

The plateau in cinema attendances and drop in video sales in the UK: the role of digital leisure substitutes

Hasan Bakhshi¹, 10 October 2006

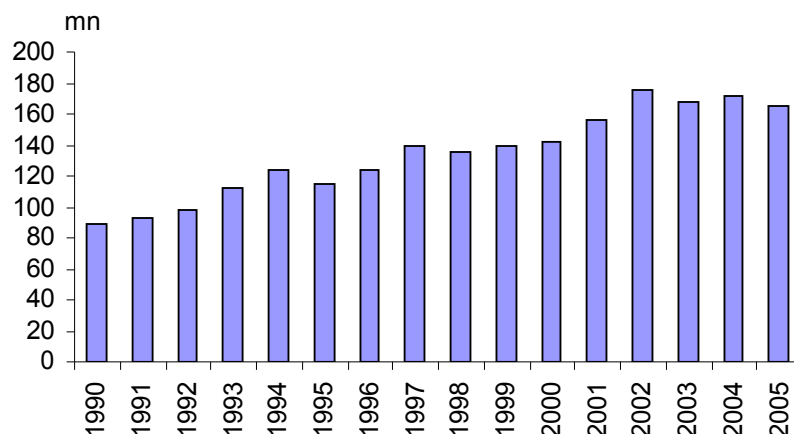
Summary

- Cinema attendances reached a plateau in 2002. DVD/video sales rose strongly up to 2004, but fell back in 2005.
- The fall in cinema attendance by the 25–44 age group is particularly marked; there is some evidence that the fall in DVD/video use is concentrated in 15–24 year olds.
- Demographic change is playing a role, but is unlikely to be the main driver.
- The plateau has coincided with a rapid rise in the availability of online entertainment and multi-channel TV, both of which may be substitutes for cinema and DVD/videos.
- Available expenditure and time use surveys suggest that there has been substitution away from DVD/video into internet use, which is likely to have been particularly strong amongst 15–24 year olds.
- It is hard to find clear evidence of substitution effects away from cinema attendance in the data that are publicly available.
- A thorough analysis of substitution effects requires statistical analysis of publicly available micro data and access to private market research data sets.
- International comparisons would also allow more robust conclusions to be drawn.
- Formal econometric modelling would give a firmer handle on the nature of the ‘puzzle’, and allow substitution effects to be investigated alongside other drivers of demand for cinema and DVD/video.

1 Introduction

After an almost uninterrupted rise throughout the 1990s, UK cinema attendances stopped growing in 2002, and by 2005 had dropped back by 11 million to 165 million (Figure 1). In per capita terms, UK cinema attendances dropped from 3.0 to 2.7 in 2005. The levelling-off in cinema attendances is mirrored in box office revenues (Figure 2).

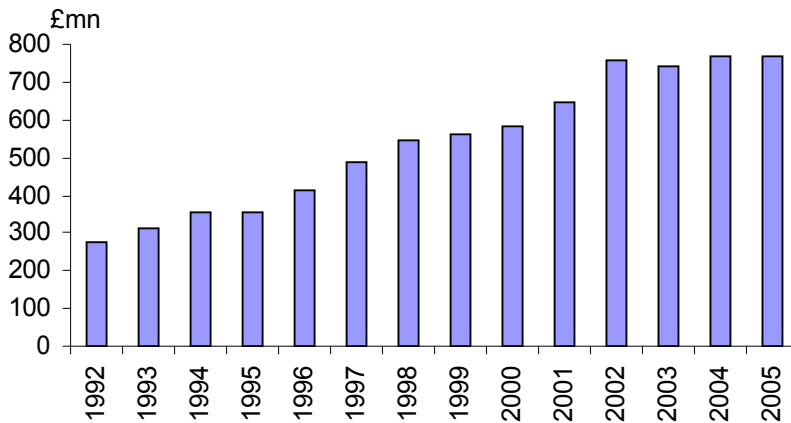
Figure 1: UK Cinema attendances



Source: CAA, Nielsen EDI

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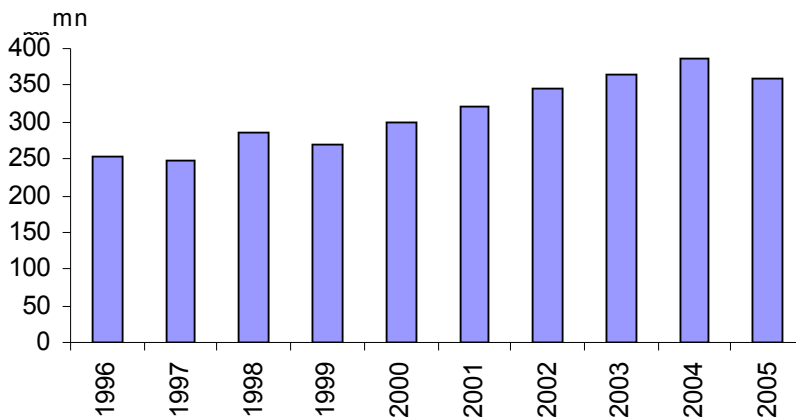
Figure 2: UK Box office



Source: CAA, Nielsen EDI

DVD/video sales – the usual suspect for unexpected weakness in cinema trends – themselves appear to have hit a difficult patch.² DVD/video sales saw a steady rise through to 2004, perhaps partly at the expense of cinema-going over this period. After this rise, however, sales and rentals (in both volume and value terms) fell back in 2005, raising the possibility that some third, common factor is responsible for the muted cinema and DVD/video audiences (Figures 3 and 4).

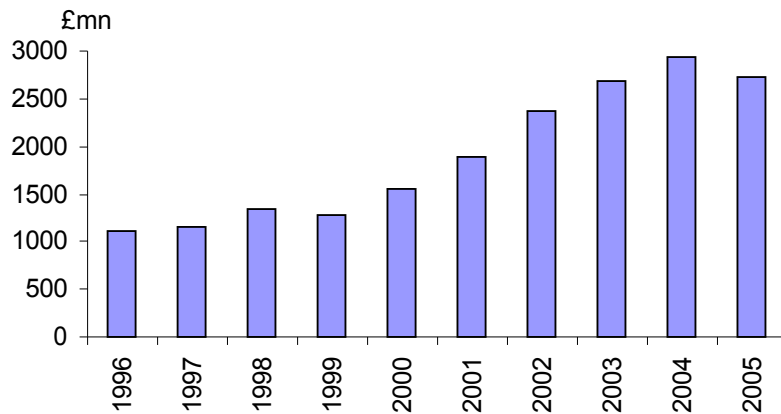
Figure 3: Volume of DVD/video transactions (sales and rentals)



Source: BVA and Official UK Charts Company

² The increase in the number of DVDs distributed free with weekend newspapers – so-called covermount DVDs – is likely to explain a portion of the drop-off in sales. A recent Screen Digest report, for example, estimated that as many as 130 million DVDs had been distributed this way in 2005 (and the quarterly number had jumped up further to 54 million in 2006 Q1). (See Screen Digest (2006)). Taking Ipsos-MORI's estimate that one in ten beneficiaries of these DVDs decided not to buy a DVD as a result, this would have implied a massive 13 million in forgone DVD sales.

Figure 4: Value of DVD/video transactions (sales and rentals)



Source: BVA and Official UK Charts Company

In principle, a host of demand and supply factors could account for the observed weakness in cinema attendance and DVD/video sales and rentals.

On the demand side, the relative price of tickets and DVD/videos and the level of household disposable incomes could have played a role if, as previous research has found, the demand for cinema in the UK is price- and income-elastic (MacMillan and Smith (2001) and Cameron (1986)). The quality of films shown on cinemas and available on DVD/video could be another determining factor. As the demand for cinema and DVD/video varies greatly across age groups, shifts in demographic structure might also be important. DVD piracy also hits cinema attendances and DVD/video sales and rentals.³ Tracking competing forms of digital entertainment, such as the explosion in online entertainment and the growth of pay-per-view TV and video-on-demand, might be particularly important in explaining recent trends.

On the supply side, cinema-goers may be feeling restricted by the number of exhibition outlets in the UK: screen density has also plateaued since 2002, at 5.6 screens per 100,000 people, lower than in many other industrialised countries. Low levels of screen density can themselves lead to lower demand, if they leave cinema-goers with a smaller range of films to choose from, or with higher transport costs to attend more distant cinemas (MacMillan and Smith (2001)).

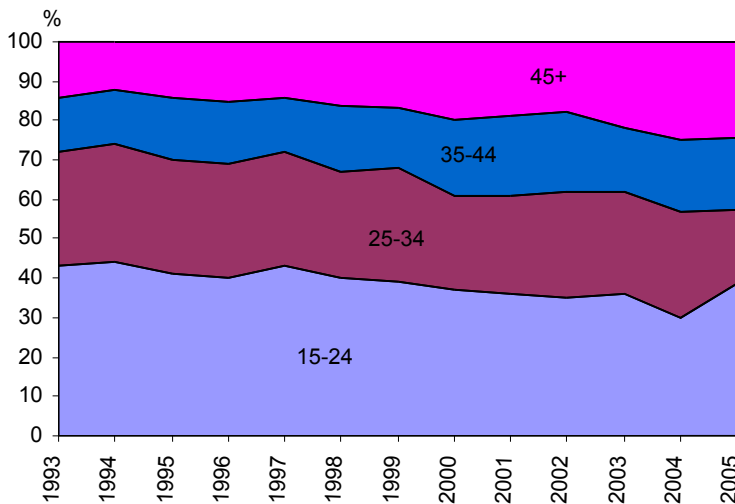
This paper focuses on one particular demand factor, namely consumers' spending and time use patterns on other forms of digital entertainment. We begin in section 2 by looking more closely at the data on the age profile of cinema and DVD users, as the expansion in digital entertainment use has been particularly strong in certain age groups. We also comment here on whether demography has an important role to play. Sections 3 to 5 set out evidence on the uptake of digital entertainment services. Sections 6 and 7 then use survey evidence to analyse whether these services are acting as substitutes for cinema and DVD use. Section 8 concludes, and Section 9 sets out possible directions for further research.

³ Research by the UK Film Council, based on survey estimates from Ipsos, suggests that in 2005 as many as 9.8 million cinema attendances and 22.2 – 56.7 million DVD sales/rentals may have been forgone as a result of DVD piracy.

2 Age trends and the role of demographic change

Looking beneath the aggregate figures on cinema attendances and DVD/video sales reveals some interesting patterns across age groups. Figure 5 shows that, taken together, the audience share of 15–24 and 25–34 year olds has continued its trend decline in 2002–2005, matched by a trend increase in the 35+ age groups. The year-to-year volatility in some of the data, and in particular in the share for 15–24 year olds in 2004 and 2005, may reflect sampling inefficiencies in the surveys on which the data are based, so it is sensible to focus on trends rather than single year movements. (Note, though, that the tick-down in the audience share of 15–24 year-olds in 2004 followed by recovery in 2005 is also seen in US data; this suggests that the pattern might be genuine).⁴

Figure 5: Shares of UK cinema audience by age

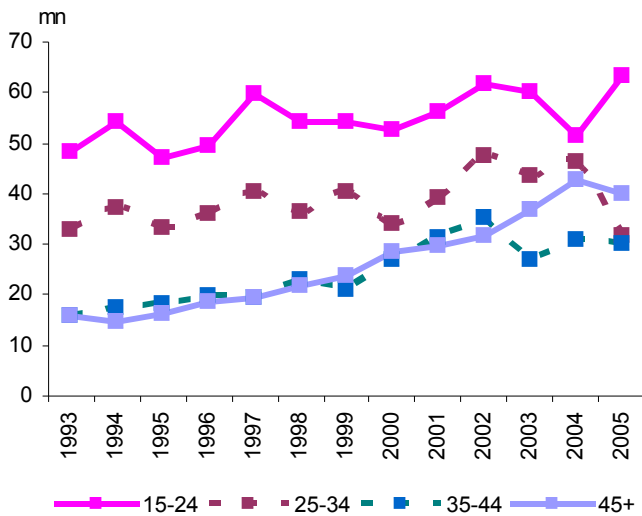


Source: NRS, CAA

Another way of looking at these data is to combine them with total cinema attendances to give an estimate for the number of attendances by age group. Figure 6 shows the turbulence in age group patterns since 2002. The 45+ year olds are the only group to have sustained their trend increase in this period, possibly at a higher rate. The 25–44 age group appears to be driving the plateau in cinema attendances since 2002, with 25–34 year olds being particularly weak. The 15–24 year old audience – the single largest group in size – bounced back in 2005, offsetting falls seen in the previous two years, though a look at more timely survey indicators for 2006 would indicate whether this recovery is a statistical or temporary phenomenon.

⁴ The volatility in the US figures for the comparable age group is much less marked than in the UK. Data for US cinema attendances are collected by the MPAA – the age breakdowns are not directly comparable with the UK data used however (the MPAA publishes audience shares for the 12-24 age group), so any comparison is only indicative.

Figure 6: UK Cinema attendances by age

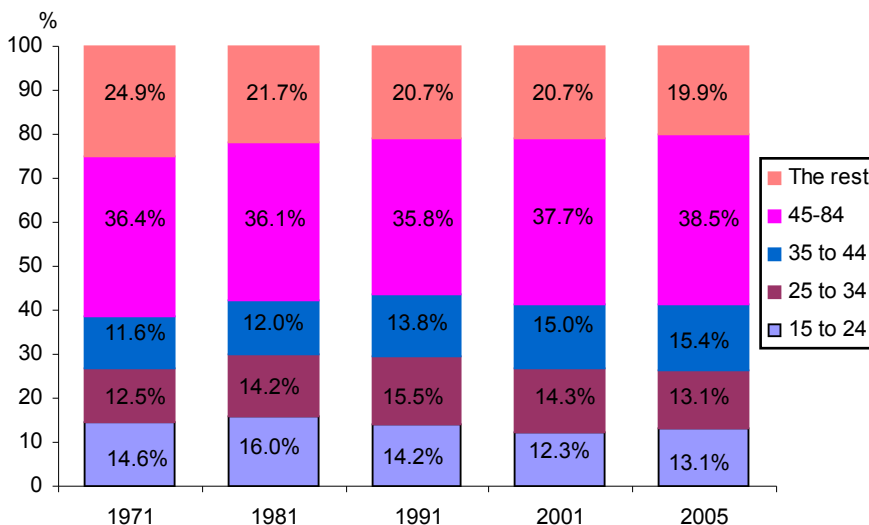


Source: NRS, CAA

Official population data suggest that the 25–34 age group has, by some way, been the slowest growing age group in the UK in recent years. The number of 25–34 year olds actually fell by 4.3% (around 360,000) between 2002 and 2005, with the overall population share of this group falling by 1.2pp (Figure 7). (The 2.7pp increase in the share of the 45–84 age group since 1991 reflects the ageing of the UK population).

These numbers suggest that at least some of the weakness in cinema attendances may reflect population trends. For illustration, assume that individuals in the 25–34 age group make 5 trips to the cinema a year (compared with the 2.7 whole economy average in 2005). The population drop in 25–34 year olds would then account for around $360,000 \times 5 = 1.8$ million, or over 15%, of the 11 million drop in attendances since 2002. This suggests that a more detailed look at age trends is warranted, and, in particular, that the robustness of age trends in the CAA data is checked with other sources.

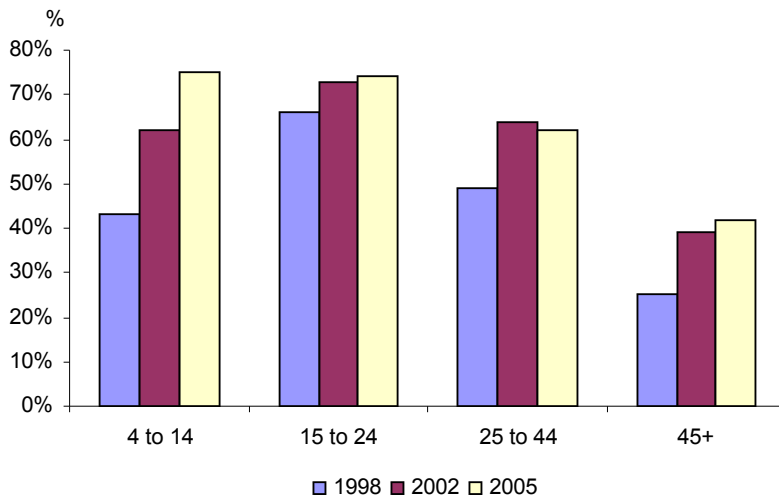
Figure 7: Demographic structure of UK population



Source: National Statistics

By identity, the growth in cinema attendances for any one age group reflects changes in its demand, or propensity, to go to the cinema, as well as any changes in its population share. Indirect evidence on the cinema propensity of different age groups, and how this has evolved over time, is available from consumer surveys. Figure 8, for example, plots the % share of different audience age groups who say that they go to the cinema, as recorded in the CAA's CAVIAR survey.

Figure 8: % UK population going to the cinema by age



Source: CAA

These figures suggest that the propensity for cinema-going has stabilised since 2002 for the 15–24 and 25–44 age groups in particular. This is broadly consistent with propensities derived from questions elsewhere in the CAVIAR survey (Figure 9). There is moreover some evidence in Figure 9 that the number of 15–24 year olds making very frequent trips to the cinema (at least once a month) has declined over time.

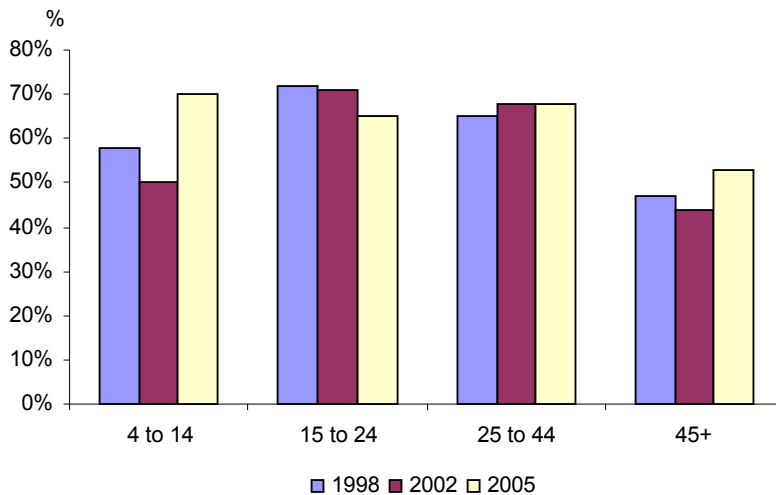
Figure 9: Frequency of visits to the cinema by age group

Year	7 – 14	15 – 24	25– 34	35+
2003				
At least once a year	91%	90%	84%	60%
At least once a month	37%	52%	33%	14%
2004				
At least once a year	92%	90%	84%	61%
At least once a month	39%	53%	34%	16%
2005				
At least once a year	93%	91%	85%	61%
At least once a month	36%	47%	36%	16%

Source: CAA

Time-series data giving a breakdown of DVD/video audiences by age group are difficult to find on a freely available basis. The CAVIAR survey does, however, contain some estimates of the percentage share of different age groups reporting to watch DVDs/videos (Figure 10). These point to a recent drop in the demand for DVD/video from 15–24 year olds, with the demand from the older 25–44 age group unchanged.

Figure 10: Population share of UK households watching DVD/video by age



Source: CAA

There are a myriad of other private sector survey estimates of the age breakdown of cinema and DVD users which are available to the UK Film Council on a paid subscription basis (see Appendix 1 for a description on UK consumer spending and time use data available from private sector sources).

To summarise this section, survey data from the CAA suggest that the plateau in cinema attendances during 2002–5 was driven primarily by the 25–44 age group. Population data suggests that a not insignificant fraction of this may be explained by demographic shifts in the UK, and the fall in the number of 25–34 year olds in particular. Estimates of cinema demand also taken from the CAA survey data point to stabilisation in the cinema propensity of 15–24 and 25–34 year olds, though there is some evidence that fewer individuals in the younger age group are making high-frequency trips. There is also tentative evidence that the 15–24 age group is watching fewer DVDs/videos.

3 An explosion of home digital entertainment

One possible explanation for the plateau in cinema attendance and drop in DVD/video sales is that the explosion in the availability and uptake in home digital entertainment is absorbing increasing amounts of people’s time and money, particularly in key age groups. The substitution away from cinema and DVD/video into other home entertainment options might be expected to be particularly marked where direct substitutes are available, such as downloadable films.

However, the nature of the substitutability between new digital technologies, cinema-going and DVD/video-watching is likely to be complex, and may change over time. So, on the one hand, we report survey evidence from Ofcom that gives prima facie evidence that individuals are substituting away from DVD/video use towards time spent online. But, on the other, there is survey evidence that people regularly use the internet to book cinema tickets.⁵

We will also show that the share of household expenditure on video games is increasing in the UK, at the same time that the share of cinema and DVD/video is falling. That is

⁵ For instance, a survey conducted by Syntegra (2003) reported that 30% of those with internet access regularly used the web to buy tickets for entertainment (including the cinema).

consistent with substitution away from watching movies towards game-playing. But a survey conducted by BMRB in September 2006 (BMRB (2006)) found that over 80% of game-players said that if they enjoyed a game they would often enjoy the related movie if there was one, and a similar proportion said that if they enjoyed a movie they often enjoyed the associated game.

These possibilities echo arguments made by some analysts following the introduction of VCR technology in the 1980s, namely that VCRs would in the long run impact positively on cinema attendances. The appetite for the big screen experience is whetted, the argument went, by positive experiences of film on video. Conversely, cinema attendance may have induced the purchase or rental of a video. Cameron (1988) actually rejects these arguments on UK data, though Dewenter and Westermann (2005) find some support for Germany.

This raises the question of the nature of the relationship between cinema and DVDs. In a Competition Commission report earlier this year into its acquisition of a smaller exhibitor, Vue – the third largest exhibition chain in the UK – argued that DVDs and cinemas were complements for the biggest grossing films, but substitutes for less popular titles (Competition Commission (2006)). While a shorter window between the release of a film for theatre exhibition and its release on DVD – now around four months – has increased the relative attraction of DVDs, the top-grossing films have always tended to earn the bulk of their box office revenues well within this window, suggesting that the shortening has probably had a limited impact on cinema-going.

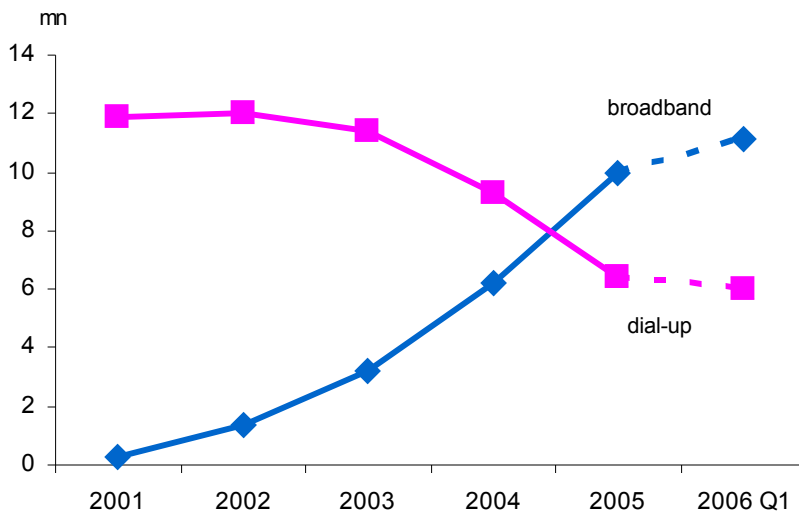
The following two sections set out publicly available data on the growth in the uptake by UK households of digital entertainment services. It covers two key areas: internet services and multi-channel TV.

4 Data on internet services

Overall internet use

The number of UK households with broadband internet access is a convenient way of tracking the consumption of digital entertainments available online. Broadband internet – which allows transmission of data at much faster speeds than traditional dial-up connections – permits consumers to download video and TV images, play games online with other users, participate more easily in online gambling and to post material on own-user websites, blogs and social networking sites more quickly. Figure 11 illustrates the exponential rise in take-up of broadband access in the UK.

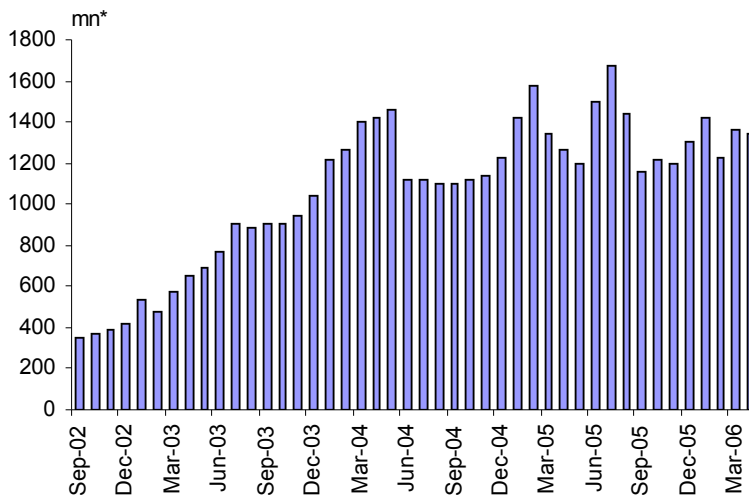
Figure 11: Number of broadband and dial-up households in the UK



Source: Ofcom

A large and increasing number of individuals in the UK are also using their mobile phones to access the internet. The Mobile Data Association (MDA) estimates that as many as 13.2 million people used their phones for downloads and for browsing the web in July 2006. Figure 12 shows that mobile internet access has grown rapidly since 2002.

Figure 12: Mobile phone internet access in the UK



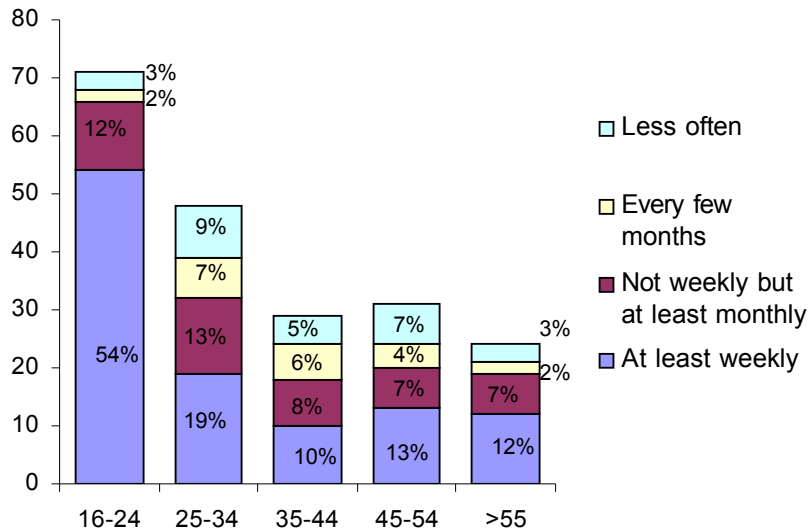
*The total number of WAP page impressions in the UK.
Source: MDA

Younger people are disproportionate users of the internet. Figure 25 on page 19 will present evidence from time-use surveys that the 16–24 age group spends significantly more time online than the population as a whole.

This is also reflected in the age profile of the use of certain online leisure services. For example, a survey conducted by Ofcom (2006b) in June 2006 showed that 70% of internet users aged 16–24 have used social networking websites (such as MySpace, Friends Reunited and Bebo), compared with 41% of the general population. Over one-

half of the 16–24 age group uses these websites on a weekly basis (Figure 13).

Figure 13: Frequency of use by UK consumers of social networking sites



Source: Ofcom (fieldwork conducted by ICM in June 2006)

With broadband increasing the speed with which users can post their own material on websites, there has also been a sharp increase in the number of individuals who have contributed their own material to a website or blog. The young –18-24 year olds – have again been the heaviest users, with 37% of this age group having contributed to a website or blog, by, say, writing a comment or posting a photo or video (Figure 14).

Figure 14: UK consumers posting online content by age group

18-24	25-34	35-44	45-54	>55	TOTAL
37%	19%	10%	9%	4%	14%

Source: Ofcom (fieldwork conducted by ICM in June 2006)

Film downloads

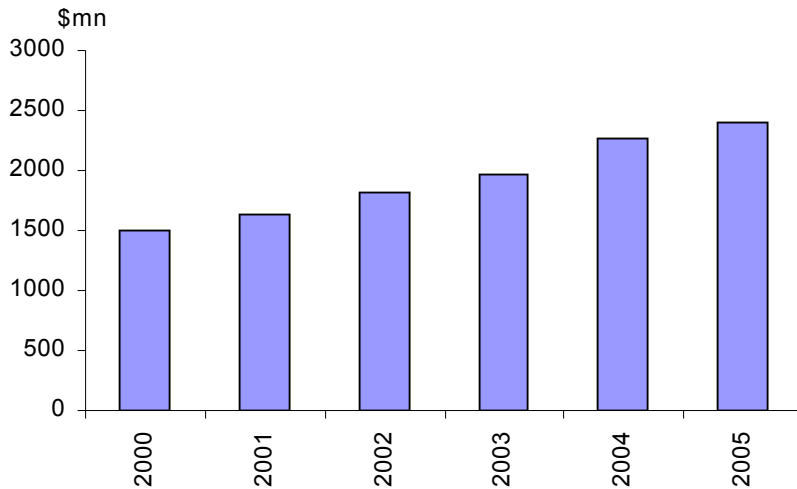
There are three ways consumers can download films from the web. First, through paid subscription digital streaming services; second, through free downloads eg Internet Archive at <http://www.archive.org/index.php>; and, third, through illegal downloads.

What data there are available suggest that few films have until now been downloaded through subscription services. PWC (2006), for example, estimates that only \$1 million was spent on such services in the US in the whole of 2005. Data on the number of free legal movie downloads is not generally publicly available, but Research Director Lucy Burton at market research specialists TNS, for example, confirms that the number of individuals in TNS’s entertainment surveys saying that they have downloaded movies is ‘almost zero.’ The number of individuals downloading movies illegally is likely to be much higher, though for obvious reasons this activity is even more difficult to measure. Estimates from the British Video Association suggest that as many as 1.7 mn people in the UK may have downloaded illegal film or TV files in 2003, up from 0.6 mn in 2002.

Online video games

The UK has the third-largest video game market in the world, after the US and Japan. At around £1.3 billion in 2005, video game spending (including online games) is already almost double overall revenues at the UK box office (Figure 15).

Figure 15: Spending by UK households on video games (console, handheld, PC and online)* US\$mn

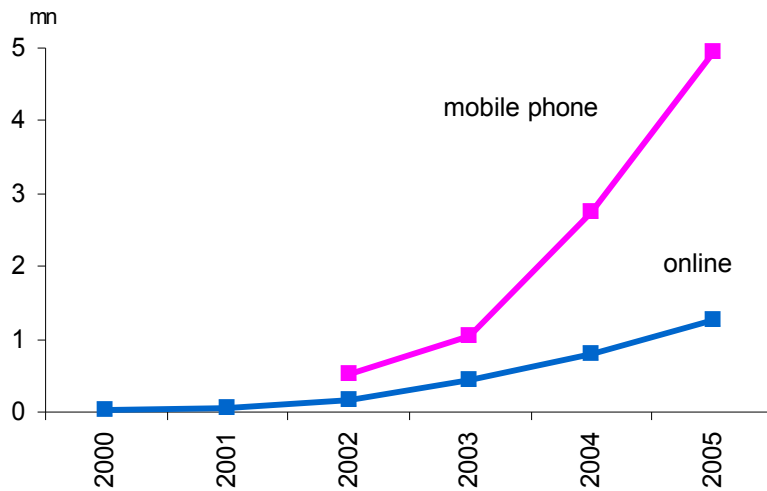


*Excludes hardware.
Source: PWC

The number of UK households downloading video games online on their PCs and directly onto their mobile phones has increased rapidly over the 2002–2005 period. Estimates of the numbers involved vary wildly – suggesting that we should probably focus on trends rather than precise numbers. But, calculations based on PWC data, suggest that there are now as many as 4.9 million households subscribing to wireless game services in the UK and a further 1.3 million households playing online games, significantly up on 2002 (Figure 16). (These estimates are based on the assumption that the UK's share in online subscriptions in the Europe-Middle East-Africa region is equal to the UK's share in the overall video games market).⁶

⁶ Market researchers BMRB's estimate that there are 4.7 million online gamers in the UK is significantly higher than PWC's estimate.

Figure 16: Number of UK subscribers to online and wireless games services

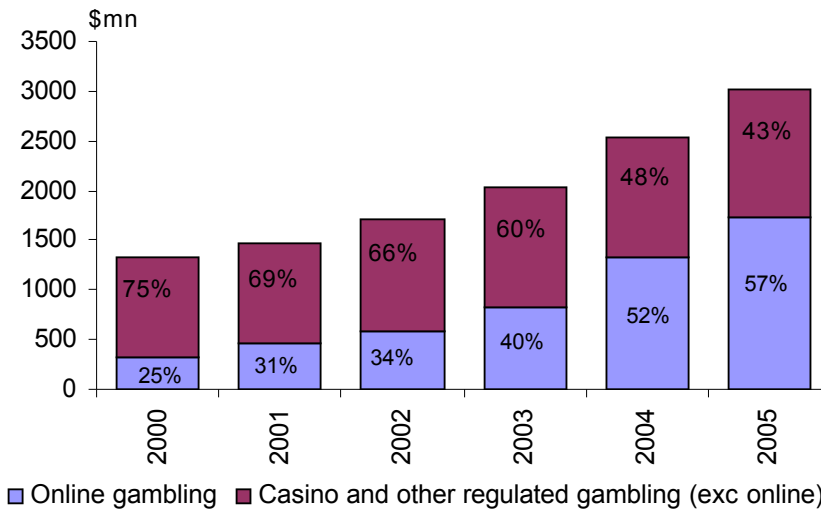


Source: PWC and own calculations

Online gambling

High and rising rates of broadband use in the UK, and changes in the legislative framework passed in 2005, have meant that online gambling has grown particularly quickly in the UK (Figure 17).

Figure 17: Revenue of UK regulated gambling industries

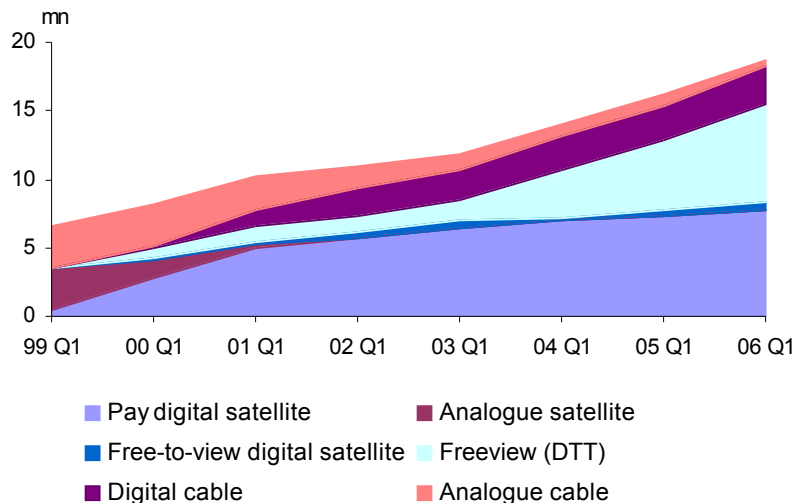


Source: PWC

5 Data on multi-channel TV

The period since 2002 has been associated with a step-up in the growth rate of households with access to multi-channel TV. Figure 18 shows that this has been driven by the increased popularity of Freeview.

Figure 18: Number of UK households with multi-channel TV



Source: Ofcom

Data collected by DGA Metrics and BARB and analysed by the UK Film Council show that the number of films broadcast on multi-channel television has increased three-fold from 4573 in 2002 to 13144 in 2005. However, estimates of viewing instances for feature films across all TV formats (including network channels, but excluding pay-per-view) suggest that some of this increased choice has been at the expense of films shown on network channels: DGA Metrics/BMRB estimates that the total number of film viewing instances was broadly unchanged between 2002 and 2005, at around 3.4 bn.

Video-on-demand (VOD)

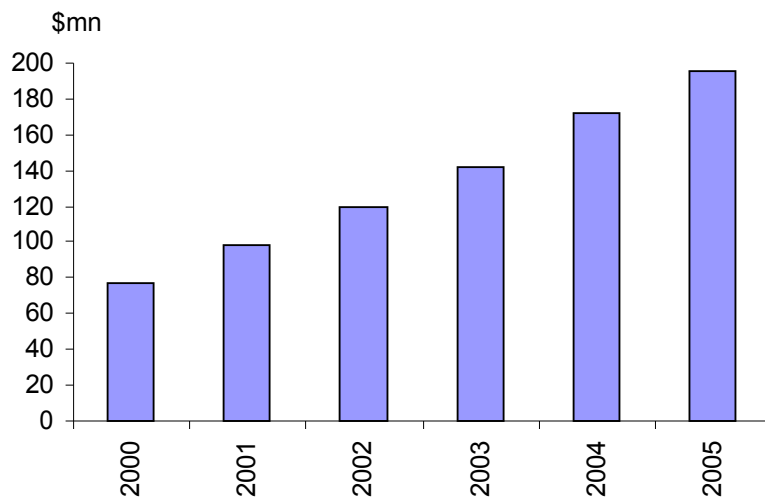
VOD technology has two distinguishing characteristics: first, it enables viewers to access films at a time of their choosing; and second, it has VCR functionality, which means that users can pause, rewind or fast-forward films. This contrasts with pay-per-view, where movies are broadcast on dedicated channels and shown at scheduled times. VOD also offers viewers more films to pick from at any one time than pay-per-view, as it requires only one channel to access the server (meaning that channel capacity is in effect unlimited).

VOD remains, as yet, an emerging technology, with PWC (2006) estimating that in 2005 still only 5.5 million households in the Europe-Middle East-Africa regions had accessed VOD services (up from 0.6 million in 2002). The relative unpopularity of cable TV in the UK – the proportion of households with cable TV in 2005 was 11.6% compared with a 31.3% average for Western Europe as a whole – means that the UK's share of the 5.5 million households is likely to be small (VOD is available on cable but not on satellite, which is far more common in the UK).

Pay-per-view

Pay-per-view channels are relatively popular in the UK, because of the dominance of satellite TV. Figure 19 shows that household spending on pay-per-view has continued rising at a brisk pace since 2000.

Figure 19: UK household spending on pay-per-view



Source: PWC

6 Evidence of substitution effects from UK household expenditure patterns

The previous sections show that the past five years have seen both a rapid rise in digital entertainment services, and a plateau/drop in cinema and DVD/video sales. But correlation does not prove causality. The following two sections look to expenditure and time use surveys to draw out evidence on whether there are substitution effects at play.

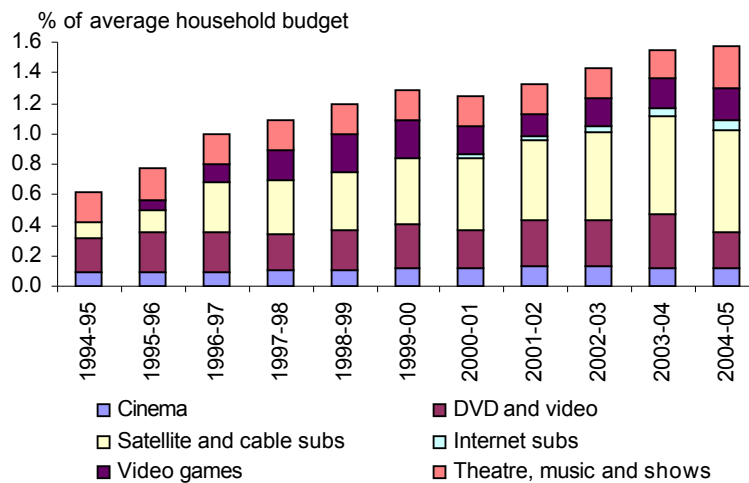
National Statistics' Expenditure and Food Survey (EFS), and prior to 2001/2 the Family Expenditure Survey (FES), is the primary source of official data on UK household expenditure patterns. It is the main input into the estimates of consumption expenditure that enter the UK National Accounts. From 2001/2, data on average weekly household spending on a number of leisure goods and services have been published on an annual basis in National Statistics' Family Spending Report, downloadable from the National Statistics website. Prior to 2001/2 – in the FES – a different classification was used, though it is not difficult to identify similar categories which can be spliced onto EFS data post-2001/2.

Figure 20 plots the series for average spending on cinema, DVD & video, satellite & cable TV subscriptions, internet subscriptions, video games and theatre, live music & shows as a proportion of overall household spending. The plateau in cinema attendances since 2002, and drop in DVD and video sales in 2005, is mirrored clearly in these spending data.⁷ And consistent with the increased popularity of new technologies identified above, there has been a marked increase in the average household budget devoted to satellite and cable TV subscriptions, video games and, more recently, internet subscriptions.

⁷ National Statistics also publishes estimates for whole economy weekly expenditure based on the EFS, from which figures for annual spending on the different categories can be derived by multiplying by 52. According to these, aggregate household spending on cinema was £682 mn in 2005 (compared with £770 mn recorded box office revenues). There is a larger discrepancy between household spending on DVD purchases/rentals and industry data: the EFS records £1.2 bn and £0.13 bn spending on sales and rentals respectively in 2005 (the sales figures also include spending on blank DVDs/videos), while industry estimates point to sales of £2.3 bn and rentals of £0.4 bn.

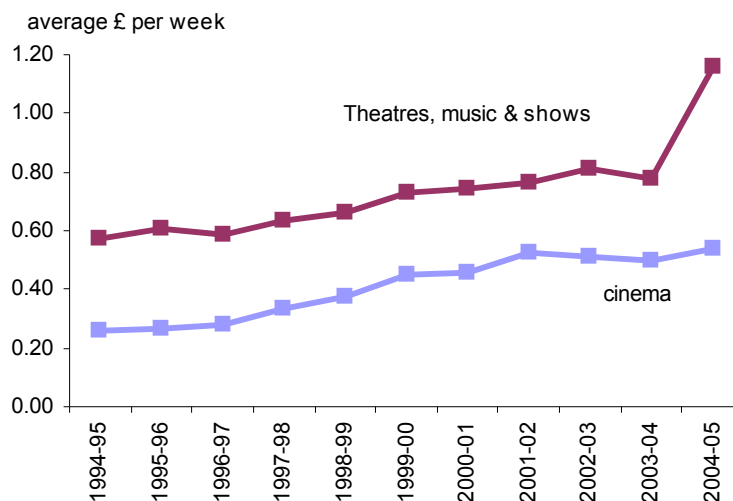
Whilst the data presented here focus mainly on forms of alternative entertainment that can be consumed in the home, Figure 21 includes for comparison spending on theatre, live music & shows. Interestingly, there is a close correlation between spending on cinema and on theatre, live music & shows over the sample period, though this breaks down in 2005 when there is a marked jump up in recorded spending on theatre, live music and shows. Whether this is a statistical artefact of the data – reflecting small sample inefficiencies – or a genuine divergence between theatre and cinema spending in 2005 is worth pursuing. The latter would be consistent with the increased use of new digital technologies: households might be expected to treat such entertainments as closer substitutes to cinema than to theatre and live music.

Figure 20: % Weekly spending by UK households on selected leisure items



Source: Expenditure and Food Survey, Family Expenditure Survey

Figure 21: Weekly spending by UK households on cinema and theatre, live music and shows



Source: Expenditure and Food Survey, Family Expenditure Survey

A flat/falling expenditure share for cinema/DVD and rising expenditure share for multi-channel TV and internet subscriptions is clearly consistent with the existence of

substitution effects between these categories. The quarterly household-level data that makes up the EFS is available free to non-commercial researchers via the ESRC's UK Data Archive (www.data-archive.ac.uk). The Institute for Social and Economic Research at Essex University (ISER) has already been using these data to develop econometric models of telecommunications expenditure to analyse substitution effects between the internet and telephony spending. They have used these models as tools for projecting future expenditure patterns based on assumptions about price changes and demographics. (See Zong and Anderson (2006)). Ben Anderson, Deputy Director at ISER, has confirmed it would be straightforward to apply the same methods to the leisure categories in the EFS of interest in this paper.

The British Household Panel Survey (BHPS) is a separate longitudinal or panel survey that has been tracking the same individuals on a yearly basis since 1991. The BHPS regularly includes questions on leisure use eg on going to the cinema, on using the internet and on playing video games. The longitudinal nature of this data set – again available free to non-commercial users through the UK Data Archive – means that it is simpler to analyse the causes of change in an individual's behaviour, since much is known about what these individuals were doing *before* that change.

7 Evidence of substitution effects from UK consumers' time use behaviour

Surveys of household expenditure, such as the EFS, provide a direct view of what leisure items households are spending their money on. A different angle is to look at how households are using their time.

National Statistics' Time Use Survey (2005 and 2000)

National Statistics published a paper earlier this summer reporting the results of a time use study carried out in 2005 as part of the National Statistics Omnibus Survey. The diary results for 2005 are compared with the data collected in the UK 2000 Time Use Survey in Lader, Short and Gershuny (2006).

The surveys asked respondents how many minutes each day they had spent on various activities. Three categories are of particular interest to us: "Entertainment and culture" (which includes going out to concerts and theatres as well as the cinema); "TV & Video/DVDs, radio and music"; and "Computing."

	2000	2005
Entertainment & culture	8 minutes	5 minutes
TV & video/DVD, radio and music	156 minutes	157 minutes
Computing	12 minutes	20 minutes

Source: Table 5.22 "The Time Use Survey 2005" in Lader, Short and Gershuny (2006)

Figure 22 shows that computing time increased from an average of 12 minutes a day in 2000 to 20 minutes in 2005. Time spent watching TV & Video/DVDs or listening to radio and music remained broadly unchanged over the same period. There was a slight fall in average time spent on entertainment and culture.

These numbers do not on the surface indicate any substitution between TV/video/radio/music and computing use, but are consistent with some substitution from entertainment and culture (though the numbers are small). As averages across the

population as a whole, however, they mask some important differences between groups. Lader, Short and Gershuny (2006) make an interesting comparison between time use behaviour of those that had and had not used a computer (including internet) on their diary day in the two surveys.

Figure 23 shows that those individuals that had used a computer on the day their time use was surveyed spent an average 96 minutes on this activity in 2000. That jumped up to 120 minutes in 2005. (The % of respondents saying that they had in fact used a computer at home that day also increased, from 12% to 16%). Note that these estimates include all computer use by individuals (including work and study done on the PC at home, but excluding work done outside the home).

In 2000, time spent on TV & video/DVDs, radio, music (157 minutes) and on “entertainment and culture” (7 – 8 minutes) was broadly the same for those having used a computer that day and those that had not. But in 2005, a different pattern had emerged, with those having used a computer spending only 135 minutes watching TV & video/DVDs or listening to radio/music compared with 160 minutes by those that had not used a computer. This is a very significant difference by the standards of other shifts in time use recorded over the two surveys, and indicates strong substitution effects between these leisure activities and computer use over time (though the survey alone cannot unfortunately shed any light as to which activities within this broad category are the ones that are losing out).

Interestingly, although average time spent on entertainment and culture – which includes cinema – is lower in 2005 compared with 2000, the difference between those having used a computer that day and those that had not remained very small (time spent on these leisure activities by non-computer users had fallen from 8 minutes to 5 minutes in 2005, compared with a fall from 7 minutes to 4 minutes for computer users).

Figure 23: Average time spent on selected leisure activities by UK computer users and non-computer users, 2000 and 2005

	2000		2005	
	Computer user	Non-computer user	Computer user	Non-computer user
Computing	96 minutes	0 minutes	120 minutes	0 minutes
TV & video/DVD, radio & music	157 minutes	157 minutes	135 minutes	160 minutes
Entertainment & culture	7 minutes	8 minutes	4 minutes	5 minutes

Source: Table 5.22 “The Time Use Survey 2005” in Lader, Short and Gershuny (2006)

This would suggest substitution effects in the 2000-05 period between computer use and going out (including to the cinema) have been much weaker than substitution effects between computer use and home-based audio-visual entertainment (including watching video/DVDs). This would make sense if home-based entertainment is a closer substitute to home-based computer use, such as surfing the web, watching TV on the PC or downloading movies, than is going out to the cinema (the latter serves a social purpose as well as a pure entertainment one).

(Note that the 2000 and 2005 ONS time use surveys are also available via the ESRC’s Data Archive).

Other time use surveys

Time-use surveys constructed on a consistent and regular basis over time are few and far between. The ISER has a repository of many of the surveys that have been done. It has, for example, already published similar analysis based on an earlier panel time-survey – the Home On-Line Survey – collected by BT between 1998 and 2001. That research showed, for example, that there had been clear effects from internet use – and in particular web use – on TV watching (see Anderson, Partridge and Stoneman (2006)).

Ofcom (2006b) has published comparative time use figures for 2001 and 2005, based on a variety of different industry sources (Figure 24). These suggest that there has been a significant increase in the average time spent by UK consumers on the internet.

Figure 24: Weekly communications consumption

Activity	2001	2005	Change
TV	25 hours 23 minutes	25 hours 34 minutes	+11 minutes
Radio	20 hours 30 minutes	20 hours 6 minutes	-24 minutes
Internet	2 hours 10 minutes	2 hours 29 minutes	+19 minutes

Source: Ofcom/RAJAR/BARB/TGI-BMRB

Note: TV and radio hours are per individual; weekly internet hours are for Q4 of each year for adults 15+ who have used the internet at least once in the previous 12 months. This will include a significant number of low-use individuals who drag down the weekly average.

Survey-based estimates of time spent on the internet are notoriously sensitive to how the survey question is phrased and on the sample studied. So, for example, another survey conducted by Ofcom (2006a) reported that individuals spent an average of 9.9 hours a week on the internet (with broadband users spending 12.7 hours online), much higher than the estimates in Figure 24. This survey asked respondents to include time spent on the internet at work. Another survey, this time of broadband users – conducted by YouGov (2006) – reported an average of seven hours and 54 minutes spent on the internet, of which four hours and 40 minutes were devoted to online games, and two hours and 23 minutes to watching TV online.

Figure 25, taken from Ofcom (2006b), breaks down the average time spent on watching TV, listening to the radio and using the internet into different age groups.

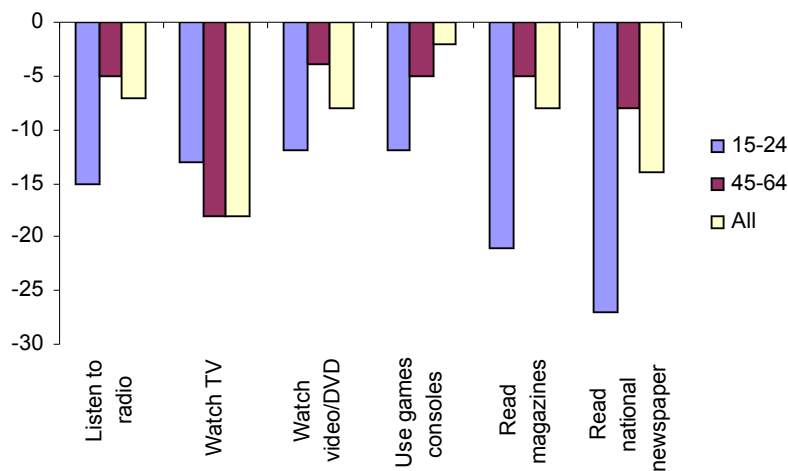
Figure 25: Weekly communications consumption by age group, 2005

Activity	All ages	16-24	Difference
TV	25 hours 34 minutes	18 hours 21 minutes	-7 hours 13 minutes
Radio	20 hours 6 minutes	18 hours 18 minutes	-1 hours 48 minutes
Internet	2 hours 29 minutes	2 hours 50 minutes	+21 minutes

Source: Ofcom/RAJAR/BARB/TGI-BMRB

It makes the point that the 16–24 age group is a particularly heavy user of the internet compared with the population as a whole, and that TV consumption in this group is relatively low. This is interesting, as it is broadly this group which CAA data suggests has cut back on watching DVDs and videos. Such substitution effects are also consistent with direct survey evidence from Ofcom that this age group has reduced time spent watching DVD and video in favour of increased time spent online (Figure 26).

Figure 26: Reduced consumption time resulting from increased internet use



Source: Ofcom

Unfortunately, Ofcom did not include cinema-going as an activity in this survey, but separate evidence – from a survey of 18–65 year olds conducted by Intel (2005) – indicates that consumers may be substituting directly out of cinema-going too. Intel reported that 26% of respondents claimed to be going to the cinema on a less frequent basis directly due to the increased availability of digital leisure facilities in the home.

8 Conclusions

This paper has reviewed publicly available household expenditure and time use data to investigate the effects of more widespread use of digital leisure technologies on cinema and DVD/video audiences.

It has presented survey data which show that the plateau in cinema attendances since 2002 and drop in DVD/video sales in 2005 appears to have been driven by younger audiences. The paper has also discussed survey evidence that it is these same younger consumers that have been heavy users of the new digital technologies.

The evidence considered here is probably more supportive to date of substitution effects between DVD/videos and the new technologies than it is of substitution between cinema and the new technologies. There appear to be marked differences in time use surveys, for example, in audio-visual leisure use when individuals are using computers and when they are not, although the high level of aggregation across leisure activities in these surveys makes it difficult to be precise about DVD/video use or cinema-going *per se*.

In surveying the available data, we have suggested that more detailed work on household-level evidence underlying the ONS's Expenditure and Food Survey and Time Use Survey may be warranted. In addition, it is important to investigate the robustness of the patterns identified in this paper using private sector survey data sets available from the market research companies.

9 Priorities for further research

There are at least three obvious directions for future research:

(i) More detailed examination of data on cinema-going/DVD-watching behaviour and digital leisure technology habits by age and socio-economic group.

This should be based on data collected on a consistent basis over time and across socio-demographic groups. It might also be interesting to look at other forms of entertainment, such as going to theatre and live music, as a way of controlling for common factors such as household income and consumer confidence which impinge on individuals' decisions to consume *all* leisure goods and services.

The main attraction of official survey data, such as the EFS, BHPS and ONS Time Use Survey, is that it is free, and there are well-respected UK academics who have experience of analysing such data sets. The disadvantage of the official survey data is that the level of aggregation across activities means that it will be difficult to identify use of specific new technologies eg the surveys will pick up time spent on the internet vis-à-vis watching DVD/video, but will not pick up time spent downloading movies vis-à-vis web-surfing.

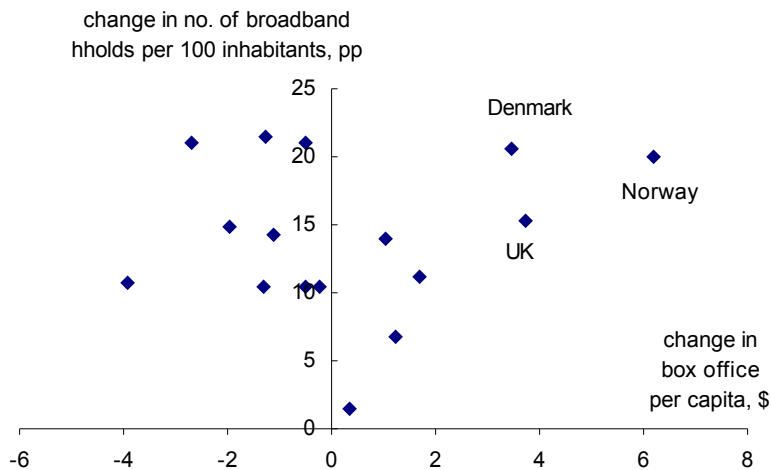
The big attraction of commercial data sets collected by the market research companies is that they provide data on specific new technologies and uses of leisure time (see Appendix 1). Disadvantages include the high cost of obtaining the data on a regular basis, and, in a crowded market, it may be difficult to establish upfront which data provider has the most useful data sets for analytical purposes.

(ii) Analysis of international patterns in cinema-going, DVD/video audiences and digital technology consumption patterns.

Looking at the experience of other countries will provide valuable information for understanding the plateau in UK cinema attendances and drop in DVD/video sales. If digital leisure substitutes were the main story for the global weakness in cinema admissions, for example, we might expect take-up of these technologies to be negatively correlated with increase in cinema attendances across countries. That this is probably not the case is illustrated by the following chart showing increase in broadband penetration between 2001 and 2005 against increase in per capita box office revenues over the same period for the main countries in Western Europe (Figure 27). This reflects the fact that a number of countries, notably the UK, Denmark and Norway, have

achieved rapid increases in broadband take-up in the past five years at the same time as per capita box office revenues have increased significantly (driven in the UK by the strong rise from 2001 – 2002).

Figure 27: Increase in broadband penetration and per capital box office revenues in Western Europe, 2001-05



Source: PWC and OECD

(iii) Econometric modeling of cinema demand.

A major limitation of correlation analysis – be it at the micro or macro level, or at the UK or cross-country level – is that it says little about causality. Perhaps DVD rentals in 2005 would have been weaker still in the absence, say, of increased use of the internet? For example, PWC (2006) estimates that the online DVD rental market in the Europe-Middle East-Africa region now makes an important contribution to overall DVD rentals, with business almost doubling in 2005 from \$122 million to \$216 million (within this region the UK has the biggest market).

Another significant benefit from more formal econometric modeling is that it allows competing demand and supply factors to be treated in one consistent framework, and gives us a better sense of statistical standard errors. This is important for characterizing just how ‘big’ is the puzzle in UK cinema attendances and DVD/video sales.

Appendix 1: Private sector surveys

Provider	Survey	Nature of data	Sample period	Indicative cost	Contact
Screen Digest	1. TV Intelligence	Penetration rates of different pay-per-view TV platforms.	1996 to date.	£16,500	Ben Colbeck
	2. Video & DVD Intelligence	VCR/DVD penetration; piracy rates.	1998 to date; 2002 to date.	£16,500	
	3. Games Intelligence	Mobile gaming.	2002 to date.	£11,000	
	4. Broadband Intelligence	Broadband penetration; Movie downloads; Games on demand.	1999 to date; 2003 to date; 2005 to date.	£11,000	
Ipsos-MORI	Engage study	Penetration rates for wide range of technologies (inc. broadband, blogs, VOD, pay-per-view TV); Attitudes and time use.	October 2006 onwards; Tech Tracker survey back data from 1996 to date.	£15,000 +VAT	Jim Ford
nVision	Leisure activities in the home;	Consumption of services on internet, interactive TV, game playing and DVD.	Most questions on 2-yearly basis back to 1999/2000.	£18,000 – 20% discount for public sector.	Christian Bennewitz
	Leisure activities outside the home	Cinema; theatre and other activities outside the home.			
TNS	Worldpanel Entertainment survey	Panel survey of cinema, DVD rental and pay-per-	2002 to date;	£4,890 for a one-off time-series of	Lucy Burton

		view TV use. DVD, VHS and games sales.	1999 to date.	spending on different activities.	
Mintel	Cinemas - UK	Cinema use; DVD retail and rental; internet use.	2002, 2004 and 2006. Can splice on to earlier Mintel surveys to construct back data.	£995	Tabitha Dudeney

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