

Chapter 6

A Consumer Perspective on Digital Terrestrial and Interactive Television

Robert G. Picard

Jönköping International Business School, Jönköping University

Perhaps the most fundamental impact of digital communications on consumers is its ability to improve the quality of video and audio signals and to transform one-way communications that has traditionally been received in a relative passive manner into two-way communications in which users can play a more active role. These changes have led policymakers and broadcasters of various types to promote opportunities in digital television (DTV), digital terrestrial television (DTTV) and interactive television (iTV). Digital television is being offered to many consumers through cable and satellite systems, and broadcasters in some European nations are beginning to offer basic DTTV broadcasts. Simple interactive services are appearing in some markets as a prelude to future more extensive interactive operations.

The introduction of DTTV and iTV, however, is being far more affected by the marketplace than were the introduction of analogue television and cable television, both of which tended to receive significant financial support and market protection from European governments. Because these newer broadcast services are being developed within a consumer-oriented commercial context, consumers are at the centre of decisions that will determine their success or failure. Although public service broadcasters are among the strongest supporters of DTTV and offering many of the new channels and services (as shown in chap. 3), they are doing so in a market-based environment that requires significant consumer spending for set-top boxes (STBs) and in which consumers have choices of other digital television services. DTTV and iTV are not alone in this regard as choices involving many information and communications technologies and services today are now being left to consumers and the marketplace (Picard, 2003).

Issues of consumer acceptance and use are important because it is the choices of consumers in markets that determine how much of their financial

resources are devoted to various media and those choices influence decisions of sources of capital, marketers, and advertisers (Albarran, 2000; Picard, 2002).

The development of linking communications such as the Internet and other telecommunications-based systems has made it possible to combine content availability with a high degree of user selectivity, filtering and participation. The greatest developments in this regard to date are currently seen in the World Wide Web, which at the beginning of 2003 provided users more than 171 million hosts to choose among (Internet Software Corporation, 2003). It is browsed with software that permits users to be both audiences and content providers, to search for specific material and to exclude others, to collect and reorganise information, and to obtain and react to material.

The underlying technologies that have created these Internet opportunities are now being transferred to the television environment because the digitalisation of television signals uses technologies that are compatible with linkages to telecommunications systems such as the Internet and will permit users to easily play more active roles in determining what material they receive and when and how they receive it. The technologies also allow them greater control over what they do with the material received and provide opportunities to react to it and otherwise interact with the content.

Interactive television and digital television (whether terrestrial, cable, or satellite) are inextricably combined because iTV can be added to the technology of the digital platform easily and cost effectively.

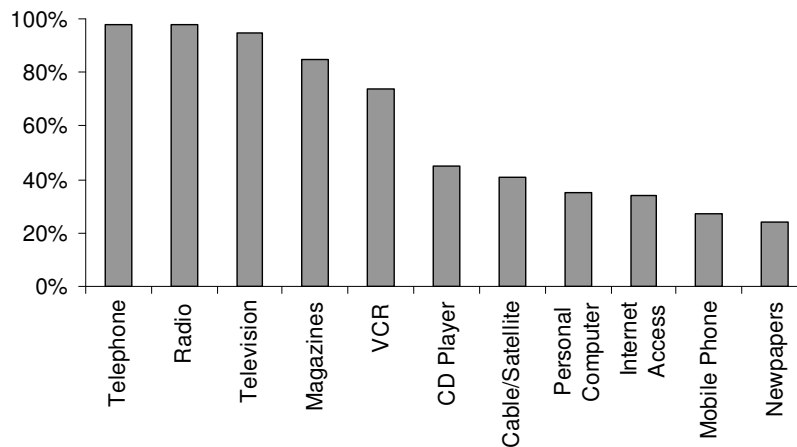
ISSUES IN CONSUMER DEMAND

Consumer demand for digital and interactive television is affected by a number of factors. Demand for and acceptance of new media products and services as a whole are dictated by a variety of factors including the uniqueness of the content and services, the improvements they provide over existing media, the amount of use expected, their belief in the success of the technologies, and — of course — price (Picard, 2002 and 2003). The extent to which DTTV and iTV provide sufficient incentives to large number of consumers in these regards remains uncertain.

Wide individual differences in demand for other media and communications products and services have produced highly different patterns of acquisition (Figure 6.1). DTTV and iTV are being introduced in an environment of unclear demand and with political wishes for universal acceptance in a relatively short time. Given the patterns of acquisition for other media and communication products and services, the desire seems highly problematic because even

terrestrial television is not acquired in all households and other interactive media are used in far less than half of all households.

Figure 6.1: Penetration of Selected Media and Communication Products/ Services in European Households, 2000



Source: Eurostat, 2001

The difficulties of achieving household acquisition of DTTV are illustrated in the countries where it is currently being offered. For example, one year after its introduction digital terrestrial television reaches less than 1 per cent of households in Spain and 3 per cent in Finland. Three years after its introduction in the United Kingdom DTTV serves only about 5 per cent of households.

Cost issues associated with digital and interactive television present a significant challenge because acquisition of signals and services requires significant consumer investment in STBs. Basic boxes to receive digital signals but not including a feedback loop for interactivity require consumer expenditures of €300 to €500, and advanced STBs that support interactive services are €1,000 or more. In some households additional expenditures to upgrade reception antennas will be required as well.

These costs to consumers represent significant household expenditures and will require a significant transfer of discretionary income given that the European average household spending for all media is currently under €1,000 per annum. As a result costs of acquiring hardware will clearly influence choices of consumers to acquire the technologies in the market.

Consumer demand for digital television is also highly affected by the number of new channels provided and the pre-existence of channels via

terrestrial and other means. It is affected by the number of free channels, basic paid channels, and premium channels available. It is affected by the amount of original, syndicated, and repeat programming provided. It is affected by whether programming is provided for general or niche audiences. It is affected by the number of movies broadcast, and the number of specialised channels provided. Demand changes because the audience fragments and becomes disinterested in some available content (Picard, 2000) and because as the number of media and content providers increase, audiences change their traditional media use patterns (Becker & Schoenbach, 1999).

This occurs because a major factor in demand for new television services is the diminishing marginal utility of additional channels and viewing choices. The result of this factor is that each additional channel or programme choice is less valuable to viewers than the last. This reality has led cable and satellite system operators to engage in bundling and tiering practices that allow them to market packages of programming and engage in a variety of pricing practices in attempts to overcome this limit on consumer demand.

In the case of DTV, then, consumer demand will depend on currently available offerings and whether the additional channels are perceived as sufficiently desirable, that consumers anticipate viewing them, and that the new channels are expected to provide utility that justifies expenditures to acquire them.

Both DTTV and iTV, then, are less likely to appeal to viewers who choose not to have cable, satellite or Internet services because their benefits are similar to those provided by those technologies. Bruce Owen (1999) has noted that an important factor in consumer demand for television is a desire for passive entertainment, but that newer technological opportunities tend to satisfy different demands. As a result, they are not fully substitutable and are unlikely to gain equal consumer interest.

Digital television in its various forms presents consumers with a number of choices through which to satisfy their viewing desires. To date, DTTV has not provided a sufficiently desirable proposition to consumers to induce them to choose DTTV over cable or satellite, or to reject analogue terrestrial broadcasting. In situations with many choices and mixed advantages, consumers tend toward inertia and the avoidance of choice making, to continue pre-existing behaviours, and to wait for market clarity to reduce uncertainty before reconsideration. These behaviours present a significant challenge to the rapid uptake of DTTV.

In addition to these consumer issues, concerns over the use and usability of STBs and interactive systems also will affect demand. Many consumers are currently confused by basic videocassette recorders (VCRs) and computers,

which limits their acquisition and use. The perception of complexity will have to be overcome for iTV services, in particular, to become attractive.

A use issue also exists because most current DTTV and iTV services require households to acquire a STB for each television set in the home, thus requiring higher expenditures for full use of the technologies.

Demand issues also exist among the second set of consumers involved in DTTV and iTV—advertisers. Uncertainty about viewer acceptance of the technologies and the audiences that will become available, as well as a prolonged downturn in their advertising expenditures, is limiting their interest in the potential of these developments.

In addition, the high costs of establishing and operating iTV advertising systems and difficulties in integrating advertising and sales processes to make effective use of iTV are also constraining advertiser activities in iTV (European Commission, 2002).

INTERACTIVITY, iTV, AND CONSUMERS

The key characteristic of iTV is interactivity that permits the users more influence over the content than the mere traditional choice of whether to watch or not watch what has been provided by a broadcaster. In interactive television, the user gains greater control and becomes the driver of the process. Interactive media are not defined by technology used in delivering content but by the ability of users to act and determine the course of the interaction between themselves and the content provider.

Interactive television is based on the reception of a broadcast signal with a link back to the broadcast organisation or service provider via a communication system that allows the user to exert influence over the content provided or to link to other communication systems.

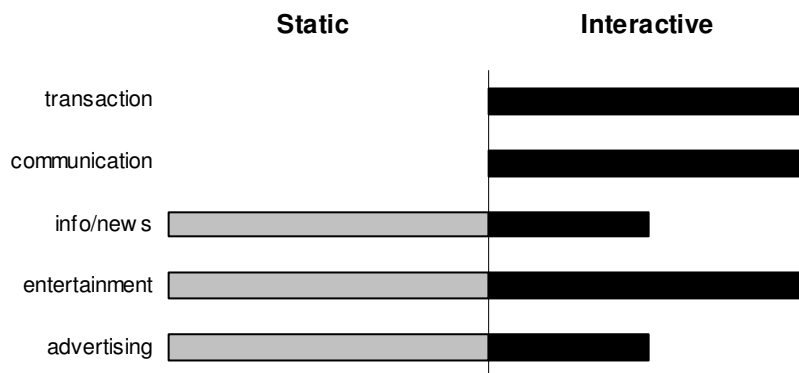
The concept is not completely new. Cable television, for example, has provided interactive television capabilities using analogue technologies for more than two decades by allowing viewers to place telephone orders for pay-per-view programming and, more recently, to use Internet-based ordering systems.

What is new regarding interactive television, however, is that it acquires greater potential and features with digital television — whether terrestrial, cable, or satellite — because it allows creation of content in formats and provides the underlying infrastructure that creates enhanced usability and greater interactivity. It is the improvements that digitalised content, content management systems, and distribution systems provide that create natural linkage between some digital television activities and iTV.

Digital television combined with interactive functions allows users to choice among video and audio signals; it creates the ability for viewers to opt out of programme streams though time shifting; and it allow individuals to make unique free and fee-based programme selections. It also gives users digital recording and playback ability and the potential for data transmission in the form of e-mail, messaging, Internet, and e-commerce.

In understanding the potential interactivity, one must consider the functional differences and use difference for various types of interactive activities proposed for iTV. The primary types of activities proposed involve transactions, communication, information/news, entertainment and advertising (Fig. 6.2).

Figure 6.2: Communication Functions and Use in Static and Interactive Formats



In traditional broadcasting—whether analogue or digital—users can only use information/news, advertising, and entertainment in a static way, that is, they can only passively receive the content. Because of the technological limitations, they are not able to use the system for communications or transactions. With iTV, the ability to interact is heightened, although somewhat less for information/news and advertising where interaction is primarily search and selection rather than fuller participation.

For marketers, including broadcasters themselves, iTV offers the ability to communicate with persons actively engaged in media use, to communicate with a single audience member and consumer rather than an amorphous audience, and to communicate with an identifiable receiver of an advertiser's message. These factors all increase the effectiveness of marketing messages, so interactivity appeals to those wishing to engage the audience for commercial purposes. Even general advertising becomes more effective because iTV allows

some interactivity that can be used to establish channels for personal marketing, and hopefully, for transactions.

Because gaining new capabilities and communications opportunities is a central component in consumer demand for media products and services, it is important to understand exactly what they gain by iTV.

Important functions provided by iTV include recording and playback. These functions allow users to view materials that were offered in a broadcast stream by a broadcaster but missed by the viewer. Thus, a viewer who missed last night's episode of *The Sopranos* can use the broadcast channels interactive system to see it today.

This function is not new and has been provided for three decades by VCRs and more recently by digital recording devices such as TVRO. Such recording and playback functions are popular among consumers. VCRs, for example, cost only about €150 and are found in about three-quarters of European homes.

Newer digital recording and playback systems, such as TiVO, record available DTV programming. These consumer electronic systems are separate units like VCRs, but they also require payment for services that operate the equipment, and made so that users avoid the necessity of planning by specifying genres of programmes, directors, actors, types of sports, etc. that should be recorded or specific programme titles. The hardware for the systems currently costs about €300 and service cost about €150 per year.

Plans for the full-blown iTV systems in the future would replace the need for consumers to acquire separate devices and incorporate the functions at the broadcaster level or within the system. Interactive television playback also has advantages over VCRs in that users do not have to plan ahead, do not have to set their equipment to record the programme, and are able view the programme in digital quality.

Some limited, poor resolution playback capability of television content is now available on computer screens via the Internet. They are primarily limited to news and public affairs content because of copyright limitations, and broadcasters supplying this service provide video files which can be downloaded or streamed with user-friendly point-and-click technology. As iTV develops, these same functions will be transferred to the television environment bringing the quality up to DTV standards and—when copyright payment issues are resolved—availability will be extended to the entire range of broadcast content.

Another significant function involves information seeking, in which iTV users can access programme archives and the Internet to seek information and news. The systems will allow them to use search capabilities to seek out text, audio, and video clips containing information and news from a wide variety of local, domestic, and global sources.

This function will thus permit television users to acquire information not currently in the broadcast stream, not available from local broadcasters, not currently being broadcast, and will meet the unique informational requirements of the user. These capabilities have been widely used in policy debates as a justification for DTTV, iTV, and public policies supporting their development.

Another capability of iTV is the accessing of information about products and services in the market in which the user is interested. A viewer who is planning to purchase a new automobile might be attracted by an advertisement for Volkswagen in a broadcast stream and then use the interactive system to find out additional information about specific models and features or to view models in preferred colours.

Interactive television also presents the opportunity for users to play and take part in games and gaming activities. Users can play videogames without having to purchase game devices such as PlayStation or Xbox, and play with individuals at other locations through the Internet connection.

The gaming opportunities allow users to take part in gambling activities, including live casino games and betting on sport events. Not only could wagers be placed on the outcomes of events such as horse races or hockey matches, but wagers could be made in real time. During a football match, for example, a viewer could place a wager on the outcome of a penalty kick.

Transactional functions of iTV make it attractive for e-commerce, banking, and other transactional activities. Viewers watching a movie, for example, might like it so much that they choose to purchase a DVD copy that can be shipped to their home or to order takeout pizza from a local shop to consume while viewing the motion picture. Both these functions can be accommodated using the iTV system.

Similarly, viewers wishing to receive a pay-per-view broadcast of a boxing match or motion picture could use the system to make the financial transaction and begin receiving the content.

Interactive television also provides the communication capabilities available through the Internet such as e-mail, messaging, chatting, and voice transmission.

The additional programming and enhanced functions provided by DTV and iTV provide users content and services not previously available in the broadcast format. The increased content and functionality are a factor in the demand for communication products, but they alone do not determine consumer acceptance.

THE CONTEXT OF DTTV AND iTV

Comprehending the potential for DTTV and iTV also requires that the context in which these technologies have been introduced be well understood. Throughout Europe, DTTV has been promoted by governments and major firms, not by consumer demand. Although consumers will enjoy the primary benefits of clearer signals, increases in the number of channels available, and the potential for interactivity, these have not driven developments in DTTV. Instead, the aspirations of the European Commission and national governments to be world leaders in information and communication technologies and to free existing analogue television frequencies that can be potentially auctioned for other uses have been the primary impetus toward DTTV. The governmental initiative has been supported by major technology manufacturing and service firms that stand to gain financially by the transition to digital broadcasting.

Existing terrestrial broadcasters have not been wholly supportive because DTTV makes it necessary for them to acquire new studio technology—a capital cost factor—and the policy requirements and transition time for consumer switchover requires them to maintain both analogue and digital broadcasts, which have operating cost implications. Nevertheless, the longer term potential for existing broadcasters to provide additional channels and services through multiplexes make DTTV strategically interesting.

Public service broadcasters have shown the greatest interest in DTTV because it allows them to increase niche offerings and provide more localised services. The infrastructure and operating costs remain a concern, however, because most have not been provided additional financial resources with which to provide DTTV services. In some markets, potential income from supplemental services based on digital infrastructure and revenue-generating interactive services may provide resources to help pay for the additional costs.

Commercial broadcasters typically have been less supportive of DTTV because of the relatively short history of advertising-supported television in many nations, the relatively short time many have had to depreciate analogue equipment purchased in the 1990s, and because new channels and broadcast competitors created by DTTV are coming just as television market stability is developing after the upheaval caused by the rapid increase in analogue channels in the late 1980s and 1990s.

Market questions today are creating great uncertainty about DTTV and iTV developments and the issues are primarily related to consumer choices and behaviour, rather than technology and supply side questions. The basic technologies and infrastructures necessary for iTV exist today, but companies

are moving slowly toward integrating systems and content because of concerns over the ability and willingness of consumers to accept these new systems.

The concern revolves around consumer cost issues. The willingness of consumers to pay additional costs for the services and the necessity for consumers to purchase STBs with capabilities far beyond mere acquisition of DTTV signals are slowing iTV development. The uncertain business potential and high financial risks involved, and current limitations on available capital, are all slowing the movement of firms into DTTV and iTV services.

These issues are compounded because consumer knowledge about DTTV and iTV is generally limited, because current DTTV and iTV offerings are limited as those on the supply side await more consumer take-up before investing in more services, because development and performance of DTTV and iTV have not lived up to the promoted vision and expectations of policymakers and digital broadcast firms in markets where they have been introduced, and because issues involving technologies and standards of STBs have created consumer and industry uncertainty.

DTTV and iTV clearly offer consumers additional services to those they currently receive. Consumer research on DTTV and iTV shows audiences welcome improvements in picture quality, increased choices among content, electronic programme guides, and supplemental audio programming that is provided. Where interactive systems actually exist, consumers show great willingness to use the new capabilities to access programme guides, online games, gambling, and pornography. When it comes to the communications capabilities for e-mail, messaging, and internet activities, however, limited interest is shown.

Market data show that only a few consumers acquiring STBs for DTV are acquiring the advanced boxes needed for significant interactivity, and most of the few consumers acquiring DTTV boxes are purchasing low-end boxes with little interactivity capabilities.

The most advanced existing iTV systems, such as those offered by BSkyB through its satellite-based digital television operations in the United Kingdom, only provide very rudimentary interactivity in which viewers can make highly limited, pre-established choices using their remote control device. These allow viewers the ability to select among various cameras at sporting events and to respond to viewer polls, for example.

Part of the difficulty with the entire process of introducing digital and interactive television to consumers is that it has relied primarily on market funding. Policy makers and companies have assumed that there would be strong consumer demand for DTTV and rapid, widespread adoption. This approach has brought the entire funding methods of DTTV and iTV to a crisis point. It has

been a remarkable failure because it was based on policy and technology triumphing over the marketplace.

For the most part, the movement to DTTV and iTV have been designed to support frequency reallocation, designed to support the information and communication technology sectors, and designed to promote images of European and national leadership in technology. Consumer interest and demand were never seriously a factor in past policy decisions regarding DTTV and iTV.

The result is that across Europe, we are currently seeing resistance to and rejection of DTTV and iTV costs by consumers. Market failures of ONdigital in the United Kingdom and Quiero TV in Spain and consumer disinterest in Germany and elsewhere are hampering development of DTTV and iTV services.

As a result, some European governments are floating the idea of free or subsidised distribution of digital TV boxes and considering the approach of the Federal Communications Commission in the United States to force television set manufacturers to install digital receivers in sets. Many are making efforts to delay implementation of DTTV broadcasting and moving to postponing planned switch-offs of analogue broadcasting.

The necessity for slowing development of DTTV and iTV underscores two major problems with the view of consumers in the planning of the systems: the assumption that there would be universal interest in DTV services and the assumption that there would be universal take-up at some point.

Both of these views are extremely problematic. The first is problematic even if one considers existing services beyond basic terrestrial broadcasting. Only about half of Europeans make use of cable and satellite services to obtain additional channels and programming (a major advantage of DTTV) and only about one-quarter access premium services, even though basic and premium cable and satellite services are widely available (Cable and Satellite Europe, 2000). These take-up numbers present difficulties for iTV because, as Owen (1999) has observed, interactive television is unlikely to appeal to television viewers that do not currently have cable or satellite services.

DISCUSSION

The consumer perspective on DTTV and iTV produces an evaluation that is more negative than evaluations emanating from technical or policy perspectives. Serious consumer impediments exist to the adoption and use of the related technologies that must be overcome if the technologies are to be successful. The need to overcome these constraints is critical because introduction is based on market financing.

The limited introduction of DTTV and iTV to date appears to present classic cases of failures, or at least false starts, in the introduction of new technologies. Consumer disinterest and resistance have been particularly strong. Many of the primary benefits of DTTV and iTV are related to political/social goals sought by policymakers and to commercial gain sought by hardware and service providers. As a result, individual consumers do not directly accumulate the greatest benefits and have less desire to pay the price for them. It should not be surprising that they are not rushing to embrace the opportunities of these new technologies. For this situation to be overcome, a better accommodation of consumer behaviour and a balancing of producer and consumer funding will need to emerge, perhaps through public policies that deal with the failure.

Part of the problem is that DTTV is being introduced simultaneously, and in some cases after, the introduction of cable and satellite digital services. Cable and satellite in analogue form are well understood by consumers and digital offerings have been introduced as enhancements by the marketing arms of industry firms and federations. A number of operators also provided subsidised digital STBs that did not increase subscription costs to users or did so in an inconsequential way.

The introduction of DTTV, digital cable and satellite services, and iTV are occurring within the context of the wholesale transformation of European broadcasting of the last 15 years, and the industry is beginning to reach the limits of potential market expansion (Picard, 2001). It should not be surprising that consumers are evidencing technology fatigue, reduced willingness to invest, and perceiving fewer benefits in additional services.

It must be recognised, however, that the consumer demand issues vary widely across Europe because of wide differences in the markets based on size of nation, pre-existing terrestrial cable and satellite channels and their use, and household incomes. Because many of the interactive television services use telecommunications and Internet feedback loops, current infrastructure supporting those technologies and computer and Internet adoption and use patterns will also affect demand for iTV.

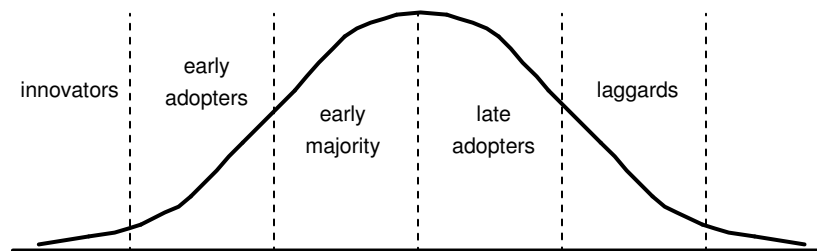
Such issues are important because consumers who do not wish to interact online are not likely to significantly interact with television, and because persons who have access to cable and satellite services but choose not to acquire and use them are unlikely to find DTTV and iTV attractive.

The introduction of the technologies also faces significant challenges because of language. Because use of services requires the ability to view and interact in the language in which content and services are provided, the technologies are being introduced at the national rather than European level. Although limited market adoption in highly populous nations might provide sufficient number of consumers to maintain commercial operations, limited

adoption in the many smaller nations of Europe will lead to commercial failures. Limited adoption in smaller nations can be overcome by aggregating audiences across those nations but linguistic limitations make that impractical.

In recent years, information and communication technology advocates and policy makers have regularly used the adoption curve (Fig. 6.3) to project take-up of new products and services. They assume that the curve represents widespread or universal adoption of the technologies. The curve, however, does not represent the entire population but only those who ultimately adopt the new product or service. In many cases, projections are based only on the first half of the curve and its “S” curve. These approaches are problematic because the number of adopters and the time and capital required to reach the lower thresholds of adoption for continued operations may halt the spread and acceptance of the technology altogether.

Figure 6.3: The Adoption Curve



Many proponents of DTV and iTV have seemed to assume that because they provide some benefits, they would be automatically embraced by consumers. The current situation shows that there are a range of impediments to success within the broadcasting industry and from choices of consumers. The difficulties in the introduction of digital and interactive television underscore the fact that good technologies can be rejected or delayed when consumer desires and choices do not coincide with those of policymakers, technology firms, infrastructure firms, content providers and other interested parties (Picard, 1998).

A consumer perspective thus shows that the introduction of digital terrestrial television and interactive television face significant challenges and that their success in the market is uncertain. Only if and when the consumer-related impediments are overcome can these technologies survive and begin to achieve the social and individual benefits they are asserted to provide.

REFERENCES

- Albarran, Alan B. 2000. *Media Economics: Understanding Markets, Industries and Concepts*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Becker, Lee, & Klaus Schoenbach 1999. *Audience Responses to Media Diversification*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Cable and Satellite Europe 2000.
- European Commission 2002. *ACTIVE-AD: Analysis of Success Criteria for Interactive Advertising Formats*, Public Final Report. Luxembourg: Office for Official Publications of the European Communities, 2002
- Internet Software Corporation. Host Survey Data. Accessible at www.isc.org Accessed 6 May 2003.
- Owen, Bruce M. 1999. *The Internet Challenge to Television*. Cambridge, MA: Harvard University Press, 1999.
- Picard, Robert G. 1998 Interacting Forces in the Development of Communication Technologies: Business Interests and New Media Products and Services, *European Media Management Review* No. 1, pp. 16-22.
- Picard, Robert G. 2000. Audience Fragmentation and Structural Limits on Media Innovation and Diversity, pp. 180-191 in Jan van Cuilenburg & Richard van der Wurff (Eds.), *Media and Open Societies: Cultural, Economic and Policy Foundations for Media Openness and Diversity in East and West*. Amsterdam: Het Spinhuis, 2000.
- Picard, Robert G. 2001. *Expansion and Limits in EU Television Markets: Audience, Advertising, and Competition Issues*. Discussion Papers C2/2001, Business Research and Development Centre, Turku School of Economics and Business Administration.
- Picard, Robert G. 2002. *The Economics and Financing of Media Companies*. New York: Fordham University Press.

Picard, Robert G. 2003. Business Issues Facing New Media, in Jan Servaes (Ed.), *The European Information Society: A Reality Check*. Bristol, UK: Intellect Publishing.