.1	–1.1	–1.0	–0.5	–0.5	–0.2	4.7
2000 Q1	3.6	1.7	0.8	0.6	–0.1	1.3	0.7	4.3	–2.2	–0.6	0.1	2.0	–0.5	4.8
Q2	2.3	0.3	0.8	0.7	–0.1	1.4	0.8	6.6	–1.5	–0.7	0.3	2.3	–0.4	4.7
Q3	0.7	–1.4	0.7	0.9	–	1.2	0.7	5.3	–0.4	–0.6	0.2	1.6	–0.4	4.7
Q4	2.3	0.2	0.7	1.3	0.1	1.0	0.9	4.4	–0.4	–0.8	–0.1	1.1	0.2	4.8
2001 Q1	1.4	0.8	0.6	0.4	–	0.2	0.7	0.6	2.3	–0.5	–0.4	0.5	0.5	4.7
Q2	–0.6	–	0.5	–0.2	–	–0.7	0.2	–5.2	–1.1	–0.7	–0.6	0.6	–0.4	4.9
Q3	–0.5	–0.2	0.4	0.2	–0.1	–1.1	–0.3	–10.4	–2.6	–0.8	–1.0	–0.4	–0.8	5.1
Q4	..	..	..	..	..	..	..	–12.8	–3.7	–1.0	–1.5	–0.6	–1.3	5.4
2002 Q1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2001 Feb	..	..	..	..	..	..	..	1.8	2.2	–0.3	–0.4	0.8	0.7	4.7
Mar	..	..	..	..	..	..	..	–1.4	2.3	–0.7	–0.4	0.5	0.5	4.7
Apr	..	..	..	..	..	..	..	–3.9	–	–0.7	–0.6	–	–0.2	4.8
May	..	..	..	..	..	..	..	–4.8	–1.1	–0.7	–0.6	–0.2	–0.4	4.9
Jun	..	..	..	..	..	..	..	–6.9	–2.2	–0.8	–0.7	2.1	–0.6	4.9
Jul	..	..	..	..	..	..	..	–8.6	–2.2	–0.8	–0.8	0.6	–0.6	5.0
Aug	..	..	..	..	..	..	..	–11.3	–3.3	–0.7	–1.0	–1.2	–0.6	5.0
Sep	..	..	..	..	..	..	..	–11.1	–2.2	–0.8	–1.0	–0.6	–1.3	5.3
Oct	..	..	..	..	..	..	..	–12.2	–3.4	–0.8	–1.3	–0.5	–1.6	5.4
Nov	..	..	..	..	..	..	..	–13.1	–2.2	–1.0	–1.6	0.5	–1.1	5.4
Dec	..	..	..	..	..	..	..	–13.1	–5.6	–1.2	–1.7	–1.8	–1.2	5.5
2002 Jan	..	..	..	..	..	..	..	–10.7	–4.4	–1.4	–1.6	–3.4	–1.4	5.3
Feb	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Percentage change on previous quarter														
	ILGN	HUDA	HUDB	HUDC	HUDD	HUDE	HUDF	ILHH	ILIB				ILIV	
1999 Q1	–1.0	–1.3	0.1	0.4	–0.1	–	0.2	1.4	0.4				–1.8	
Q2	2.1	1.6	0.4	–	0.1	0.1	0.2	–0.3	–0.4				2.2	
Q3	0.8	1.0	0.1	–0.2	–0.2	0.3	0.2	2.7	–0.4				–	
Q4	–1.3	–1.3	0.1	–	–0.1	0.2	0.2	1.2	–0.7				–0.6	
2000 Q1	2.0	0.4	0.2	0.8	0.1	0.7	0.1	0.6	–0.7				–2.1	
Q2	0.8	0.2	0.4	0.1	–	0.3	0.3	1.9	0.4				2.3	
Q3	–0.7	–0.7	–	–	–0.1	0.1	0.1	1.5	0.8				–	
Q4	0.3	0.3	–	0.3	–	–	0.4	0.3	–0.7				–	
2001 Q1	1.0	1.0	0.2	–	–	–0.2	–	–3.1	1.9				–1.8	
Q2	–1.2	–0.6	0.3	–0.5	–	–0.5	–0.2	–4.0	–2.9				1.4	
Q3	–0.5	–1.0	–	0.5	–0.1	–0.3	–0.4	–4.0	–0.8				–0.4	
Q4	..	..	..	..	..	..	..	–2.4	–1.9				–0.5	
2002 Q1	..	..	..	..	..	..	..	..	..				..	
Percentage change on previous month														
								ILKH	ILKR				ILLB	
2001 Jan								–3.7	2.2				–1.2	
Feb								0.6	–				–0.1	
Mar								–2.0	–1.1				0.4	
Apr								–2.0	–2.2				0.7	
May								–1.0	–				0.8	
Jun								–0.7	–				–0.2	
Jul								–2.3	–				–0.2	
Aug								0.3	–1.1				–0.1	
Sep								–3.3	–				–0.7	
Oct								0.1	–1.1				0.1	
Nov								–1.5	1.2				0.4	
Dec								1.7	–3.4				–1.1	
2002 Jan								–1.1	3.6				–1.4	

GDP = Gross Domestic Product at constant market prices
PFC = Private Final Consumption at constant market prices
GFC = Government Final Consumption at constant market prices
GFCF = Gross Fixed Capital Formation at constant market prices

Sales = Retail Sales volume
CPI = Consumer Prices, measurement not uniform among countries
PPI = Producer Prices (manufacturing)
Earnings = Average Earnings (manufacturing), definitions of coverage and

7 World trade in goods[1]

	Export of manufactures			Import of manufactures			Export of goods			Import of goods			Total trade	
	Total	OECD	Other	Total	OECD	Other	Total	OECD	Other	Total	OECD	Other	manufactures	goods
Percentage change on a year earlier														
	ILIZ	ILJA	ILJB	ILJC	ILJD	ILJE	ILJF	ILJG	ILJH	ILJI	ILJJ	ILJK	ILJL	ILJM
1992	4.3	3.3	8.6	5.3	4.3	8.3	4.2	3.7	5.9	5.1	4.2	7.8	4.8	4.6
1993	4.8	2.2	15.3	4.0	1.0	12.5	4.0	2.3	9.1	3.3	0.8	10.3	4.3	3.6
1994	12.0	9.9	19.9	11.9	12.3	11.0	10.6	9.3	14.0	10.9	11.0	10.8	12.0	10.8
1995	9.6	10.0	8.6	11.0	10.4	12.4	8.9	9.4	7.8	9.9	8.9	12.2	10.3	9.4
1996	6.4	6.4	6.5	6.9	7.8	4.6	6.6	6.4	7.2	6.0	7.0	3.5	6.7	6.3
1997	11.3	11.9	9.4	10.8	11.4	9.5	10.4	11.1	8.9	9.6	9.8	8.9	11.1	10.0
1998	6.0	6.4	4.8	6.8	9.5	–0.4	5.4	5.8	4.3	6.2	8.3	0.3	6.5	5.8
1999	5.9	6.1	5.6	7.9	10.4	0.8	5.4	5.7	4.7	6.3	8.8	–0.9	6.9	5.8
2000	13.8	12.6	18.3	14.6	13.9	16.6	12.6	12.1	13.8	13.0	12.1	15.9	14.2	12.8
2001	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1995 Q4	6.6	6.8	5.9	7.1	6.2	9.4	6.1	6.0	6.4	6.2	5.0	9.5	6.8	6.1
1996 Q1	5.6	5.6	5.7	6.8	7.2	5.8	5.5	5.1	6.6	6.1	6.2	5.7	6.2	5.8
Q2	5.7	5.2	7.6	5.9	6.6	4.1	5.7	4.9	7.8	5.0	5.8	3.1	5.8	5.4
Q3	6.7	6.8	6.2	6.9	8.7	2.5	7.0	7.0	7.2	5.9	7.8	1.1	6.8	6.4
Q4	7.8	8.1	6.5	8.0	8.9	5.8	8.4	8.8	7.3	7.1	8.3	4.0	7.9	7.7
1997 Q1	8.2	8.0	9.0	8.2	8.2	8.3	7.9	7.6	8.7	7.2	7.2	7.1	8.2	7.5
Q2	11.9	13.1	7.8	11.5	12.4	9.3	11.3	12.5	8.2	10.3	10.7	9.2	11.7	10.8
Q3	12.9	14.0	9.0	12.1	12.5	11.2	11.8	12.9	8.7	10.7	10.7	10.8	12.5	11.3
Q4	12.2	12.4	11.6	11.4	12.3	9.1	10.8	11.2	9.8	10.0	10.5	8.7	11.8	10.4
1998 Q1	10.7	11.4	8.5	10.5	13.1	3.7	10.0	11.0	7.4	9.7	11.5	4.7	10.6	9.8
Q2	7.1	6.8	8.3	7.8	9.5	3.2	6.3	6.2	6.5	7.0	8.4	3.4	7.5	6.7
Q3	4.1	4.1	4.0	4.9	7.8	–2.9	3.4	3.4	3.5	4.4	6.9	–2.3	4.5	3.9
Q4	2.2	3.3	–1.6	4.1	7.6	–5.4	1.9	2.5	–	3.5	6.5	–4.6	3.2	2.7
1999 Q1	1.5	2.6	–2.2	4.5	7.3	–3.5	1.4	1.8	0.3	3.5	6.2	–4.1	3.0	2.4
Q2	3.7	4.0	2.8	6.1	9.0	–2.2	3.7	3.7	3.5	4.6	7.6	–3.6	4.9	4.1
Q3	7.3	7.3	7.3	9.0	11.3	2.3	6.7	7.2	5.3	7.1	9.5	–	8.2	6.9
Q4	11.2	10.4	14.3	12.0	13.8	6.6	9.9	10.0	9.6	9.9	11.8	4.1	11.6	9.9
2000 Q1	14.9	14.0	18.5	14.3	14.9	12.6	13.4	13.6	12.7	12.4	12.9	10.9	14.6	12.9
Q2	14.9	14.0	18.1	15.4	15.2	16.2	13.4	13.3	13.5	13.7	13.1	15.6	15.2	13.5
Q3	14.0	12.4	19.6	15.5	14.4	19.1	12.9	11.9	15.7	14.2	12.7	19.0	14.7	13.6
Q4	11.5	10.0	16.8	13.0	11.3	18.6	10.7	9.8	13.4	11.6	9.7	17.9	12.3	11.2
2001 Q1	6.7	5.8	9.9	7.4	5.7	13.0	6.8	6.0	9.0	7.2	5.3	13.0	7.1	7.0
Q2	0.1	–0.4	1.8	0.9	–0.4	5.1	0.8	0.3	2.0	1.4	0.2	5.3	0.5	1.1
Q3	–4.5	–4.6	–4.1	..	–4.7	..	–3.3	–3.5	–2.7	..	–3.8	..	..	..
Q4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Percentage change on previous quarter														
	ILJN	ILJO	ILJP	ILJQ	ILJR	ILJS	ILJT	ILJU	ILJV	ILJW	ILJX	ILJY	ILJZ	ILKA
1995 Q4	1.3	1.5	0.8	1.3	1.9	–0.2	1.3	1.3	1.3	0.9	1.4	–0.2	1.3	1.1
1996 Q1	2.2	2.2	2.3	2.0	2.7	0.3	2.3	2.3	2.1	1.6	2.3	–0.3	2.1	1.9
Q2	1.0	0.7	2.2	1.0	1.0	1.0	1.1	0.7	2.0	1.1	1.3	0.5	1.0	1.1
Q3	2.0	2.3	0.7	2.4	2.8	1.2	2.3	2.5	1.6	2.2	2.5	1.2	2.2	2.2
Q4	2.4	2.7	1.1	2.4	2.2	3.0	2.5	2.9	1.4	2.1	1.9	2.7	2.4	2.3
1997 Q1	2.6	2.0	4.7	2.2	2.0	2.8	1.8	1.2	3.4	1.6	1.3	2.6	2.4	1.7
Q2	4.5	5.5	1.1	4.1	4.9	1.9	4.3	5.3	1.5	4.0	4.6	2.5	4.3	4.1
Q3	2.8	3.1	1.9	3.0	2.9	3.1	2.7	3.0	2.1	2.6	2.5	2.7	2.9	2.6
Q4	1.8	1.3	3.5	1.7	2.0	1.1	1.6	1.3	2.5	1.5	1.8	0.7	1.8	1.6
1998 Q1	1.3	1.1	1.8	1.4	2.7	–2.4	1.1	1.0	1.1	1.3	2.2	–1.2	1.3	1.2
Q2	1.1	1.1	0.8	1.6	1.6	1.5	0.7	0.8	0.7	1.5	1.6	1.2	1.3	1.1
Q3	–0.1	0.6	–2.1	0.2	1.3	–3.1	–0.1	0.2	–0.8	–	1.1	–3.0	0.1	–
Q4	–0.1	0.5	–2.1	1.0	1.8	–1.5	0.1	0.5	–0.9	0.6	1.4	–1.7	0.4	0.4
1999 Q1	0.6	0.4	1.2	1.7	2.4	–0.4	0.6	0.3	1.4	1.3	2.0	–0.7	1.2	1.0
Q2	3.2	2.5	5.9	3.1	3.2	2.9	3.0	2.6	3.9	2.6	2.9	1.7	3.2	2.8
Q3	3.4	3.8	2.2	3.0	3.5	1.4	2.9	3.6	0.9	2.3	2.9	0.6	3.2	2.6
Q4	3.5	3.3	4.3	3.8	4.1	2.7	3.1	3.1	3.0	3.3	3.6	2.3	3.7	3.2
2000 Q1	4.0	3.7	5.0	3.8	3.3	5.2	3.8	3.7	4.3	3.6	2.9	5.8	3.9	3.7
Q2	3.2	2.5	5.6	4.1	3.5	6.1	3.0	2.3	4.7	3.8	3.1	6.1	3.7	3.4
Q3	2.5	2.3	3.4	3.0	2.8	3.9	2.5	2.3	2.8	2.8	2.6	3.6	2.8	2.6
Q4	1.3	1.1	1.9	1.6	1.3	2.3	1.1	1.1	1.0	0.9	0.8	1.4	1.4	1.0
2001 Q1	–0.4	–0.2	–1.2	–1.4	–1.9	0.2	0.1	0.1	0.2	–0.5	–1.1	1.4	–0.9	–0.2
Q2	–3.2	–3.5	–2.2	–2.2	–2.5	–1.3	–2.8	–3.1	–2.0	–1.8	–2.0	–1.2	–2.7	–2.3
Q3	–2.2	–2.1	–2.6	..	–1.7	..	–1.6	–1.6	–1.9	..	–1.5	..	..	..
Q4	..	..	..	..	..	..	..	..	..	..	..	..	..	..

1 Data used in the World and OECD aggregates refer to Germany after unification

Source: OECD - SNA93

Productivity Measures: ONS Strategy

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Summary

Improving productivity is one of the Government's key policy objectives. This article provides a coherent strategy for ONS's work on productivity, with clear statements of the priorities. It starts with a quick review of the ONS work on productivity to date, followed by the results of a consultation with key users conducted in October/November 2001, which identify users' priorities and concerns. The work programmes to be taken forward by the ONS are outlined in Section IV. These programmes fall into four main areas: service sector productivity, labour input, capital input and utilisation of the Annual Business Inquiry data. We believe that though each is small in its own right, these programmes together constitute a significant step forward in terms of meeting users' requirements for productivity data.

I. Introduction

Improving UK productivity has been one of the government's key policy objectives since 1997. This policy drive has resulted in rising demand for better and more comprehensive productivity data to understand the nature of the UK productivity gap with other major industrial countries and in turn to inform policies targeted to close the gap. The Treasury and the Bank of England also analyse productivity trends for fiscal and monetary policy decisions as it is seen as a key determinant of the long-term trend growth of the economy.

As preparation for this strategy paper, a series of bilateral consultations were conducted in October/November 2001 with key users. A list of the government departments and organisations consulted is given in Annex A. The key aims of the exercise were to identify data gaps in productivity measurements and to find out users' views of where the ONS's priority should lie in filling those gaps.

This article is structured as follows:

- Section II provides a summary of ONS's recent work.
- Section III describes the consultation process and gives a broad summary of the outcome.
- Section IV outlines ONS work programmes on productivity to be taken forward within existing resources.
- Section V offers conclusions, summarising ONS's plans for work on productivity, and suggesting further work that could be taken forward if more funding is made available in the next Spending Review, for 2004–2007.

II. ONS productivity work to date

The following list outlines the ONS productivity work completed in 2001 under the steer of the ONS Productivity Programme Board.

- In April 2001, changes were made to existing productivity measures to improve the consistency between the output and labour input data.

- New measures of output per hour were published in April 2001.

- The dissemination of productivity data has been significantly improved. In April a productivity web page was established and in September a quarterly Productivity First Release was published for the first time. The first release includes a commentary on productivity and unit wage costs data as well as data not available in any other paper releases.

- The ONS took over from the DTI the publication of international comparisons of productivity in October with improvements to the methodology.

- A review of non-production productivity measures was completed, and its findings and recommendations were first published on the ONS website and then in the February 2002 *Economic Trends*. The publication was accompanied by the release of new experimental data, including quarterly measures for the total services and combined sections G/H (Distribution, hotels and catering) as well as annual measures for the combined sections A/B (Agriculture, forestry and fishing). The publication of a measure for the construction section has been withdrawn due to concerns about the quality of the productivity measure.

III. The consultation process and outcome

In October 2001, the ONS Productivity Team conducted a series of bilateral consultations with key users on ONS productivity work. A list of the users who took part is attached in Annex A.

During the consultation, users were asked to comment on and prioritise seven potential areas of ONS work relating to productivity. This list was not exhaustive and was sometimes augmented by users consulted. These areas of work, identified in terms of data outputs, were:

- Service sector productivity;
- Investment and capital stock data;
- Multi-factor productivity;
- Micro-level data for productivity;
- Skills and productivity;
- Regional productivity;
- Public sector productivity.

Notwithstanding the variations of users' needs, the three areas with consistently high scores among the users were service sector productivity (including public sector productivity), investment and capital stock data, and skills and productivity. Other areas tended to register specific interests and score highly with the specific users under concern.

The demand for official **service sector productivity** measures, with reasonable quality, was high. With the service sector now accounting for 70 per cent of the economy, service sector productivity measures would complement the wealth of detailed data, both at macro- and micro-level, on the production sector, and enable a better understanding of the performance dynamics for the whole economy. Within the service sector is the **public sector**, and the move toward output-based measurement for public sector output was welcomed.

Though not a direct measure of productivity, **investment and capital data** are often analysed closely to explain relative productivity performance and to inform policy. Users, especially HMT, the DTI and the CBI, were keen on international comparisons of business investment. There is also a demand for more visible investment data on Information and Communication Technologies (ICTs).

For the purpose of productivity analysis, capital input is more appropriately measured by capital services, which reflects the flow of productive services from the cumulative stock of past investments. ONS work on the compilation of capital services data is well underway and strongly endorsed by users.

As far as the capital stock data are concerned, better documentation of the ONS Perpetual Inventory Model would make the underlying assumptions more transparent to users. Furthermore, some users considered that the time series was not always consistent with economic intuitions. The general feeling was that a check of the data and a new review of the assumptions in the PIM might be worthwhile. It may anyway become necessary in due course as the ONS work on capital services progresses. See below for details of ONS work in improving the systems in place for modelling the capital stock and taking the opportunity to review and improve the input data.

Skills are often linked to labour productivity, but little is known about the precise relationship. The main data gaps identified were skills by firm size and industry. In addition, spatial disaggregation would help the understanding of the regional balances on skills, and international comparisons of skills were also identified as desirable.

In addition, the need to improve labour input measures was mentioned. Users felt that the ONS should strive to improve the accuracy, consistency and international comparability of the average hours worked estimate. Beyond that, quality-adjusted hours worked for skills was seen as a worthwhile project as it could be used for multi-factor productivity and for the construction of a labour composition index. The latter is useful for analysing the macroeconomic trends of labour composition and its contribution to labour productivity growth.

Micro-level data for productivity are stimulating a vibrant area of academic research, supported by the evidence-based policy fund. The main role of the ONS is to facilitate the access and the use of the dataset.

Multi-factor productivity was not among the top priorities for most of the users consulted. The main concern was the measurement difficulties of the components of MFP. However, when the ONS is confident about the quality of the component variables, *viz.* labour and capital, users were content for the ONS to investigate the production of MFP measures – in part as a quality assurance procedure.

The **regional dimension** was important to the work of specific users, notably the DTI and the DTLR. Their regional data requirements are broader than productivity measures, and include regional real growth rates, which are currently unavailable. Users would also welcome improvement on the timeliness of regional data.

IV. Outlines of ONS work programmes on productivity

This section outlines the short-term work programmes to be undertaken by the ONS, and is organised under following headings: service sector productivity, labour input, capital input, and utilisation of the Annual Business Inquiry. This reflects our priorities in response to users' need within the current resources. Over the next three to four years, ONS is undertaking a thorough upgrading of infrastructure, so resources will be extremely limited for new substantial initiatives. The longer-term work programme will depend on the outcome of the Spending Review for 2004-2007.

Before we move on to the individual work programmes, one general observation concerning productivity is noted. The quality of productivity data depends on three factors:

- the reliability of the component data: factor inputs, output, and deflators;
- the coherence of these underlying data series; and
- the length of the time series.

The first consideration reflects the fact that in essence, productivity is a derived statistic. The second consideration is specific to productivity data: it could be possible to yield better productivity measures by using a measure which may not be the most accurate measure of the component but which matches other component data series more closely. The length of the data series is important because of the cyclical behaviour of productivity performance. It is essential to analyse productivity, and its related variables, over economic cycles. For the purpose of productivity analysis, discontinuities in many of the series of key variables, due to survey changes or changes in classifications, therefore could greatly impair the values of these data.

Service sector

Further breakdowns of service sector productivity when feasible: The ONS will continue our ongoing work programme of development of the Index of Services. We will continue to review the effect of this work on productivity measures for the service sector and new measures will be published on an experimental basis whenever we are reasonably confident with their quality.

Public sector productivity: The ONS is at the forefront of developing new output-based measures for public sector output. This development enables the construction of public sector productivity measures, which are in high demand. The ONS plans to publish an article later in 2002 presenting the methodologies and some results to the public for the first time.

There are several programmes of work under way in the ONS which will support work on service sector productivity. These are as follows:

- the major work programme to develop a monthly index of services;
- the development of service sector price indices;
- the review of the National Accounts and Labour Market computer systems (which will take into account the requirements specifically related to the productivity work programme); and
- the compilation of constant price input-output tables.

Labour input

Total hours worked: The ONS is conducting a review of the estimate of total hours worked as part of a feasibility study into the development of a Labour Costs Index. Where feasible findings from this review will be incorporated into the current estimates of total hours worked. We will also ensure that the recommendations are consistent with international best practice.

Integration of Labour Force Survey and National Accounts: Better integration of the Labour Force Survey with the National Accounts would be very valuable to the construction of productivity data, which require consistency between input and output data. To this end, our work programme includes:

- an international comparative study of methods of integrating the labour market and National Accounts measures of employment, jobs and incomes;
- an investigation of the scope for greater co-ordination of the collection stage of employment and jobs data respectively through household and business surveys to ensure a better correspondence of industry and workplace classifications; and
- a systemisation of the methods applied by the ONS for the reconciliation of the employment and jobs data produced currently by the separate household and business survey data collections.

Skills data

- The responsibility of analysing and publishing the existing data on skills rests with DfES. In order to encourage greater utilisation of these data, the ONS is investigating ways to complement the work of DfES in this area, for example, by publishing relative wages by worker type. Attention will be given to ensure that the

data are grouped in such a way that is consistent with the practice of DfES.

- The National Statistics Theme Group on Education and Training Statistics will explore any possible synergies between the ONS and the DfES in producing more comprehensive and time-consistent data on skills to the benefit of all users. Currently the DfES commissions various surveys on skills, which users find useful and informative but these surveys are not time-consistent or repeated at predictable intervals.

Quality-adjusted labour input: We will conduct a feasible study of a labour composition index, equal to the difference between the growth rates of quality-adjusted (for education attainment) labour input and unadjusted total hours worked. The index will require shares of total labour compensation for each worker type as weights. At present, the Labour Force Survey provides data on shares of total wages for each qualification level but they are not consistent with the National Accounts, and ideally labour compensation should be used instead of wages. The study will investigate these issues and how this work might be taken forward.

An education satellite account: An education satellite account could link the outputs of the public sector, the private sector (both education establishments and in-house training by business) and household production to outcomes – the stock of skills / education in the economy. This would help shed some light on the relationship between skills and productivity. Initial work on education in the household satellite account, will be undertaken by the Household Satellite Accounts Branch, with a view to scoping an education satellite account towards the end of the year.

Capital input

Implementation of capital services data: ONS has compiled a preliminary volume index of capital services (VICS), in collaboration with the Bank of England. The methodology used is similar to the one set out in Oulton (2001).[1] The next step is implementation. Also since there is a great demand for information about ICT, we are looking into the possibility of publishing ICT investment and capital services data separately as part of the implementation.

Review of the ONS Perpetual Inventory Model (PIM): The ONS will produce an official documentation of the ONS PIM, which will help illuminate the underlying assumptions. In parallel, a review of the data and assumptions used by the model will be conducted so as to improve the overall quality of aggregate capital stock data. In particular, we will look at improvements on the asset categorisations which means separating assets with materially different depreciation rates, and in turn an overhaul of the treatment of ICT assets such as computers (which are currently included in plant and machinery) and software (currently included in intangibles).

International comparisons of business investment: Following the successful handover of International Comparisons of Productivity from the DTI to the ONS, the DTI and HM Treasury are interested in us doing the same for business investment. This project involves a study of the data sources used in the existing DTI system and the underlying methodologies, and making recommendations to ensure comparability both across time and countries.

Utilisation of the Annual Business Inquiry (ABI)

Productivity measures based on ABI data: The ONS will conduct a pilot study on the potential of the ABI to produce robust productivity measures. The feasibility of producing detailed industry breakdowns will be investigated as well as the possibility of extending regional measures to produce broad industry breakdowns within regions.

Facilitating the use of the ARD/ABI dataset:
The ONS will continue the process of linking relevant data sets to the ABI data through the ARD, to improve evidence base for analysis of business level data. If feasible, the data set for services will be extended back in time.

The ONS will continue the dialogue with academics to find a constructive way forward regarding on-site access, and to improve their onsite working environment.

The ONS will compile a manual for users of the data set by collating contributions from academics who have used the data set. This is part of the Business Data Linking Project. In the long run, if the demand supports this, we envisage that an ONS expert on the data set will be available to deal with users' queries more efficiently and professionally.

The ONS notes that minimising the discontinuities of the data set would greatly increase its quality. This could be done by having one overlapping year, should there be a change of reference code, to ensure complete matching. However, the cost implication would mean that it might not always be practically feasible.

V. List of ONS work programme on productivity

In summary, the ONS plans to deliver the work programmes listed below in the next three years. These are each small programme in

their own right, but together, we believe, constitute a significant step forward in terms of meeting users requirements for productivity data:

- further breakdowns of service sector productivity when feasible;
- public sector output and productivity;
- a review of the estimate of total hours worked;
- an international comparative study of methods of integrating the Labour Force Survey and National Accounts;
- a report on the scope for greater co-ordination between the Social Survey Division and the business statistics team in data collection;
- an investigation into ways of complementing DfES work on skills data;
- an investigation into any possible synergies between the ONS and the DfES in producing new skills data;
- a feasibility study of a labour composition index;
- initial work on a household education satellite account;
- implementation of capital services data;
- an official documentation of the ONS PIM;
- a review of the ONS PIM;
- international comparisons of business investment;
- a pilot study on the potential of the ABI to produce robust productivity measures; and
- facilitating the use of the ARD/ABI dataset.

A bid has been put forward in the next Spending Review for 2004–2007 for work on productivity. If this is approved, the work programme could be developed significantly, to provide a much more detailed breakdown of service sector productivity, robust deflators for the output measure of GDP, a longer back series of productivity data, and further development of data on the capital stock and skills and productivity.

Reference

1 Oulton N (2001), *ICT and productivity growth in the United Kingdom*. Working paper No. 140. Bank of England: London.

Annex A

List of participant departments and organisations in the bilateral consultations

Bank of England

Confederation of British Industry

Institute of Fiscal Studies

Department for Education and Skills

Department of Trade and Industry

Department for Transport, Local Government and the Regions

Department for Work and Pensions

HM Treasury

Analysing the effects of annual chain-linking on the output measure of GDP

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Overview

The effects of annual chain-linking on the output measure of GDP, have been described in an earlier article. This article shows further analyses of the growth estimates. Both the contribution of individual industry groups to the overall annual chain-linked growth estimates and the contributions of each industry group to the effect of annual chain-linking are estimated. The results show that fixed base growth estimates give greater weight to Information and Communication technologies (ICT) than annual chain-linked growth estimates. The analysis was carried out without the effect of the quality and balancing adjustments which were included in the original model.

The impact of replacing UK deflators with faster-falling US hedonic deflators, for one ICT group, manufacture of computers, at the same time as annual chain-linking has been investigated as a sensitivity analysis and shows that annual chain-linking removes the positive effect on growth of the faster-falling deflators.

Introduction

In *Economic Trends* October 2001, we published the results of annual chain-linking the output measure of GDP. Annual chain-linking is a method for aggregating volume measures of economic growth to better reflect the changing structure of industry. A full description is given in the earlier article. The differences between the growth estimates produced by annual chain-linking and by fixed base methodology at the A31 level of aggregation were presented. (A31 is the level of aggregation shown in appendices B and C of this article). The results show that annual chain-linking was to cause estimates of overall growth to be revised slightly downwards for the latest periods, furthest from the 1995 base year. In that article, the effects of annual chain-linking were not attributed to different industry groups.

The results showed that the fixed-weighted measure of real output based on the prices of a more recent year increased less than one based on prices of an earlier year.[1] This happens because the commodities for which output grows rapidly tend to be those for which prices increase slowly or fall (and conversely, the commodities for which output grows slowly tend to be those for which prices increase more rapidly). Using fixed base methodology, industries with fast-growing volumes and stable or falling prices tend to be over-weighted as we move away from the base year and industries with slow-growing volumes and rising prices tend to be under-weighted. In effect, annual chain-linking reduces the "substitution bias" in fixed base series by updating weights every year.

Following the introduction of annual chain-linking in *Blue Book* 2003, users may find the analysis of volume measures more complex. The experiences of US statisticians highlight the potential for confusion. Whelan reports that the introduction of chained Fisher indices in the US by the Department of Commerce led to erroneous analyses of National Income and Production Accounts data being published on many occasions.[2] The implication is that pitfalls in terms of analysis of the estimates were not sufficiently identified to users at the time of first publishing the new-style indices in 1996.

In this article, an explanation is given of how the calculation of growth contributions can be carried out in practice, given the inputs to the annual chain-linking process. Results are shown for the contributions of different industry groups to annual chain-linked growth from 1995 to 2000. A further analysis shows which industry groups contribute

to the difference between annual chain-linked and fixed base growth estimates in the output measure of GDP. The last part of this article models the effect of introducing US-style price deflators for one ICT industry group, *Manufacture of Computers*, and compares the effect on fixed base and annual chain-linked growth estimates.

Contributions to growth estimates by different components.

Users of the National Accounts express interest in how different components contribute to the percentage growth estimates of overall GDP. In practice, calculating contribution to the total volume measure series is carried out by weighting the volume measure indices for different industry groups and using these to identify the important sectors. An alternative approach, to determine the contribution to the percentage growth estimates, would be to apply the following formula (Equation a) to whichever industry group is under investigation (see derivation in appendix A) :

$$\left(\frac{w_{i,0}(q_{i,t} - q_{i,t-1})}{I_{t-1}}\right) \quad *100 \quad \text{.....(a)}$$

(where "w" is the current price weight as a proportion and "q" is the fixed base volume measure indices. "I" is the overall fixed base index for the previous year, referenced to the base year =100).

For example, the fixed base volume measure indices for Agriculture and Hunting for 1994 and 1995 were 101.3 and 100.0 respectively and the overall GDP index was 97.5 in 1994. The base year weight in 1995 for Agriculture and Hunting as a proportion was 0.0172. If the overall fixed base annual growth estimate for 1995 was *2.61 per cent*, then expression (a) would tell us that this industry group contributed *-0.02* to the *2.61 per cent*.

Once contributions have been calculated, the percentage growth contributions are additive and can be aggregated to the level of interest. This methodology was applied to the inputs of the GDP(O) model published in October 2001 and aggregated to six industry groups. The results for fixed base growth estimates are shown in Table 1.

Table 1 shows that the contribution of *Industry including Energy* was *0.43* to the total fixed base growth estimate of *2.82 per cent* in 2000. Total service industries contributed *2.36 per cent* to the total.

For annual chain-linked estimates, the need to apportion contributions to overall growth is even greater because of the non-additivity in annual chain-linked series. When annual chain estimates are published for the first time in *Blue Book* 2003, with 2000 being the last year from which weights are used, estimates from 2001 Q1 to 2003 Q2 only will show additivity because these estimates are a fixed base tail at the end of the annual chain-linked series.[3] By additivity, it is meant that the weighted volume measure indices for the aggregate of *X* and *Y* equal the arithmetic sum of the weighted

Table 1. This shows contributions (2 decimal places) to overall modelled GDP percentage growth by different industry groups, calculated using fixed base methodology.

	1995	1996	1997	1998	1999	2000
Agriculture; Forestry and fishing	*-0.02*	*-0.02*	*-0.02*	*0.04*	*0.04*	*-0.05*
Industry including energy	*0.47*	*0.36*	*0.27*	*0.25*	*0.19*	*0.43*
Construction	*0.00*	*0.14*	*0.15*	*0.06*	*0.04*	*0.09*
Wholesale and retail trade, repair of motor vehicles and household goods; hotels and restaurants; transport and communications	*0.75*	*1.02*	*1.14*	*1.00*	*0.92*	*0.91*
Financial; real estate, renting and business activities	*0.95*	*1.07*	*1.63*	*1.94*	*0.95*	*1.06*
Other services	*0.46*	*0.58*	*0.30*	*0.40*	*0.27*	*0.39*
All industries	*2.61*	*3.15*	*3.47*	*3.71*	*2.41*	*2.82*

volume measures indices of *X* and *Y*. In constant price £million terms, the aggregates will be the sum of the components. Any component analysis can therefore only be carried out by this method for the latest estimates. The formula (Equation *b*) for calculating the contributions of industries (at the level from which annual chain-linking is implemented) to annual chain-linked percentage growth estimates is as follows (see Appendix A for derivation):

$$w_{i,t-1}\left(\frac{q_{i,t}}{q_{i,t-1}}-1\right)*100 \quad \text{.....(b)}$$

(where "*w*" is weight as a proportion and "*q*" represents the fixed base indices at the level from which annual chain-linking is implemented, i.e. at broadly SIC 4 digit level for the output measure.)

For example, the expression uses the same fixed base volume measure indices for Agriculture and Hunting as before, but the base year weight in 1995 needs to be replaced by the previous years' weight in 1994 of 0.0162. If the overall annual chain-linked growth estimate for 1995 was *2.9 per cent*, then expression (b) would tell us that this industry group contributed *-0.02* to the *2.88 per cent*.

Once contributions have been calculated at the level at which annual chain-linking is implemented, the percentage growth contributions are additive and can be aggregated to the level of interest. This methodology was applied to the inputs of the GDP(O) model published in October 2001 and aggregated to six industry groups. The results are shown in Table 2 (with the full breakdown in Appendix B).

Table 2 shows that the contribution of *Industry including Energy* was 0.46 to the total annual chain-linked growth estimate of *2.58 per cent* in 2000. Total service industries contributed *2.06 per cent* to the total (discrepancy due to rounding). The major contributors in the service sector were *Other real estate, renting and business activities* and *Communication*, contributing just under *1 per cent* and *0.4 per cent* respectively to the overall *2.58 per cent* annual growth in 2000 (see Appendix B) . The differences between fixed base growth estimates in table 1 and annual chain-linked growth estimates in Table 2 are clearly caused by service industries rather than the production industries.

Contributions to the difference between annual chain-linked and fixed base growth estimates by different industry groups.

The same approach can be used to directly calculate how different components contribute to the difference between annual chain-linked growth estimates and fixed base growth estimates. Equation (c) shows the calculation required:

$$= \left(\frac{q_{i,t}}{q_{i,t-1}}-1\right)\left(w_{i,t-1}-\frac{w_{i,0}q_{i,t-1}}{I_{t-1}}\right)*100 \quad \text{.....(c)}$$

(where "*w*" is weight as a proportion, "*q*" represents the fixed base indices at the level from which annual chain-linking is implemented, i.e. at broadly SIC 4 digit level for the output measure. "*I*" is the all industries fixed base index. See Appendix A for derivation).

Table 2. This shows contributions (2 decimal places) to overall modelled GDP percentage growth by different industry groups, calculated using annual chain-linking methodology implemented from a broadly 4 digit aggregation level.

	1995	1996	1997	1998	1999	2000
Agriculture	*-0.02*	*-0.02*	*-0.02*	*0.03*	*0.03*	*-0.04*
Industry including energy	*0.55*	*0.36*	*0.27*	*0.23*	*0.17*	*0.46*
Construction	*0.00*	*0.14*	*0.15*	*0.06*	*0.04*	*0.10*
Wholesale and retail trade, repair of motor vehicles and household goods; hotels and restaurants; transport and communications	*0.85*	*1.02*	*1.05*	*1.01*	*0.76*	*0.66*
Financial; real estate, renting and business activities	*1.01*	*1.07*	*1.60*	*1.87*	*0.69*	*0.99*
Other services	*0.49*	*0.58*	*0.29*	*0.39*	*0.32*	*0.42*
All industries	*2.88*	*3.15*	*3.35*	*3.61*	*2.00*	*2.58*

Contributions to the percentage growth differences are shown for six industry groups in Table 3, with a further breakdown shown in appendix C.

It confirms that total services are the most important factor in the growth depression of annual chain-linking (Table 3) with the main contributor being the *Communication* industry group which contributes *-0.15 per cent* to the overall growth difference total of *-0.24* per cent (see Appendix C). The other area of ICT interest, *Manufacture of Electrical and Optical Goods*, contributes *-0.08 per cent* to the depression of growth. This supports the premise that these two areas are over-weighted in the current fixed base overall volume measure.

Interaction of US-style ICT deflators and annual chain-linking

The analysis presented above suggests that, using existing constant price and current price inputs, ICT industries in the service sector are overweighted using fixed base methodology and this would be re-dressed once annual chain-linking has been implemented. Developments already underway to improve price data in this area are likely therefore to interact with the introduction of annual chain-linking.

In the PPI First Release for May 2001, revisions were published showing the improvements made to the price indices for computers as a response to *Review of Short-term Output Indicators* [4], mainly reflecting the improvement in the quality of computer prices provided to the ONS by two key contributors. The revised prices are similar to the Harmonised Index of Consumer Prices (HICP) estimates and closer to, but not showing such extreme price falls as, the US PPI for computers.[5] The US price indices are hedonic price indices which quantify the changes in quality more effectively than UK price indices.[6] The GDP(O) model described in the October 2001 article was used to test the sensitivity of overall GDP(O) to the introduction of even faster-falling computer prices, by using the US hedonic computer price deflators for *Manufacture of Computers* to replace the recently revised price indices. Table 4 shows that if UK deflators were replaced with deflators similar to the US hedonic price indices for computers, and using the existing fixed base method, there would be growth estimate revision for overall GDP(O) in 1997, 1998, 1999 and 2000 of *+0.1 per cent, +0.2 per cent, +0.2 per cent* and *0.0 per cent* respectively. If US-style hedonic price indices were introduced at the same time as annual chain-linking methodology, the effect on growth estimates for 1997, 1998, 1999 and 2000 would be *-0.1 per cent, 0.0 per cent, -0.3 per cent* and *-0.2 per cent*. The increase in estimates of overall GDP(O) growth as a result of introducing hedonic price indices similar to the US-style deflators for computers would be removed by introducing it at the same time as annual chain-linking with a combined effect of depressing growth for later years. The hedonic price indices have reduced the depression of growth caused by annual chain-linking in later periods. This finding is similar to the results from US research.[7]

Table 3. This shows contributions (2 decimal places) to the difference between annual chain-linked and fixed base for the modelled overall GDP percentage growth by different industry groups.

	1995	1996	1997	1998	1999	2000
Agriculture	*0.00*	*0.00*	*0.00*	*-0.01*	*-0.01*	*0.01*
Industry including energy	*0.09*	*0.00*	*0.00*	*-0.02*	*-0.02*	*0.03*
Construction	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.01*
Wholesale and retail trade, repair of motor vehicles and household goods; hotels and restaurants; transport and communications	*0.10*	*0.00*	*-0.08*	*0.01*	*-0.16*	*-0.25*
Financial; real estate, renting and business activities	*0.06*	*0.00*	*-0.03*	*-0.07*	*-0.27*	*-0.07*
Other services	*0.02*	*0.00*	*0.00*	*-0.01*	*0.06*	*0.03*
All industries	*0.27*	*0.00*	*-0.12*	*-0.10*	*-0.40*	*-0.24*

Conclusions

Estimates from a modelled GDP(O), published in the previous article, supported the premise that introducing annual chain-linking would reduce substitution bias in volume measures as growth estimates were slightly depressed in later time periods. Further analysis of the growth estimates from the model, using the "contribution to growth" methodology shown here, identifies *Communication* and *Business services* as important in determining the overall annual chain-linked volume growth. In the analysis of contributions to the effect of introducing annual chain-linking, *Communication* once again forms an important part. This "contribution to growth" methodology can help identify which groups are important in the effect of annual chain-linking, once it is implemented in *Blue Book* 2003, although the application of balancing and quality adjustments at a level higher that the implementation level of annual chain-linking would make it an imprecise tool.

The combined effects of introducing hedonic prices indices (with values similar to the US price indices) for computers into GDP(O) and annual chain-linking of GDP(O) suggest that annual chain-linking will offset any increase in growth caused by hedonic prices, as the US experience confirms.[7] A parallel introduction of the two improvements in methodology would also reduce the impact of annual chain-linking on overall growth.

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Table 4 Shows the results of a sensitivity analysis: a comparison of GDP(O) overall percentage growth estimates using UK computer deflators and US computer deflators and calculated using fixed base and annual chain-linked methods of aggregation.

	UK computer deflators Fixed base	UK computer deflators Annual chain-linked	US computer deflators Fixed base	US computer deflators Annual chain-linked
1995	*2.6*	*2.9*	*2.6*	*2.9*
1996	*3.2*	*3.2*	*3.2*	*3.2*
1997	*3.5*	*3.3*	*3.6*	*3.4*
1998	*3.7*	*3.6*	*3.9*	*3.7*
1999	*2.4*	*2.0*	*2.6*	*2.1*
2000	*2.8*	*2.6*	*2.8*	*2.6*

Appendix A

Definitions: "*w*" is weight as a proportion, "*q*" represents the fixed base indices at the level from which annual chain-linking is implemented, i.e. at broadly SIC 4 digit level for the output measure. "*I*" is the all industries fixed base index.

The growth rate of an index I into period t is given by:

$$\left(\frac{I_t}{I_{t-1}} - 1\right) * 100$$

For a fixed-base index (indicated by *I*), growth rate is given by:

$$\left(\frac{I_t}{I_{t-1}} - 1\right) * 100 = \left(\frac{I_t - I_{t-1}}{I_{t-1}}\right) * 100 = \left(\frac{\sum w_{i,o} q_{i,t} - \sum w_{i,o} q_{i,t-1}}{I_{t-1}}\right) * 100$$

$$= \left(\frac{\sum w_{i,o} (q_{i,t} - q_{i,t-1})}{I_{t-1}}\right) * 100 = \left[\sum \left(\frac{w_{i,o}(q_{i,t} - q_{i,t-1})}{I_{t-1}}\right)\right] * 100$$

so the contribution of component *i* to overall growth in a fixed-base index is:

$$\left(\frac{w_{i,o} (q_{i,t} - q_{i,t-1})}{I_{t-1}}\right) * 100 \quad \text{..... (a)}$$

where I_{t-1} is the fixed base aggregate index for time period *t*-1, referenced to base year=100.

For an **annual chain-linked** index, this becomes

$$\left(\sum w_{i,t-1} \frac{q_{i,t}}{q_{i,t-1}} - 1\right) * 100$$

$$= \left(\sum w_{i,t-1} \frac{q_{i,t}}{q_{i,t-1}} - \sum w_{i,t-1}\right) * 100 \quad \text{because } \sum w_{i,t-1} = 1$$

$$= \sum w_{i,t-1} \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right) * 100$$

The contribution of an industry to the total is therefore

$$w_{i,t-1} \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right) * 100 \quad \text{.....(b)}$$

The difference between the contribution of industry *i* to annually weighted and fixed-base indices is therefore:

$$\left[w_{i,t-1} \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right) - \frac{w_{i,o} (q_{i,t} - q_{i,t-1})}{I_{t-1}}\right] * 100$$

$$= \left[w_{i,t-1} \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right) - \frac{w_{i,o} q_{i,t-1} \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right)}{I_{t-1}}\right] * 100$$

$$= \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right) \left(w_{i,t-1} - \frac{w_{i,o} q_{i,t-1}}{I_{t-1}}\right) * 100 \quad \text{.....(c)}$$

Appendix B

Contributions to modelled annual chain-linked GDP(O) growth estimates
NB These are not the growth estimates for individual components of GDP(O).

Percentage difference (rounded to 2 decimal places)

		1995	1996	1997	1998	1999	2000
Agriculture, hunting, forestry and fishing	A, B	-0.02	-0.02	-0.02	0.03	0.03	-0.04
Production							
Mining and quarrying							
Mining and quarrying of energy producing materials							
Mining of coal	C10	0.01	-0.01	-0.01	-0.02	-0.01	-0.01
Extraction of mineral oil and natural gas	C11	0.08	0.12	-0.02	0.06	0.08	-0.02
Other mining and quarrying	CB	-0.02	-0.03	-0.01	0.02	0.01	0.03
Total mining and quarrying	C	0.08	0.09	-0.04	0.05	0.08	0.00
Manufacturing							
Food; beverages and tobacco	DA	-0.03	0.03	0.07	-0.05	0.00	-0.01
Textiles and textile products	DB	-0.04	-0.02	-0.03	-0.08	-0.08	-0.03
Leather and leather products	DC	0.00	0.00	0.01	-0.02	0.00	-0.01
Wood and wood products	DD	-0.02	-0.01	-0.01	0.00	-0.02	0.01
Pulp, paper and paper products; publishing & printing	DE	0.05	-0.06	0.01	0.02	0.00	0.01
Coke, petroleum products and nuclear fuel	DF	0.06	-0.04	0.01	-0.02	-0.04	0.02
Chemicals, chemical products and man-made fibres	DG	0.12	0.01	0.05	0.03	0.07	0.10
Rubber and plastic products	DH	0.03	-0.01	0.00	0.03	0.00	-0.01
Other non-metallic mineral products	DI	-0.02	-0.03	0.02	-0.02	-0.01	0.01
Basic metals and fabricated metal products	DJ	0.07	0.00	0.03	-0.03	-0.09	0.02
Machinery and equipment not elsewhere classified	DK	0.01	-0.04	-0.04	0.00	-0.11	-0.01
Electrical and optical equipment	DL	0.21	0.14	0.08	0.15	0.27	0.38
Transport equipment	DM	-0.03	0.16	0.08	0.11	0.04	-0.08
Manufacturing not elsewhere classified	DN	-0.01	0.02	0.02	0.01	0.02	0.00
Total manufacturing	D	0.41	0.15	0.30	0.14	0.06	0.40
Electricity, gas and water supply	E	0.07	0.13	0.01	0.04	0.03	0.06
Total production	C,D, E	0.55	0.36	0.27	0.23	0.17	0.46
Construction	F	0.00	0.14	0.15	0.06	0.04	0.10
Service industries	G-Q						
Wholesale and retail trade (including motor trade); repair of motor vehicles, personal & household goods	G	0.31	0.54	0.40	0.39	0.30	0.30
Hotels and restaurants	H	-0.01	0.04	0.00	0.00	0.00	-0.10
Transport, storage and communication	I						
Transport and storage		0.24	0.05	0.25	0.43	0.08	0.07
Communication		0.32	0.39	0.40	0.19	0.39	0.40
Total	I	0.56	0.44	0.65	0.62	0.47	0.47
Financial intermediation	J	0.27	0.25	0.25	0.17	0.09	0.14
Adjustment for financial services	-P.119	-0.32	-0.27	-0.21	-0.18	-0.09	-0.16
Real estate, renting and business activities							
Letting of dwellings, including imputed rent of owner occupiers		0.19	0.09	0.13	0.18	0.13	0.02
Other real estate, renting and business activities		0.88	1.01	1.43	1.70	0.56	0.99
Total	K	1.06	1.10	1.56	1.88	0.69	1.01
Public administration and defence	L	-0.05	-0.05	-0.04	-0.06	-0.04	0.06
Education	M	0.08	0.07	0.06	0.03	0.04	0.02
Health and social work	N	0.28	0.20	0.21	0.22	0.20	0.17
Other social and personal services, private households with employees and extra-territorial organisations	OPQ	0.19	0.35	0.07	0.21	0.12	0.16
Total service industries	G-Q	2.35	2.67	2.95	3.28	1.77	2.06
All Industries	A-Q	2.88	3.15	3.35	3.61	2.00	2.58

Appendix C

Contributions to the difference between annual chain-linked GDP(O) growth estimates and fixed base GDP(O) growth estimates

Percentage difference (rounded to 2 decimal places)

		1995	1996	1997	1998	1999	2000
Agriculture, hunting, forestry and fishing	A, B	0.00	0.00	0.00	-0.01	-0.01	0.01
Production							
Mining and quarrying							
Mining and quarrying of energy producing materials							
Mining of coal	C10	0.00	0.00	0.00	0.00	0.00	0.01
Extraction of mineral oil and natural gas	C11	0.00	0.00	0.00	0.00	-0.01	0.00
Other mining and quarrying	CB	0.00	0.00	-0.01	0.00	0.00	0.02
Total mining and quarrying	C	-0.01	0.00	-0.01	0.00	-0.01	0.03
Manufacturing							
Food; beverages and tobacco	DA	0.02	0.00	0.01	-0.01	0.01	0.02
Textiles and textile products	DB	0.00	0.00	0.00	-0.01	-0.01	0.00
Leather and leather products	DC	0.00	0.00	0.00	0.00	0.00	0.00
Wood and wood products	DD	0.00	0.00	0.00	0.00	0.00	0.00
Pulp, paper and paper products; publishing & printing	DE	0.00	0.00	0.00	0.01	0.00	0.01
Coke, petroleum products and nuclear fuel	DF	0.01	0.00	0.00	0.00	0.00	0.01
Chemicals, chemical products and man-made fibres	DG	0.00	0.00	0.00	0.00	0.00	0.01
Rubber and plastic products	DH	0.00	0.00	0.00	0.00	0.00	0.00
Other non-metallic mineral products	DI	0.01	0.00	0.00	0.00	0.00	0.00
Basic metals and fabricated metal products	DJ	0.00	0.00	0.00	0.01	0.00	0.02
Machinery and equipment not elsewhere classified	DK	0.01	0.00	0.00	0.00	-0.01	0.00
Electrical and optical equipment	DL	0.03	0.00	0.00	-0.02	-0.01	-0.08
Transport equipment	DM	-0.01	0.00	0.00	-0.01	0.01	0.01
Manufacturing not elsewhere classified	DN	0.00	0.00	0.00	0.00	0.01	0.01
Total manufacturing	D	0.08	0.00	0.01	-0.02	0.00	0.02
Electricity, gas and water supply	E	0.01	0.00	0.00	-0.01	-0.01	-0.02
Total production	C,D, E	0.09	0.00	0.00	-0.02	-0.02	0.03
Construction	F	0.00	0.00	0.00	0.00	0.00	0.01
Service industries	G-Q						
Wholesale and retail trade (including motor trade); repair of motor vehicles, personal & household goods	G	0.03	0.00	-0.01	0.04	-0.03	-0.08
Hotels and restaurants	H	0.02	0.00	0.00	-0.01	-0.01	-0.03
Transport, storage and communication	I						
Transport and storage		0.02	0.00	0.00	0.04	-0.02	0.01
Communication		0.04	0.00	-0.07	-0.05	-0.11	-0.15
Total	I	0.05	0.00	-0.08	-0.02	-0.13	-0.14
Financial intermediation	J	0.03	0.00	-0.06	-0.19	0.00	-0.12
Adjustment for financial services	-P.119	-0.02	0.00	0.07	0.15	0.01	0.05
Real estate, renting and business activities							
Letting of dwellings, including imputed rent of owner occupiers		0.00	0.00	0.00	0.00	0.01	0.00
Other real estate, renting and business activities		0.04	0.00	-0.04	-0.04	-0.30	-0.01
Total	K	0.04	0.00	-0.04	-0.03	-0.29	-0.01
Public administration and defence	L	0.00	0.00	0.00	0.00	-0.01	0.00
Education	M	0.00	0.00	0.00	0.00	0.00	0.00
Health and social work	N	0.00	0.00	0.00	0.00	0.00	0.00
Other social and personal services, private households with employees and extra-territorial organisations	OPQ	0.02	0.00	0.00	-0.01	0.07	0.03
Total service industries	G-Q	0.18	0.00	-0.12	-0.07	-0.37	-0.30
All industries	A-Q	0.27	0.00	-0.12	-0.10	-0.40	-0.24

Business Data Linking: An introduction

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Overview

This article introduces the ONS Business Data Linking project. It describes the project and summarises the key data sets that are used in this work. *Economic Trends* will update readers regularly with recent findings from the project. This issue presents some initial findings about the relative performance of domestic and foreign businesses in the UK.

Introduction

Raising UK productivity is a major government objective: separate chapters on productivity have appeared in every Budget and pre-Budget report since 1997.

Research has been conducted for many years on UK productivity. However, because of data availability, almost all of this UK work has been aggregate in nature, either looking at whole-economy productivity or at industry-level productivity. This work has rightly been very influential in, for example, documenting the UK productivity gap with other countries and suggesting some of the productivity drivers that policy might act upon.

Such analyses cannot tell the whole story however. For example, aggregate data provides no information on how much entry of new firms and exit of older ones contributes to productivity growth.

Recent work for the US at the plant level has shown that aggregate measures hide a huge amount of heterogeneity within even very narrowly defined industries and that entry and exit are important drivers of productivity growth (Foster, Haltiwanger, and Krizan, 1998). This supports the value of such micro-level work for the UK.

Contracting out legislation from 1994 allows the Office for National Statistics (ONS) to give researchers on government contracts limited access to confidential business data. This has allowed new lines of research using disaggregated data, and this research has gained recognition in numerous recent policy documents. Work analysing productivity using these data has been drawn upon recently as follows:

- the contribution of entry and exit to productivity growth; see the 2000 Pre-Budget Report (HM Treasury, 2000b, para 3.27), HM Treasury (2000a, para 3.25), refers to Disney, Haskel and Heden, (2000), and Barnes and Haskel, (2000b) and HM Treasury (2001, para A8), refers to Griffith and Simpson (2001).

- the productivity of foreign firms: see HM Treasury (2000a, para 3.12), refers to Oulton, (2000).

- productivity and skills: see HM Treasury (2000a, Chart 3.3), refers to Barnes and Haskel, (2000b).

- the distribution of productivity: see HM Treasury (2000a, Chart 3.1), refers to Barnes and Haskel (2000b).

In the light of the topic's importance and interest, the ONS has established the Business Data Linking (BDL) branch to take this work forward. This article describes the work of BDL, the data and gives some examples of results using the data.

BDL aims to bring together users of ONS business micro data within ONS, the wider government and in the academic community to

ensure that best practice can be shared. It also aims to ensure business micro data continue to be developed and made available for research. A further goal is to make use of other business data that are collected by ONS and others to create linked data that may be used to answer a broader array of questions.

In addition to the work cited above, such data have already been used to study a variety of issues including an analysis of DTI industrial support policies, commissioned by DTI (Harris and Robinson 2001), the impact of management buyouts on economic efficiency (Harris, Siegel and Wright 2002) and returns to scale and foreign acquisitions (Girma and Görg 2002). Other work commissioned by the OECD Economics Department has worked towards comparable data on firm demography and productivity in a number of countries (Barnes, Haskel and Maliranta 2001).

This work has gained considerable additional momentum in recent months, following a successful bid to the Treasury's Evidence Based Policy Fund, jointly sponsored by DTI and ONS. The award has provided financial support for work by academics from the Centre for Research into Business Activity (CeRiBA) at Queen Mary College, University of London, and others, to enable them to carry out data linking and policy relevant analytical work.

Data: The Annual Respondents Database

The Annual Respondents Database (ARD) is constructed using the results of annual business surveys conducted by the Office for National Statistics. The database links reporting units over time and is therefore longitudinal. Its setting up and some initial descriptive statistics are given in Oulton (1997).[1]

ARD sources

The Annual Respondents Database (ARD) stores the data collected by the Office for National Statistics (formerly the Central Statistical Office) from the Annual Census of Production (ACOP) and the Annual Census of Construction (ACOC).[2] From 1998 these surveys have been incorporated into and replaced by the Annual Business Inquiry[3] (ABI) and hence the ABI data are now added to the ARD each year. The data prior to 1998 cover the vast majority of production and construction activities, but from 1998 the ABI also incorporates six other previous surveys covering distribution and other service activities. This increased coverage is reflected in the number of individual business contributors to the ARD rising from approximately 15,000 for 1970 to 1996 to approximately 50,000 for 1998 and to over 60,000 for 1999. The Business Data Linking Branch has recently instigated inclusion of archive data from past service surveys into the ARD from 1994 to 1997. This work is presently at an early stage but it is hoped will provide a useful resource for future research into the non-production sector of the economy.

At the time of writing, final data are available up to 1999. In addition provisional data for 2000 have been made available, though a number of responses are yet to be included in the data.

The businesses selected for the surveys are currently drawn from the ONS Inter-departmental Business Register (IDBR).[4] The IDBR covers about 98% of business activity (by turnover) in Great Britain. Each year a stratified sample is drawn for the ABI and thus the data stored on the ARD is from business respondents returning the questionnaires that are sent out by the ONS. Under the 1947 Statistics of Trade Act it is a legal requirement that businesses complete them. The register also records data from the administrative sources of VAT and PAYE records for all the 3.7m or so businesses. These data relate to the name, location, birth, turnover and employment of the business. For the sectors covered by ACOP/ ACOC/ABI most of these administrative data are also stored on the ARD in a supplementary file. This allows the whole population to be taken into account when using the data.

Access, Confidentiality and Disclosure

The data contained in the ARD are collected under the 1947 Statistics of Trade Act. Under this Act all data collected from businesses are confidential and remain confidential forever. Access for external researchers is possible under the 1994 Deregulation and Contracting Out Act. Researchers are contracted to ONS to conduct a specified task, and only they are permitted to use the data.

At present access to the complete data set is only permitted at ONS premises at Drummond Gate in London and Newport in South Wales. For information on gaining access to the data see Box A. In order to comply with the terms of the 1947 Act it is necessary for all work for circulation outside of ONS and contracted researchers to be cleared by the data custodians at ONS to ensure it is not disclosive of data about an individual business. The rules for determining what can or cannot be disclosed have two elements.[5] First is the threshold rule, which ensures there are at least 3 enterprise groups in a cell. Second, the dominance rule states that the sum of all but the largest two values in a cell must be greater than 10 percent of the largest observation.[6] Only if both of these rules are passed can work be cleared for release. It is important to note that clearance must be sought for all forms of release, including presentations and draft papers as well as final publications.

Box A Access to the Annual Respondents Database

Access to the ARD is available to researchers only under specific conditions to ensure confidentiality requirements in the Statistics of Trade Act are met. Access is only given to researchers who are sponsored by a government department and where the research to be undertaken is consistent with the aims and objectives of ONS.

Where access is granted it is only permitted at ONS sites in London and Newport, subject to available resources.

Inquiries should be made by e-mail to **ard.inquiries@ons.gov.uk**

Northern Ireland data

The Statistics of Trade Act only covers data for Great Britain. In Northern Ireland, data are collected under local legislation. To date, ONS has continued to design the business surveys for Northern Ireland, but the sample has often been larger than it would be using the rules for Great Britain. In addition the survey process is managed by the Department of Enterprise, Trade and Industry for Northern Ireland (DETINI) and they own the data. Therefore, all work using NI data must be cleared by DETI and it is their decision to allow access.

The range of variables

The range of variables collected since 1970 (unfortunately most of the data before 1968 was destroyed) on the ARD has varied over the years and the same variable names can sometimes hide changing definitions or elements included in questionnaires and derived variables. Records of most of these changes were kept. The central variables collected are measures of employment, turnover/output, capital expenditure and intermediate consumption. The data from these direct responses are used to calculate derived variables such as per head measures and Gross Value Added. Postcodes and industrial classification (Standard Industrial Classification codes) are included from the business register along with the nationality of the 'ultimate owner' of the enterprise (as supplied by Dunn and Bradstreet). Although the register lists business names the ARD does not. However, the ARD data can be linked to the register by using the unique business contributor codes. Acquisitions and disposals of capital goods[7] are recorded but there is no information on the scrapping of capital stock.

Table 1: Sampling in ARD source data, 1970–2000

Census year	Employment size band	Sampling fraction	Comments
1970–1971	<25	0 (exempt)	In some industries, <11
	25 or more	All	In some industries 11 was lower limit.
1972–1977	<20	0 (exempt)	
	20 or more	All	
1978–1979	<20	0 (exempt)*	All industries
	20–49	0.5	In 68 industries
	50 or more	All	In 68 industries
	20 or more	All	In all other industries
1980–1983	<20	0 (exempt)	All industries
	20–49	0.25	In most industries
	50–99	0.5	In most industries
	100 or more	All	All industries
1984	<20	0 (exempt)	All industries
	20–49	0.5	England only
	50 or more	All	20 or more outside England
1985–1988	<20	0 (exempt)	All industries
	20–49	0.25	In most industries
	50–99	0.5	In most industries
	100 or more	All	All industries
1989	<20	0 (exempt)	All industries
	20–49	0.5	England only
	50 or more	All	20 or more outside England
1990–1994	<20	0 (exempt)	All industries
	20–49	0.25**	In most industries
	50–99	0.5	In most industries
	100 or more	All	All industries
1995–1997	<10	0.2	
	10–49	0.25	
	50–99	0.5	
	100–199	0.75	
	200 or more	All	50% of industries, others with smaller thresholds
1998 onwards	<10	0.25	
	10–99	0.5	
	100–249	All or <= 0.5	Varies by industry
	250 or more	All	

Source: Oulton (1997) and Author's updates
Note: For 1997 and earlier years these are sampling frames for ACOP. From 1998 onwards they refer to ABI.
* *In 1978 a small sample of establishments employing less than 20 was also drawn.*
** *0.2 in 1993.*

Sample stratification

The Annual Census of Production/Construction was not in fact a census other than for the highest size-band businesses. For smaller size-bands a sample was selected each year. For most years of the ARD the census size was 100, but this was raised to 200 for more recent years preceding the ABI. For the ABI this has been increased to 250. The sample of businesses for the other employment size-bands is drawn from the business register (i.e. the CSO Business Register and then since 1994 the IDBR) and has changed from year to year. Table 1 below summarises how the sampling proportions have changed over time. Prior to 1995, the very smallest businesses (generally those employing less than 20 people) were not sampled at all. To limit the impact of ONS surveys on small businesses, they do not receive another survey for three years after they have completed one. Note also that these rules mean the register data on smaller companies is more dependent on administrative sources than for larger companies where responses to other surveys are also a source of revision. Note finally that stratification is also based on industry and region.

The data for each year are essentially a snap shot of those businesses selected for that year from the register. While the data were not collected or compiled with the intention of creating a longitudinal database, this possibility is created thanks to the unique ONS reference number assigned to the reporting units. It is worth noting that prior to the IDBR the CSO Business Register was subject to substantial improvements in the 1980s and in the run up to the creation of the IDBR. These improvements present an additional challenge for researchers using the data.

The business reporting units

The nature of the business units from which the data are collected can be confusing. Changes and overlaps in terminology in 1993/4 exacerbated this problem when the labels for the various levels of business units were brought in to line with the European System of Accounts (ESA). As such it is useful to be aware of the terms used before and after this change. Fortunately the reporting levels are broadly the same.

1970 – 1993

In descending level of aggregation:

- 'Enterprise Reference' - the group of all legal units under common control.
- 'Establishment' - the smallest group of legal units which could provide the full range of data required for the survey
- 'Local unit' - the individual site or workplace (factory, shop etc) at which activity takes place

1994 onwards

In descending level of aggregation:

- 'Enterprise Group' - the group of all legal units under common control.
- 'Enterprise' - the smallest group of legal units within an enterprise group with a relative degree of autonomy.
- 'Local unit' - the individual site or workplace (factory, shop etc) at which activity takes place.

Although there have been changes in reporting arrangements over time, essentially the former 'Enterprise Reference' label now corresponds to the 'Enterprise Group', and the former 'Establishment' with the 'Enterprise' term now used. The use of the term 'Local Unit' is unchanged but since 1992 data have not been collected directly for this level of business unit although administrative data at this level are still available on the register.

The data in the ARD are recorded under CSO/IDBR Reporting Unit References. The business contributor level is currently at the Enterprise or 'Local Unit List Level'. Where an Enterprise reports as a complete unit this is known as the 'Enterprise Reporting Unit'. Where an Enterprise is broken up by regions or activities these sub units are called 'Local Unit List Reporting Units'. Both types of reporting units may report for several local units. Until 1992 limited data was also collected on local units.

Problems arising in using the data

Some researchers are concerned that changes in the composition of the Enterprise through Local Units closing or changing ownership may distort the data from Enterprises. Hence they apportion the Enterprise data across the Local Units recorded on the business register for that Enterprise. This is done using employment recorded for that unit on the IDBR as provided by VAT or PAYE returns or from other ONS surveys.[8] These IDBR size data are not considered to be as reliable as directly returned data partly because there can be a delay in its updating.[9]

Obviously directly returned data are only available for contributors that are selected in the ACOP/ACOC/ABI surveys and that returned a form. This returned data held in the ARD is sometimes called the raw data,[10] but it is more accurate to call it 'contributor' data as the returned data may have been adjusted or used to impute some variables where contributors have not been asked for a full range of data. For example, when businesses fail to return the questionnaires the contributor data for that unit may be constructed if ONS has sufficient information from other sources. Thus constructed data may use returned data such as turnover, stocks and capex from other inquiry sources and will generally be based on what ONS already knows about that particular company and its history (e.g. from follow-up or other current and past surveys). Also constructed data are

usually used only for the 1:1 cells i.e. where a census has taken place. This is therefore more accurate than straight pro-rata allocations based on measures of size from the register. Therefore for many purposes the 'processed' data can be treated as real returned data even when constructed or imputed, but researchers should be aware of these constructed, imputed or outlier adjusted contributor data where this could affect results.

The main need for imputation arises from the use of 'short-forms'. These are used to reduce business compliance costs. A percentage of firms, other than in 100% sampled cells,[11] are sent shorter forms than the full survey questionnaire. These forms ask for the full range of data, including sectoral specific questions. However they generally ask for totals only for a number of sections where the long form asks for a breakdown, e.g. breakdown of intermediate consumption. These short form values are expanded to give the full breakdowns on a cell by cell basis using ratios derived from long form returns in the cell.

ONS regards a response as an outlier if it is outside certain limits of what to expect for that Enterprise i.e. when compared with previous surveys or administrative data. Where this cannot be reconciled through follow-up enquiries, smoothed outliers are added to the original and constructed respondent data to produce a set of variable sets prefaced by 'WQ'. The 'W' refers to the method of smoothing outliers known as 'Winsorisation'.[12] This was the method of dealing with outliers used between 1993 and 1997 on the 'new' ACOP Results system. In the ABI Results system alternative outlier correction methods are used. The view of ONS is that the processed data are for most purposes a reliable measure of the individual business variables. In the ARD data files, winsorised data are not supplied but imputations have been done.

As all the contributors in the ARD are identified by their unique business register reference number, it might seem straightforward to link the data for individual businesses through time. In practice there are many problems that arise. For example, apart from the size-bands where there is a yearly census, the firms selected for surveys change year to year. Thus longitudinal linking may return missing values for the smaller businesses across the years where they were not included in the ACOP/ABI surveys. Changes in SIC structures, e.g. from SIC 80 to SIC 92, also complicate longitudinal linking of industries. In addition changes in the register due to both gradual improvements and complete revisions (e.g. the move to the IDBR) present extra problems. When this happened it can be unclear where previous contributors ended up on the new register. The problems of allowing for changes in local units associated with an enterprise and changes in ownership have already been mentioned.

Demographic data

In Table 3 below, we summarise the data according to the definitions given in Table 2 below.

Table 2 Definitions of demographic status

Status	Definition
Continuer	Present in t-1, t and t+1
Entrant	Present in t and t+1, not present in t-1
Exitor	Present in t-1 and t, not present in t+1
One-Year	Present in t only

Table 3 Number of reporting units and employment by status

Year	Number of reporting units				Employment			
	Continuers	Entrants	Exitors	One-Year	Continuers	Entrants	Exitors	One-Year
1980	102,667		3,476		6,179,728		256,103	
1981	93,262	3,579	9,405	213	5,436,345	125,065	192,768	7,941
1982	95,000	4,253	1,841	114	5,179,553	113,430	82,872	4,087
1983	42,881	1,506	56,372	710	4,605,333	116,557	516,433	12,980
1984	39,428	9,549	4,959	82,991	4,420,175	264,085	258,971	327,451
1985	46,476	78,217	2,501	15,294	4,466,677	412,394	135,453	85,102
1986	106,994	19,535	17,699	4,260	4,585,082	186,175	225,206	22,301
1987	107,365	20,106	19,164	3,878	4,580,044	176,725	270,849	21,943
1988	112,239	7,132	15,232	20,098	4,651,077	142,282	233,632	58,402
1989	103,480	27,655	15,891	10,917	4,588,500	183,170	273,371	35,745
1990	116,659	16,451	14,476	4,307	4,539,950	148,201	236,866	29,320
1991	96,081	4,094	37,029	10,856	4,182,156	119,665	333,240	31,618
1992	88,550	8,795	11,625	51,403	3,913,568	150,563	264,279	162,188
1993	85,062	41,437	12,283	9,282	3,628,195	197,864	292,444	33,962
1994	104,938	22,699	21,560	8,813	3,555,510	267,890	258,403	173,571
1995	112,477	33,735	15,178	14,122	3,692,887	344,143	316,611	138,671
1996	131,427	17,740	14,785	3,832	3,652,517	188,032	352,182	73,645
1997	133,773	17,128	15,394	4,442	3,744,431	280,922	273,649	65,950
1998	150,901	18,455			4,044,728	220,612		

Source: Author's calculations using the ARD

We begin in 1980 since that is the earliest year we can calculate entry, exit and representative employment. Unfortunately the universe files[13] in the 1970s do not contain any employment data making it difficult to move from the sample to the population. The number of reporting units jumps in the second half of the 1990s with the introduction of the IDBR. A register improvement in 1984 is also very evident in the large number of one-year observations that year.

Business Data Linking in action

Previous work using the ARD is summarised in Barnes, Haskel and Ross (2001). Here recent work undertaken by the Business Data Linking Branch is summarised. In future issues of *Economic Trends* this work will be explored in more detail.

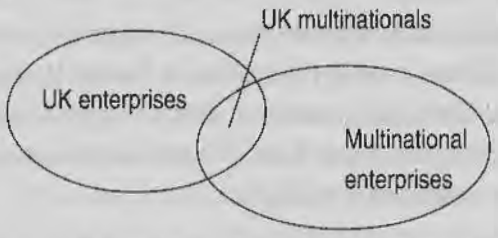
Work under way at present is focussing on two main approaches to using the data. First, linking over time and comparing, for example, changes in the distribution of businesses over time. A key focus being to look at what makes successful businesses different from less successful ones. Second, work is taking place to link other surveys to the ARD in one or more years. At present this work includes bringing in the Community Innovation Survey from the DTI, the New Earnings Survey and E-Commerce Survey from ONS. To introduce this work, Box B presents early results from linking the ONS Annual Inquiry into Foreign Direct Investment.

Box B: Minding the right gap

Business Data Linking research shows UK owned firms are better than they seem relative to foreign owned ones

A recurrent issue on the UK government's economic policy agenda is the productivity gap between the manufacturing sector of the UK and other industrialised countries.[14] In their quest for an explanation and a cure for Britain's weaker performance economists researching this issue using the ARD have come across a striking fact:[15] The pattern found in the international comparisons of aggregate data is replicated at the business level. The labour productivity of foreign-owned enterprises in the UK is on average 40% higher than the productivity of domestically-owned enterprises.[16] As both groups of firms operate in the same institutional environment and are supplied from the same pool of labour, this raises issues about managerial performance and inefficient control rather than poor skills or inadequate institutions in explaining the international productivity gap. Moreover, one may conclude that a policy to raise productivity would include the government attracting as much foreign direct investment as possible. The problem with this line of argument can be seen in Figure 1

Figure 1



Foreign owned establishments are by definition all part of multinational enterprises. The same is true only for a small subset of the population of UK establishments. To find out if the superiority of foreign owned firms is a consequence of their multinational nature[17] rather than a result of poor British managerial abilities we have to compare foreign-owned firms' performance with that of multinational enterprises which are owned by UK institutions or residents. Although this seems straightforward this has not been possible so far because the ARD data does not contain any marker of UK multinational establishments. It was only after linking the ARD data with information from the Annual Inquiry into Foreign Direct Investment (AFDI) that such a differentiation could be made. Results[18] - reported in columns 3 and 4 of Table 4 - suggest that the foreign effect is indeed a multinational effect. The productivity of UK multinationals in 1998, approximately £40,000 per employee, is only slightly below the average figure for foreign owned firms.

Table 4 Characteristics of domestic and multinational enterprises in the UK

	1 all UK	2 all Foreign	3 UK non-MNE	4 UK MNE	5 Total
Observations	7,275	1,370	6,398	877	8,645
Share of value added (%)	64.6	35.4	42.8	21.8	
Share of employment (%)	71.2	28.8	52.0	19.2	
Average value added per employee (£)	29,967	41,465	28,580	40,082	31,789

Note: Calculations based on unweighted sample of 1998 ARD and 1998 AFDI.

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Notes

1. References to specific survey names have been removed from the name of the database to reflect linking of multiple surveys.
2. Note that despite their names, ACOP and ACOC were in reality only a census for larger businesses, and were a stratified random sample for smaller observations. In addition in many years the very smallest businesses were exempt to reduce their administrative burden.
3. Published results from the ABI are available from the National Statistics web site at **www.statistics.gov.uk/abi**
4. Prior to 1994 the surveys were drawn from the CSO Business Register.
5. For a background to disclosure issues see GSS (1995).
6. For example, if presenting employment numbers and the largest observation in a cell has employment of 1,000, then the sum of the employment of all the observations in the cell except the next largest must be greater than 100 to pass the dominance rule.
7. Plant and machinery, vehicles, and buildings.
8. The employment numbers on the register for local units are likely to be imputed. From 1994 the IDBR also contains turnover data.
9. In addition it is likely that recent changes in the composition of enterprise local units which may be included in the returned survey data may be absent from the local units on the register. This is almost certain when looking at the snapshot of the register from which the sample was drawn (known as the 'non-selected' file).
10. These data have also been termed the 'selected' data.
11. In 2001 and beyond some completely enumerated cells do contain short forms for compliance control reasons.
12. See Smith and Kokic (1997) for more detail on Winsorisation techniques.
13. Universe files contain register data on all reporting units available to be selected that were not sampled or that were excluded from sampling for compliance control or sample design reasons.
14. See for example the Treasury's Pre-Budget Reports for 2000 and 2001.
15. Studies include Griffith and Simpson (2001), Oulton (1998) .
16. Compare the last row of columns 1 and 2 of Table 1.
17. A large literature starting with Dunning (1981) suggests that multinationals should have a superior productivity performance.
18. For more in-depth analysis see Criscuolo and Martin (2002).