

# The Contribution of Mobile Phones to the UK Economy

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This report is published by mmO2 as part of its continuing commitment to demonstrate the role and importance of the mobile telephony industry.

This report has been produced by **cebr**, an independent economics and business research consultancy established in 1993 providing forecasts and advice to City institutions, government departments, local authorities and numerous blue chip companies throughout Europe. The contributors to this report are Douglas McWilliams, Ian Mitchell and Dominic Walley.

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# Contents

## Key findings of the study

Objectives and approach.....	3
Contribution of the mobile phone industry to GDP.....	4
Employment.....	8
Productivity.....	10
Government finances.....	11

## Annex

Introduction and approach.....	13
Building blocks.....	14
Direct contribution.....	15
Indirect contribution.....	15
Sources.....	16
Telecommunications industry.....	17

# Key findings of the study

# Objectives and approach

## **The study measures the economic contribution of mobile phones**

This study was commissioned by mmO2 and conducted by cebr to measure the contribution of mobile phones to the UK economy. The study estimates the contribution of mobile telephony and directly related services on the output and employment of the UK economy.

## **We have a narrow definition of mobile telephony...**

For the purpose of the study, mobile telephony was described as:

*"The manufacture, operation and distribution of mobile phones and any additional services that are directly facilitated by mobile telecommunications."*

This definition includes the processes of making mobile phones, selling them, providing mobile telephone services ranging from ordinary voice traffic and text messaging to more exotic services provided over mobile phones like gambling.

## **...and we exclude activity that would have taken place anyway**

Where a service provided through a mobile phone is merely a substitute for the same service that might have been provided through some other route, this impact has been netted out in our calculations. So – in the case of gambling over mobile phones – the addition to the economy is only the additional amount of gambling that results from the new opportunities created by being able to gamble over the mobile phone and not the crude total of activity created by gambling over mobile phones, which will inevitably include some activity that might otherwise have taken place over fixed lines, over the internet or by direct access to the bookmaker.

## **We have looked at a range of measures of the industry's contribution**

We have measured the contribution of the industry as its contribution to GDP (total national output); to employment; to productivity; and to government finances.

# Contribution of the mobile phone industry to GDP

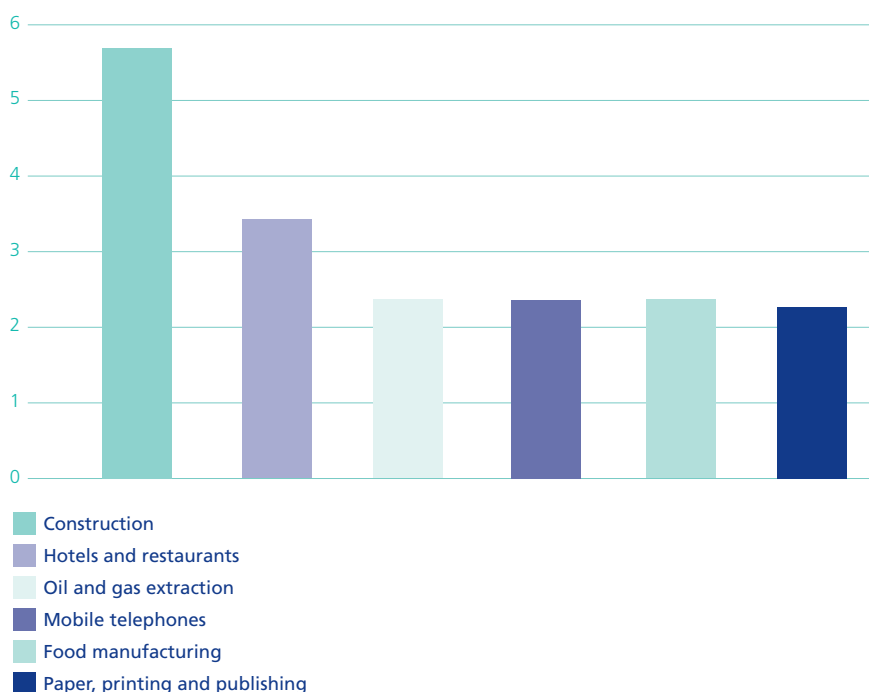
## Mobile telephony 2.3% of GDP

We estimate the contribution of the mobile telephone industry contributed £22.9 billion to UK GDP in 2003. This is just over 2.3% of the UK's total economic output.

## Smaller than construction but the same size as the UK's oil and gas industry

To put this in context it is worth looking at the direct contribution to GDP of other industries<sup>1</sup>. The contribution of mobile telephony is about half the direct contribution of construction (5.8% of GDP) and slightly smaller than the direct contribution of hotels and restaurants (3.4%). But the contribution of mobile telephony is in line with oil and gas extraction (2.3%); food manufacturing (2.3%) and printing, publishing and paper (2.2%)<sup>2</sup>.

**FIGURE 1 CONTRIBUTION TO GDP OF SELECTED INDUSTRIES (% OF GDP, 2002 OR 2003)**



## Operators responsible for £13.8 billion in 2003

In Figure 2 below we set out where the contributions arise. Operator service revenues, at just over £13.8 billion, are the largest single contributor to the output of the mobile telephone industry. These revenues relate largely to the costs of calls, texts and handsets.

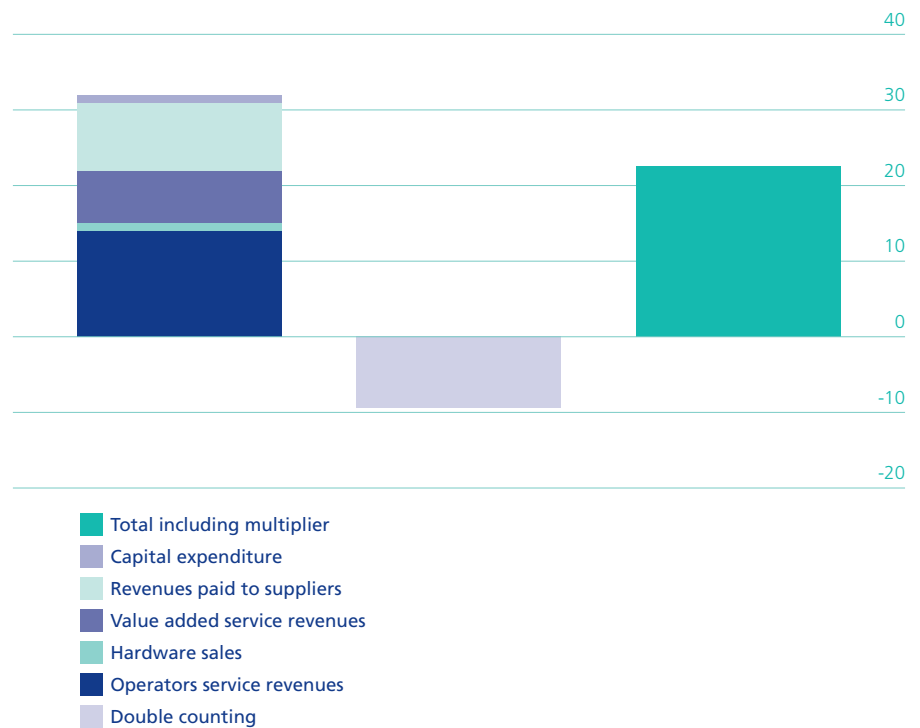
A significant adjustment is made for double counting in the revenue figures. This is particularly relevant for the revenue received by operators. This revenue includes payments made by mobile phone users that appear in a user's bill but which relate to services (or indeed phones) provided outside the operator.

A multiplier has also been applied to the final figure output figure. This represents the knock-on effect of mobile telephone activity on the rest of the economy.

<sup>1</sup> In some sense this comparison does not compare like with like because we are looking at not only the direct contribution of the mobile telephone industry but also the indirect contribution from related industries whereas for the other industries we are only looking at the direct contribution. However this approach can be justified in that mobile telephony is an enabling industry providing key infrastructure that enables other activities to take place whereas this is not so to the same extent for the other industries.

<sup>2</sup> The figures for oil and gas extraction and for construction are for 2003 and based on the National Accounts Press release of 26 March 2004. Those for the other sectors are for 2002 and taken from the 2003 Blue Book.

FIGURE 2 MOBILE TELEPHONY ESTIMATED OUTPUT, £ BILLION, 2003



Source: cebr

#### Value added services account for 22% of output

Value added service revenues were £1.4 billion in 2003. These revenues relate to services provided using mobile phones and include revenues arising from music downloads, web browsing, traffic updates, ring tone downloads, football score alerts and other services purchased via mobiles including, for example, payment of London's congestion charge. These services accounted for 22.4% of the mobile sectors' revenues in 2003.

Most commentators expect these revenues to rise sharply in the coming years.

#### Delayed 3G expenditure reduced 2003 impact from capex

Capital expenditure in 2003 was relatively low by historical standards and amounted to £1.5 billion - just 4.8% of total expenditure; down from 18.5% in 2001. This reflected the decision by the existing 2G mobile operators to delay the rollout of 3G phones until 2004 and therefore defer some of the associated capital expenditure.

#### Hardware revenues held down by cross-subsidy

Hardware revenues were just £1.1 billion in 2003. This figure is artificially deflated by significant subsidies offered by operators on the purchase of mobile telephones. Revenues received in relation to the true value of hardware are therefore captured in the figure for 'operator revenues' and in the 'revenues paid to suppliers'.

#### Second level service providers receive over £8 billion

Revenues paid by operators to suppliers were approximately £8 billion in 2003. These costs include payments made to mobile phone producers such as Nokia, Sony Ericsson and Motorola. These revenues also encompass the expenditure of the operators on maintaining the network of masts and other ongoing costs.

Table 1 below sets out in detail the revenues produced by elements of the phone industry.

**TABLE 1 REVENUES ARISING FROM MOBILE TELEPHONY AND GDP IMPACT**

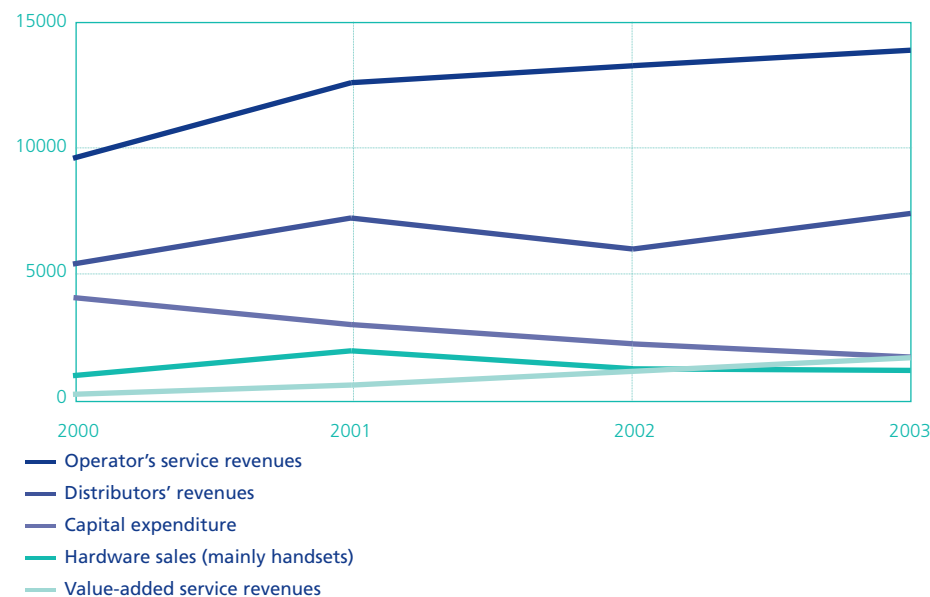
Category	£ million in 2003
Operators' service revenues	13,844
Hardware sales (mainly handsets)	1,089
Distributors' revenues	7,061
Value-added service revenues	1,370
Games	142
Ringtones and other music	152
Lottery	67
Adult	12
Other (cricket scores etc paid for by credit card)	166
Value added services sold by operators	831
Revenues paid by operators to suppliers [cost of sales]	8,030
Capital expenditure	1,504
By operators	1,400
By distributors and others suppliers to operators	97
By value added service providers other than operators	7
Total spend	32,898
MINUS double counting	-9,981
Revenues from value-added services already included in operators' service	831
Operating expenditures of operators (cost of sales)	8,030
Imports	3,757
<b>Total impact on GDP</b>	<b>20,280</b>
<b>(% of GDP)</b>	<b>2.01%</b>
Multiplier	1.13
<b>Total impact of GDP including multiplier impact</b>	<b>22,917</b>
<b>(% of GDP)</b>	<b>2.27%</b>

**Ring tone and music revenues over £150 million**

Ringtone and music revenues not sold by the main operators equated to £152 million in 2003 — the largest of the value added groups. Games revenues were not far behind at £142 million while adult content contributed £12 million.

Figure 3 below shows how the main groups of mobile telephony revenues have altered over recent years.

**FIGURE 3 MOBILE TELEPHONY EXPENDITURE £MILLION**



Source: cebr

### Operator revenues up by 41.6% since 2000 but growth has slowed

The revenues generated by calls and texts have increased in every year between 2000 and 2003, and are 41.6% up on the start of the period, but the rate of increase reduced over the period. Revenues have been supported by an increasing customer base making additional use of their phones but these increases have been offset by the falling prices of calls.

### High street slowdown hit distributors in 2002

Distributors' revenues have also increased over the period, with the 2003 figure up 32.3% on the 2000 level. Providers like Phones 4 U and Carphone Warehouse saw their revenues fall by 13.7% in 2002 following a slowdown in take-up, weaker consumer spending growth and strong price competition on the high street. The distribution sector recovered in 2003 with revenues rising to £7.1 billion and above the 2001 level.

### Capex down 59.4% on 2000 peak

Capital expenditure in the mobile phone sector fell back significantly between 2000 and 2003. In 2000, capex accounted for 18.5% of the above categories of mobile expenditure at £3.7 billion. However, as population coverage has neared saturation and new investment by operators has fallen, capex in the sector fell to £1.5 billion in 2003 — 59.4% down on its 2000 peak. We can expect the arrival of 3G to herald significant additional investment by the operators — implying that the economic contribution is set to rise in 2004.

**TABLE 2 BUILDUP OF IMPACT ON GDP FROM MOBILE TELEPHONY (£ MILLION)**

Category	1999 est				
	(NERA)	2000	2001	2002	2003
Operators' service revenues		9,778	12,160	13,424	13,844
Hardware sales (mainly handsets)		1,164	1,447	1,204	1,089
Distributors' revenues		5,336	6,989	6,033	7,061
Value-added service revenues		162	401	885	1,370
Games					142
Ringtones and other music					152
Lottery					67
Adult					12
Other (cricket scores etc paid for by credit card)					166
Value added services sold by operators		98	243	537	831
Revenues paid by operators to suppliers [cost of sales]		5,671	7,296	8,055	8,030
Capital expenditure		3,706	2,812	1,971	1,504
By operators		3,613	2,689	1,861	1,400
By distributors and others suppliers to operators		92	120	104	97
By value added service providers other than operators		1	3	6	7
Total spend		16,038	31,105	31,572	32,898
MINUS double counting		-6,248	-8,637	-9,663	-9,981
Revenues from value-added services already included in operators' service		98	243	537	831
Operating expenditures of operators (cost of sales)		5,671	7,296	8,055	8,030
Imports		1,605	3,683	3,592	3,757
<b>Total impact on GDP</b>		<b>8,664</b>	<b>19,883</b>	<b>19,389</b>	<b>20,280</b>
<b>(% of GDP)</b>		<b>0.9%</b>	<b>2.0%</b>	<b>2.0%</b>	<b>2.0%</b>
Multiplier		1.1	1.1	1.1	1.1
<b>Total impact of GDP including multiplier impact</b>		<b>5,280</b>	<b>9,791</b>	<b>22,467</b>	<b>21,909</b>
<b>(% of GDP)</b>		<b>0.6%</b>	<b>1.0%</b>	<b>2.3%</b>	<b>2.3%</b>

# Employment

## The sector is responsible for nearly 200,000 jobs

The mobile telephone sector directly supported 174,600 jobs in 2003. This was 0.59% of total UK employment in the same period. Once account is taken of the jobs created in other industries by the wealth generated by the mobile phone sector the number of employees dependent on the mobile phone sector rises to 197,300 and 0.66% of the economy.

## Operators employ 21.4% of total

Employment in the sector is spread relatively evenly between operators, distributors and suppliers. The five mobile phone operators are the largest employer group with 37,300 jobs — 21.4% of the total.

**FIGURE 4 ESTIMATED JOBS SUPPORTED BY MOBILE TELEPHONY, THOUSANDS, 2003**



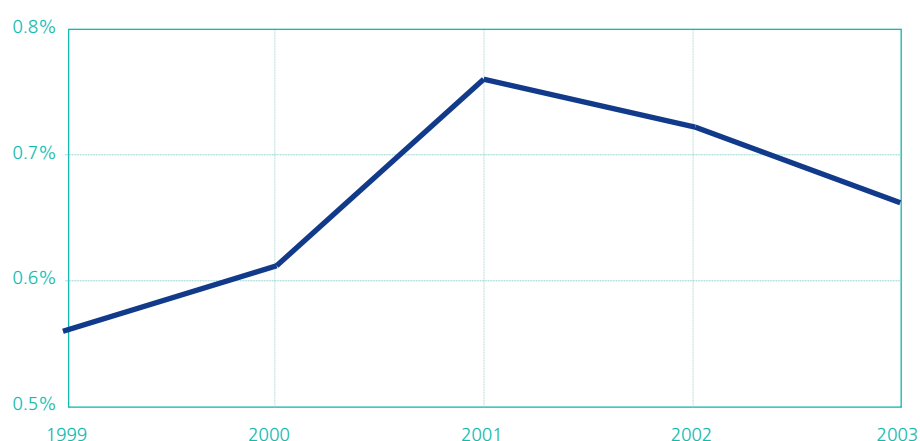
Source: cebr

**TABLE 3 ESTIMATED JOBS SUPPORTED BY MOBILE TELEPHONY, 2003**

Category	2003
In operators	37,343
Suppliers of goods and services to operators	32,127
Distributors	31,185
Suppliers of value added services	9,451
Suppliers of goods and services to distributors and service providers	34,959
From capital expenditure	29,571
<b>Total of number of jobs</b>	<b>174,636</b>
<b>% of total employment</b>	<b>0.59%</b>
Multiplier	1.1
<b>Total of number of jobs including multiplier impact</b>	<b>197,338</b>
<b>% of total employment</b>	<b>0.66%</b>

Source: cebr

Those people employed in relation to value added services totalled 9,400 in 2003. Employment in value added services is now 5.4% of the total directly employed in the mobile sector.

**FIGURE 5 MOBILE TELEPHONY SHARE OF UK EMPLOYMENT (% TOTAL UK EMPLOYMENT)**

Source: cebr. 1999 estimate from *The Economic Impact of the UK mobile market*; report for MTAG prepared by NERA October 2000

#### Mobile telephone employment down 25,000 from 2001 peak

The contribution of mobile telephony to UK employment fell in both 2002 and 2003. At its peak, employment in the sector accounted for 0.76% of total UK employment. Cost cutting at the main operators and a reduction in employment in relation to capital expenditure against a background of increasing employment in the UK economy as a whole has reduced the figure to 0.72% in 2002 and 0.66% in 2003.

The value added services sector saw a significant rise in employment from around 1,100 in 2000 to 9,400 in 2003.

**TABLE 4 BUILDUP OF IMPACT ON JOBS FROM MOBILE TELEPHONY (NO OF JOBS)**

Category	1999	2000	2001	2002	2003
In operators		31,815	39,566	37,343	37,343
Suppliers of goods and services to operators		27,371	34,039	32,127	32,127
Distributors		28,724	34,264	36,596	31,185
Suppliers of value added services		1,115	2,764	6,107	9,451
Suppliers of good and services to distributors and service providers		25,670	31,855	36,738	34,959
From capital expenditure		76,314	56,797	39,308	29,571
<b>Total number of jobs</b>		<b>159,193</b>	<b>199,284</b>	<b>188,220</b>	<b>174,636</b>
<b>(% of total employment)</b>		<b>0.54%</b>	<b>0.68%</b>	<b>0.64%</b>	<b>0.59%</b>
Multiplier		1.1	1.1	1.1	1.1
<b>Total number of including multiplier impact</b>		<b>163,916</b>	<b>179,888</b>	<b>212,689</b>	<b>197,338</b>
<b>(% Of total employment)</b>		<b>0.57%</b>	<b>0.61%</b>	<b>0.76%</b>	<b>0.72%</b>

# Productivity

The continued expansion in revenues against a background of falling employment has been driven by dramatic increases in productivity.

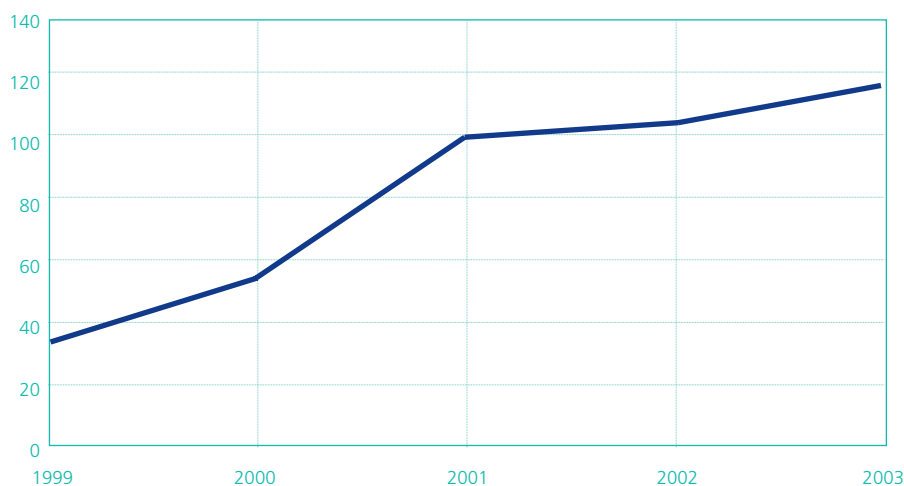
## Productivity more than tripled between 1999 and 2003

Productivity in the mobile telephony sector has more than tripled from its value in 1999. Productivity in 2003, in terms of value added per employee, was £116,000 as against £32,200 in 1999.

## Productivity three times the national average

We estimate that the UK's productivity on the same measure was £39,630 in 2003. The mobile telephone sector is one of the most productive of the UK economy and is a key sector for the government's drive to narrow the productivity gap between the UK and the US and other parts of Europe.

**FIGURE 6 VALUE ADDED PER EMPLOYEE IN UK MOBILE TELEPHONY (£THOUSANDS PER EMPLOYEE)**



Source: cebr, 1999 NERA estimate [full source]

## Sluggish 2002 gave way to a further 12.7% improvement in 2003

Productivity grew strongly between 1999 and 2001 before slowing in 2002 as mobile penetration and revenue per user growth slowed on the back of weaker consumer spending.

Growth in productivity between 2002 and 2003 was 12.7%. This significant increase on an already healthy figure highlights the success of the sector in servicing a large increase in mobile usage with limited additional expenditure and employment.

# Government finances

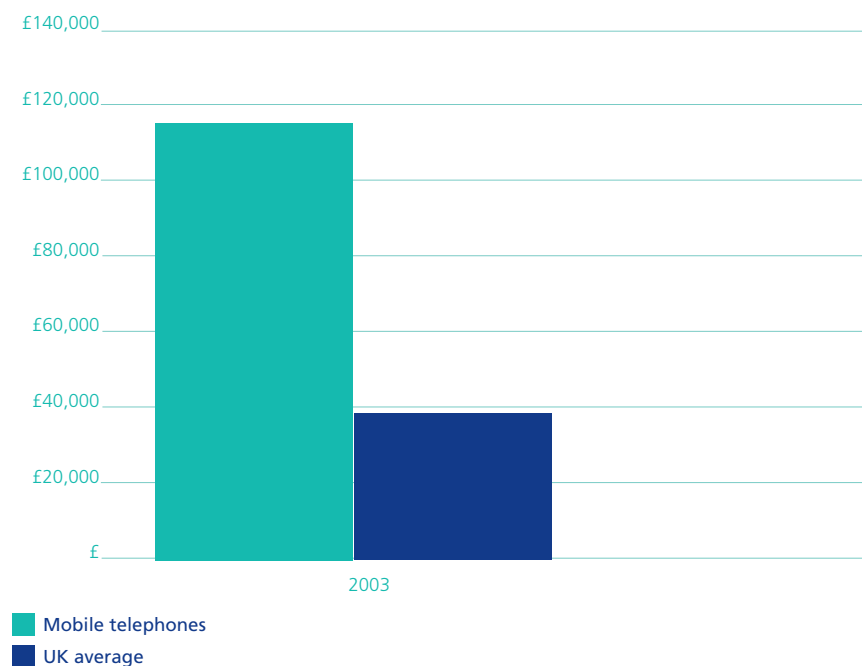
It is economic activity that ultimately supports the activity of government through tax receipts.

## Model based simulation to find out impact on government finances

We have therefore carried out a simulation to attempt to measure what the impact might be on government revenues and expenditures if mobile telephony did not exist.

We have used UKMOD, cebr's macro economic forecasting and simulation model, to run this simulation. We have simulated the impact of a £29,890 million per annum reduction in consumer spend on government revenues and expenditure.

**FIGURE 7 PRODUCTIVITY IN MOBILE TELEPHONY IS THREE TIMES THE NATIONAL AVERAGE - FIGURES SHOW VALUE ADDED PER EMPLOYEE IN MOBILE TELEPHONY VS GDP PER EMPLOYEE**



The model allows interest rates and exchange rates to adjust and so allows for the fact that with reduced consumer spend and pressure of demand, inflation and hence interest rates ultimately would be lower.

## Industry contributes £15 billion a year to government finances

The impacts are shown in Table 5. They show that the industry contributes £10 billion a year to government revenues. In addition they show that if the industry did not exist, the government would have to find an additional £5.5 billion to pay for additional unemployment related benefits. The total impact therefore on government finances is over £15 billion.

**TABLE 5 IMPACT ON GOVERNMENT FINANCES IF MOBILE TELEPHONY DID NOT EXIST**

Revenue	£ millions
Income tax receipts	-4,628
Corporate tax receipts	-655
Indirect tax receipts	-5,029
<b>Total revenue</b>	<b>-10,312</b>
<b>Government expenditure</b>	<b>5,536</b>
<b>Total impact on government finances</b>	<b>-15,848</b>

# Annex

# Introduction and approach

This section sets out our approach to producing the estimates for the contribution of the mobile telephone industry.

- i) In putting together our estimates we have taken two main approaches. These are:
- ii) a building block approach based on the output of individual elements of the supply chain
- iii) estimates on the basis of survey data on business and consumer spend on mobiles

In addition we have produced a short analysis of the total telecommunications sector to sense check our findings and place them in a wider context. The two approaches are described below.

# Building blocks

Using information from the annual accounts of the main UK operators, distributors and manufacturers of mobile phones.

Payments for the purchase of mobile phones, calls, text and other messages and related services such as music downloads are largely paid for using the individual's (or company's) mobile. For post-pay customers charges would appear on their bill while for pre-pay customers the 'charge' is against their talk time. As the mobile phone operators manage this process the information that they hold on revenues actually reflects the revenues of the entire industry.

In our first approach to measuring the industry we have therefore analysed in detail information contained in the operators' financial accounts. In addition, we have used relatively up-to-date information from OFCOM on call revenues and volumes to produce figures to 2003.

## **Consumers and business expenditure**

This section produces estimates on consumer and business spend on mobile phones.

In estimating consumer expenditure on mobiles we examined data from the family expenditure survey (FES).

While there is likely to be some inconsistency in the way that mobile spend is recorded by respondents to the survey, the increase in mobile related services is certain to reflect the increasing preponderance for consumers to purchase value added services on their mobile phones.

We have also produced estimates of overall business expenditure based on surveys of expenditure by individual firms. OFCOM collected information on small and medium businesses' average expenditure on mobiles until August 2002.

Taken together these figures give an indication of total private sector expenditure on mobile telephony.

## Direct contribution

The industry's output was considered under three headings:

- i) the direct impact from manufacturing, operating and distributing mobile phones;
- ii) the contribution of related activities facilitated by mobiles, for example traffic alerts and ringtones; and
- iii) the indirect contribution in terms of the diverse group of other industries that benefit from mobile phones, for example advertising, construction and mast manufacture

## Indirect contribution

This section considers the knock-on impact of the mobile telephone industry on the rest of the UK economy. This would include those revenues and jobs created in, say, the advertising industry that are directly dependent on mobile phone activities.

In performing this analysis we have drawn on the input-output tables published by government. These tables quantify the interdependency between industries.

Our findings do not imply that the identified jobs and revenues would disappear in the absence of the mobile telephone industry. In competitive markets, economic theory suggests that the most remunerative activity will crowd out the marginal activity when supply resources are limited. This implies that, in the absence of a mobile phone industry, revenues and employee jobs would be lower but many of those working in the associated industries would work on other industries and assignments instead.

Our findings are intended to give an indication of the current economic activity associated with the mobile industry.

# Sources

These contributions were measured using several approaches and sources. We have considered:

- i) official figures on the telecomms industry (including Office for National Statistics Annual Business Inquiry data)
- ii) survey information on consumers, businesses and Government on their consumption of mobile phones (OFCOM survey data, Family Expenditure survey)
- iii) information from the annual accounts of mobile operators and distributors
- iv) Input-output tables plotting business expenditure by industry of suppliers (ONS)

Using these sources has allowed us to sense check our findings and also to ensure that we are not double-counting activity.

# Telecommunications industry

This section of the annex considers the official sources of output data on the mobile phone industry.

The Office for National Statistics (ONS) conducts the Annual Business Inquiry (ABI) a survey covering employers across the sectors and sub-regions of the UK. Data is collected on the telecommunications industry as a whole but is not disaggregated further. In this section we outline developments in this sector before examining mobile phones contribution to the sector in more detail.

The telecommunications sector, as measured by the Annual Business Inquiry, is defined as including the:

“transmission of sound, images, data or other information via cables, broadcasting, relay or satellite:

- telephone, telegraph and telex communication
- maintenance of the network
- transmission (transport) of radio and television programmes”<sup>1</sup>

The official definition notes that “telephone answering activities” and the “production of radio and television programmes” are not included.

In terms of the delivery mechanism of this information transfer we can consider that the category includes the following (product) areas”:

- Telephony (land line and mobile)
- Internet and broadband
- Television and radio

The key figures on the output of telecommunications sector are set out below:

**TABLE 6 TELECOMMUNICATIONS INDUSTRY**

Category	1995	1996	1997	1998	1999	2000	2001	2002 <sup>2</sup>
Total turnover (£m)	20,726	23,092	27,098	31,871	36,254	41,640	45,604	50,000
Approximate gross value added at basic prices (£m)	11,065	11,920	15,052	16,844	16,623	19,395	19,617	20,435
Total employment - average during the year (thousands)	..	..	..	198	202	232	262	255

Source: Office for National Statistics, Annual Business Inquiry

As the table above shows, the telecommunications sector grew quickly between 1995 and 2002 with turnover more than doubling in nominal terms and gross value added increasing by just under £10 million.

In real terms, growth in the sector would be even starker as prices have fallen steeply relative to the general level of inflation.

The industry is a key contributor to the UK economy accounting for over 2% of turnover, 3% GVA and 1% of employment.

<sup>1</sup> Note that this definition relates to the Standard Industrial Classification (SIC(92)) system of categorising industry. Amendments to these classifications were made in 2003 (SIC(03)). For full definitions of industry sectors see [http://www.statistics.gov.uk/abi/sic92\\_desc.asp](http://www.statistics.gov.uk/abi/sic92_desc.asp)

<sup>2</sup> 2002 data is provisional

**TABLE 7 TELECOMMUNICATIONS AS A PROPORTION OF UK ECONOMY**

Category	1996	1997	1998	1999	2000	2001	2002
Total turnover	1.42%	1.41%	1.56%	1.79%	1.95%	2.11%	2.22%
Approximate gross value added at basic prices	3.08%	2.56%	2.92%	3.13%	2.89%	3.20%	3.09%
Total employment - average during the year (thousands)				0.90%	0.90%	1.00%	1.11%

Source: Office for National Statistics, Annual Business Inquiry, cebr analysis

The sector has also played an important role in the growth of the UK economy over the period. The table below shows the proportion of recent UK growth attributable to the sector.

**TABLE 8 TELECOMMUNICATIONS AS A PROPORTION OF UK FIGURE**

Category	1995-2002	1998-2002
Growth in turnover	4.6%	5.6%
Change in GVA	3.3%	3.5%
Change in employment	—	3.8%

Source: Office for National Statistics, Annual Business Inquiry, cebr analysis

The table shows that of the growth in the UK output between 1995 and 2002, around 4.6% arose from the expansion of the telecommunications sector. The sector is increasingly important in both GVA and employment growth with both accounting for over 3.5% of the change in the four years between 1998 and 2002.





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