

# **Broadband in the Home: An Analysis of the Financial Costs and Benefits**

Final Report to the Post Office

18 September 2008

# Contents

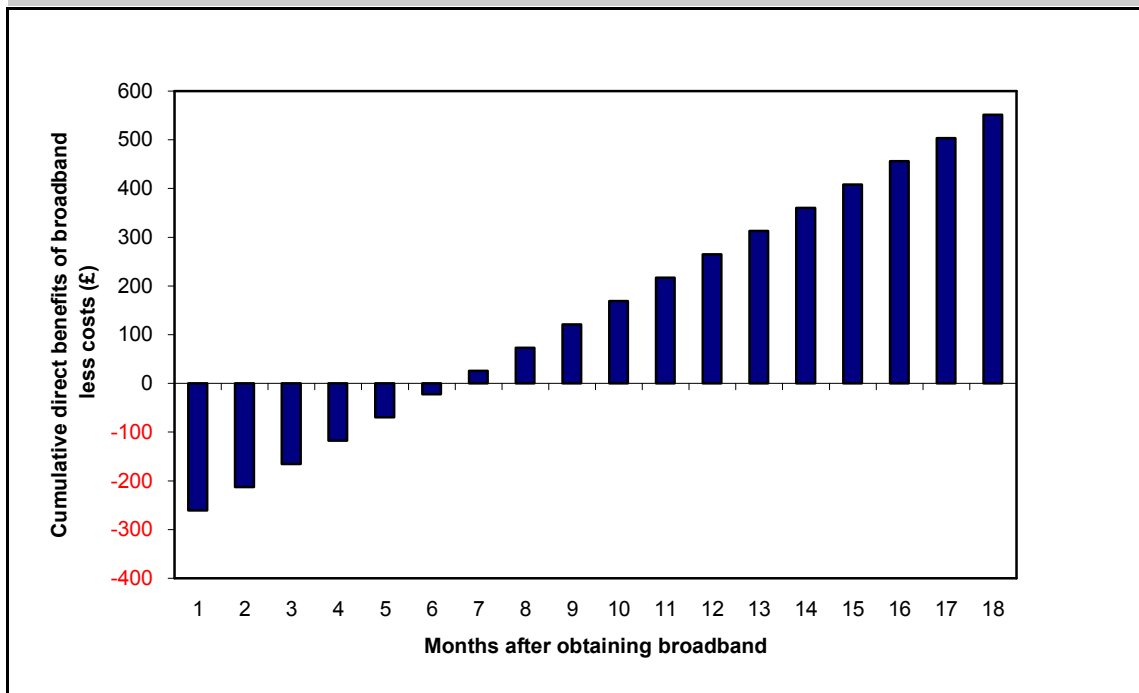
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<b>Executive Summary .....</b>	<b>1</b>
<b>1: Introduction .....</b>	<b>4</b>
<b>2: Direct financial benefits of broadband in the home .....</b>	<b>6</b>
<b>3: Wider benefits of broadband in the home .....</b>	<b>20</b>

## Executive Summary

1. The last few years have witnessed extraordinary growth in the use of broadband internet connectivity. However, there remain approximately one-third of UK households without any internet connection at all. With the majority of homes now having broadband internet, the remaining non-users will face increasing risks of exclusion from social and economic opportunities. This report aims to contribute to the understanding of the financial implications of having – or not having – broadband internet access at home for households at various income levels.
2. We estimate that the direct financial benefits of broadband in the home are in the order of **£70 per month** for the average UK household – ranging from £23 for the 10% of households with the lowest income to £148 for the 10% with the highest incomes. In total, the third of UK households which are not yet online are foregoing direct financial benefits of approximately **£4.4 billion per annum**.
3. On average, a household's investment in broadband internet access (including a computer) would **pay for itself within about six and a half months**.

Figure 1 : Cumulative direct benefits less costs, by month after obtaining broadband, for the average UK household



Source: SQW estimates, 2008

4. In absolute terms, the direct benefits are greatest for the households which spend most: the payback period is just 2.5 months for the 10% of households with the highest incomes. However, our estimates also indicate that this **payback period will be less than 18 months for 80% of UK households** (i.e. those with a gross income of more than £11,180 p.a.).

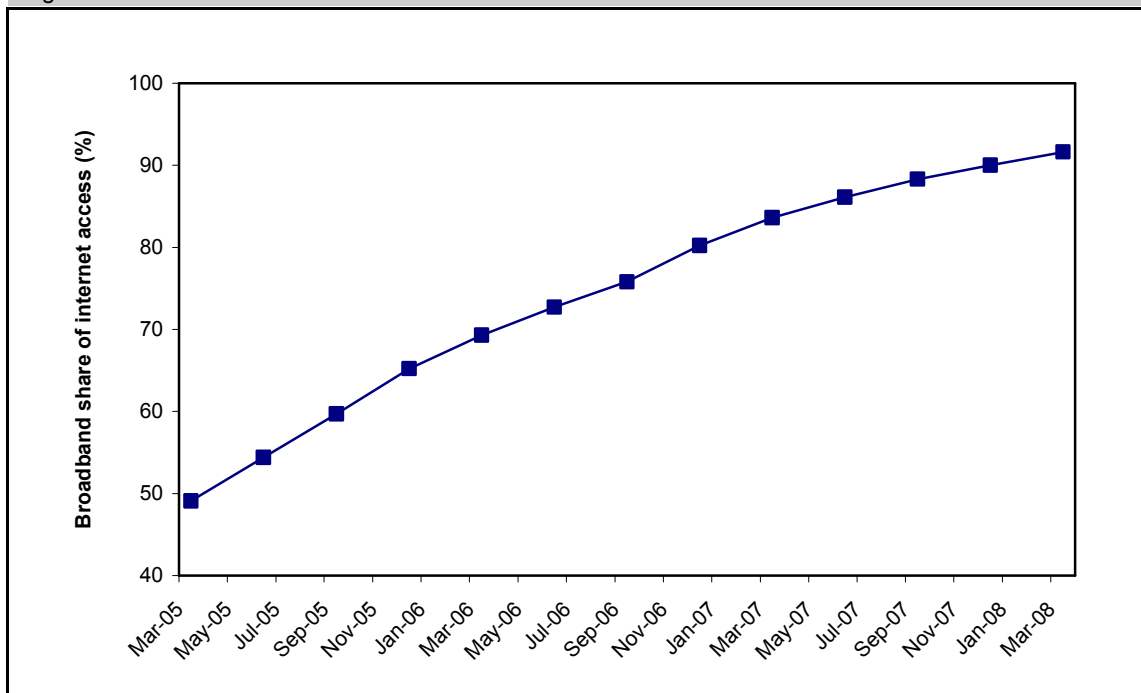
5. Most of the direct financial benefit (£63 per month on average) comes from reduced household spending. Using household expenditure data from the Office for National Statistics, we identified 15 cost categories - ranging from insurance and mortgage interest payments through to holidays, electronics and clothing - on which significant savings could potentially be made by using the internet to search for the best available deals on products and services (whether those were then purchased online or off-line). Altogether these categories account for about 46% of household expenditure. Informed by public domain data from previous research, we then estimated the typical percentage saving that could be obtained through the use of broadband internet in each expenditure category, and then applied that to the ONS data in order to derive estimates of typical reductions in household expenditure by income decile. We consider these estimates to be reasonably conservative: they represent *typical* savings rather than the maximum possible savings, and they are based on 2006 expenditures, which in some cases (such as energy) will have since risen significantly.
6. The remainder of our estimated direct benefit (c. £7 per month on average) comes from increased income from household investments, by using the internet to search for the best available deals (which in many cases may be internet-only savings accounts).
7. Set against these benefits are initial costs of about £308 (for an entry-level computer and printer) and ongoing costs of about £22 per month (for broadband service and for the electricity, printer ink and paper associated with using a computer and printer). Again, we have sought to be conservative here, by including the full costs associated with a computer and a printer as well as the broadband costs.
8. Of course, the direct financial benefits of broadband tell only part of the story: most internet-using households will have purchased a computer and broadband for the entertainment and other opportunities they provide, rather than for saving money. These less tangible, but no less real wider benefits of broadband in the home include:
  - employment prospects – having a computer and broadband in the home raises skills and confidence in the use of Information & Communication Technology (ICT) which have become important for employability, given that around three in four jobs now entail the use of computers; the jobs that use computers are typically better paid (one study suggests a 20% wage premium); and online job searches have become an important way of finding employment
  - education – children who use computers outside school tend to have better ICT skills and confidence than those who do not; furthermore the internet is becoming increasingly important as a research tool for homework, and research indicates that there is a positive link between home access to ICT and educational outcomes
  - entertainment and communication – as the popularity of services such as MSN Messenger, iTunes, YouTube and Facebook continues to grow, households left without home access to broadband are at an increasing risk of a new form of exclusion; the importance of this new medium is such that by the age of 15, UK children would, on average, miss the internet more than they would miss TV if it was taken away from them

- access to public services – for adult internet users, obtaining information from public authorities' websites (such as tax, health and council services) is one of the most frequently cited uses of the internet; as the range and sophistication of the public sector's online services continues to increase, households with broadband internet access will tend to be better informed about public services, and have more convenient access to public services than those without broadband.

# 1: Introduction

- 1.1 The last few years have witnessed extraordinary growth in the use of broadband internet connectivity. In the UK, there were 15.6 million broadband subscribers at the end of 2007, compared with just 1.4 million at the end of 2002 [source: Ofcom]: a ten-fold increase over a five year period.
- 1.2 The process of converting internet users from dial-up to broadband is now almost complete. As shown in the chart below, the Office for National Statistics (ONS) estimates that c. 92% of internet connections now use broadband connectivity.

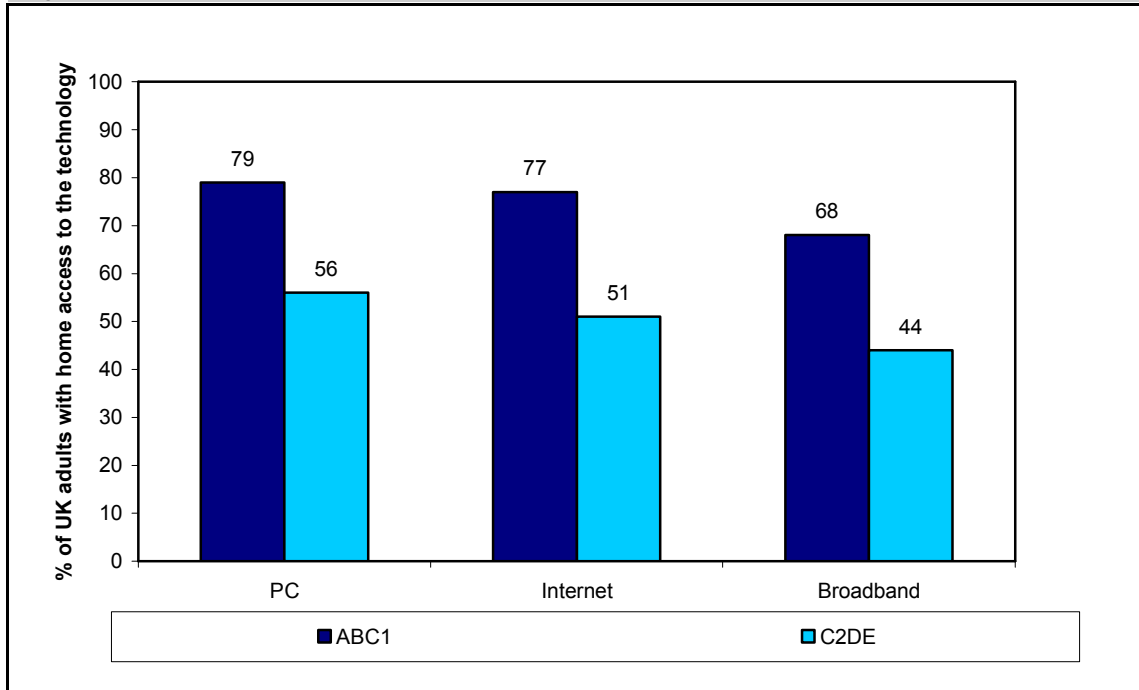
Figure 1 -1 : Broadband's share of internet access in the UK



Source: ONS, Internet Connectivity, May 2008

- 1.3 However, there remain approximately one-third of UK households without any internet connection at all – whether dial-up or broadband. Extending broadband internet access to these households is of considerable interest both to the industry (in order to expand the market) and to policy-makers: with the majority of homes now having broadband internet, the remaining non-users will face increasing risks of exclusion from social and economic opportunities.
- 1.4 Indeed, there is strong and consistent evidence that the take-up of broadband and the internet is lowest in lower income households. Ofcom estimates, for example, that just 44% of adults in the C2DE social groups have access to broadband internet at home, compared with 68% of those in the ABC1 groups (see Figure 1 -2).

Figure 1 -2 : Access to PC, internet and broadband at home



Source: Ofcom, Communications Market - Nations and Regions 2008, May 2008 (research conducted Jan-Mar 2008)

1.5 This report aims to contribute to the understanding of the financial implications of having – or not having – broadband internet access at home for households at various income levels. It summarises the findings of a study undertaken by SQW Consulting on behalf of the Post Office. Our report is structured as follows:

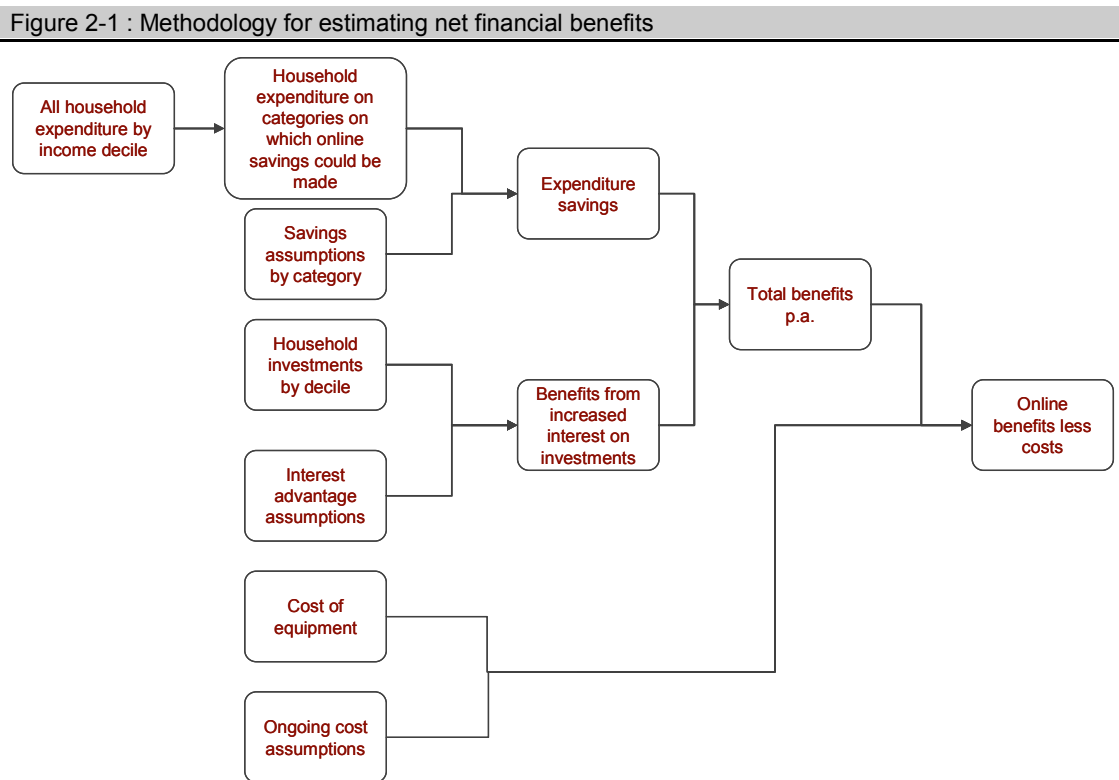
- section 2 considers the costs and cash benefits to households, available through the use of the internet to search for, compare and purchase products and services at a more beneficial rate than is typically achieved off-line
- section 3 considers the less tangible, but no less real, wider benefits to the household, in terms of improved employment prospects, education, communication and entertainment, and access to public services.

1.6 Note that, for simplicity, we have tended to equate ‘broadband internet access’ with ‘internet access’ in this report; i.e. we make comparisons between having broadband internet access, and not having internet access at home at all (rather than comparing broadband vs dial-up internet access). We consider this justified, given that broadband service can now be obtained for prices close to or even cheaper than those for dial-up access, and given that the vast majority of internet access is now via broadband. Our interest is primarily with the c. 35% of households that have no internet access at all, rather than the c. 8% that have yet to convert from dial-up to broadband<sup>1</sup>.

<sup>1</sup> These proportions are based on the Ofcom 2008 estimate that 65% of UK adults have access to the internet at home, and 57% of adults have access to broadband at home (i.e. using proportion of adults as a proxy for proportion of households)

## 2: Direct financial benefits of broadband in the home

- 2.1 In this section we develop indicative estimates of the net direct financial benefits of broadband internet access in the home. The methodology for this is illustrated in the chart below.



Source: SQW

- 2.2 Both the initial and ongoing costs of having broadband internet access are estimated, and we subtract these from the total benefits, which are derived from:
- reduced household expenditure, as a result of being able to search for, compare and/or purchase certain goods and services online at a lower price than is typically achieved off-line
  - increased investment income, by taking advantage of the higher interest rates that are available for online savings accounts.

### Reductions in household expenditure

- 2.3 Our source data for household expenditure is the ONS's *Family Spending, 2007 edition*<sup>2</sup>, published in January 2008. This provides a detailed analysis of household expenditure in the

<sup>2</sup> [http://www.statistics.gov.uk/downloads/theme\\_social/Family\\_Spending\\_2006/FamilySpending2007\\_web.pdf](http://www.statistics.gov.uk/downloads/theme_social/Family_Spending_2006/FamilySpending2007_web.pdf)



UK in the calendar year 2006, including a breakdown of expenditure by household income decile<sup>3</sup>.

- 2.4 Informed by our research on online shopping, we identified the following expenditure categories for which households could potentially reduce their expenditure through use of broadband internet:

**Table 2-1: Expenditure categories in which the use of broadband internet could potentially provide significant savings**

Ref	Expenditure category
3.1	Clothing
4.4	Electricity, gas and other fuels
7.1	Purchase of vehicles
7.2.2	Petrol, diesel and other motor oils
7.3.4	Other travel and transport
8.2	Telephone and telefax equipment
8.3.1	Telephone account
9.1.1	Audio equipment and accessories, CD players
9.1.2	TV, video and computers
9.1.3	Photographic, cine and optical equipment
9.5.1	Books
9.6	Package holidays
11.2	Accommodation services
12.4	Insurance
13.1.1	Mortgage interest payments

*Source: SQW analysis of ONS expenditure categories in Family Spending 2007*

- 2.5 Altogether, these 15 categories account for £211.77 expenditure per week in the average UK household (c. 46% of total household expenditure).

- 2.6 An important expenditure category that is not included in the above list is *1. Food and non-alcoholic drinks*, which alone accounts for 10% of household spending. While online purchase of groceries is certainly popular, through services such as Tesco.com, the products are generally at the same prices as those charged in-store, and there is typically a delivery charge which would outweigh any savings in average travel costs. The benefits of online grocery shopping are primarily convenience rather than cost.

- 2.7 While there are websites such as MySupermarket.com which can help online shoppers compare the total cost of their baskets between supermarkets, and potentially reduce costs, our report is primarily concerned with offline vs online costs. With various factors influencing shoppers' choice of supermarket, including location, ambience and product range

<sup>3</sup> i.e. considering the ten per cent of households with the least income, up to the ten per cent of households with the highest income

as well as price, we suspect that the likelihood of previously-offline households switching their weekly shop to a cheaper supermarket as a result of an online comparison, will in practice be rather small. It is likely, for example, that households in the lowest income deciles are already shopping in the cheapest supermarkets, while households in the highest income deciles will typically continue to shop in the more expensive supermarkets.

2.8 For each of the categories we have estimated average percentage savings that can typically be achieved through the use of the broadband internet to search for, compare and/or purchase products and services online. These savings assumptions have been informed by our research on previous studies, price comparison sites and suppliers' claims. The assumed average savings, together with our rationale for the assumptions are summarised in the table below.

2.9 In some cases, it should be noted that the benefits may primarily be through online *search* rather than online *purchase*: i.e. the wealth of information on products and prices available online allows the consumer to find the best deal – whether they then purchase the product online or offline.

Table 2-2: Assumed percentage savings through the use of broadband internet

Ref	Expenditure category	Assumed average saving	Rationale for saving assumptions
3.1	Clothing	8%	Various websites sell branded clothing at substantial discounts. mandmdirect.com, for example, claims up to 75% savings on the RRP. Which? research <sup>4</sup> in August 2007 reported an 17% saving for a basket of consumer durable goods including clothing vs the High Street (including postage and packing) – though offline outlet villages were cheaper still: 34% cheaper than the High Street. Given that the Which? report compared online with the High Street shops in central London, we suspect that the 17% represents an upper limit on the online saving for the UK as a whole. We have assumed that average online savings on clothing will be greater than 0%, but less than 17%, and we have taken 8% as the approximate mid-point of this range.
4.4	Electricity, gas and other fuels	6%	Comparing energy suppliers' prices online can uncover better deals for consumers, and online tariffs offer customers savings for managing their accounts online. Ofgem <sup>5</sup> reports that online tariffs provided average savings of £55 p.a. (6% of the average household energy bill) in 2007.
7.1	Purchase of vehicles	7%	Online purchasing of both new and second hand cars can provide substantial savings over list prices. In February 2008, Which? found that online purchasing offered an average seven per cent discount on list prices across 15 different cars <sup>6</sup> .
7.2.2	Petrol, diesel and other motor oils	3%	Online comparisons of forecourt prices can help motorists identify the cheapest fuel in their area – likely to become increasingly popular given the recent price rises. Using Petrolprices.com, Moneysavingexpert.com <sup>7</sup> reported a variation of c. 5% in unleaded petrol prices for sample postcodes. We assume that the average achievable saving is approximately half this (i.e. from the average price to the lowest price, rather than from the highest price to the lowest price).
7.3.4	Other travel and transport	5%	This 'Other' category primarily consists of airfares, car leasing and taxis. Substantial savings can be obtained through online search and booking of airfares (40% of this expenditure category). Using the search engines provided by ebookers, expedia and opodo we researched in July 2008 the prices of flights in early September for eight popular routes (seven

<sup>4</sup> <http://www.which.co.uk/advice/outlet-villages/our-research/index.jsp>

<sup>5</sup> <http://www.ofgem.gov.uk/Markets/RetMkts/Compet/Documents1/DRMR%20March%202007doc%20v9%20-%20FINAL.pdf>

<sup>6</sup> <http://www.which.co.uk/advice/buying-cars-online/test-results/index.jsp>

<sup>7</sup> <http://www.moneysavingexpert.com/travel/cheaper-fuel#petrol>

Ref	Expenditure category	Assumed average saving	Rationale for saving assumptions
			international and one domestic). The cheapest prices were 5% to 60% lower than the most expensive flights, with the average spread being 25%. We assume that the average saving achieved through the use of online search and booking is approximately half of this spread (i.e. from the average price to the lowest price, rather than the highest price to the lowest price), and have multiplied this by 40% to reflect the proportion of this category that relates to airfares.
8.2	Telephone and telefax equipment	12%	The Office of Fair Trading <sup>8</sup> cites Which? research findings that online prices for electrical items were 12% lower online than offline
8.3.1	Telephone account	30%	<p>This sub-category relates to fixed line phone services (mobile phone account costs are in other sub-categories). Use of broadband internet can help households reduce their telephony costs in various ways:</p> <ul style="list-style-type: none"> <li>• by signing up to a bundle of telephone and broadband services which is cheaper than the combined costs of the services purchased separately</li> <li>• by using Voice over IP services such as Skype and Vonage</li> <li>• and by substituting phone calls with services such as email, instant messaging and video chats – which incur no call costs as such over broadband – particularly relevant, perhaps, for households with teenage children.</li> </ul> <p>Substantial savings can be obtained, for example, on communications with friends and relations overseas by using free video chats rather than telephone calls. VOIP is reported to save 30%-90% of a household's regular monthly bill<sup>9</sup>; we have taken the bottom of this range for the purposes of our analysis.</p>
9.1.1	Audio equipment and accessories, CD players	15%	Which? research <sup>10</sup> in August 2007 found typical savings of 11% for digital radios, 23% for micro hi-fi systems and 11% for MP3 players, through online vs offline purchases. We have taken a savings assumption towards the lower of these typical savings.
9.1.2	TV, video and computers	15%	Which? research <sup>11</sup> in August 2007 found typical online savings of 12% for DVD recorders but 29% for CD/Plasma TVs. We have taken a savings assumption towards the lower of these typical savings.
9.1.3	Photographic, cine and optical equipment	15%	Which? research <sup>12</sup> in August 2007 found typical online savings of 19% for digital cameras and 11% for digital camcorders. We have taken a savings assumption in between these typical savings.
9.5.1	Books	14%	Which? research <sup>13</sup> in August 2007 found typical online savings of 14% for a selection of books.
9.6	Package holidays	16%	The advent of broadband internet has had a profound effect on the holiday/travel industry, as consumers have been able to shop around for the best deals more easily. The Office of Fair Trading <sup>14</sup> cites Which? research findings of 16% online savings in the travel sector – broadly in line with our estimate above of average savings on airfares (12%).
11.2	Accommod-	16%	Assumed to be similar to the savings associated with searching for and

<sup>8</sup> [http://www.offt.gov.uk/shared\\_offt/reports/consumer\\_protection/oft921.pdf](http://www.offt.gov.uk/shared_offt/reports/consumer_protection/oft921.pdf) (see footnote 73)

<sup>9</sup> <http://www.voip-service-reviews.com/voip-faq.html>

<sup>10</sup> <http://www.which.co.uk/advice/online-bargains/online-savings/index.jsp>

<sup>11</sup> <http://www.which.co.uk/advice/online-bargains/online-savings/index.jsp>

<sup>12</sup> <http://www.which.co.uk/advice/online-bargains/online-savings/index.jsp>

<sup>13</sup> <http://www.which.co.uk/advice/online-bargains/online-savings/index.jsp>

<sup>14</sup> [http://www.offt.gov.uk/shared\\_offt/reports/consumer\\_protection/oft921.pdf](http://www.offt.gov.uk/shared_offt/reports/consumer_protection/oft921.pdf) (see footnote 73)

Ref	Expenditure category	Assumed average saving	Rationale for saving assumptions
	ation services		purchasing package holidays online.
12.4	Insurance	10%	The Office of Fair Trading <sup>15</sup> cites US findings of 8%-15% online savings in insurance. Which? buying guide <sup>16</sup> for car insurance suggests that online quotes are up to 10% cheaper than phone quotes.
13.1.1	Mortgage interest payments	6%	Broadband internet can be used to shop around more easily for better mortgage deals. In May 2008 Moneyextra.com <sup>17</sup> reported a spread of £553 'near best' to £719 'near worst' per month quoted repayments on a £120,000 interest only mortgage, based on its site usage in April 2008. Bearing in mind the complex nature of mortgage products, and the role of offline mortgage brokers, we have assumed that the average saving would be in the order of one quarter of this spread – i.e. c. 6%.

*Sources: Various*

- 2.10 We have applied the above average savings assumptions of Table 2-2 to the total expenditure per category per household income decile (Table 2-4 below) to produce indicative estimates of the potential average reduction in household expenditure per income decile (Table 2-5 below).
- 2.11 Note that the income ranges of the deciles are as follows:

**Table 2-3 : Gross household income ranges for the decile groups**

	Lower boundary of household income (£ per week)
Lowest decile	-
Second decile	143
Third decile	215
Fourth decile	293
Fifth decile	384
Sixth decile	497
Seventh decile	624
Eighth decile	763
Ninth decile	939
Highest decile	1,274

*Source: ONS, Family spending 2007, January 2008*

<sup>15</sup> [http://www.of.gov.uk/shared\\_of/reports/consumer\\_protection/oft921.pdf](http://www.of.gov.uk/shared_of/reports/consumer_protection/oft921.pdf) (see para 9.6)

<sup>16</sup> <http://www.which.co.uk/reviews/car-insurance/page/buying-guide/>

<sup>17</sup> <http://www.moneyextra.com/about/publicrelations/docs/2008/shop-around-and-you-can-still-save-thousands.pdf>

Table 2-4: Total household expenditure on the 15 expenditure categories (£ per week), by household income decile<sup>18</sup>

	Lowest decile	Second decile	Third decile	Fourth decile	Fifth decile	Sixth decile	Seventh decile	Eight decile	Ninth decile	Highest decile	All
Clothing (3.1)	5.40	7.30	10.30	12.10	14.60	16.90	20.20	27.50	32.70	41.90	<b>18.90</b>
Electricity, gas and other fuels(4.4)	10.24	12.45	13.95	13.97	15.39	15.92	16.38	18.01	19.66	22.94	<b>15.89</b>
Purchase of vehicles (7.1)	4.60	4.00	12.00	12.30	14.10	19.30	21.60	32.80	44.90	68.70	<b>23.40</b>
Petrol, diesel and other motor oils(7.2.2)	4.21	5.26	9.56	12.68	16.52	18.38	21.90	26.93	29.79	37.10	<b>18.23</b>
Other travel and transport(7.3.4)	1.30	2.30	3.20	7.80	4.90	4.00	5.10	5.10	7.70	13.60	<b>5.50</b>
Telephone and telefax equipment(8.2)	0.10	0.40	0.40	0.60	0.50	0.71	0.68	1.52	1.03	1.31	<b>0.72</b>
Telephone account (8.3.1)	2.90	3.30	4.10	4.60	6.00	6.00	6.80	6.90	8.10	8.50	<b>5.70</b>
Audio equipment and accessories, CD players(9.1.1)	0.58	0.58	0.57	1.82	1.23	1.86	1.83	3.48	3.64	3.61	<b>1.92</b>
TV, video and computers(9.1.2)	1.10	1.34	2.27	2.76	3.26	6.06	5.56	7.71	7.14	8.66	<b>4.59</b>
Photographic, cine and optical equipment(9.1.3)	0.00	0.50	0.40	0.30	0.68	0.26	0.56	1.10	0.78	1.75	<b>0.64</b>
Books(9.5.1)	0.43	0.61	0.73	0.96	1.14	1.54	1.80	2.45	2.42	3.96	<b>1.60</b>
Package holidays(9.6)	2.61	4.82	8.20	7.84	13.38	14.22	17.41	18.88	21.14	32.45	<b>14.10</b>
Accommodation services(11.2)	0.82	1.34	2.31	2.34	3.46	4.24	5.94	8.64	10.93	20.21	<b>6.02</b>
Insurance(12.4)	4.26	6.15	8.81	11.30	13.37	15.02	18.19	19.97	23.78	29.68	<b>15.05</b>
Mortgage interest payments (13.1.1)	7.02	8.53	12.79	19.37	25.89	33.85	39.94	45.45	59.18	73.85	<b>32.60</b>
<b>Totals</b>	<b>70.05</b>	<b>90.22</b>	<b>126.25</b>	<b>150.87</b>	<b>179.00</b>	<b>205.60</b>	<b>235.72</b>	<b>284.27</b>	<b>335.64</b>	<b>440.14</b>	<b>211.77</b>

Source: ONS, Family Spending 2007, January 2008

<sup>18</sup> Note that for categories 8.3.1 and 13.1.1 the distribution by income decile is not available at this level of detail in the ONS statistics . We have estimated these expenditures by calculating the average proportion of these sub-categories within their parent categories, and applying that proportion across all income deciles.

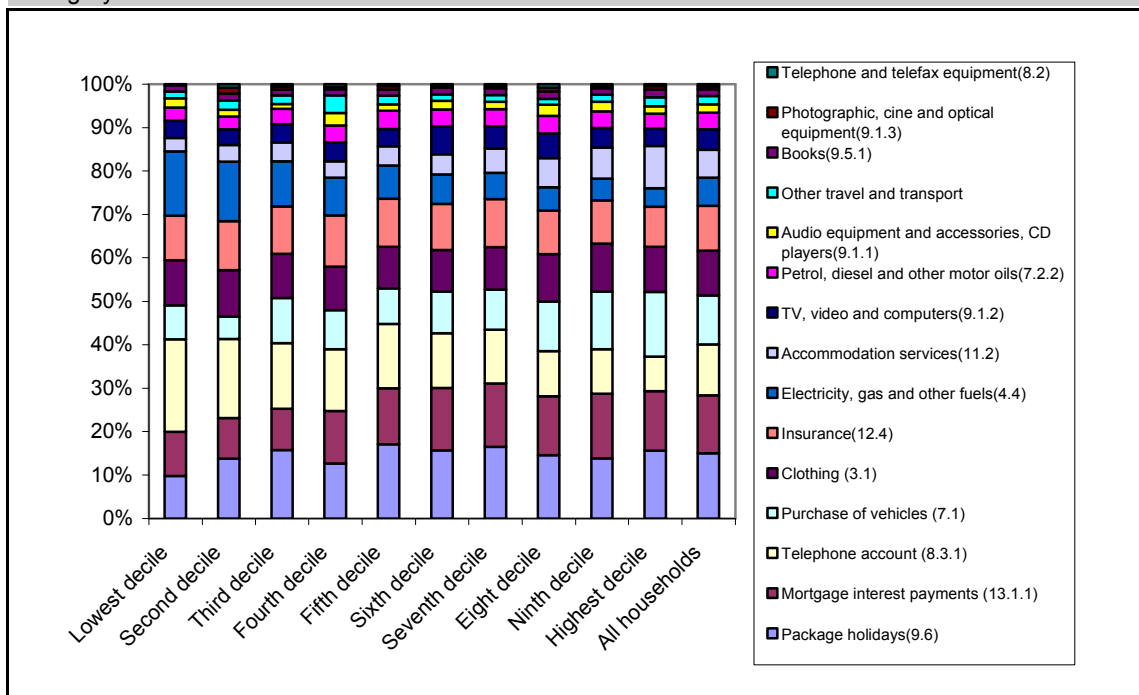
Table 2-5: Indicative savings associated with broadband internet (£ per week), by household income decile

	Lowest decile	Second decile	Third decile	Fourth decile	Fifth decile	Sixth decile	Seventh decile	Eight decile	Ninth decile	Highest decile	All
Clothing (3.1)	0.43	0.58	0.82	0.97	1.17	1.35	1.62	2.20	2.62	3.35	<b>1.51</b>
Electricity, gas and other fuels(4.4)	0.61	0.75	0.84	0.84	0.92	0.95	0.98	1.08	1.18	1.38	<b>0.95</b>
Purchase of vehicles (7.1)	0.32	0.28	0.84	0.86	0.99	1.35	1.51	2.30	3.14	4.81	<b>1.64</b>
Petrol, diesel and other motor oils(7.2.2)	0.13	0.16	0.29	0.38	0.50	0.55	0.66	0.81	0.89	1.11	<b>0.55</b>
Other travel and transport (7.3.4)	0.06	0.11	0.16	0.39	0.25	0.20	0.25	0.26	0.38	0.68	<b>0.28</b>
Telephone and telefax equipment(8.2)	0.01	0.05	0.05	0.07	0.06	0.08	0.08	0.18	0.12	0.16	<b>0.09</b>
Telephone account (8.3.1)	0.88	0.99	1.23	1.37	1.80	1.79	2.03	2.08	2.44	2.55	<b>1.72</b>
Audio equipment and accessories, CD players (9.1.1)	0.09	0.09	0.09	0.27	0.18	0.28	0.27	0.52	0.55	0.54	<b>0.29</b>
TV, video and computers(9.1.2)	0.17	0.20	0.34	0.41	0.49	0.91	0.83	1.16	1.07	1.30	<b>0.69</b>
Photographic, cine and optical equipment (9.1.3)	0.00	0.08	0.06	0.05	0.10	0.04	0.08	0.17	0.12	0.26	<b>0.10</b>
Books(9.5.1)	0.06	0.09	0.10	0.13	0.16	0.22	0.25	0.34	0.34	0.55	<b>0.22</b>
Package holidays(9.6)	0.40	0.75	1.27	1.22	2.07	2.20	2.70	2.93	3.28	5.03	<b>2.18</b>
Accommodation services(11.2)	0.13	0.21	0.36	0.36	0.54	0.66	0.92	1.34	1.69	3.13	<b>0.93</b>
Insurance(12.4)	0.43	0.61	0.88	1.13	1.34	1.50	1.82	2.00	2.38	2.97	<b>1.51</b>
Mortgage interest payments (13.1.1)	0.42	0.51	0.77	1.16	1.55	2.03	2.40	2.73	3.55	4.43	1.96
<b>Total weekly saving (gross)</b>	<b>4.14</b>	<b>5.45</b>	<b>8.09</b>	<b>9.62</b>	<b>12.11</b>	<b>14.12</b>	<b>16.42</b>	<b>20.07</b>	<b>23.75</b>	<b>32.26</b>	<b>14.60</b>

Source: SQW estimates, July 2008

- 2.12 Hence, our analysis indicates that the average UK household could save approximately £15 per week (£759 per annum) as a result of being able to use broadband internet access to search for, compare and/or purchase products and services online.
- 2.13 As the lowest income deciles naturally spend the least per week, it is unsurprising that the absolute potential savings associated with broadband are lowest for these groups (£4.14 per week for the lowest income decile to £32.26 for the highest decile). However, we also find that the *relative* savings associated with broadband as a proportion of total household expenditure tend to increase with household income – from 2.6% for the lowest income decile to 3.4% for the highest income decile (average 3.2%). Intuitively this would appear to make sense, given that the higher profit margins associated with higher-end products and services provide more scope for price variations (and hence for potential savings through effective online search and comparison).
- 2.14 The shares of the various expenditure categories in the potential savings per income decile are illustrated in the chart below. Note how the potential savings in basic services such as energy and telephony account for much higher shares of the savings for the lower income deciles than they do for the high income groups.

Figure 2-2 : Breakdown of the share of potential savings associated with broadband, by expenditure category and income decile



Source: SQW estimates, July 2008

## Increased investment income

- 2.15 A further potential direct financial benefit from having broadband internet access at home, is that more beneficial interest rates can be obtained on 'liquid' household investments such as money held in deposit accounts.
- 2.16 The Family Resources Survey 2006/7<sup>19</sup> provides information on savings and assets held by UK households, as shown in the table below.

Table 2-6: Percentage of households with savings and assets, by household income and by savings band

Amount of savings (£)	Average household income per week											All
	Less than £100	£100 to £200	£200 to £300	£300 to £400	£400 to £500	£500 to £600	£600 to £700	£700 to £800	£800 to £900	£900 to £1k	£1k +	
None	43%	36%	33%	29%	28%	23%	21%	18%	15%	15%	9%	24%
<1500	21%	29%	27%	26%	25%	26%	26%	25%	23%	22%	15%	24%
1500 to 3000	6%	6%	6%	7%	7%	7%	8%	9%	9%	10%	8%	7%
3000 to 8000	11%	12%	13%	12%	13%	15%	16%	15%	18%	18%	17%	14%
8000 to 10000	2%	2%	3%	3%	3%	3%	3%	4%	5%	5%	5%	3%
10000 to 16000	5%	6%	6%	6%	6%	7%	7%	8%	8%	7%	10%	7%
16000 to 20000	1%	2%	3%	3%	3%	3%	3%	3%	3%	4%	5%	3%
20000 or more	10%	8%	10%	14%	16%	17%	16%	19%	18%	21%	31%	17%

Source: DWP, Family Resources Survey 2006/07

- 2.17 We have estimated the average liquid savings per household per income decile, by using the mid-point of the above savings bands (and taking £20,000 for the £20,000+ band), and by approximately mapping the above income bands to household income deciles. This indicates average household savings, for the purposes of this analysis, rising from c. £3,900 for the lowest income decile up to c. £10,100 for the highest income decile.
- 2.18 An analysis of the savings accounts listed on <http://www.thisismoney.co.uk/bestsavingsrates> in mid July 2008 found that the median gross interest rate on branch-based accounts was 4.80%, whereas the average rate on the top five internet-based accounts was 6.42%. Assuming that broadband internet access would enable households to move from the average branch-based interest rate towards best-buy internet-based interest rates, we estimate that this would generate an additional £81 p.a. for the average household, as shown in Table 2-7.

<sup>19</sup> [http://www.dwp.gov.uk/asd/frs/2006\\_07/frs\\_2006\\_07\\_report.pdf](http://www.dwp.gov.uk/asd/frs/2006_07/frs_2006_07_report.pdf). The assets and savings reported include bank accounts, stocks and shares, ISAs, PEPs, premium bonds etc – but exclude the value of housing equity and pension savings.



Table 2-7: Indicative increase in household savings income, by income decile

	Lowest decile	Second decile	Third decile	Fourth decile	Fifth decile	Sixth decile	Seventh decile	Eight decile	Ninth decile	Highest decile	All households
Assumed liquid savings per household (£)	3,907	3,932	4,642	5,402	5,850	6,297	6,565	6,975	7,327	10,077	6,227
Potential gross increase in liquid savings income (£ p.a.)	63	64	75	88	95	102	106	113	119	163	101
Assumed tax rate on savings income	0%	20%	20%	20%	20%	20%	40%	40%	40%	40%	20%
<b>Potential net increase in liquid savings income (£ p.a.)</b>	<b>63</b>	<b>51</b>	<b>60</b>	<b>70</b>	<b>76</b>	<b>82</b>	<b>64</b>	<b>68</b>	<b>71</b>	<b>98</b>	<b>81</b>

Source: SQW estimates, July 2008

## Total direct benefits

- 2.19 In total, then, we estimate that the total direct benefits are in the order of £840 per annum (£70 per month) for the average household – ranging from £279 p.a. (£23 per month) for the lowest income decile to £1,775 p.a. (£148 per month) for the highest income decile.
- 2.20 Informed by the Oxford Internet Survey 2007 data<sup>20</sup> on the internet take-up by household income, we have estimated the current internet penetration by income decile – rising from 20% for the lowest income decile to 92% for the highest income decile. From this, we estimate that the total direct benefits being foregone by offline households are in the order of £4.4 billion p.a., as shown in the table below.

Table 2-8: Estimate of total direct benefits foregone by offline households

	Lowest decile	Second decile	Third decile	Fourth decile	Fifth decile	Sixth decile	Seventh decile	Eight decile	Ninth decile	Highest decile
Total direct benefits £ p.a. per household	279	334	481	570	706	816	917	1,112	1,306	1,775
Estimated proportion currently online (%)	20	35	50	65	75	80	85	88	90	92
Estimated number of households offline (million)	2.0	1.6	1.3	0.9	0.6	0.5	0.4	0.3	0.3	0.2
Foregone benefits for offline households (£ million p.a.)	558	544	601	499	441	408	344	333	327	355

Source: SQW, 2008

<sup>20</sup> [http://www.oii.ox.ac.uk/research/oxis/OxIS2007\\_Report.pdf](http://www.oii.ox.ac.uk/research/oxis/OxIS2007_Report.pdf)

## Costs of broadband internet access

2.21 There are, of course, costs associated with having and using broadband internet access in the home. For the purposes of this analysis, we estimate initial costs of approximately £308, and ongoing costs of approximately £267 p.a. The assumptions underlying these estimates are presented in the tables below.

	Assumed cost	Rationale
Computer	£283	In July 2008, the prices of entry-level computers in selected retailers were as follows: £300 at PC World, £250 at Currys, and £300 at Comet. We have taken the average of these prices.
Printer	£25	Although a printer is not necessary to obtain broadband internet access, we would contend that this is a necessary investment, in practice, for households buying a computer and internet access. In July 2008, the prices of entry-level printers in selected retailers were as follows: £35 at PC World, £20 at Currys, and £20 at Comet. We have taken the average of these prices.
Broadband connection cost	£0	Most broadband providers offer free connection.
<b>Total initial cost</b>	<b>£308</b>	

Source: SQW, July 2008

	Assumed cost p.a.	Rationale
Broadband service rental	£192	We have assumed a £16 per month – a typical current price (as of July 2008) for a standalone entry-level broadband service (e.g. from BT and the Post Office), excluding introductory offers.
Electricity	£18	We assume 175 Watts for a computer, 35 Watts for an LCD monitor and 15 Watts for a printer – all on for 2 hours per day, every day of the year. We use the estimated domestic cost of electricity in 2007 of 10.93 pence per kWh from BERR <sup>21</sup> , giving £0.1093 per kWh x (260Wx2hrs/dayx365days/year)/1000 = £17.95
Printer ink	£50	Recent research from Kodak <sup>22</sup> found that the average person spends £105 p.a. on printer ink. For the purposes of this analysis we assume that new broadband users would not be as intensive users as existing users, and we have assumed approximately half of the average printer ink costs found in the Kodak research.
Paper	£7	Approx £3.50 for 500 sheets on the High Street. Assume c. 20 sheets per week, implying two packs of 500 per annum.
<b>Total ongoing costs p.a.</b>	<b>£267</b>	

Source: SQW, July 2008

2.22 There is an argument that only a share of the expenditure on a computer and printer should be apportioned to the costs of household broadband internet access, as these pieces of equipment may be used for offline activities (e.g. word processing, offline games). For the purposes of this analysis, however, we have taken the full costs of these items, on the basis that they are, in practice, going to be necessary expenditures in order to obtain and exploit broadband internet.

<sup>21</sup> <http://stats.berr.gov.uk/energystats/qep551.xls>

<sup>22</sup> [http://www.photographyblog.com/index.php/weblog/comments/uk\\_thinks\\_printer\\_ink\\_is\\_a\\_rip\\_off/](http://www.photographyblog.com/index.php/weblog/comments/uk_thinks_printer_ink_is_a_rip_off/)

## Total net benefits

- 2.23 As noted above, we estimate that the direct financial benefits of broadband in the home are in the order of £840 per annum for the average UK household (£759 in reduced expenditures, plus £81 in additional investment income). Set against this are initial costs of about £308 and ongoing costs of £267 p.a.
- 2.24 This implies that, on average, a household's investment in broadband internet access would payback within about 6.5 months, though, as shown in Table 2-11 below, the net benefits and the speed of payback vary substantially by household income levels.
- 2.25 Our estimates indicate that the payback period will be less than 18 months for 80% of households (i.e. those in the third to highest deciles), and just 2.5 months for households in the highest income decile.
- 2.26 However, the analysis suggests that the households in the lowest two income deciles (i.e. those with a household income of less than £215 per week) may still not have achieved a direct financial net benefit from broadband internet (at the assumed typical prices for entry-level computers and broadband service) even after three years. For these households, spending £16 per month for broadband service represents a substantial expenditure – which, together with other ongoing costs such as printer ink - almost exceeds the direct financial benefits.
- 2.27 These *direct* financial benefits do not tell the whole story, however. In the next section we consider the less tangible, but no less real wider benefits of broadband in the home.

Table 2-11: Indicative estimates of broadband's cumulative direct financial benefits less costs, by month after connection, per income decile<sup>23</sup> (£ per household)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Lowest decile	-307	-306	-305	-304	-303	-302	-301	-300	-299	-298	-298	-297	-296	-295	-294	-293	-292	-291
Second decile	-303	-297	-291	-286	-280	-275	-269	-263	-258	-252	-246	-241	-235	-230	-224	-218	-213	-207
Third decile	-291	-273	-255	-237	-219	-201	-184	-166	-148	-130	-112	-94	-77	-59	-41	-23	-5	13
Fourth decile	-283	-258	-233	-207	-182	-157	-131	-106	-81	-56	-30	-5	20	45	71	96	121	146
Fifth decile	-272	-235	-199	-162	-126	-89	-52	-16	21	57	94	130	167	203	240	277	313	350
Sixth decile	-263	-217	-171	-125	-80	-34	12	58	103	149	195	240	286	332	378	423	469	515
Seventh decile	-254	-200	-146	-91	-37	17	71	125	180	234	288	342	396	451	505	559	613	667
Eight decile	-238	-168	-97	-27	44	114	184	255	325	396	466	536	607	677	748	818	888	959
Ninth decile	-222	-135	-49	38	125	211	298	384	471	558	644	731	818	904	991	1,077	1,164	1,251
Highest decile	-183	-57	69	194	320	446	572	697	823	949	1,074	1,200	1,326	1,451	1,577	1,703	1,829	1,954
<b>All</b>	<b>-261</b>	<b>-213</b>	<b>-165</b>	<b>-117</b>	<b>-70</b>	<b>-22</b>	<b>26</b>	<b>74</b>	<b>121</b>	<b>169</b>	<b>217</b>	<b>265</b>	<b>313</b>	<b>360</b>	<b>408</b>	<b>456</b>	<b>504</b>	<b>551</b>

Source: SQW estimates, July 2008

<sup>23</sup> Note that the first column shows the first month's benefits per decile, less the initial outlay and less one month's costs.

## 3: Wider benefits of broadband in the home

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### Employment prospects

- 3.1 An important advantage of households having a computer and broadband internet access at home is that this potentially enhances employment prospects, which will in turn improve household income.
- 3.2 The key effects here are as follows:
- By having home broadband access, working age adults in the household can become more familiar with computers and the internet, **increasing their ICT confidence and skills**. This is important for employment prospects, because so many jobs now use computers. An analysis of the 2006 Skills Survey<sup>24</sup> found that three in four jobs entailed job-holders using computers, with computer use being essential for one in two jobs (up from one in three jobs in 2007). This aligns with the findings from SQW's recent research in the Northwest<sup>25</sup>, in which we found that, on average, 65% of employees at the 82% of firms with computers use computers everyday as a routine part of their job. Hence, basic ICT skills developed through having a computer and broadband at home increase the job opportunities available to the household's wage-earners – or, put another way, continued lack of such skills would lead to ever-reducing numbers of opportunities.
  - Furthermore, **jobs which entail the use of computers tend to be better paid**. A study for the European Commission<sup>26</sup> found that the risk of economic exclusion increases markedly for those without ICT at the workplace; controlling for other factors (experience, education, gender etc.), the study found a 20% wage premium associated with using computers at work in Great Britain.
  - Finally, broadband internet makes it **easier to search for jobs**. Online job searches have become an important means of finding employment. For example, Jobcentre Plus reported<sup>27</sup> an average of 5.3 million job searches per week on its website in the six months to March 2007 – up by 26% on the same period the previous year. Eurostat<sup>28</sup> estimates that in 2007 c. 15% of individuals had used the internet in the previous three months for looking for a job or sending a job application, and some predict<sup>29</sup> that the internet will be the largest recruitment advertising channel by 2009 – surpassing national newspapers, trade magazines and regional newspapers in the recruitment advertising market.

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<sup>24</sup> *Computers and Pay*, Green et al, July 2007

<sup>25</sup> [http://www.sqw.co.uk/file\\_download/127](http://www.sqw.co.uk/file_download/127)

<sup>26</sup> <http://www.eurescom.de/e-living/deliverables/e-liv-D11.3-Final.pdf>

<sup>27</sup> <http://www.jobcentreplus.gov.uk/JCp/News/SSC051107095354.xml.html>

<sup>28</sup>

[http://epp.eurostat.ec.europa.eu/portal/page?\\_pageid=1996.45323734&\\_dad=portal&\\_schema=PORTAL&screen=welcomeref&open=/science/isoc/isoc\\_ci/isoc\\_ci\\_in&language=en&product=EU\\_science\\_technology\\_innovation&root=EU\\_science\\_technology\\_innovation&scrollto=212](http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996.45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&open=/science/isoc/isoc_ci/isoc_ci_in&language=en&product=EU_science_technology_innovation&root=EU_science_technology_innovation&scrollto=212)

<sup>29</sup> [http://www.enhancemedia.co.uk/advertising\\_spend/2008/](http://www.enhancemedia.co.uk/advertising_spend/2008/)

## Education

- 3.3 The above arguments regarding home broadband helping to **improve ICT skills and confidence** apply to any children in the household as well as to the adults – thereby helping to improve their future employment prospects. For example, Passey et al (2004)<sup>30</sup> reported that, in the view of head teachers, pupils who use ICT outside school have more practised ICT skills and stronger attitudes towards ICT than those who do not.
- 3.4 Furthermore, the use of the **internet as a research tool for homework is becoming increasingly important**. In BECTA's Harnessing Technology Schools Survey (2007)<sup>31</sup>, for example, it was reported that 30% of secondary school teachers now often set homework that requires use of the internet. Such explicit direction from teachers is likely to understate the actual use of the internet for homework, however: a 2004 study for BT<sup>32</sup> on 50 broadband-connected UK households found that almost every child in the sample group (97%) used broadband to assist them in their homework, with 58% saying that their schoolwork would suffer without it. Valentine et al (2005)<sup>33</sup> notes that:

*Teachers however, are generally reluctant to explicitly ask children to use ICT for school work outside of school because of their concerns about digital divides in access to hardware and software. This is problematic because children, whether explicitly or implicitly, pick up the message that they should use ICT at home if they have access to it. As such the digital divide in terms of the opportunity to use ICT (with the potential advantages and attainment gains it may bring) is still there even if teachers do not explicitly set homework using technology.*

- 3.5 So, for households with children, arguably the most important impact of having broadband internet in the home is the long term difference that access to this technology can have on the development of the children's skills and educational attainment. This issue is at the heart of a recent consultation on Home Access to Technology by the Department for Children, Schools and Families<sup>34</sup>, which proposes:

*to ensure that every family with 5-19 year old learners in England has access to learning where and how they need it through access to ICT resources and support at home.*

- 3.6 This Home Access programme is informed by evidence from various recent studies that there is a **positive link between home access to ICT and educational outcomes**. For example, Valentine et al (2005)<sup>35</sup> found that pupils, parents and teachers reported that using ICT raised pupil's confidence and had motivational effects:

*ICT was motivational because it contributed both to making school work more enjoyable and also to pupils' perceptions of achievement. Specifically, ICT was regarded as making homework less boring because*

<sup>30</sup> <http://www.dcsf.gov.uk/research/data/uploadfiles/RR523new.pdf>

<sup>31</sup> [http://schools.becta.org.uk/upload-dir/downloads/page\\_documents/research/harnessing\\_technology\\_schools\\_survey07.pdf](http://schools.becta.org.uk/upload-dir/downloads/page_documents/research/harnessing_technology_schools_survey07.pdf)

<sup>32</sup> <http://www.vnunet.com/vnunet/news/2125819/broadband-chalks-uk-education-success>

<sup>33</sup> <http://www.dcsf.gov.uk/research/data/uploadfiles/RR672.pdf>

<sup>34</sup> <http://www.dcsf.gov.uk/consultations/downloadableDocs/Home%20Access%20Consultation%20Document%20revised.pdf>

<sup>35</sup> <http://www.dcsf.gov.uk/research/data/uploadfiles/RR672.pdf>

*children regarded using computers as: ‘cool’; interactive and multimodal texts were more interesting than books; ICT saved time (e.g. it is easier to write and revise documents on a computer than by hand) and enhanced the presentation of children’s work; the Internet was a good source of information (range and depth) and educational materials (such as revision websites); ICT enabled multi-tasking and was perceived by children to improve grades (just under 50% of children thought that using computer improved their marks).*

- 3.7 The same study found a significant positive association between pupils’ home use of ICT for educational purposes and attainment at Key Stages 2, 3 and 4 in Mathematics and at Key Stage 4 in English. It should be noted, though, that using a computer out of school *for leisure activities* was associated with *decreases* in attainment: the more time pupils spend playing computer games, the less time they may have available for other tasks, including homework and study. Clearly, then, it is important for schools and parents to help direct children’s use of computers and the internet towards an appropriate balance of education and fun.

## Entertainment and communication

- 3.8 Households with a computer and broadband internet access have access to a range of communication and entertainment options, which have become extremely popular and part of everyday life for many. Applications include:

- email, and chat – text or video (e.g. MSN Messenger)
- music streaming or downloads (e.g. iTunes)
- video streaming or downloads (e.g. YouTube)
- games – online (e.g. Team Fortress) or offline (e.g. The Sims)
- social networks (e.g. Facebook).

- 3.9 Recent research from Nielsen Online<sup>36</sup> confirms that entertainment and communication dominate the UK’s most popular web sites and applications, with MSN Messenger alone accounting for nearly 8% of the UK’s online minutes in the year to May 2008, as shown in the table below.

Table 3-1: UK’s most popular web sites and applications, June 2007-May 2008

Rank	Website/application	Average monthly UK minutes (millions)	Average monthly share of UK minutes	Core service
1	MSN Messenger	2,626	7.8%	Instant Messaging
2	eBay	1,630	4.8%	Auctions
3	Facebook	1,406	4.2%	Social Network
4	Google Search	872	2.6%	Search
5	Hotmail	705	2.1%	Email
6	Windows Media Player	694	2.1%	Media Player

<sup>36</sup> <http://blog.nielsen.com/nielsenwire/wp-content/uploads/2008/07/report.pdf>

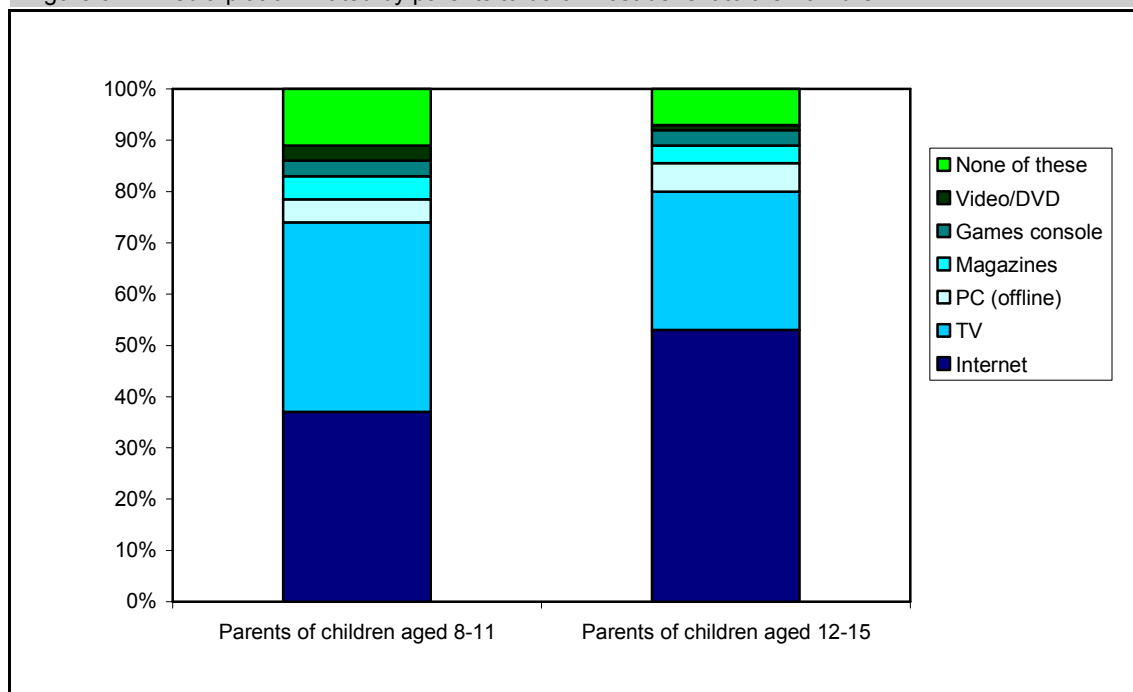


Rank	Website/application	Average monthly UK minutes (millions)	Average monthly share of UK minutes	Core service
7	<i>YouTube</i>	539	1.6%	<i>Video</i>
8	<i>Bebo</i>	530	1.6%	<i>Social Network</i>
9	<i>iTunes</i>	529	1.6%	<i>Media Player</i>
10	<i>Yahoo! Mail</i>	514	1.5%	<i>Email</i>

Source: Nielsen Online, July 2008. Note: entertainment and communication-focused sites/applications italicised

- 3.10 Facebook was the fastest growing website/application in the UK over this period: increasing from 462 million minutes in May 2007 to 2,249 million minutes in May 2008, a growth of 387% in the year.
- 3.11 Another web application to have seen phenomenal recent growth is the BBC iPlayer service, which offers the last seven days of BBC TV and radio programmes for streaming or for download, via the BBC website or via Virgin Media’s cable TV service. Only fully launched on Christmas Day 2007, iPlayer received more than 20 million programme view requests via its website in June 2008 – with a further 10 million views via the Virgin Media platform.
- 3.12 As the popularity of such services continues to grow, households left without home broadband are at an increasing risk of exclusion. Ofcom reports<sup>37</sup>, for example, that by the age of 15 children would, on average, miss the internet more than they would miss TV if it got taken away from them. The proportion of 12-15 year olds saying that internet is the media activity that they would miss the most if it got taken away rose from 8% in 2005 to 24% in 2007. Parents of 8-15 year olds consider that the internet is the media platform that is of most benefit to their children, as shown in the chart below.

Figure 3-1 : Media platform rated by parents to be of most benefit to their children



Source: Ofcom, Media Literacy Audit – Report on UK Children’s Media Literacy, May 2008

<sup>37</sup> [http://www.ofcom.org.uk/advice/media\\_literacy/medlitpub/medlitpubrss/ml\\_childrens08/ml\\_childrens08.pdf](http://www.ofcom.org.uk/advice/media_literacy/medlitpub/medlitpubrss/ml_childrens08/ml_childrens08.pdf)

## Access to public services

- 3.13 Finally, we note that the internet has become an important channel to public services. In 2007, the ONS<sup>38</sup> reported that 46% of recent internet user adults had used the internet to obtain information from public authorities' web sites – the fourth most frequently cited internet activity after finding information about goods and services (86%), sending/receiving email (85%), and using services related to travel and accommodation (63%). Furthermore, 25% had used the internet to send completed forms to public authorities.
- 3.14 E-government applications include, for example:
- obtaining information on tax, including tax credits
  - filing tax returns online
  - obtaining information on health, via NHS Direct
  - obtaining information on local council services
  - renewing car tax and driving licences.
- 3.15 The growing popularity of e-government applications is reflected in the traffic to the UK government's DirectGov website – which received 6.8 million visits from 5.1 million unique users in June 2008<sup>39</sup>.
- 3.16 As the range and sophistication of the public sector's online services continues to increase, households with broadband internet access will tend to be better informed about public services, and have more convenient access to public services than those without broadband.

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<sup>38</sup> <http://www.statistics.gov.uk/pdfdir/inta0807.pdf>

<sup>39</sup> [http://ukonline.direct.gov.uk/en/SiteInformation/DG\\_10036216](http://ukonline.direct.gov.uk/en/SiteInformation/DG_10036216)