

BBC DIGITAL SERVICES AND THE TAKE-UP OF DIGITAL TELEVISION

A REPORT PREPARED FOR THE BBC

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EXECUTIVE SUMMARY

The proposal for a digital licence fee to finance extra BBC services raises a number of issues for commercial broadcasters, public policy makers and the BBC itself. Some commercial broadcasters have argued that it would be detrimental to their interests, in that it would tend to deter take-up of digital television; and also contrary to public policy interests, in that it would make it harder to switch off analogue transmission. They argue that multi-channel households watch little or no BBC programming, and should not be “taxed” for such services.

The analysis in this report, prepared by ●econ for the BBC, suggests their view may be short-sighted. Analysis of viewer preferences and the nature of interest in digital television suggests that provision of licence-fee based services has the potential of increasing digital take-up very significantly, above the natural “plateau” for pay TV that would otherwise occur. The effect of well resourced BBC digital services would be to grow the market, broaden the appeal of digital television, help to prevent the emergence of an “information underclass” and therefore actually make it easier to switch off analogue transmission. Without strong free-to-air BBC services digital take-up may plateau well short of the critical mass required for such a switch-over. The analysis also indicates that BBC viewing is still highly significant in multi-channel households. The main points in the report are summarised below.

- ***There is no such thing as the typical viewer.*** Although some programmes appeal to almost all viewers, the ranges of programmes enjoyed by individual viewers are extremely diverse. In a survey of viewer habits, fewer than 1% of survey respondents identified the same subset of 14 genres as being ones that they would personally choose to watch. 1307 respondents registered 846 different combinations of genres that they watched personally.
- ***Commercial broadcasters cannot be expected to meet the full range of appetites for digital services.*** Commercial broadcasters’ profit-maximising incentives will naturally lead them to concentrate on genres, such as movies and sport, which either deliver large audiences (for advertising-funded broadcasting) or for which there is a high willingness to pay (for pay-TV or subscription bundles). Commercial subscription “bundles” will be designed to maximise the level of profits, not the number of viewers. Even though pay TV operators could attract more viewers by reducing the price and extending the range of programmes and packages, such a strategy is likely to lower revenues and profits and is therefore unattractive, as demonstrated by the history of analogue pay TV.
- ***Diversity of taste can only be met by diversity of funding.*** Whilst it is possible to offer something of interest to 96% of the population by providing a combination of films, soaps, sports, news and factual programming, such a mix would leave much of the overall demand for diversity unsatisfied. Improved pay TV offerings may need to be

complemented by improved free-to-air services, utilising the potential of digital technology. Licence fee funding enables the unmet appetite for diverse digital services to be met economically, and may be needed to promote widespread adoption of the new platform. Without this contribution to the broadcasting ecology, digital television may fall well short of becoming a universally accessible technology. As for the BBC's mainstream programmes, licence fee funding enables broadcasters to provide a range of services for society as a whole which would not appeal to commercial broadcasters.

- ***Up-front hardware costs are a bigger disincentive to take up than ongoing subscriptions or licence fees.*** Commercial broadcasters clearly believe that subscription charges are not a significant deterrent to take-up, in that they are increasing these, over the long term, in order to reduce the up-front hardware costs to subscribers
- ***BBC programmes remain an important part of viewing even in multi-channel households.*** Almost all channels, including the BBC, have lost market share as the number of channels has increased threefold in the past seven years. But the BBC still accounts for over a quarter of all viewing in multi-channel households. The biggest losers of total viewing share have been ITV, Sky One and the Sky movie channels, which have dropped back to a level comparable with the premium rate sports channels.
- ***There is expected to be a “plateau” in the demand for pay TV services.*** Although this of course may change over time, it is currently estimated at not much more than 55% of households are potentially interested in pay TV. This is clearly below the level at which it would be acceptable to switch off analogue transmission. The strategy of subsidising set-top boxes, motivated by the desire to win market share over rival broadcasters at an early stage and build an established base of customers locked into a particular system, will increase the cost of services in the long run, and restrict the choice available to customers. In other words, the free box strategy that helps to drive early take-up means higher subscription charges, reducing long-term penetration. Even though penetration might be increased further by reducing cost or extending the range of programmes and packages, this is likely not to be in the commercial interest of pay TV broadcasters.
- ***There is a clear preference divide between “early adopters” and those resistant to digital TV.*** The types of programmes favoured by the second category tend to be those on which the BBC is seen to provide the best programming by viewers – notably, national events, nature programmes, education, documentaries and news.
- ***Interest in digital TV is low amongst older age groups and lower income groups.*** These are amongst those more likely to put BBC programming top of their lists of preferences.
- ***Licence-fee funded services would add significantly to the level of interest in digital TV.*** Surveys show that those currently least

interested in digital TV tend to be those most inclined to put BBC programmes top of their list of preferences. The problem is not a lack of information about digital, which commercial broadcasters could hope to overcome over time, but is rooted in tastes. Such people tend to be well aware of the existence of digital television, but their tastes are such that they are least likely to take up the type of pay TV programming offered by commercial digital broadcasters.

1. INTRODUCTION

The proposal by the Independent Review Panel chaired by Gavyn Davies for a digital licence fee (DLF), to provide additional funding for the BBC's development of additional and improved digital services, has come under heavy criticism from other broadcasters. They have argued that an additional levy on households opting for digital television would slow down the take-up of digital services, thus frustrating the commercial companies' efforts to establish the new technology and reducing the value of their investments. Moreover, they argue such a move might jeopardise the Government's plan for an early analogue switch-off, which would release valuable frequency that could be used more efficiently in other ways.

Whilst it is obvious that the DLF will increase the price of "going digital" this by no means implies that such an increase will have the detrimental effects on take-up asserted by competing broadcasters. Firstly, there are good reasons to expect that moderate increases in the *ongoing* cost of receiving digital services will not have a significant impact. There is evidence in the behaviour of commercial pay-TV broadcasters that this is what they themselves believe in that they have decided to offer heavy subsidies for set-top boxes which will inevitably require an increase in ongoing subscription charges.

Secondly, any price effect might be more than compensated for by the effects of an improved digital BBC offering. In particular, such an offering might attract viewers who would not be particularly well served, or attracted, by commercial broadcasters.

In this paper, we address the second effect in more detail. In particular, we argue that:

- Viewer preferences for television programmes are very heterogeneous. Even though there may be a number of programme types or genres with universal appeal, most viewers have widespread interests covering a multitude of genres. Moreover, these preferences are extremely diverse across viewers. Consequently, widespread or even universal take-up of a new technology such as digital television will only be achieved if this technology offers access to programming that is attractive to all viewers, not just a subset.
- Commercial broadcasters focus on viewers who are commercially attractive, either because they generate subscription or pay-per-view revenues, or because they constitute an audience that is valuable to advertisers. The commercial constraints within which these broadcasters operate limit the extent to which they can be expected to provide programming serving the needs of all viewers.

Moreover, some of the commercial strategies pursued by pay TV operators in order to win market share and build an established base of customers locked in to a particular system will increase the cost of services in the long run, and restrict the choice available to customers. This may further restrict the universal appeal of a digital television environment that is dominated by pay TV services.

- A variety of services, including those that would not appeal to commercial broadcasters, is required in order to make digital television attractive for the largest possible audience. The broadcasting ecology would be less rich without a digital BBC offering that exploits the capabilities of the new technology and matches the advances in service quality available from other broadcasters. This, in turn, would make the digital proposition overall less attractive, and thus slow down the migration towards digital.
- Thus a DLF, enabling the BBC to contribute to diversity and choice in the digital age, could be expected to promote take-up and facilitate an early analogue switch-off compared with a situation in which digital TV is driven mainly if not exclusively by commercial objectives.

2. THE HETEROGENEITY OF VIEWER PREFERENCES

2.1. INTRODUCTION

Even though it is true that there are some types of programming that are liked by almost everyone, this does not imply that people's tastes are similar. Most viewers are interested in a range of programming, and this range differs widely between people. This lack of similarity in tastes between individuals means that it would be quite wrong to suppose that there are a small number of "types" of viewers whose needs can all be met by a few bundles of specifically targeted programming. Rather, this diversity in tastes can only be met by corresponding diversity in programming.

It is not easy to give a full picture of this heterogeneity. Most of it is lost through aggregation, and so cannot be reconstructed from summary statistics. We therefore use a variety of indicators.

2.2. DATA SOURCE

An important source for this analysis is the raw data from a survey conducted by BMRB for the BBC in early 1999. More specifically, we have used information about the specific preferences of respondents for a range of programme genres, and a number of socio-demographic characteristics. It is worth noting, however, that the survey instrument was not designed for the purpose of the analysis we are undertaking in this section, and that we have used only a small subset of the information gathered. It is also worth noting that the variety of tastes for different genres can be expected to understate the true diversity of preferences, as each genre contains a potentially quite diverse range of programming. This is perhaps most obvious in the case of films, where individual programmes may range from *Emma* to *The Exterminator*.

BMRB asked a total of 1307 people about their preferences for 14 different genres, namely:

- **Arts/Music** (e.g. The Proms, Later with Jools Holland, A History of British Art, Top of the Pops)
- **Children's** (e.g. Grange Hill, Blue Peter, Teletubbies)
- **Current Affairs** (e.g. Panorama, Question Time, Coverage of Parliament)
- **Factual** (e.g. Horizon, Animal Hospital, Songs of Praise, Watchdog, Tomorrows World, Life of Birds, Vets in Practice)
- **Drama – Non Soaps** (e.g. Casualty, The Lakes, City Central)

- **Drama – Soaps** (e.g. Eastenders, The Archers)
- **Education** (e.g. Schools Programmes, Open University)
- **Films**
- **Light Entertainment – Comedy** (e.g. Men Behaving Badly, Goodness Gracious Me)
- **Light Entertainment – Other** (e.g. Big Break, Question of Sport, Changing Rooms)
- **News** (e.g. Newsnight, Nine O’Clock News, Six O’Clock News, Today)
- **Regional Programmes** (e.g. News, McCoist & MacAuly)
- **Sport** (e.g. Match of the Day, Grandstand)
- **Programmes for Minority Groups** (e.g. See Hear).

Respondents were asked to state whether they

- had heard of the genre at all;
- would personally choose to watch or listen to programmes of that genre;
- would watch or listen to programmes of that genre if nothing better were on;
- would watch or listen to programmes of that genre if somebody else was;
- would never watch or listen to programmes of that genre; or
- did not know.

The average responses for each of the genres are summarised in Table 1. The key features are that:

- films, factual and news programmes, drama and light entertainment are the most popular genres (that is, have the highest proportion of respondents who would watch them personally);
- some genres such as films are watched personally by many and disliked by few;
- on the other hand, some genres such as sport demonstrate *polarised* preferences, with many people either personally watching or else never watching such programming, and relatively few having a neutral opinion.

Table 1: Summary of genre preferences

	<i>Watch personally</i>	<i>Watch if nothing better is on</i>	<i>Watch if someone else watches</i>	<i>Never watch</i>	<i>Have never heard of</i>	<i>Don't know</i>
Films	79.4%	7.5%	6.0%	3.5%	3.6%	0.0%
News	70.0%	13.4%	8.4%	4.4%	3.7%	0.2%
Light Entert. – Comedy	62.3%	12.7%	9.3%	11.2%	4.1%	0.6%
Factual	61.9%	17.2%	9.4%	6.5%	4.5%	0.5%
Drama- Non Soaps	55.9%	17.2%	10.7%	11.8%	4.0%	0.4%
Light Entert. – Other	55.4%	19.2%	11.4%	9.9%	3.4%	0.6%
Drama - Soaps	51.6%	14.0%	13.5%	16.3%	3.5%	1.0%
Sport	41.3%	12.2%	18.1%	24.7%	3.2%	0.7%
Current Affairs	41.2%	23.4%	15.8%	15.6%	3.6%	0.4%
Regional Programmes	36.3%	18.7%	16.0%	17.8%	10.5%	0.7%
Arts/Music	34.2%	19.2%	17.6%	22.3%	6.4%	0.5%
Education	21.0%	16.2%	27.2%	31.6%	3.6%	0.5%
Children's	16.8%	12.4%	31.8%	34.9%	3.6%	0.5%
Programmes for Minority Groups	7.1%	8.7%	22.3%	44.3%	16.0%	1.6%

Source: BMRB. Proportions weighted to give a nationally representative sample of adults with TV sets.

2.3. DIVERSITY OF PREFERENCE COMBINATIONS

These averages cannot reveal the great diversity of preferences across different genres expressed by respondents. This can be illustrated by looking at the combination of genres people would personally choose to watch. We find that there are 846 different combinations of preferred genres amongst the 1267 respondents who identified at least

one genre they would personally watch or listen to. Therefore there was very little clustering of preferences.

- The most frequent combination of genres that people would personally choose to watch was the complete list of all 14 programme types. This accounted for around 0.95% of responses.
- There were 8 genre combinations listed by between 0.76% and 0.5% of respondents.
- The remaining 837 genre combinations that were watched personally were each listed by no more than 0.5% of respondents.

This clearly demonstrates that there is no such thing as a “typical” viewer. However, the data suggest that cable and satellite customers may be slightly more homogeneous than customers currently not subscribing to cable or satellite services. More specifically, we have looked at the number of different genre combinations within the group of 441 cable and satellite customers, and the number of different genre combinations one would expect to encounter in a sample of 441 customers drawn at random from the non-cable and satellite customers. The results are summarised in Table 2

Table 2: Preference diversity of cable and satellite customers

	<i>Cable and satellite customers</i>	<i>Random sample of non-cable and satellite customers</i>
Number of individuals	441	441
Different preference combinations	345	362.3 – 364.3*

Based on 5,000 random samples, we obtained an average number of 363.3 different preference combination with a standard sampling error of 0.5; Source: BMRB

This difference implies that the group of cable and satellite customers is likely to be less diverse with regard to the range of genre combinations the different individuals prefer than non-cable and satellite customers.

2.4. PREDICTING GENRE PREFERENCES

Another way of illustrating this diversity in preferences is to look at whether it is possible to predict whether a respondent would personally watch a particular genre, given information about the other genres that the respondent personally watches, the respondent’s age, income, social class and so on. In fact it turns out to be extremely difficult to predict whether or not a particular individual will like a particular genre.

Table 3 shows the success of an econometric model in predicting whether or not a respondent will like one genre given his/her tastes for other genres and relevant socio-economic characteristics.¹ The numbers for the variance explained measure the success of the model in predicting whether a particular viewer would personally choose to watch the genre based on his/her preferences for other genre and the set of socio-economic characteristics. A value of 100% would imply that the model could perfectly predict a person's preference for a particular genre based on that information. By contrast, a value of 0% means that the model has no predictive power at all. As indicated by the low values, preferences are highly idiosyncratic and vary from individual to individual so that knowing what other genres a particular person likes is not very helpful in predicting whether or not he/she would choose to watch the genre in question.

¹ More precisely, a logit model was used for whether genre x was watched personally, using whether genres other than x were watched personally as explanatory variables. Explanatory variables for class, income, region, age and family composition were also included. The proportion of variance explained in Table 2 is the pseudo- R^2 from this logit estimation. Note that 'News' and 'Current Affairs' have the highest proportion of variance explained, since tastes for these genres are somewhat correlated. That is, personally watching news is a reasonable indicator that a respondent will personally watch current affairs programs and vice-versa.

Table 3: Preference diversity

<i>Genre</i>	<i>Proportion of variance in tastes explainable</i>
News	29%
Current Affairs	25%
Drama (Soaps)	23%
Education	21%
Children's	20%
Programmes for Minority Groups	20%
Drama (Non Soap)	19%
Films	18%
Factual	17%
Light Entertainment (Comedy)	17%
Regional Programmes	15%
Light Entertainment (Other)	11%
Arts/Music	10%
Sport	10%

3. THE INCENTIVES OF COMMERCIAL BROADCASTERS, AND THEIR EFFECTS ON TAKE-UP

3.1. INTRODUCTION

Since viewers vary widely in the programming that they like and dislike, there is no simple programming proposition that is universally attractive. In this section, we address the extent to which commercial broadcasters can be expected to serve these diverse needs, which in turn affects the overall attractiveness of a new technology such as digital TV to potential viewers.

In doing so, we focus primarily on the incentives faced by pay TV broadcasters. This is because these broadcasters appear to be seen, and wish to be seen, as being the main promoters of digital TV. However, we also address briefly the incentives faced by broadcasters funded through advertising revenues.

3.2. BROADCASTER'S OBJECTIVES

The main objective of commercial broadcasters, as for any other business, is to maximise profits, either through advertising revenues or through payments for subscriptions or pay-per-view events. This holds true even where such broadcasters have to meet public service obligations incorporated in their licences (e.g. ITV companies or Channel 4); these obligations act as constraints on the broadcasters' commercial strategies rather than replacing them

Commercial broadcasters choose their programming strategy in line with this profit maximisation objective. This has certain implications.²

- Broadcasters funded mainly or exclusively through advertising revenues have an incentive to offer programmes that attract large audiences or

² A full discussion of the relationship between the funding of broadcasting services and the nature of the broadcast output is beyond the scope of this paper. For such a discussion see, for example, C Koboldt, S Hogg and B Robinson: "The Implications of Funding for Broadcasting Output", in: A Graham et al., *Public Purposes in Broadcasting: Funding the BBC*, University of Luton Press, 1999. In general, when making choices about programming the incentives of commercial broadcasters will not be wholly aligned with overall social objectives. Any scheme in which viewers pay for services on a subscription or pay-per view basis will lead to some potential viewers being discouraged by the cost of viewing. Therefore, commercial broadcasters cannot in general capture all of the social benefit of the programming they offer, which distorts programme choice relative to what is socially optimal. Advertising funded broadcaster does not necessarily have good incentives to offer a socially optimal programming mix either. The incentive for such a broadcasters is to win large audiences, and in particular to serve those parts of the population that are most valuable to advertisers.

audiences that are particularly valuable to advertisers (e.g. fairly homogeneous groups of high-spending customers).

- Broadcasters relying mainly on subscription or pay-per-view revenues have an incentive to offer programming for which a sufficiently large number of viewers have a sufficiently high willingness to pay. These broadcasters have an incentive to bundle their services into channel packages or bouquets in a way that maximises overall revenues.

These factors have led to commercial broadcasters focusing on particular genres – mainly films and premium sports – and, in the case of pay TV broadcasters, offering bundles of programmes that extracted to the maximum possible extent the value viewers placed on the channels included in the bundles.

3.3. GENRE CHOICE BY COMMERCIAL BROADCASTERS

3.3.1. A STYLISED EXAMPLE

The choice of which genres a commercial broadcaster will supply is mainly driven by the number of people who like a particular genre, rather than necessarily reflecting the variety of tastes across the population at large.

Consider a simple stylised example. Assume that there are five different types of viewers, A to E, and that their preferences for five different genres I to V are as summarised in Table 4, where a tick means that a person would want to watch a particular genre.

Table 4: Genre preferences – a stylised example

Viewer Genre	A	B	C	D	E
I	✔	✔	✔	✔	✔
II		✔			✔
III		✔	✔		
IV	✔		✔		
V		✔		✔	✔

A commercial broadcaster wishing to reach the largest possible audience would focus on genre I, liked by all viewers, followed by genre V, liked by 60% of viewers. Assuming that the cost of providing a particular genre is the same for all genres, that the revenue achievable through providing a genre is proportionate to the size of the audience

attracted³, and that the costs of providing a genre are at a level that it cannot be covered by attracting less than 50% of the audience, then only genres I and V will be offered by commercial broadcasters. This implies that the preference of viewers for genres II to IV will not be served. Provided that the preferences for these genres are sufficiently diverse, a large proportion of the demand for particular genres may remain unserved.

Defining *reach* with reference to the audience that would be interested in a particular genre (i.e. the number of ticks in any particular row), *interest* with reference to the number of genres any particular person is interested in (i.e. the number of ticks in a column), and *overall demand* with reference to the sum of interest across the entire population (i.e. the total sum of ticks in the matrix), we can state the following:

- It may be possible to achieve high *reach* by offering only a small number of genres.
- There may be a large number of customers whose *interest* is not particularly well served, even though they are attracted by these genres.
- As a result, a strategy that is focused on *reach* does not necessarily lead to a wide satisfaction of *overall demand*.

3.3.2. REACH, OVERALL DEMAND AND DIVERSITY

The extent to which reach and overall demand diverge clearly depends on the heterogeneity of viewer preferences. If all viewer preferences were concentrated on a few genres, then offering these would bring both reach and satisfy overall demand. On the other hand, if there are a few genres with universal appeal, but viewers in general have much wider and highly diverse interests, then the gap between reach and overall demand may become rather wide if broadcasters have an incentive to increase reach.

We have used the information on genre preferences collected by BMRB to illustrate how large this gap between reach and need might be in practice. In particular, we have ordered genres in terms of their *incremental* effect on reach, implying that the first genre on offer would be the one that has the widest appeal, the second genre the one that attracts the largest number of viewers not already attracted by the first genre, and so forth.

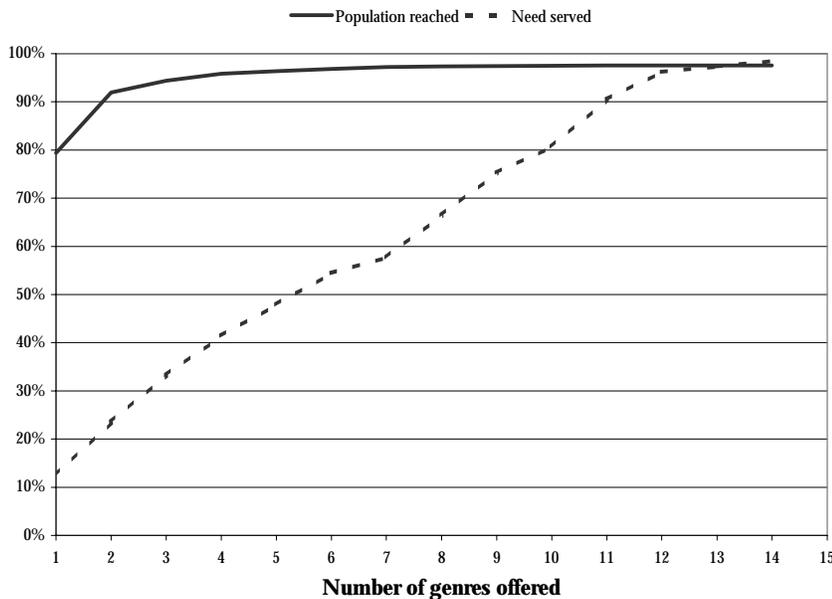
The results of this exercise are summarised in Figure 1. The two curves represent the proportion of the population attracted by at least one of the genres offered, and the proportion of overall demand served. The figure shows that with only a few genres a

³ It should be noted that this assumption somewhat understates the importance of audience size for advertising funded broadcasters where revenues per viewer increase with the size of the total audience. At the same time it overstates the importance of audience size for pay TV broadcasters where even small audiences may be profitable if the individual willingness to pay is sufficiently high.

large proportion of the population can be reached, but that this does not necessarily imply that viewers' varied needs are well served.

In particular, it is possible to reach 96% of the population by offering a mixture of films, sports, soaps, and news and factual programming.

Figure 1: The relationship between reach and overall demand served



Clearly, this approach does not exactly reflect the relative importance of genres to broadcasters. Because offering a broader programming mix tends, in general, to be more costly, in particularly where this involves originated programming rather than archive material, commercial broadcasters must design their commercial strategies appropriately to ensure that the additional revenue generated from additional programming exceeds its cost. To the extent that such strategies focus on increasing reach, they may result in programme choices that do not fully reflect overall demand.

A subscription broadcaster has an incentive to broaden out its programming to the extent to which (a) it increases the value of its proposition to its existing customers, which can then be exploited through increased charges, or (b) makes the extended proposition attractive to additional customers not already served by the broadcaster. In the first case, pay TV broadcasters may be interested in offering genres for which incremental reach is small (providing that this increases the willingness of existing viewers to pay more for the service bundle), or for which willingness to pay is so strong that they can be offered on a stand-alone basis (as so-called “premium channels”). This

is because pay TV broadcasters are not necessarily interested in reaching a wide audience, but in reaching an audience that is prepared to pay a sufficiently high price for the services offered.⁴

However, there are likely to be limits to this, as existing subscribers may not be interested in additional channels or genres and thus not prepared to tolerate a price increase. Therefore, the second of these effects – making the bundle attractive to a broader group of subscribers, i.e. broadening the reach – becomes important, and the broadcaster will be interested in offering additional programming in a manner that attracts additional subscribers where the additional revenue generated exceeds the cost of the additional programming. However, as we have shown above, the incremental benefit to a subscription broadcaster of additional genres of programming in attracting more subscribers rapidly diminishes once even a modest mixture of genres is offered. This can mean that there is substantial overall demand that is not served since there is little incentive to do so.

Two points need to be stressed:

Variety offered by commercial broadcasters is not synonymous with a larger number of channels. This is firstly because an increase in the number of channels may mainly provide more convenience (e.g. through similar programming on staggered schedules), rather than a more diverse range of programming. Secondly, an increase in the number of channels may cover more genres, but not necessarily provide more variety within each genre.

In this context, the distinction between originated programming and archive material is likely to be important. Even where commercial broadcasters offer considerable variety in terms of archive material, they may have little or no incentive to originate varied and differentiated programming, given the considerable cost of such a strategy.

3.4. BUNDLING PRACTICES

Bundling of channels is common in the provision of pay TV services. The reason for such a practice is that it effectively acts like price discrimination, increasing the number of customers who will be prepared to a particular mix of programming and allowing

⁴ Of course, the list of questions asked by BMRB and the answers that constitute our data source on preferences do not capture this preference intensity. This is particularly evident for sport, which based on its incremental reach would not be one of the top three programme genres. However, as we know from the experience with pay TV around the world, sport is a main driver of pay TV take-up because those who are interested in this genre place a considerable value on it, and are therefore willing to pay significant amounts of money for premium sports coverage.

operators to spread the costs of programming (which are often fixed with regard to the number of subscribers served) across a larger customer base.

3.4.1. A STYLISED EXAMPLE

Again, a stylised example is useful to illustrate this concept. Assume there are five customers (or customer types) whose willingness to pay for three different pay TV channels is given in Table 5. This table also indicates the maximum willingness to pay for a bundle consisting of all three channels (which is simply the sum of the valuation of the individual channels), the profit maximising price, the number of customers served at this price, and the revenues earned.⁵ For example, Channel 1 could be sold at £1 to all five customers, yielding a revenue of £5. Alternatively, it could be sold at £3, at which price three viewers would be willing to subscribe, giving a revenue of £9. A price of £4 would generate a revenue of £8, and a price of £10, at which only customer A is willing to subscribe, generates a revenue of £10.

As can easily be seen, rather than selling the channels individually, a broadcaster could do better by selling a big package containing all three channels, which gives revenues of £52 rather than £42 (the sum of the individual channel revenues).

Table 5: Channel bundling – a stylised example

	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>Optimal price</i>	<i>Quantit y</i>	<i>Revenue</i>
Channel 1	10	1	3	4	1	10	1	10
Channel2	5	5	10	4	4	4	5	20
Channel 3	-	3	3	5	8	3	4	12
Bundle of Channels 1, 2 and 3	15	9	16	14	13	13	4	52
Consumer surplus with big package	2	-	3	1	-			
Consumer surplus from purchasing channel 2 only	1	1	6	-	-			
Consumer surplus from purchasing Channel 3 only	-	-	-	2	5			

⁵ Throughout this example we focus on revenues rather than profits, assuming that the cost of providing a channel is fixed with regard to the number of subscribers. Given the cost structure of broadcasting, this assumption is justified.

Customer B is not prepared to pay £13 for the big channel package, and thus remains unserved. The broadcaster has no incentive to reduce the price to £9, because even though at this price all five customers would purchase the package, revenues would be lower (£45 rather than £52).

Similarly, even though in principle the broadcaster could try to attract customer B by offering Channel 2 or Channel 3 as a stand-alone option, this is not an attractive strategy. In order to see why, we have to look at the consumer surplus each of the customers enjoys under the various packaging and pricing options. Consumer surplus refers to the difference between the amount a customer would be prepared to pay for a service, and the price she actually has to pay. So in the case of customer A, the consumer surplus from buying the big channel package is equal to £2 – the difference between the total value of £15 and the price of £13.

If Channel 2 or Channel 3 were made available as a stand-alone option, customers whose consumer surplus from purchasing these channels separately would exceed the surplus they enjoy from buying the big package would “trade down” from the big package to individual channels. In this case, if Channel 2 were made available stand-alone, then customer C would opt for this channel instead of the big package. Similarly, if Channel 3 were made available, customers D and E would decide to trade down. This would result in a loss of revenue for the broadcaster, and would thus not be an attractive option.

This stylised example shows that pay TV broadcasters may prefer a strategy that limits the number of customers served over a strategy that would maximise the number of customer served because the latter may result in lower revenues and thus profits. Whilst this example is rather simple, it reflects the commercial logic visible throughout the history of analogue pay TV take-up in the UK.

3.4.2. THE TAKE-UP OF ANALOGUE PAY TV IN THE UK

BSkyB is the leading supplier of pay TV services and the owner of premium content through its long-term exclusive contracts with the major Hollywood studios and sports organisations. It has pursued a strategy of attracting customers who were prepared to spend considerable sums on pay TV services. BSkyB was widely seen as following a strategy of maximising revenues per subscriber rather than penetration, until a new senior management took over in late 1997.⁶

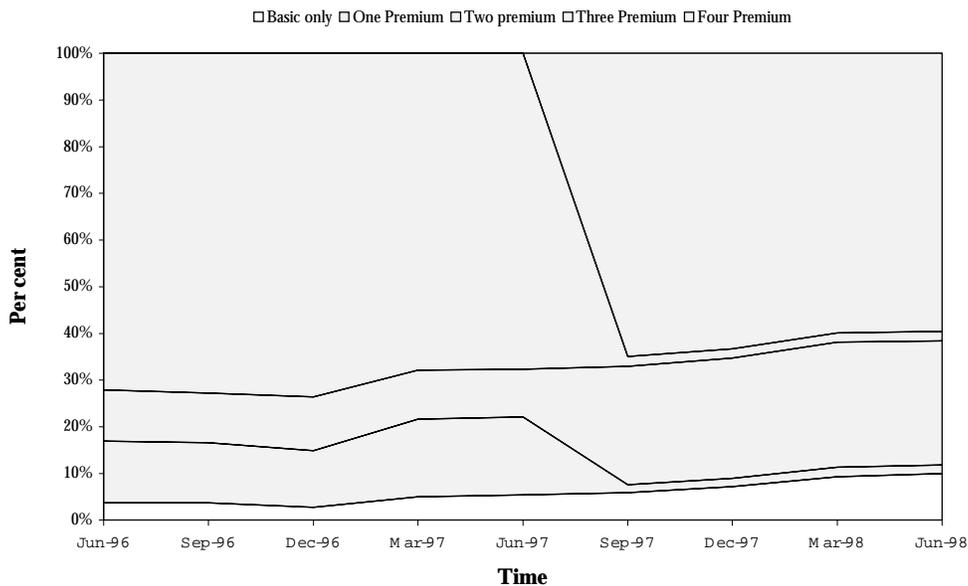
Consequently, BSkyB was offering a big basic package with an increasing number of channels (from 12 basic channels in 1993 to 29 basic channels by the end of 1997). In line with the increase in the number of basic channels, the price of the basic package increased from £6.99 in 1993 to £11.99 in 1997). On top of this basic package,

⁶ *European cable and satellite economics*, Screen Digest and European Media Services, April 1999

subscribers could take individual premium channels (BSkyB's movies and sports channels).

Although premium channels were made available individually, the price structure for these services was such that it created a strong incentive to subscriber to take the full range of premium channels by reducing the incremental price for additional premium channels and offering “free” bonus channels for subscribers of larger packages. Consequently, a large proportion of BSKyB's subscribers takes the full package of three or, following the introduction of separate charging for Sky Sports 2 in August 1997, four premium package. This is shown in Figure 2. Indeed, the desire to be receive premium channels are widely regarded as having been the main driver of DTH take-up, with the big basic package being an “add-on” which had to be bought in order to get access to the premium services.⁷

Figure 2: The composition of the DTH subscriber base



Source: Salomon Smith Barney, 30 September 1998

⁷ This is consistent with the results of studies into customer price responsiveness. A study undertaken by Telewest found that customer were not particularly sensitive to changes of the basic package price, they are responsive to changes in the price of basic plus premium channels. Whilst a fall in the price of the basic package by 10% would increase subscriber numbers by only 8.2% (i.e. would result in decreasing revenues), the same percentage reduction in the price of the basic plus two premium package would increase subscriber numbers by almost 14%. A 10% fall in the full package price would even increase subscriber numbers by 18% (Telewest study reported in *UK Pay TV: Winners and Losers to 2007*, Screen Digest and Oliver & Ohlbaum, 1997)

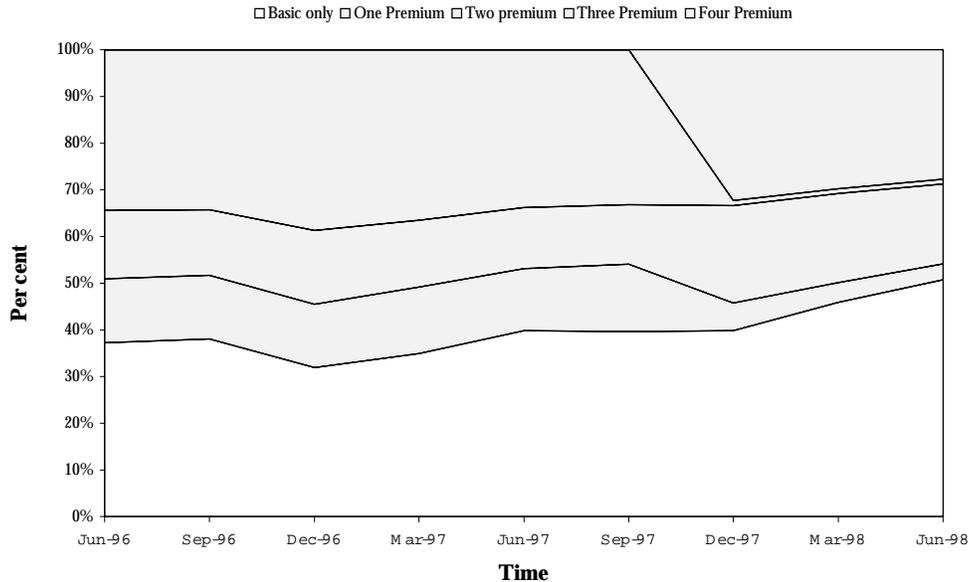
Even with the allegedly more flexible packaging of BSkyB's digital services, where three different basic tiers are offered, most BSkyB customers seem to be interested in the full package. According to New Media Markets (January 1999), nearly all subscribers to BSkyB's digital service (96.8%) opted for the full basic package, priced at the same level as the big analogue basic package. Given the pricing structure, this is not surprising. At current prices, the "Value" tier for £7/month gives the customer access to only two channels in addition to the bouquet of digital free-to-air channels that can be received even without taking out any subscription (viz. Sky One and the Discovery Channel). The mid-basic option offers a selection of 13 channels arranged around a particular theme (e.g. kids, lifestyle) etc. for £10/month, whilst the "Family" basic package offers 44 channels for a monthly charge of £13. This means an effective reduction in the per-channel charge from £3.50 in the Value tier to £0.30 in the Family basic package.

By contrast, cable operators have different incentives. Given that DTH was the only option for many if not most early adopters of pay TV, cable operators were faced with a different customer base as they rolled out their networks. A large proportion of those people who were keen on multi-channel TV had already signed up with BSkyB and cable operators. Anxious to earn some revenues from those homes they had to pass under their licence obligations, cable operators were much keener on boosting penetration at the expense of revenues per subscriber. Their ability to attract viewers by reducing the price of premium channels⁸ was limited by BSkyB's wholesale pricing structure, and viewers appeared to be interested in only a few channels.⁹ So offering smaller access tiers appeared to be the most attractive option. Indeed, a much larger proportion of cable customers is interested in the basic package only, and customers taking the full range of channels are in the minority, as shown in Figure 3.

⁸ This would have been the only viable pricing instrument, given the price responsiveness of viewers (see footnote 7 above).

⁹ According to BARB figures, even though the average pay TV household has access to around 40 channels (both free-to-air and pay TV channels), it only watches 10 channels in any given week, out of which only 6.5 channels are pay TV channels (reported in *UK pay TV: Winners and Losers to 2007*, Screen Digest and Oliver & Ohlbaum, 1997).

Figure 3: The composition of the cable subscriber base



Source: Salomon Smith Barney, 30 September 1998

It is worth noting that these differences occurred despite the fact that BSkyB, as the main wholesaler of channels to the cable operators and as the dominant provider of premium channels, was trying to incentivise cable operators to replicate its own bundling strategy through its wholesale pricing structure and a variety of restrictions such as buy-through conditions or minimum carriage requirements¹⁰. Cable operators, who were convinced that increased packaging flexibility would help them to increase pay TV penetration amongst homes passed, pressed hard for such restrictions to be lifted.¹¹ The investigation into BSkyB's position in the wholesale pay TV market undertaken by the Office of Fair Trading brought some relief in this regard (reducing the minimum carriage guarantee on Sky basic channels from 100% to 80%), and allowed cable operators to experiment with smaller access tiers in late 1996.

¹⁰ These minimum carriage requirements obliged the distributor to supply a channel to a specified proportion of its subscribers. Initially, such minimum carriage requirements were set at 100%, which meant that the channel had to be offered to all customers. The more channels were subject to such requirements, the larger the basic package distributors had to offer.

¹¹ A full discussion of these restrictions on bundling flexibility, which have been the subject of a number of inquiries by both the Office of Fair Trading (OFT) and the Independent Television Commission (ITC), is beyond the scope of this paper. For a full description see "The Director General's Review of BSkyB's position in the Wholesale Pay TV Market", OFT, December 1996, and the ITC consultation papers of November 1996 and August 1997 as well as its resulting proposal of April 1998.

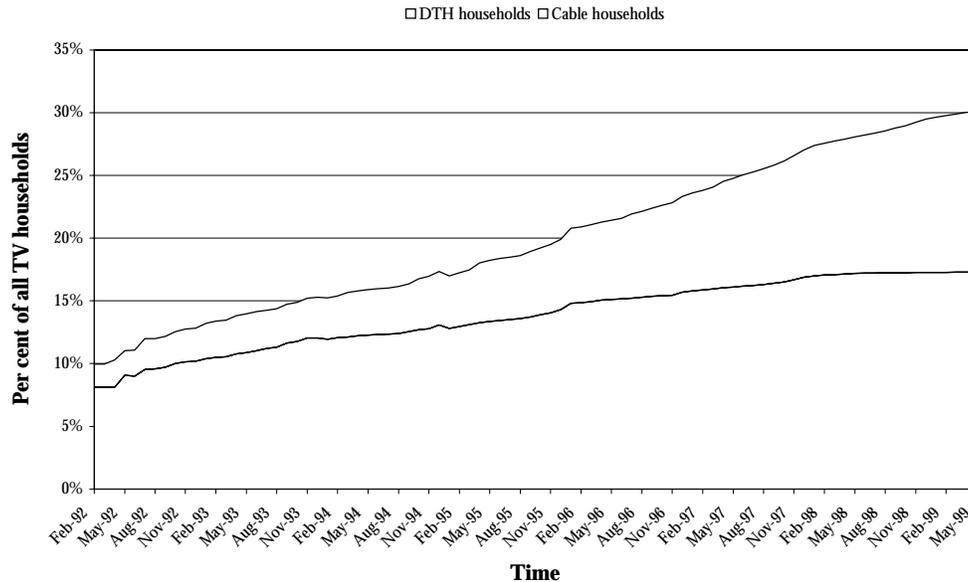
Cable operators began to plan and test restructured channel packages by the end of 1996. CableTel was first to launch new packages in 1997, offering a small entry tier. This offered customers access to premium channels as well as the option to upgrade with additional basic channels. This resulted in penetration rates that by far exceeded the best rates achieved previously.¹² Soon CWC, NTL and Telewest followed with similar offerings. The drawback to increased packaging flexibility was, as expected, a reduction in the average revenue per subscriber as a result both of new subscribers taking lower-cost packages, and of existing subscribers trading down. However, overall the growth in penetration outweighed any loss in revenue resulting from lower average subscriber spend.

Scope for flexibility was further increased over the next years. With the ongoing consolidation of the UK cable industry, giving cable operators a stronger bargaining position relative to channel providers, minimum carriage guarantees were negotiated away and were finally banned by the Independent Television Commission in June 1998. Cable penetration increased further¹³, whilst the growth of the DTH subscriber base levelled off. For the past two years, cable was the main driver of increasing pay TV penetration, as shown in Figure 4, bringing in customers who were not attracted by the big basic tier offered by BSkyB throughout most of its history.

¹² As stated in New Media Markets (6 March 1997), “*[t]he need for a substantial leap in penetration underpins the experimentation with tiering and linked cable television-telephony packages which several operators have introduced or trialled. It seems that those operators which are adopting flexibility in packaging are beginning to see it reflected in their penetration figures.*”

¹³ See statistics for cable penetration in New Media Markets (12 March 1998 and 18 March 1999).

Figure 4: DTH and cable households since 1992



Source: BARB

In the light of the difference in the characteristics of cable and DTH customers, it is instructive to link the growth of pay TV subscribers to the split between cable and DTH customers.

Figure 5 combines information on the growth of the pay TV subscriber base and information on the split of new subscribers:

- the bars with corresponding values for growth rates on the right axis) shows the annual rate of growth of the total pay TV customer base (on a monthly basis, relative to the same months in the previous year).
- the light and the shaded areas with corresponding percentage values on the left axis show the relative proportions of new cable and DTH customers signed up over the same period.

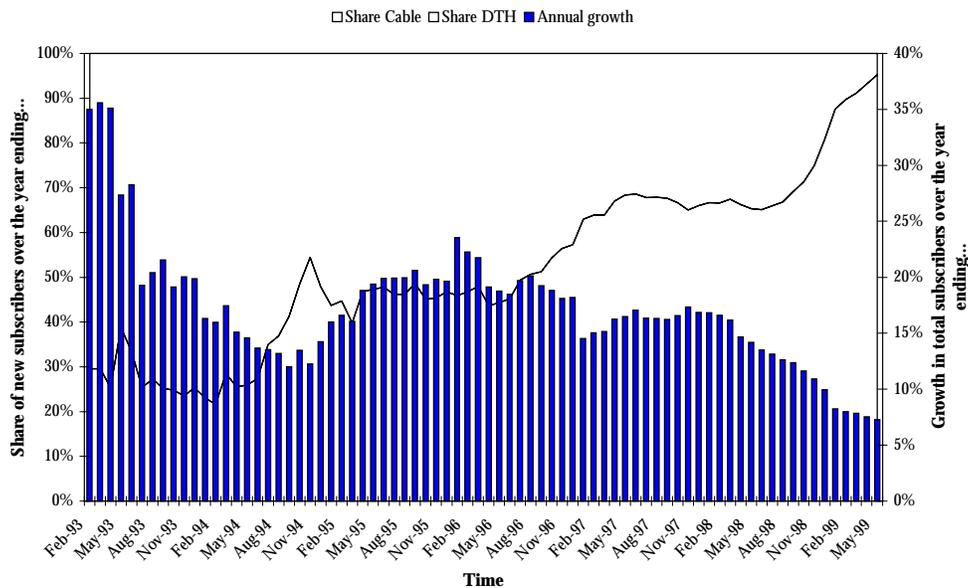
The combination of these shows three distinct phases in the growth of the UK pay TV customer base since 1992/93:

- Up until late 1994, the majority of new subscribers were DTH customers. Growth was extremely high (still fuelled by BSkyB's acquisition of the rights to Premier League football in 1992), but declining sharply.
- A new growth wave (over the period of 1995 and 1996) coincided with an increased proportion of new customers being won by cable operators. This suggests that the attraction of DTH may have started

to fade, and that there may have been demand for pay TV services from customers who did not want or could not have satellite dishes.

- Increased packaging flexibility, starting in early 1997 and continuing throughout the rest of the period, has led to an ever increasing share of cable customers amongst new pay TV subscribers, with the proportion of new DTH customers falling to around 5%. Even though this has again lead to a slight increase in growth, growth has been falling since early 1998.

Figure 5: Annual growth of multi-channel homes and the split between DTH and cable



Source: BARB

Even though falling growth rates are a natural consequence of an ever increasing base, this would suggest that pay TV penetration may reach a saturation level well below universal take-up, and operators have little incentive to increase penetration if this resulted in ever smaller revenues per subscriber, thus reducing rather than increasing their profits.

3.5. REDUCING THE UP-FRONT COST FOR CUSTOMERS

Any hardware cost the subscriber has to incur before being able to receive pay TV services may constitute a natural barrier to take-up. Customers may be reluctant to invest in decoders, dishes or set-top boxes, in particular where such an investment is considerable and the nature and quality of the services that can be received are uncertain. Consequently, pay TV providers may have an incentive to reduce this cost for

customers, e.g. by renting out the necessary equipment (as cable operators do) or by providing a considerable hardware subsidy,¹⁴ or even by making available the necessary equipment for free. This incentive is often increased by the fact that network effects may lead to effective standardisation (e.g. of the conditional access system), leaving the operator controlling the standard in a powerful position. Therefore, it becomes important to succeed in establishing a base of customers early on that is larger than that of a rival. As a consequence, considerable weight is given to early adopters, even if this leads to lower overall penetration in the long run.

In any case, a strategy that relies on subsidising or financing hardware increases customer acquisition costs, and needs to be accompanied by an increased revenue stream over the customer's lifetime in order to be commercially attractive.¹⁵ Indeed, it is quite common in industries (such as, for example, the video games market) which have the same "hardware-software" model characteristic as pay TV to subsidise the initial hardware. They may, for example, sell game consoles below costs and recover the subsidy through higher software charges generating revenues over the customer's lifetime (for example, charging a mark-up on games).

Whilst such a strategy is commercially sensible, it is not necessarily one that maximises take-up.

- Firstly, it implies that service prices are higher in the long run, probably deterring later adopters, who might through such higher service prices have to contribute to the subsidies enjoyed by earlier adopters.
- Secondly, it requires some customer lock-in. Otherwise independent channels providers who have not contributed to the subsidy and are therefore able to offer services at lower prices would undermine the ability of those broadcasters subsidising the hardware to recoup their investment. This, together with the network effects described above, provides strong incentives for broadcasters to support incompatible technologies because lock-ins are easier to enforce with proprietary technologies.

As a result, customers face higher prices and restricted choice in the long run. The switching costs created by the choice of incompatible technologies and contractual lock-ins create strong incentives to compete for market share at an early stage. Even though

¹⁴ For the avoidance of doubt we should note that these 'subsidies' are in fact cross-subsidies where revenues from the sale of services are used in order to finance lower hardware costs.

¹⁵ For BSkyB the migration to digital, and the associated costs of attracting customers, has resulted in pre-tax losses of \$388.7 million for the year to the end of June, compared to a £270.9 million pre-tax profit the year before. Even though this was largely accounted for by the cost of a fund of £450 million for transferring BSkyB's analogue customers to its digital service, the set-top box give-away beginning only in May had led to an appreciable increase in marketing costs (Financial Times, 12 August 1999)

some subsidies for initial adopters may be desirable from a welfare maximising perspective, vigorous competition for market share is quite likely to lead to levels of subsidy that are in excess of those that would be socially optimal.

The story of digital television in the UK closely reflects these considerations. Despite an earlier agreement to choose compatible set-top box technologies, ONdigital (then BDB) decided in early 1998 to opt for a proprietary architecture of its set-top boxes. In May 1998, the set-top box manufacturer Pace announced that it would be able to offer a side-car module that would make both technologies compatible. However, given the differences between the technologies chosen by BSkyB and ONdigital, such a side-car would be almost as expensive (and quite as large) as a full set-top box.

In order to support its commercial launch later this year, BSkyB decided in August 1998 to spend up to £500 million on subsidising free installation of satellite dishes from August 1998 until 2003. Set-top boxes would benefit from a subsidy provided by Open (then BIB, a consortium involving BSkyB, BT, HSBC and Matsushita), conditional upon subscribers keeping their box connected to an operational phone line for at least one year.¹⁶ These subsidised boxes would retail at a price of around £200. ONdigital boxes would be subsidised and retail at around the same price, but since DTT should be available through standard aerials, no further installation cost was required.

The commercial launch of BSkyB's digital services in October 1998 proved to be a success. There were rather more new customers and more customers upgrading from their analogue service than expected. By the end of 1998, BSkyB had signed up around 225,000 digital customers, 31% of whom were new customers. ONdigital, which launched its DTT service one month later, has found it more difficult to attract subscribers, but even so take-up was sufficiently strong to lead to a shortage of ONdigital boxes before Christmas 1998. ONdigital reported 50,000 subscribers by the end of 1998.¹⁷

In May 1999, ONdigital broadened its offer to give away a set-top box with any TV set costing more than £199. Recipients of free boxes had to subscribe for at least one year to ONdigital's services. ONdigital then extended its offer by providing a free box if the

¹⁶ This condition replaced the initial condition of subscribing to BSkyB's services for at least one year which was opposed by the European Commission. However, since the main purpose of getting a DTH box subsidised by Open would appear to be receiving DTH pay TV, and as BSkyB's minimum contractual period for digital services was set at one year, the formal replacement of the initial requirement seems to have little effect in practice.

¹⁷ *European Cable and Satellite Economics*, Screen Digest and European Media Services, April 1999. In the first four months, Sky Digital gained more than 350,000 digital subscribers (compared to a target of 200,000). By the end of March 1999 Sky Digital had signed up 551,000 subscribers of whom 121,000, or 22%, were new subscribers. ONdigital announced that it had gained 110,000 subscribers by the end of March 1999, a number in excess of market expectations (New Media Markets, May 1999).

customer bought any electrical equipment for more the £199. Initially, the customer had to pay the cost of the box, and then apply for a refund.¹⁸ Now, ONdigital boxes are available for free as long as the customer subscribes to ONdigital – in essence a rental arrangement. This has led analysts to revise their forecasts. Merrill Lynch, which initially had predicted 380,000 subscribers by the end of 1999 revised its forecast to 480,000; Matthew Horsman from Investec Henderson Crosthwaite revised his forecast from 350,000 up to 500,000.¹⁹ As shown in Table 6, decoder subsidies will make up a significant proportion of marketing costs, and will initially almost completely take out all the revenues.

Table 6: ONdigital's decoder subsidy, marketing costs and revenues (£m)

	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>
Decoder subsidy	1.7	45.8	39.5	26.2	18.8	10.4	5	3.1
Marketing costs	18.3	104.1	99.5	80.7	72.3	59.1	50.6	50.2
Revenues	0.8	49.3	152.1	256.2	362.9	459.6	518.1	590.4
<i>Decoder subsidy as percentage of</i>								
Marketing costs	9.3%	44.0%	39.7%	32.5%	26.0%	17.6%	9.9%	6.2%
Revenues	212.5%	92.9%	26.0%	10.2%	5.2%	2.3%	1.0%	0.5%

Source: Merrill Lynch, New Media Markets, 27 May 1999

In response to the free decoder give-away, subscription prices have been increased from an initial £7.99 for the basic tier of six primary channels to £9.99.²⁰ The full set of primary channels costs £11.99.

As soon as ONdigital had announced its plans to offer free boxes, by the end of May 1999 BSkyB decided to offer free boxes to its subscribers as well, but charging for installation (£40 for subscribers, £100 for non-subscribers). As with the initial subsidy bringing the retail price down to £199, there is no formal requirement to subscribe to BSkyB's service, but the box needs to be connected to an operational telephone line for

¹⁸ New Media Markets, 27 May 1999.

¹⁹ New Media Markets, 27 May 1999.

²⁰ Customers will be able to access all primary channels for the first three months, but will have to choose six channels after that, or have to upgrade their subscription to the full primary channel package.

a minimum of one year in order for the user to be able to access Open's interactive services. However, BSkyB's minimum subscription period is one year as well. Like ONdigital, BSkyB increased the prices for its packages, from 1 pence per month for its lowest access package (from £6.99 to £7) to £1.01 per month for its most popular full family basic package (£11.99 to £13), and further price increases to some of its premium channels.

4. THE CONTRIBUTION OF AN IMPROVED DIGITAL BBC OFFERING TO TAKE-UP

4.1. INTRODUCTION

So far we have seen that:

- viewers have extremely heterogeneous tastes, requiring diverse programming to meet them;
- commercial broadcasters, faced with their objectives, cannot necessarily be expected to provide programming that fully reflects this diversity of tastes;
- in particular, pay TV providers may focus on reaching a subset of highly valuable viewers through focusing on a limited range of programming, and bundling their channels in a way that extracts the maximum willingness to pay.

In itself, this suggests that the BBC may have an important role in increasing the overall attractiveness of digital television by enriching the programming ecology. In this section we see that in fact those who are currently most resistant to taking up digital TV are indeed those who are most likely to be influenced by a BBC digital offering.

4.2. THE CHARACTERISTICS OF THOSE INTERESTED IN DIGITAL TV

Those interested in acquiring digital TV are a relatively small minority of the population. Table 7 shows the proportion of TV owning households interested in digital TV. Taken together those very interested in getting or already using digital TV account for around 16% of households.

Table 7: Interest in digital TV

<i>Response</i>	<i>Proportion</i>
Already got digital	1.5%
Very interested	14.7%
Quite interested	28.5%
Not very interested	30.0%
Not at all interested	25.3%

Source: BMRB, April 1999

Moreover, those most interested in digital are not representative of the population at large. Table 8 shows the characteristics of those very interested in or currently using digital TV as compared with the remainder of the population. The key features are that potential early adopters tend to be:

- significantly younger;
- existing multi-channel households;
- families with children;
- drawn from the top 25% of the income distribution; and
- less likely to count a BBC channel as their favourite.

Table 8: The characteristics of those interested in digital TV

	<i>Very interested or currently using digital</i>	<i>Others</i>	<i>P-value</i>	<i>Significance</i>
Proportion counting a BBC channel as favourite	28.8%	40.9%	2.1%	-
Age	35.2	46.6	0.0%	=
Proportion with children	48.6%	35.1%	0.2%	++
Proportion of multi-channel households	52.6%	29.2%	0.0%	++
Income quartile 1	20.9%	24.4%	48.6%	
Income quartile 2	25.6%	31.9%	52.3%	
Income quartile 3	32.5%	30.9%	48.6%	
Income quartile 4	21.0%	12.8%	1.2%	+
ABC1	53.0%	47.6%	12.9%	
C2	22.3%	20.4%	84.1%	
DE	24.6%	31.9%	12.3%	

Source: BMRB data

*Notes: The p-value column shows the statistical significance of any difference between the two groups, i.e. the chance of seeing such a difference (or a greater difference) at random. The **lower** this p-value, the **greater** the statistical significance of the results.*

Where a variable is higher for those interested in or using digital TV, we show a single '+' in the final column where this is statistically significant at the 5% level and two '+'s where this is statistically significant at the 1% level. Similar '-' shows where a variable is statistically significantly lower at the 5% level and '=' where it is significantly lower at the 1% level.

There are also significant differences in the viewing preferences of those who have already adopted or intend to adopt digital. Table 9 shows how many respondents would personally watch a particular programming genre, depending on their interest in digital TV. We rank the genres according to the difference in the proportion of viewers who would personally watch a genre between those interested in digital TV and those that are not.

As we would expect, based on the experience with analogue pay TV, potential early adopters of digital are very much more interested in sport and films than the population at large. More surprisingly, arts and music and children's programming are also more highly rated by potential early adopters.

Table 9: Proportions of those personally watching genres according to interested in digital TV

	<i>Very interested or currently using digital</i>	<i>Others</i>	<i>Difference between the two groups</i>	<i>P-value</i>	<i>Significance</i>
Light Entert. - Comedy	76.5%	59.6%	17.0%	0.0%	++
Sport	52.7%	39.2%	13.5%	0.1%	++
Films	89.1%	77.5%	11.6%	0.0%	++
Arts/Music	43.2%	32.4%	10.8%	0.0%	++
Light Entert. - Other	63.7%	53.9%	9.9%	1.8%	+
Children	24.4%	15.4%	9.1%	0.8%	++
Drama- Soaps	56.0%	50.7%	5.3%	15.9%	
Regional Programmes	40.5%	35.5%	5.0%	10.1%	
Programmes for Minority Groups	9.2%	6.7%	2.5%	6.4%	
Drama – Non soap	54.5%	56.2%	-1.7%	88.4%	
Factual	58.8%	62.4%	-3.6%	70.2%	
Current Affairs	37.3%	41.9%	-4.7%	94.0%	
Education	15.2%	22.0%	-6.9%	50.0%	
News	63.1%	71.3%	-8.2%	40.2%	

Source: BMRB

Notes: See Table 8 for an explanation of the 'p-value' and 'significance' columns.

There is strong evidence, therefore, that potential early adopters of digital TV and potential late-adopters have very different characteristics. Given the particular characteristics of those currently not interested in digital, what programming proposition would be attractive to this group and encourage take up?

The range of genres more favoured by late adopters suggests that improved BBC digital services could make a major contribution to attracting those viewers. Even though there is no one-to-one correspondence, these genres broadly match those in the provision of which the BBC is seen to have the largest lead. An Attitude Survey on behalf of the BBC Funding Review conducted by MORI shows that the BBC is seen to provide the best programming (with a wide lead over other broadcasters) in the following genres:²¹

- National events
- Nature programmes
- Education
- Documentaries
- News

This list broadly corresponds to the last four genres in Table 9, which are more highly favoured by late adopters.

4.3. THE ROLE OF MULTI-CHANNEL HOUSEHOLDS IN DIGITAL TAKE-UP

We have already seen that at present the strongest interest for digital TV appears to come from those who already have multi-channel services. Some 53% of those with, or very interested in, digital TV are multi-channel households as opposed to 29% of those not very interested in digital. According to customer interviews reported in the Pace Report²², improved picture and sound quality is the most important reason why people would eventually get digital TV (29% of respondents, with 75% of respondents valuing this particular feature), followed by increased choice (21% of respondents, with 64% of respondents valuing this particular feature).²³ Interestingly, increased choice is more important for people who already subscribe to multi-channel services (27% compared to 19% of terrestrial households quoted more choice as one of the main reasons for getting digital TV).

²¹ *The Future Funding of the BBC*, Report of the Independent Review Panel, July 1999, Annex 5

²² *UK Consumer Attitudes Towards Digital Television*, The Pace Report, 1998. The results are based on interviews of nearly 1200 viewers across the UK.

²³ It is worth noting that in terms of valuable features, access to local news was ahead of more choice, with 66% of respondents valuing this feature, although it was a less important driver for getting digital TV.

All of this suggests that multi-channel homes will be a major factor in digital take-up, which in turn implies that programming strategies targeted at these households may be successful in establishing digital TV. However, another implication is that take-up of digital TV may be limited in the same way as multi-channel penetration. Even if all cable and satellite customers will eventually migrate to digital services, this would still leave a large proportion of customers unattracted by digital. Moreover, innovative digital BBC services may still be important in attracting multi-channel households since the BBC still has an important place in these households' viewing.

4.3.1. LIMITS TO PAY TV PENETRATION

Overall, pay TV in the UK has been a huge success. The UK pay TV market is the second largest in Europe in terms of revenue, with around 30% of UK TV households subscribing to pay TV services. However, even though pay TV take-up has been impressive, it is clear that the appeal of the current pay TV proposition is far from universal. In comparison with the introduction of other major TV consumer propositions – such as VCRs – pay TV take-up has been healthy but not spectacular.

Growth of pay TV households is beginning to slow, at a current penetration of about 30% of UK TV households. Even though penetration is still growing, industry experts estimate that total pay TV penetration will eventually stabilise at a level of between 50% and 60%. Surveys on future demand suggest that about 27% of people have not yet taken up pay TV, but are potentially interested in subscribing.²⁴ This means that even if *all* those being potentially interested did eventually subscribe, this would only lead to an overall penetration of 57%.

This is not surprising, given that pay TV operators have an incentive to target particular audiences, maximising their profits rather than take-up. These incentives are unlikely to be very different in the digital age.²⁵ DTT will perhaps open up new customer groups, in particular customers who might be interested in a 30 plus channel package, are not able to receive cable, and are unable or unwilling to use satellite dishes. However, even this is unlikely to result in universal take-up.

²⁴ Continental Research, O&O analysis, quoted in *UK pay TV: Winners and Losers to 2007*, Screen Digest and Oliver & Ohlbaum, 1997.

This suggests that pay TV, even if it offers increased choice and flexibility and is augmented by interactive services (e.g. home shopping, home banking etc.) will not by itself succeed in making digital television a universally attractive technology. Improved pay TV offerings may need to be complemented by improved free-to-air services, utilising the potential of digital technology, in order to promote widespread adoption of digital TV which will eventually allow the government to switch off analogue services and release valuable spectrum to more efficient uses.

4.3.2. A STRONG BBC DIGITAL PROPOSITION IS LIKELY TO BE IMPORTANT EVEN TO MULTI-CHANNEL HOUSEHOLDS

Thus, strong digital services offered free-to-air, including an attractive range of digital BBC services, can make a major contribution to the promotion of digital take-up. Certainly, operators themselves regard free-to-air services as a major potential contributor to the attractiveness of a new technology. For example, the decision of the ITV companies not to make their digital services available on the satellite platform may be motivated to a large extent by a desire to promote ONdigital, owned by Carlton and Granada. Similarly, both BSkyB and ONdigital stress the availability of digital free-to-air programming from the BBC. Although it would not make any money on customers not subscribing to its services, BSkyB argued that

*from June 1, people taking advantage of its free box offer would immediately be able to receive 16 free-to-air or in-the-clear digital channels via the digital platform, without a subscription, by asking the BBC for a free viewing card. These include the six BBC digital channels, Channels 4 and 5 and the two SAC digital channels, along with CNN, the Chinese channel CNE, Shop!, TV Travel Shop, the Travel Channel and Sky News.*²⁶

Free-to-air services, and in particular the BBC's programmes, remain an important part of TV viewing even in multi-channel households. Even though it is true that the BBC's viewing share has fallen over time, this is the inevitable consequence of more channels

²⁵ As stated by David Coverdale from Pace Micro Technology, "[t]he drivers for digital television will be very little different from those for analogue television, whether terrestrial, satellite or cable: programming and incentives" (UK Consumer Attitudes Towards Digital Television, The Pace Report, 1998, page 3). Similarly, prices for digital services are unlikely to be lower. Continental Research's Chairman John Clemens points out that "homes will have to be persuaded to buy digital set-top boxes to obtain new services, and most of these new services will mean paying for TV channels rather than obtaining them free of charge. And these new services will not be any cheaper than the satellite services that to date have tempted less than one in three homes to pay for additional TV" (UK Consumer Attitudes Towards Digital Television, The Pace Report, 1998, page 6).

²⁶ New Media Markets, 27 May 1999

being added to the package, and has to be seen in this context. Table 10 shows the consequences.

- All of the major channels with the exception of Channel 4 and Sky Sports have suffered a loss in viewing shares. In the case of Sky Sports, there has been an increase in the number of sports channels from one to three. As can be seen, this has led to a step-change in viewing shares, with shares falling subsequently.
- ITV, Sky One and the Sky movie channels have experienced the most severe losses. As a result, the movie channels, once one of the key drivers of multi-channel TV in terms of viewing shares, have dropped to about the same level of viewing as the sports channels.
- Over the same time, the number of channels has increased more than threefold. A large number of channels in the basic package each have a minute share of total viewing.

Overall, the clear winner is Channel 4. The BBC has lost viewing share as a result of broadening the channel package, but has fared much better than the average.

Table 10: Viewing shares in multi-channel households

	<i>BBC1&2</i>	<i>ITV</i>	<i>C4</i>	<i>Sky 1</i>	<i>All Sky Movies</i>	<i>All Sky Sport</i>	<i>Number of channels</i>	<i>Average viewing share</i>
1992	32.1%	30.9%	6.4%	7.1%	9.7%	3.3%	14.3%	6.8%
1993	31.1%	30.7%	7.2%	7.1%	8.5%	3.2%	17.3%	5.8%
1994	30.4%	30.3%	7.0%	5.4%	7.8%	3.6%*	22.5%	4.3%
1995	30.4%	30.3%	7.0%	5.4%	7.8%	3.6%	22.5%	4.3%
1996	30.1%	28.3%	7.3%	5.0%	7.4%	4.5%	24.3%	4.0%
1997	28.7%	25.8%	7.0%	4.2%	6.0%	5.2%*	40.8%	2.4%
1998	28.3%	24.7%	6.9%	4.3%	4.5%	4.5%	43.8%	2.2%
1999Q1	27.3%	26.6%	6.8%	4.4%	3.8%	4.4%	46.0	2.1%
Change	-3.8%***	-6.2%	0.5%	-2.8%	-5.1%	1.2%	29.5	-4.6%

* Sky Sports 2 launched in August 1994 ** Sky Sports 3 launched in August 1997 *** This is mainly due to reduced viewing of BBC1, with BBC 2 share falling only by 0.4 percentage points from 6.9% to 6.5%
Source: BARB

4.4. HOW IMPORTANT IS A BBC OFFERING LIKELY TO BE IN ATTRACTING THOSE RESISTANT TO DIGITAL?

We have seen already that:

- those not currently interested in digital tend to favour BBC channels more than those interested in digital;
- current interest in digital is lower amongst older and lower income groups; and
- current interest in digital is related to preference for genres such as films and sport.

This suggests that the BBC may have an important role in reaching out to those groups not currently interested in digital. In order to investigate this, we have analysed the link between preferences for BBC services and respondents' awareness of, and intention to get, digital services based on information from the BMRB survey.

A lack of interest in digital is not explained simply by a lack of awareness. Indeed, the analysis presented in the Annex shows that:

- those who count BBC channels as favourites are significantly more likely to be aware of the services offered by digital TV;
- some of this is because those who favour BBC channels lie in socio-economic groups which are more likely to be aware of the potential of digital TV;
- nevertheless, even taking account of the differences between socio-economic groups, counting a BBC channel as favourite is associated with a significantly higher awareness of digital.

Whilst those who count BBC channels as their favourites are likely to be better informed than the average viewer about digital TV, this does not translate into this group being more likely to take up digital TV. Rather, the *opposite* is true. Those who favour BBC programming are more likely to be aware of what digital TV has to offer, but less likely to take up the digital proposition at present.

This suggests strongly that *tastes* rather than *consumer information* are a key driver of digital take-up. At present, it would appear that there is an association between liking the BBC and having little *taste* for digital TV. Put differently, the evidence of the BMRB survey is that BBC programming is likely to be attractive to those currently resistant to adopting digital. Therefore a BBC digital proposition, although it might not necessarily be that important to early adopters of the technology, is likely to be important in ensuring that digital penetration does not plateau at the levels suggested for pay TV penetration. Avoiding a situation in which a substantial group of viewers were unwilling or unable to adopt digital TV is of considerable benefit. It would ease analogue switch-off and help prevent the emergence of an information underclass.

5. ANNEX

In this annex we present econometric analysis of awareness of and intention to adopt digital TV. We use the BMRB dataset of April 1999 discussed in the main text.

The main variables of interest were:

- Whether a respondent was very interested in adopting digital (called `digvint` in the estimations below);
- Whether a respondent was aware of at least one digital channel from either the BBC or another broadcaster (called `awaredig` below);
- Whether a respondent's favourite channel was BBC1 or BBC2 (called `likebbc` below).

AWARENESS OF DIGITAL SERVICES

Below we report two logit models estimated on those respondents yet to take up digital. The first is very simple and looks at the *unconditional* effect of liking the BBC on being aware of digital channels. Clearly liking the BBC (or not) is correlated with many socio-economic factors and also with whether households are multi-channel or not. However, this does show that those who favour BBC channels are significantly more likely (at the 5% level) to be aware of digital channels.

Logit estimates		Number of obs	=	1286
		LR chi2(1)	=	5.93
		Prob > chi2	=	0.0149
Log likelihood = -825.16983		Pseudo R2	=	0.0036

awaredig	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
likebbc	.3022573	.1249665	2.419	0.016	.0573275 .5471871
_cons	.5398132	.0719217	7.506	0.000	.3988492 .6807772

The second model looks at this effect, conditioning on socio-economic factors, location and whether or not a household is multi-channel. It shows that even conditioning on these factors, liking the BBC has a significant effect on whether a respondent is aware of digital channels.

```

Logit estimates                                     Number of obs   =       1079
                                                    LR chi2(22)    =       194.30
                                                    Prob > chi2    =       0.0000
Log likelihood = -570.46456                       Pseudo R2      =       0.1455

```

awaredig	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
likebbc	.4062899	.1614292	2.517	0.012	.0898945	.7226854
cs	.0915056	.1627198	0.562	0.574	-.2274194	.4104305
Iincqu_2	-.1439814	.2059167	-0.699	0.484	-.5475706	.2596079
Iincqu_3	-.6038795	.1948968	-3.098	0.002	-.9858702	-.2218888
Iincqu_4	-.6044036	.2442175	-2.475	0.013	-1.083061	-.125746
Iclass_2	.1873242	.2015029	0.930	0.353	-.2076142	.5822626
Iclass_3	-.4129963	.1702989	-2.425	0.015	-.746776	-.0792167
No_kids	.2719861	.1833579	1.483	0.138	-.0873888	.631361
Iageca_2	-.7857367	.1942123	-4.046	0.000	-1.166386	-.4050875
Iageca_3	-2.039647	.2263154	-9.012	0.000	-2.483217	-1.596077
itv_r1	.4644786	.330755	1.404	0.160	-.1837893	1.112747
itv_r2	.2934811	.4081252	0.719	0.472	-.5064296	1.093392
itv_r3	-.0977173	.3461221	-0.282	0.778	-.7761042	.5806696
itv_r4	-.5062722	.2901989	-1.745	0.081	-1.075052	.0625072
itv_r5	.1246895	.2693988	0.463	0.643	-.4033224	.6527013
itv_r6	.7077831	.298848	2.368	0.018	.1220519	1.293514
itv_r7	.1905718	.4767295	0.400	0.689	-.7438009	1.124945
itv_r8	.1660988	.3344483	0.497	0.619	-.4894077	.8216054
itv_r9	.5257029	.5219579	1.007	0.314	-.4973156	1.548722
itv_r10	-1.280467	.6331818	-2.022	0.043	-2.521481	-.0394539
itv_r11	-1.45977	.4707411	-3.101	0.002	-2.382406	-.5371348
itv_r12	.4753826	.3445683	1.380	0.168	-.1999588	1.150724
_cons	1.816804	.3713623	4.892	0.000	1.088947	2.544661

Notes:

- (a) `cs` is an indicator variable for whether a household is multi-channel or not.
- (b) The `Iincqu_x` are indicator variables for rough income quartiles. The classification of income groups by the BMRB survey was not sufficiently fine to allow precise quartiles to be constructed. Therefore there was not quite 25% in each group. The actual proportions are given below.

Approximate quartile 1	20.7%
Approximate quartile 2	22.5%
Approximate quartile 3	30.3%
Approximate quartile 4	26.5%

- (c) `Iclass_x` is an indicator variable for social class. Class 1 is ABC1, Class 2 is C2 and Class 3 is DE.

- (d) `No_kids` is an indicator variable for no children
- (e) `Iageca_x` is an indicator for age category, where category 1 is under 35, category 2 is 35 to 54 and category 3 is over 55.
- (f) `Itv_rx` are indicator variables for ITV regions.
- (g) One ITV region variable perfectly explained awareness and so was dropped with the corresponding observations.

INTEREST IN ADOPTING DIGITAL

Similar logit equations were estimated for intention to adopt digital. We included awareness of digital channels as an explanatory variable. As would be expected, awareness of digital channels was a very strong explanatory factor of the intention to adopt. By including this awareness variable, we can condition for respondents' information (or lack of information) about digital TV. Therefore, we can interpret the effect of remaining explanatory variables as largely reflecting the effects of *taste* rather than information.

Looking at the *unconditional* effect of favouring BBC channels, we can see that liking the BBC has a negative effect on intention to take-up, having conditioned for whether respondents are aware of digital. This is at the borderline of significance at the 5% level, and certainly significant at the 10% level. This shows that those who like BBC programming have less taste for digital TV.

```

Logit estimates                               Number of obs   =       1286
                                                LR chi2(2)      =        59.64
                                                Prob > chi2     =        0.0000
Log likelihood = -457.13525                    Pseudo R2      =        0.0612

```

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
digvint					
awaredig	1.676498	.2642076	6.345	0.000	1.158661 2.194336
likebbc	-.3592628	.1852752	-1.939	0.052	-.7223957 .00387
_cons	-3.122329	.251493	-12.415	0.000	-3.615246 -2.629411

If we look at the effect of liking the BBC on take-up intentions conditioning on a range of socio-economic factors and whether or not a household is multi-channel, we do not find any significant effect of liking the BBC on take up. This means that whilst the effect of liking the BBC is negatively correlated with a taste for digital TV across the population at large, there is little correlation with specific socio-economic groups.

```

Logit estimates                               Number of obs   =       1064
                                                LR chi2(22)    =       100.10
                                                Prob > chi2     =        0.0000
Log likelihood = -368.00703                    Pseudo R2      =        0.1197

```

digvint	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
awaredig	1.543991	.3382029	4.565	0.000	.8811259	2.206857
likebbc	-.153967	.2167537	-0.710	0.477	-.5787965	.2708624
cs	.435541	.2014095	2.162	0.031	.0407857	.8302964
Iincqu_2	-.0850731	.2739085	-0.311	0.756	-.621924	.4517778
Iincqu_3	.2383373	.267824	0.890	0.374	-.286588	.7632626
Iincqu_4	.4157468	.2932474	1.418	0.156	-.1590074	.9905011
Iclass_2	-.3471855	.2509991	-1.383	0.167	-.8391347	.1447637
Iclass_3	-.3534713	.2295789	-1.540	0.124	-.8034376	.0964951
kids4	-.2461095	.2063908	-1.192	0.233	-.650628	.158409
Iageca_2	-.6449396	.2154452	-2.994	0.003	-1.067204	-.2226747
Iageca_3	-1.002304	.3182537	-3.149	0.002	-1.626069	-.3785377
itv_r1	.7315514	.3844967	1.903	0.057	-.0220483	1.485151
itv_r2	.2108264	.4270697	0.494	0.622	-.6262148	1.047868
itv_r3	.2492234	.4373644	0.570	0.569	-.6079951	1.106442
itv_r4	.2260875	.3716097	0.608	0.543	-.5022541	.9544291
itv_r5	.1365195	.3326571	0.410	0.682	-.5154763	.7885154
itv_r6	.1849936	.3643039	0.508	0.612	-.529029	.8990161
itv_r7	-.2669043	.6787877	-0.393	0.694	-1.597304	1.063495
itv_r8	.144391	.4254876	0.339	0.734	-.6895494	.9783315
itv_r9	.1964266	.73754	0.266	0.790	-1.249125	1.641978
itv_r11	.4143336	.7191736	0.576	0.565	-.9952208	1.823888
itv_r12	.5048309	.4002154	1.261	0.207	-.2795768	1.289239
_cons	-2.944615	.5466485	-5.387	0.000	-4.016026	-1.873204

Fuller modelling of digital awareness shows that:

- Age is a very strong driver (the young are most aware);
- Those who count BBC channels as their favourites are more aware of digital than the average;
- Those who have polarised tastes (i.e. like just a few genres) are less likely to be aware of digital.
- Whether a household is multi-channel or not does not significantly affect awareness of digital.

```

Logit estimates                                     Number of obs   =       1053
                                                    LR chi2(24)     =       207.95
                                                    Prob > chi2     =       0.0000
Log likelihood = -545.97982                       Pseudo R2      =       0.1600

```

awaredig	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
likebbc	.379345	.1652842	2.295	0.022	.055394 .703296
cs	-.0000746	.1666417	0.000	1.000	-.3266863 .326537
Iincqu_2	-.1003328	.2095405	-0.479	0.632	-.5110245 .310359
Iincqu_3	-.5618661	.1990428	-2.823	0.005	-.9519829 -.1717493
Iincqu_4	-.5526706	.250976	-2.202	0.028	-1.044575 -.0607667
Iclass_2	.145918	.2061339	0.708	0.479	-.258097 .5499331
Iclass_3	-.3976243	.1752635	-2.269	0.023	-.7411344 -.0541142
kids4	.3012109	.1889904	1.594	0.111	-.0692035 .6716253
Iageca_2	-.7918689	.1996585	-3.966	0.000	-1.183192 -.4005454
Iageca_3	-2.027077	.2329718	-8.701	0.000	-2.483693 -1.570461
itv_r1	.570635	.3498343	1.631	0.103	-.1150277 1.256298
itv_r2	.3950728	.4294333	0.920	0.358	-.4466011 1.236747
itv_r3	-.1033512	.3620764	-0.285	0.775	-.8130079 .6063056
itv_r4	-.4716254	.2973648	-1.586	0.113	-1.05445 .1111989
itv_r5	.1081499	.2778436	0.389	0.697	-.4364136 .6527134
itv_r6	.6353535	.306954	2.070	0.038	.0337347 1.236972
itv_r7	.3166062	.4861856	0.651	0.515	-.6363002 1.269513
itv_r8	.1390814	.3429781	0.406	0.685	-.5331434 .8113062
itv_r9	.4984874	.5361172	0.930	0.352	-.552283 1.549258
itv_r10	-1.381067	.6478988	-2.132	0.033	-2.650925 -.1112089
itv_r11	-1.501577	.4783499	-3.139	0.002	-2.439125 -.5640279
itv_r12	.4434765	.3499011	1.267	0.205	-.2423171 1.12927
genavg	-.1856206	.1233144	-1.505	0.132	-.4273124 .0560711
genvar	-.3319567	.1250334	-2.655	0.008	-.5770177 -.0868957
_cons	2.699687	.4640052	5.818	0.000	1.790254 3.609121