Regulation of television advertising

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Abstract

Regulation of television advertising typically covers both the time devoted to commercials and restrictions on the commodities or services that can be publicized to various audiences (stricter laws often apply to children's programming). Time restrictions (advertising caps) may improve welfare when advertising is overprovided in the market system. Even then, such caps may reduce the diversity of programming by curtailing revenues from programs. They may also decrease program net quality (including the direct benefit to viewers). Restricting advertising of particular products (such as cigarettes) likely reflects paternalistic altruism, but restrictions may be less efficient than appropriate taxes.

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1   Introduction

Most nations restrict the advertisements that are broadcast on television. There are restrictions on both the length of commercial breaks, and on the content of the advertisements themselves. This paper is concerned with the economic rationale underlying such regulations. Examples of type of regulatory constraints on advertising broadcast on television are drawn from Europe, the United States, and, most prominently, from Australia. The Australian case is particularly useful because the regulations are clearly set forth in official publications. Many of the regulations in Australia have counterparts in other nations.

Length restrictions are widespread in developed nations with the conspicuous exception of the lack of US restrictions (the US does not restrict the broadcasting of commercials, except during children's programming). Understanding the economic rationale for length restrictions requires first understanding the complex interactions in the market for television advertisements. The main players in the market are the advertisers, the television viewers, and the broadcasters who coordinate the two sides of the market. Advertisers want to communicate with viewers, who are the prospective consumers of the products touted in the ads. Viewers want to enjoy the program content, and "pay" for it through being exposed to the advertisements. Broadcasters must balance the revenues earned from delivering eyeballs to advertisers with the distaste to ads that viewers express by switching off or switching over. A broadcaster's calculus does not fully internalize the net social costs of ads (viewer distaste minus advertiser surplus), and broadcasters are also able to exploit market power in delivering viewers to advertisers. Furthermore, the private demand for advertisements may exceed or fall short of the social demand, depending on the type and role of advertising (or, indeed, one's view thereof). This means that the unregulated broadcast market can involve too much or too little advertising. The case for advertising caps revolves around there being excessive advertising in a market system.

Length restrictions are socially harmful if there is under-advertising, where the term under-advertising is used to denote less advertising than would be socially optimal. Under-advertising may arise if nuisance costs to viewers are relatively low, and if the social benefits (from informing viewers of socially valuable transaction opportunities, for example) are high. On the other hand, length restrictions may be beneficial if it can be argued that the market system leads to excessive advertising. Such over-advertising is likely if the nuisance to viewers is large relative to the benefits to advertisers. The benefits to advertisers may in turn overstate the social benefits from advertising (although the converse is also possible). However, a simple study of whether there is too much or too little advertising, taking as given the existing market parameters may seriously misread the full economic effects of advertising length caps. Indeed, advertising caps may reduce program quality, the breadth of programming, and overall choice diversity by reducing the profitability to broadcasters of producing programming. These factors need to be incorporated too into the evaluation of the desirability of regulations.

Advertising content restrictions are also widespread in developed nations. Many countries ban or restrict the advertising of certain products. These can mostly be understood as being demerit goods (like tobacco, liquor, and gambling). The argument for banning advertising of such goods reflects paternalistic concerns about the consumption of these goods. The goods themselves are frequently heavily taxed. One question here is why the ads themselves could not be taxed instead, or perhaps the products might be taxed even more heavily. In response, one might argue that it might seem to be rather hypocritical (or counter-productive effect at any rate) if a cigarette advert were followed by an anti-smoking ad financed by the revenues from the previous ad or the advertised product. So it is that several commodities cannot be legally advertised, and consumers are protected from harmful products that advertising might otherwise glamorize or indeed make consumers more aware of consumption possibilities.

This type of consumer protection is taken further when it comes to children's advertising. Regulations in this area are even stricter, and some countries completely ban advertisements during programming aimed at children, or even ads using characters from children's programming. Here, presumably, the view is that children are not able to make fully rational consumption decisions themselves, either through limited information, or through limited decision-making capacity. Advertisements may put undue pressure on parents to purchase products the parents might otherwise deem not in the best interests of their offspring (rather like the signs in some supermarkets that indicate certain check-out lanes where candy is not on display). Knowing that children are not subverted by advertising messages may reassure parents to allow television-watching privileges. One might view the paternalism inherent in banning cigarette advertising to adults as rather similar, with some manipulable consumers being (somewhat) protected from making bad consumption decisions.

The converse case to demerit goods is illustrated by the fact that many countries require stations to carry certain public service announcements (PSAs) as well as party political broadcasts in election season. One might view these as merit commodities that are encouraged by the government with an implicit subsidy to their promotion. Another related type of regulation in the television context is local content - for example, some European countries restrict the amount of material broadcast of foreign origin.

There may be perverse economic effects in the industry sectors that are affected by restrictions or banning (although it seems unlikely that such effects in practice do underlie actual restrictions). For example, drawing on the economics of advertising, it is conceivable that an advertising ban might even raise industry profits. This outcome might transpire if an unrestricted outcome would involve much advertising that served mainly to shuffle demand among producers. An interesting and controversial case in its own right is that of Direct To Consumer Advertising of prescription drugs. Only two nations allow such advertising, and it is arguable that it leads to overprescribing of drugs. Counterarguments include that consumers are better informed, and may be better induced to get treatment once they know of potential cures for maladies suffered.

The rest of the paper is organized in the following way. The next section

describes the regulations for Australia in more detail, and also gives details on EU regulations and selected European countries. Section 3 sets out a model of advertising caps and discusses the market interaction in television markets between viewers and advertisers, intermediated by broadcast "platforms." The discussion of the basic market form is extended to allow for quality choice and format competition. Section 4 addresses why certain goods are barred from being advertised in some countries, and also discusses some possible implications for the product markets concerned. Section 5 concludes.

2 Regulations and restrictions

In what follows, the Australian case is treated in some detail, followed by short remarks for salient features from other nations. There is a detailed set of guidelines to draw on for Australian television.[1] Many of the regulations in Australia have counterparts in other nations. Australian television is governed by the Australian Broadcasting Authority (ABA). One of the objectives of the ABA is to promote the development and reflection of Australian identity, character, and cultural diversity through what is broadcast. While the ABA leaves the primary responsibility for ensuring that broadcasts meet community standards with the television stations themselves, it also has developed a code of practice that suggests guidelines as well as some compulsory standards. These include Australian content and children's program content.[2] They also include restrictions on both the length of advertisements (advertising caps) and the content of advertisements and the types of goods that may be advertised.

2.1 The Australian Broadcast Authorities Code of Practice

The ABA Code of Practice is intended to regulate the content of commercial television according to current community standards and ensure that viewers are helped to make firm choices about their viewing and that of their children. There is quite a complex layer of regulations and publications that describe the guidelines. The code operates alongside three overlapping authorities. These are ABA standards that regulate programs for children and sustain Australian content; advertising codes from the Australian Competition

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[1] The July 2004 draft of the Australian "Commercial Television Industry Code of Practice" is available online at www.freevaust.com.au, and from Free TV Australia, Mosman, NSW 2088, Australia.

[2] The ABA also has specific regulations aimed at sports content. First they include an "anti-siphoning" list that prevents certain sports events from being siphoned off by pay television - this would prevent free-to-air viewers from being able to watch the event. Conversely, the ABA also enforces free-to-air broadcasters via an anti-hoarding provision that is intended to discourage them from holding back the live coverage of certain events. Concerns similar to those that underscored the Australian regulation were also a worry in the European Union. Hansen and Kyhl (2001) give some background details to the European case, as well as providing an analysis of the positive and normative economics of pay-per-view broadcasts.

and Consumer Commission (ACCC) governing the content of television commercials and advertising generally; and the commercial television advisory notes which respond to cultural diversity, people with disabilities, etc.

There are several requirements in the code concerning television commercials. First, television advertisers are expected to make sure that their ads comply with both the Advertisers Code of Ethics[3] and the code for advertising for children. The code also sets up restrictions on the amount of advertising and other program matter that stations may air during the day. There are also placement restrictions on certain types of "sensitive" advertising. Moreover, commercials must not be too noisy or strident or even sound louder than adjacent programming, and transmission should not be higher in advertising breaks.[4] In addition, commercials and other promotions[5] must be easily distinguished by viewers from program material. This is especially important where children are concerned. There are also guidelines for disclosure of commercial arrangements, for example, if products or services are endorsed or featured in the program and such endorsements have been paid for by the sponsoring firm. The ABA requires that at least eighty percent of advertising time broadcast each year between 6am and midnight be used for Australian-produced advertisements.[6]

Rules on commercials and promotions intend there to be "a reasonable balance between program and non-program matter broadcast by a licensee."[7] Non-program matter includes several sub-categories. The most important are spot commercials, which are defined as advertising for a product service or belief that is scheduled within a program break or between programs. The second sub-category comprises advertising that takes the form of superimposed text occupying all of the screen during the program. The third type is a program promotion (known as a "tune-in" in the United States) or station promotion. The code exempts several categories from being non-program matter. These include a prize, a competition, or an information segment. Another exempted category includes community service announcements that promote a charitable cause or activity, and are broadcast free by licensees. Likewise exempted are

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[3]The Australian Association of National Advertisers (AANA) was adopted for advertising self regulation. The intention is to ensure that ads are legal, decent, honest and truthful with a "fair sense of responsibility to competitors". In particular, ads should not be misleading or deceptive, nor likely to be so, and "shall not contain a misrepresentation which is likely to cause damage to the business or goodwill of a competitor." Neither should ads portray people in a discriminatory way (disability, age, sex, ethnicity, etc.) Ads should not present violence, sex or obscene language unless justified by context. There is a separate Automotive Code of Practice that relates to advertising for motor vehicles.

[4]Casual empiricism regarding radio advertisements for used cars in the US suggest such standards are not applied in America! Likewise, television commerical breaks in the US are often noticeably louder than the surrounding programming.

[5]These include program promotions ("tune-ins"), station promotions, and community service announcements.

[6]Since 1981, New Zealand commercials have fully qualified as Australian.

[7]The code uses as a reference point the amount of non-program matter on the Final Schedules. These are the last schedules prepared before the broadcast and indicate when breaks are to be aired and what is aired within the breaks. The idea here is to give flexibility and not oblige licensees to force breaks in live programs because of unpredicted segment lengths.

announcements for an election authority, and sponsorship announcements[8]. Interestingly, infomercials are also excluded. Another way to get an exemption is to use a voice-over or promotion over the closing credits of another program or superimposed text over only part of the screen during the program. Various other announcements and restricted "tune-ins" are exempted. As long as they contain no more than 10 seconds of program content, these announcements include those that indicate that a program will not be shown when advertised, a list of programs to be broadcast that day, a short announcement of the next program, and a movie-opener (a brief introductory sequence to a feature film). Also permitted are station identification, a plot summary at the beginning of an episode of a series, and a program trailer for a future episode if this is broadcast before the closing credits.[9]

Having described what counts as advertising, we now consider the Australian Rules for Limitations to the number of adverts that may be aired. There are both average limitations and limitations for particular hours. These are quite close together in terms of number of minutes (as opposed to the European context, in which the numbers are quite different). In Australia, an average of thirteen minutes of non-program matter may be broadcast between 6 p.m. and midnight, and fifteen minutes at other times (excepting in P and C periods as discussed below). In any particular hour, between 6 p.m. and midnight up to fifteen minutes maybe broadcast, but no more than fourteen minutes (average) in any four hours. During election periods, stations can add one minute of political matter. At all other times, the maximum hourly limit is sixteen minutes. The two categories of programming that concern children are P and C periods. No commercials may be broadcast during P periods. In the C period, each half hour may contain no more than five minutes of commercials and one minute of other promotions. Further restrictions on advertising to children are described below.

Placement of commercials for certain types of goods and services are also restricted. Alcoholic drinks (including beer, wine, and spirits) may be advertised only in mature and adult time periods. Exceptionally, they may accompany live broadcasts of sporting events on public holidays and weekends. Commercials for betting and gambling also must only be shown during mature audience periods although government lotteries, etc., are accepted. Commercials for X-rated films may not be broadcast, and commercials for R-rated films only after 8:30 p.m.

Additional regulations concern children. The AANA code for advertising to children concerns advertising self-regulation towards children of fourteen years

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[8]Sponsorship announcements must make no reference to prices nor last more than 10 seconds per sponsor (with a maximum of 30 seconds).

[9]Since the types of advertisement exempted (such as tune-ins) are primarily informative, the economic question is whether informative advertisements can be excessive in equilibrium. Few economic analyses suggest that information provision may be excessive in a market equilibrium. Grossman and Shapiro (1984) find such a result for oligopolists providing information about their competing products. Dixit and Norman (1979) also find that oligopolists may over-advertise in the context of persuasive advertising. These issues are discussed in more detail below.

or less. Notably, adverts for food and drink should not encourage an inactive lifestyle nor promote unhealthy eating habits. Also, the host or the character in the program must not promote products for services. Finally, children's television standards must not demean people or groups on the basis of ethnicity etc., nor must they distress or frighten children, display unsafe situations. Advertisements to children must not mislead or deceive them and must be clearly understood by them. Advertising must not cause children to put undue pressure on their parents to buy goods. They also must not undermine parental authority nor must they imply that a product makes children who own it superior to their peers or that persons who buy what is advertised are more generous than those who do not buy such products. Any claims made in advertising must be clear and truthful. If prices are mentioned, they must be done so accurately. The presentation should not then play down prices by words by using such qualifying adjectives as "only" or "just".

2.2 Regulations in European Countries

In Europe, broadcast advertising has been legally controlled via the Television Without Frontiers Directive enacted by the Council of the European Community in 1989. The TWF Directive has the purposes of securing access for viewers and listeners in all Members States to broadcasting signals emanating from any other Member State and the harmonization of European Union broadcast advertising standards. The directive contains chapters devoted to promotion of television program production and distribution, protection of minors, television advertising and sponsorship, and right of reply.

The TWF Directive (89/552/EEC, as amended by Directive 97/36/EC) allows 9 minutes of commercials in average, with a maximum of 12 minutes in any given hour. Some member states have stricter limits. For example, in France, all broadcast channels must carry at most 6 minutes of commercials on average, with a maximum of 12 minutes in any given hour. The exception is the Franco-German venture ARTE, which is restricted to 4 minutes of commercials on average, and a maximum of 9 minutes in any given hour. Cable television is only governed by the EU standard.

In the UK, no advertising is allowed on public television (the BBC). The average viewer time in Great Britain is 225 minutes per day, and 41% of the viewers of broadcast television and 28% of satellite viewers watch the BBC. Commercial broadcasting is allowed no more than nine minutes per hour average per day, with a maximum of 12 minutes in any given hour, in accord with European laws. However, there can be no more than seven and a half minutes on average in prime time viewing. Cable television is also regulated by the EU standard. Ads must fall in natural breaks in programming and be at least 20 minutes apart. Ads are not allowed to interrupt certain types of programs such as religious ceremonies, royal ceremonies, or programs including members of the royal family, parliamentary broadcast, and scholastic and children's programs. Excluded sectors are political ads, tobacco, betting, private detective agencies, weapons, pornography, prescription medicine, and products

that mask the effects of alcohol. Some restrictions are applied to religious messages, those soliciting donations, marital agencies, alcohol, financial messages, food products, betting, and medicines. It is understood that spirits should not be advertised. There are also specific rules that forbid subliminal ads and comparative ads are only authorized under reservations. The sound volume of ads should not be louder than the surrounding programming.

In the Netherlands, the overall law for time limits conforms with the EU directive of 20% per hour but in practice, the Dutch minister sets a much tighter limit of 6.5% of daily programming for the public television stations. Advertisement spots are in blocks of at least 2 minutes and must only occur in natural breaks. Excluded sectors include tobacco, prescription drugs, or ideological messages. Alcohol is allowed to be advertised, but with a three second educational slogan such as "drink but moderately", "Stay sociable. Drink moderately", "Let's stay sociable and drink with moderation". The Dutch also have several regulations designed for the protection of children, and there should be no pressure for children under 12 to buy products and children's inexperience and credulity should not be abused. For candy ads, a pictogram of toothbrush and toothpaste is featured prominently.

Sweden has one of the highest percentages of TV household ownership at 97%, and the average viewing time in Sweden is 140 minutes per person per day. Half of the viewers of broadcast television are equally split between two public televisions (SVT1 and SVT2). These stations are not allowed to advertise. For other stations, the time allowed for advertisements is eight minutes maximum in any given hour, rising to ten minutes between 7 p.m. and midnight. However, ads may only take up an average of six minutes per hour over the whole day, and six minutes per hour from 6 p.m. to midnight. Ads must fall in natural breaks in programming (such as halftime in football matches) and they must be at least twenty minutes apart. Advertising spots must be clearly identified in terms of beginning and end points. Products which are excluded from advertising are alcohol, tobacco, and prescription medicine. Sweden has the strictest regulations concerning children.[10] Indeed, no advertisement may be directed primarily to children under 12 years old, there can be no advertising before and after children's programs and presenters of children's programs must not feature in any adverts.

Outside the EU, in Norway, a broadcaster is now allowed to interrupt a programme with advertising breaks to a larger extent than previously.[11] The rules are quite complicated. For example, a fictional series like "Friends" could not be interrupted under the old rules. It may now be interrupted once, with a commercial break lasting at most 60 seconds.

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[10]Sweden voted against the regulations promoted by the European community because it felt that they were not strict enough.

[11]I thank Tore Nilssen for this information. The Norwegian regulations were last amended in July 2004. The "old" Norwegian regulations (the English version has not been updated since 1998) on broadcasting, including advertising, can be found at http://www.odin.dep.no/kkd/engelsk/acts_regulations/018001-990111/index-dok000-b

3 A model of advertising caps

Commercial (or free to air) television exists because of advertising revenues. Advertising caps might therefore substantially alter the performance of the industry. As well as having a direct effect on reducing nuisance to viewers and curtailing information flows from firms to prospective purchasers, caps may change both the types of programs, the quality of programming, and the variety of programs offered. To understand how advertising caps may affect broadcast firms' incentives (and the ensuing equilibrium), we need to carefully describe the structure of competition within the industry. The broadcast industry has a very interesting economic structure quite different from the industrial organization of most markets for consumer goods. The basic business model is that broadcasts are used as entertainment for viewers and these broadcasts also carry advertisements. Viewers are then exposed to advertisements as a side product of their consumption of the entertainment content. The entertainment content is paid for by advertisers who use the intermediary of the broadcast company to deliver messages to the advertising firms' prospective customers. This setup may be described as a two-sided market with network externalities.[12] In this vein, we may view the intermediary, the broadcast company, as a "platform" that needs to get both sides on board in order to generate revenues. That is, the broadcaster must deliver viewers to advertisers and does so by judicious choice of the level (and perhaps the type) of advertising it proposes along with an attractive enough vehicle to entice the prospective buyers of the advertisers products to watch. Competition with other broadcasters (other platforms), is also an important feature of the competitive landscape. A broadcaster needs to take into account the extent to which increasing the number of advertisements shown will cause viewers to switch off or switch channels, and this decision also impacts the amount of revenue raised per viewer from the advertisers.

A careful description and construction of a model of platform competition in two-sided markets therefore requires that we describe the behavior of the three types of agent who interact on the platform. We first describe advertisers, then viewers, then the broadcaster that bring the two together.

3.1 Advertisers

Advertisers wish to communicate with viewers who are the prospective consumers of the wares they advertise. We describe the advertiser side of the market by their willingness to pay to communicate. We shall abstract from various well-established features of advertising. First, marketers recognize that a viewer typically needs to see an advertisement at least two or three times before there is any marked change in her awareness of the good being advertised. Thereafter the benefit from "hitting" a particular consumer with an ad falls off quite rapidly after several exposures in a short time frame. Instead, it is assumed here that a single "hit" suffices to reach a viewer. Second, we

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[12]For more on such two-sided markets, see Armstrong (2004), Caillaud and Jullien (2001 and 2003), Rochet and Tirole (2003 and 2004), and Wright (2003).

also abstract from the time dimension. In particular, by assuming that there is a single viewing period, we circumvent the issue that a broadcaster may be able to deliver to an advertiser in one time slot a viewer who was delivered by a different broadcaster in another time slot. Third, we shall furthermore assume that all viewers are homogenous to advertisers so that there is no matching of advertisements to programs (golf clubs in a golfing program). Fourth, we shall assume also that the demand for advertising time by a particular advertiser is a simple linear function of the number of viewers delivered. This means that if an ad delivers twice as many viewers as another, then the advertiser is willing to pay twice as much in order to air the ad before the higher group size.

Let the demand price per viewer when a adverts are aired be given by $p(a)$. Thus if a broadcaster delivers N_i viewers and airs a_i advertisements, the broadcaster's advertising revenue is $N_i p(a_i) a_i$. It will be convenient in what follows to write $R(a_i) = p(a_i) a_i$, as the revenue earned on a per viewer basis when a_i advertisements are screened. We shall assume that $R(.)$ is log-concave meaning that $\ln R$ is concave. This in turn implies that the ratio R'/R is a decreasing function. This means that the revenue function has the standard hump shape, although it does not necessarily have to be strictly concave.

3.2 Viewers

We assume that viewers react to the full price, f_i, associated to viewing option i. This full price may be decomposed into advertising nuisance, which we assume to be a linear function of the number of adverts watched, and any direct monetary subscription price for watching television, if applicable. That is,

$$f_i = \gamma a_i + s_i,$$

where γ is the nuisance cost imposed per ad, a_i is the number of ads screened on channel i and s_i is its subscription price. Viewers choose which channel to watch according to a discrete choice model: viewers choose to watch the program that yields the highest utility. The conditional utility to a viewer from watching channel i is depends on the match value of the option minus the full price paid:

$$u_i = \varepsilon_i - [s_i + \gamma a_i],$$

where the term in square brackets is the full price, f_i, and ε_i is the idiosyncratic evaluation of the consumer for the particular viewing option. Viewers all dislike ads to the same degree.[13] In the sequel, this idiosyncratic benefit may be visualized as a distance function (as in models based in spatial economics) or else a random draw from a taste distribution as in standard discrete choice models.

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[13] We might also deduct from the full price any expected surplus the consumer expects from buying products showcased in the ads seen. Such surplus (loosely) reduces the effective γ, and may even make it negative. Infomercials may constitute an example of negative γ insofar as some consumers actively watch to garner information about such goods as exercise bikes. Such advertising provides a positive net benefit rather than a loss.

Denote by $N_i(f_i, f_{-i})$ the number of viewers in the population who choose to watch channel i where f_{-i} denotes the vector of full prices of other stations. We shall frequently invoke the assumption of fully covered markets, which means that each viewer selects one of the n available stations to watch. Let $N_i' < 0$ denote the derivative of the own viewer share with respect to own full price and we will use the notation N' to describe the derivative under a symmetric market situation. Thus, for example, the derivative $\frac{\partial N_i}{\partial a_i}$, when evaluated at a symmetric solution, will be written as simply $\gamma N'$.

3.3 Broadcasters

There are n broadcasters in the market and they are each individually assumed to maximize profits. These profits are given by the product of the number of viewers and the total revenues earned per viewer. The revenues per viewer potentially comprise two terms, the subscription price and the advertising revenues. Thus

$$\pi_i = N_i(f_i, f_{-i})[s_i + R(a_i)].$$

First consider the case of a monopolist which chooses only its advertising level (we refrain from considering subscription prices for the moment). The monopolist's first order condition for its choice of advertising level is

$$\frac{\partial \pi_i}{\partial a_i} = \gamma N_i'(f_i) R(a_i) + N_i(f_i) R'(a_i) = 0.$$

Since N_i' is negative then marginal revenue, $R'(a_i)$, is necessarily positive at any interior solution. This means that the monopolist reins back advertising levels so as to not lose too many viewers. This condition can usefully written as

$$\frac{R'(a_i)}{R(a_i)} = \frac{-\gamma N_i'(f_i)}{N_i(f_i)}.$$

The left-hand side is strictly decreasing under the assumption that R is log-concave, and the right-hand side is increasing in the advertising level under a similar assumption on the demand function, $N_i(f_i)$. The optimal choice is then visualized as a familiar-looking intersection (with the quantity of ads on the horizontal axis) of a downward-sloping curve with an upward sloping one. The effect of an increase in γ is then seen to be that the upward sloping curve shifts up, and so the chosen advertising level must fall. This is because a higher γ corresponds to a higher nuisance value from advertising and so a higher loss rate from raising the number of ads. Put another way, individual viewer demand becomes more elastic in advertising, and so the advertising "price" paid by viewers falls.

For the welfare analysis that follows, we must consider the surpluses accruing to three types of agent in the model.[14] We therefore sum the broadcasters'

[14]The following draws on Anderson and Coate (2004). Other authors who have addressed welfare issues include Crampes, Haritchabalet, and Jullien (2004), Dukes (2004), Hansen and Kyhl (2001), Kind, Nilssen, and Sorgaard (2004), and Stegeman (2004).

profits, the advertisers' surplus, and the viewers' entertainment benefits. Note that the advertising revenue component of the broadcasters' profit is simply the revenue under the advertising demand curve, so that the total surplus from advertising is measured simply as the full area below the advertising demand curve. In the case of a fully covered market (i.e., if all viewers watch), the analysis is also simplified because subscription prices are simply a transfer from viewers to broadcast firms and the subscription price level is therefore revenue neutral and plays no role in the overall welfare analysis. It is, however, crucial in determining the distributional effects of any policy change.

Now consider the optimal level of advertising when there is a single broadcast channel. If the market is fully covered, then the optimal level of advertising stipulates simply that the marginal cost of advertising equals the marginal benefit of advertising. With fully covered markets, the marginal cost is just the nuisance to viewers, γ (this insight carries over to the analysis of several broadcast channels which follows). The marginal social benefit is the per advertisement per viewer demand price, p, and so the social optimum stipulates the equality of advertising nuisance and demand price per viewer. In the case of markets that are not fully covered (so that there is some leakage to the non-viewing option at the margin) the marginal social cost of advertising must be augmented by the lost surplus caused by inducing another viewer to switch off. This lost surplus consists of the advertiser benefits that no longer accrue on account of that viewer.

We can now compare the optimal level of advertising with the equilibrium level for the monopoly as described above. From this comparison we can determine whether (binding) advertising caps have beneficial or detrimental social consequences. Notice first that if the advertising nuisance, γ, is very low then the monopolist's optimal choice of advertising will be where marginal revenue is practically zero. This is because the monopolist holds back advertising levels in order to extract the maximum revenue per viewer from the advertising market. However the social optimum, in the case of negligible nuisance costs to viewers, stipulates that all advertisers with positive demand prices ought to be allowed access to the viewers (who anyway do not view the adverts as an intrusion in this particular benchmark case). This clearly implies that the market equilibrium level of advertising is below the optimal level – in the same manner that a monopolist's output is below the competitive output. Any advertising cap in such a situation would just exacerbate the market failure because a binding cap must be less than the monopolist's advertising choice and therefore even further from the socially optimal level of advertising.

Consider now the opposite scenario where the advertising nuisance per advertisement is high. Indeed, this nuisance can be higher than the demand price of the advertiser with the highest willingness to pay to reach viewers (prospective consumers). In this case the socially optimal level of advertisements is zero because no consumer ought to be disturbed by an ad that returns to its sender less benefit than it inflicts on the unfortunate viewer whose entertainment is disturbed by it. However, the market equilibrium must always involve a positive level of advertising. Even though this level of advertising falls with the

nuisance cost to viewers (because the higher the advertising cost, then the larger propensity for viewers to turn off, a situation the monopolist guards against), this level of advertising must always be positive. This is because, in the absence of the ability (or the technology) to use subscription pricing, the only source of revenue for a free to air broadcaster is revenue from advertising. In this scenario the market level of advertising is necessarily too high. Any ad cap will then improve social welfare by drawing down the level of advertising by the monopolist to closer to the socially optimal level. Notice that there are strong distributional consequences to such an advertising cap. The broadcaster's profits fall (because marginal revenue is positive in the neighborhood of its choice); viewers' utility rises since they suffer less nuisance from ads; and advertisers' surplus necessarily falls as the reduced level of advertising implies a higher price per ad per viewer and correspondingly less producer surpluses for the advertisers. Some care is needed with the provisional conclusion that welfare rises from such an ad level restriction. The fact that broadcast profits have fallen will mean, in the broader context of several firms, that some firms may no longer find it profitable to enter and serve the market. Viewers would then suffer an additional loss from reduced variety of television offerings. Secondly, even with a fixed number of broadcast firms in the market, the change in profit incentives induced by the advertising cap may in turn change the quality and the type of programming offered. We turn to these themes below.

3.4   Quality

We now address how the presence of advertising caps may affect the quality provision of television programming in the market place. The presence of binding advertising caps affects the revenue earned per consumer reached and so affects the incentive to provide quality. For simplicity, we consider a monopoly. Let the utility of a consumer be given by

$$u = q - \gamma a - tx,$$

if the consumer watches television, and zero otherwise. Here q denotes quality of the program and the firm may be viewed as locating at zero; and t is the disutility cost faced by viewers per unit distance away from the ideal type, x.[15] Hence, the market length served by the monopolist is proportional to

$$\hat{x} = \frac{q - \gamma a}{t},$$

and the monopolist viewership is given by

$$N = 2\phi\hat{x},$$

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[15]The term "quality" is meant in the sense of a positive shift in demand for viewing. This may not necessarily be synonymous with a higher art form. "Higher quality" could well be Howard Stern or "Friends" over a BBC documentary or a Shakespearean drama!

where ϕ is the consumer density, and the 2 simply represents the fact that the monopoly serves consumers in both directions away from its own location. The monopolist's profit is therefore given by

$$\pi = 2\phi\hat{x}R\left(a\right) - C\left(q\right).$$

First consider the monopoly solution in the absence of any restriction on advertising levels. The advertising first order condition is

$$\frac{\partial\pi}{\partial a} = 2\phi\left[\hat{x}R'\left(a\right) - \frac{\gamma}{t}R\left(a\right)\right]$$

and the quality first order condition is

$$\frac{\partial\pi}{\partial q} = 2\phi\frac{R\left(a\right)}{t} - C'\left(q\right).$$

These first order conditions show how advertising levels and quality are related. In particular, a higher consumer density ϕ will entail a higher quality provision because of economies to scale in providing quality that the television program is effectively a public good.

The advertising first order condition above gives the following relation:[16]

$$\frac{R'}{R} = \frac{\gamma}{t\hat{x}} = \frac{\gamma}{q - \gamma a},$$

and the conditions may be combined to give $2\phi\hat{x}R'\left(a\right) = \gamma C'\left(q\right)$.

Now consider the effects of an advertising cap set at level $\bar{a}$. Then the firm's profit is

$$\pi = 2\phi\hat{x}R\left(\bar{a}\right) - C\left(q\right),$$

meaning that the quality choice is determined, as above, by

$$\frac{\partial\pi}{\partial q} = 2\phi\frac{R\left(\bar{a}\right)}{t} - C'\left(q\right).$$

This shows that a lower advertising cap will cause the monopolist's quality choice to be smaller. The social effects of this cap depend on both whether advertising was previously over-provided and whether quality was over-provided or under-provided. In particular, the monopolist's quality choice depends upon the extra revenue that may be extracted from the marginal viewer, while the socially optimal level of quality depends upon the improvement in average total surplus from further quality.

The social welfare function for this problem comprises three component parts, for viewers, broadcasters, and advertisers. The viewer surplus is the average surplus of $(q - \gamma a - t\hat{x}/2)$ over the $2\phi\hat{x}$ viewers served. The profit is

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[16]If the advertising demand is linear, $p\left(a\right) = \alpha - ba$, and the cost of providing quality is quadratic, $C(q) = \frac{q^2}{2}$, then the problem is not concave. Care must be exercised in such problems with quality fixed costs if there is insufficient curvature to marginal quality.

$2\phi\hat{x}R\left(a\right) - C\left(q\right)$, and advertiser surplus is $2\phi\hat{x}\left\{\int_0^a p\left(\tilde{a}\right)d\tilde{a} - R\left(a\right)\right\}$. The last term represents the number of viewers reached times the advertisers' surplus per viewer. Note that the revenue per viewer is simply a transfer from advertisers to the broadcaster. We can then write the welfare function as

$$W = 2\phi\hat{x}\left\{q - \gamma a - t\hat{x}/2 + \int_0^a p\left(\tilde{a}\right)d\tilde{a}\right\} - C\left(q\right).$$

where $\hat{x} = \frac{q-\gamma a}{t}$. Denote the term in brackets by Ω, which is therefore the surplus per consumer.

It is a useful point of reference to derive the full optimum for this model. First of all, the optimal quality choice is determined by

$$2\phi\hat{x} + \frac{2\phi}{t}\Omega - C'\left(q\right) = 0.$$

This indicates that, like the equilibrium, the optimum quality choice is increasing in the consumer density. The fixed cost of quality is then spread over a larger consumer base, and so the quality will be higher. Such a result also underscores the empirical findings of Berry and Waldfogel (2001) for newspapers, and is in turn based on insights in Sutton (1991) and Shaked and Sutton (1987).

The socially optimal advertising choice (again, when interior) is determined by

$$-2\phi\hat{x}\gamma - \frac{2\phi\gamma}{t}\Omega + 2\phi\hat{x}p\left(a\right) = 0,$$

and so reduces to

$$\hat{x}\left[p\left(a\right) - \gamma\right] = \frac{\gamma}{t}\Omega.$$

The left-hand side of this expression represents the positive divergence between demand price and nuisance cost, which is caused by the rate of turn-off of viewers and the consequent surplus lost on that account, as represented on the right side. An alternative interpretation (Anderson and Coate, 2004) is to view $\frac{\gamma}{t\hat{x}}\Omega$ as an additional term (on top of the direct nuisance term, γ) in the marginal cost of advertising: this term is the lost surplus per consumer (Ω) times the turn-off rate ($\frac{\gamma}{t}$).

The next issue to consider is the effect of a cap on advertising levels. Clearly, the monopolist is worse off through being constrained. Moreover, the monopolist provides a lower program quality because the cap reduces its incentives to attract viewers. A priori, it is unclear whether viewers are better off (because they suffer less nuisance from commercials) or worse off from the lower program quality. The next example gives a case where viewers are always worse off with a tighter cap.

Suppose that the demand for ads per viewer by advertisers is perfectly elastic at rate β per ad per viewer. This implies that the revenue function is $R\left(a\right) = \beta a$. The monopolist's choice of advertising for a given quality is from the advertising first order condition above as

$$a = q/2\gamma. \tag{1}$$

Suppose further that the cost of quality provision is given by $C(q) = q^3/3$. Then the profit derivative with respect to quality, q, is $\frac{2\phi\beta a}{t} - q^2$. This implies that the monopolist's quality choice, as a function of the advertising level, is given by

$$q = \sqrt{\frac{2\phi\beta a}{t}}. \tag{2}$$

Combining these last two equations indicates that the unconstrained monopoly solution is to set quality at $q^m = \frac{\phi\beta}{t\gamma}$, and to set advertising at $a^m = \frac{1}{2\gamma}$.[17] It is useful for what follows to further note that the marginal profit from increasing the advertising level, given a starting level of advertising $\bar{a}$, given that the firm is choosing its quality to maximize profits, is proportional to $\sqrt{\frac{2\phi\beta\bar{a}}{t}} - 2\gamma\bar{a}$. The consumer surplus for this problem is given by

$$CS = 2\phi\frac{(q - \gamma a)^2}{2t}$$

and, given from (2) that the quality chosen varies with an advertising cap, $\bar{a}$, according to

$$\frac{dq}{d\bar{a}} = \sqrt{\frac{2\phi\beta}{t\bar{a}}}$$

the consumer surplus varies with the advertising cap, $\bar{a}$, according to

$$\frac{dCS}{d\bar{a}} = 2(q - \gamma a)\left[\sqrt{\frac{2\phi\beta}{t\bar{a}}} - \gamma\right].$$

Now, as long as the cap is binding: that is, $\sqrt{\frac{2\phi\beta\bar{a}}{t}} > 2\gamma\bar{a}$, as noted above, then this expression is necessarily positive. Hence, consumer surplus necessarily rises with a cap. Put differently, a more binding cap necessarily hurts consumers because the downgrading the broadcaster makes to quality more than offsets the direct benefit to reduced nuisance from advertisements themselves. Since the monopolist itself is worse off with a more binding cap, then a cap is welfare deteriorating for all involved. Thus tighter advertising caps make all market players worse off.

We now address the generality of these properties. Let $N(\gamma a - q)$ denote the demand (number of viewers) for the monopolist's program, as a function of the full price, $\gamma a - q$. Assume that the monopoly problem

$$\max_{\{a,q\}} R(a) N(\gamma a - q) - C(q)$$

has an interior solution.

If there is an advertising cap at some level, $\bar{a}$, below the monopoly's preferred choice, then it satisfies

$$R'(\bar{a}) N(\gamma\bar{a} - q) + \gamma R(\bar{a}) N'(\gamma\bar{a} - q) > 0. \tag{3}$$

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[17] The second order conditions hold at this solution.

The first order condition for quality choice at level q^* is

$$-R(\bar{a}) N'(\gamma \bar{a} - q^*) - C'(q^*) = 0$$

(where the first term is positive since $N'(\gamma \bar{a} - q^*) < 0$).

Applying the implicit function theorem, this tells us that the quality choice varies with the cap according to the relation

$$\frac{\partial q^*}{\partial \bar{a}} = \frac{R'(\bar{a}) N'(\gamma \bar{a} - q^*) + \gamma R(\bar{a}) N"(\gamma \bar{a} - q^*)}{(R(\bar{a}) N"(\gamma \bar{a} - q^*) - C"(q^*))} \tag{4}$$

where we assume the denominator is negative from the second order condition for a maximum to the quality choice problem. If $N" \leq 0$, then the numerator is necessarily negative, so that a concave demand function implies that quality falls as the cap gets tighter. Otherwise, consider the following argument. From the binding ad cap condition, (3), we have that

$$\gamma R(\bar{a}) < -R'(\bar{a}) \frac{N(\gamma \bar{a} - q)}{N'(\gamma \bar{a} - q)},$$

and hence (considering the numerator of (4)) that

$$R'(\bar{a}) N'(.) + \gamma R(\bar{a}) N"(.) < R'(\bar{a}) N'(.) - R'(\bar{a}) \frac{N(.)}{N'(.)} N"(.)$$

for $N"(\gamma \bar{a} - q^*) > 0$. Now, since $R'(\bar{a}) > 0$, the R.H.S. of this expression is necessarily negative if $N(.)$ is strictly log-concave $((N')^2 - N"N \geq 0)$. Hence the L.H.S. is also negative and so $\frac{\partial q^*}{\partial \bar{a}} > 0$. The intuition for this condition is that an ad cap reduces the revenue yield per viewer delivered to advertisers, and so the broadcaster's marginal benefit is lower than without an ad cap. This leads to lower provision of quality. It is also straightforward to find conditions under which $\frac{\partial q^*}{\partial \bar{a}} < 0$. For example, if unconstrained, the monopoly advertising first-order condition (3) holds with equality. This implies that, for a binding cap in the neighborhood of the unconstrained monopoly optimum, quality is unchanged for a log-linear demand, and it actually rises with a tighter cap if the viewer demand is more "convex" than log-linear (i.e., strict log-convexity, but not more than (-1)-concavity since otherwise the second order conditions may be violated). In such cases, viewer surplus necessarily rises as the cap tightens (locally).

This latter case of log-convex demand and a cap in the neighborhood of the unconstrained solution is also interesting because quality rises with a (slightly) tighter cap, so viewer surplus does too. Indeed, from the demand function, $N(\gamma \bar{a} - q^*)$, a lower full price, $\gamma \bar{a} - q^*$, will mean higher surplus per viewer (and also a higher equilibrium number of viewers) so that viewer surplus rises with the level of the ad cap (equivalently, the tighter the cap, the lower the viewer surplus). Moreover, a tighter cap also is a tighter constraint on the broadcaster's actions and so decreases profit, but in the neighborhood of a non-binding cap, this effect is second-order small. The total welfare effect is therefore that welfare rises with a slightly tighter cap.

In summary, if demand is "convex" enough, both viewer surplus and total welfare may rise with a tighter ad cap. Otherwise, the quality reduction resulting from a cap offsets the direct viewer gain. If the quality reduction outweighs the direct effect (as was shown in the linear demand example), then tighter caps reduce the surplus of all market participants.

3.5   Product Selection and Advertising Caps

Advertising caps may also affect the breadth of products offered in a equilibrium. The basic insight follows from Gabszewicz, Laussel, Sonnac (2004). To see this, consider a simple sketch of duopoly product selection along the lines of the well-trodden framework pioneered by Hotelling (1929). In the simplest version of the model (see Lerner and Singer, 1937, and Eaton and Lipsey, 1975), firms simply compete by choosing locations (program formats in the current context) in order to maximize the number of viewers. Such would be the relevant behavioral assumption when firms are constrained by an advertising cap, or indeed if viewers face no nuisance cost from the presence cost of the advertising and advertising was fixed from the demand side. This setup is then the classic "ice-cream sellers' problem" with two firms striving to sell to the most consumers. The (unique) equilibrium is that both firms choose the central location in the market, a situation described by Boulding (1955) as the "Principle of Minimum Differentiation." Any location of one firm away from the center would induce the other to locate right next to it on the longer side of market. Notice for the later development that, as long as firms are constrained by ad caps, each wants to move in closer to its rival. This is because the market served by a firm is determined by the midpoint between its own location and that of its rival, and so is increasing as the firm moves closer to its rival (leaving aside for the moment the possibility of jumping over its rival location).

Now consider the ingredient to this model, namely the version of the Hotelling model written down by d'Aspremont, Gabszewicz, and Thisse (1979). This model, as did Hotelling, considers a sub-game perfect equilibrium in which two competing firms are to choose locations on the unit segment, following which they both rationally anticipate the sub-game equilibrium choice of prices that ensues from the location chosen in the first stage of the game. The difference introduces by these authors over the original Hotelling specification was to specify transportation as a quadratic function of distance, as opposed to Hotelling's original linear specification. D'Aspremont, Gabszewicz, and Thisse (1979) show that the unique sub-game perfect equilibrium involves the firms locating at the extreme points of the unit interval.[18] This outcome results from the balance of two opposing forces that apply to the pricing sub-game. First,

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[18]This maximal differentiation result relies on the restriction that the locations are constrained to lie within the unit interval. There does not seem any technological reason why indeed the support of the product specification must necessarily be the same as the support as the consumer taste distribution. Relaxing this restriction and instead allowing the firms to locate anywhere on the real line gives instead the equilbrium locations as -1/4 and 5/4, which means that firms do locate far apart but not as far apart as might be physically possible. See Anderson (1988) for further details.

ceteris paribus, moving closer to one's rival triggers a more acute level of price competition, in particular a lower rival's price, which a firm strives to avoid by locating far away. However, as we argued above in the fixed price version of the model, locating closer to the rival also gives the firm a higher market share. In the version of the model with quadratic transportation costs, the former effect dominates throughout the location on the unit integral leading to the maximal differentiation result.

We now show how to translate this location result into the context of the advertising framework. Suppose that the demand for ads is perfectly elastic, and each advertiser is willing to pay β in order for their advertisement to be seen by a prospective consumer (television viewer). Assume to that the number of viewers attracted to the station depends linearly on the nuisance on the advertising, and indeed that we may write the utility of a viewer at location $x \in [0,1]$ is

$$u_i = y - \gamma a_i - t|x - x_i|^2, \quad i = 1, 2,$$

where y is consumer income (for simplicity the same for all consumers), x_i is the location of product i, and t is the transportation rate per unit distance. The demand addressed to firm i, N_i, is then determined by the measure of consumers for whom u_i exceeds u_j, $i \neq j$. This is exactly the same viewer demand equation as in the standard spatial formulation. The profit to firm i can then be written as

$$\pi_i = \beta a_i N_i,$$

which is exactly the same (up to a multiplicative constant) as the formulation of d'Aspremont, Gabszewicz, and Thisse (1979), with a_i replacing the standard price p_i. Therefore, the maximum differentiation result holds under this specification that is firms avoid intensive advertising competition by locating as far apart as possible. They still would like to come closer to increase unilateral market share, but refrain from doing so to keep advertising levels, and hence advertising revenues, as high as is possible under Bertrand-Nash advertising competition.

We now allow for advertising caps in the framework sketched out above. First note that, as a function of symmetric locations, the sub-game equilibrium advertising levels are greatest the further apart are the firms. This means that an advertising cap, if set below the level that attains at maximally differentiated locations, will necessarily be locally binding on both firms. Consequently, under such a binding cap firms will find their profits locally increasing as long as the cap is binding, as they move in toward each other, following the logic of the fixed price model. However, at some point the cap must necessarily be reached since the equilibrium advertising level falls continuously to zero at the point of minimal differentiation (when firms locate together then they are indistinguishable and there is not product differentiation so that competition a la Bertrand with homogenous products and price goes to the competitive level, namely zero.) As soon as the cap is reached, the firms clearly wish to go no further together from the logic of the model with endogenous advertising levels expounded above.

The lesson from this simple sketch is first of all, that advertising caps may have an impact on product selection and the existence of caps may increase the proclivity of firms to produce similar programming. Indeed, the seminal analysis of Steiner (1952) suggests that duplication may be a prevalent problem in television broadcast selection.[19] His analysis though, relies on the assumption that broadcasters aim to maximize the number of viewers, an assumption that is only effectively tenable if advertising levels are capped (or indeed if viewers do not care about the level of advertising they consume) Nevertheless, some care ought to be exercised in taking literally the result from the quadratic cost model. In particular, this model always predicts that the free market equilibrium product selection is socially excessive (the optimal format choices being at the quartiles). Other transportation cost functions, and hence the possibilities of other outcomes prove remarkably difficult to analyze in a tractable fashion but there is no *a priori* presumption that the equilibrium format choices would necessarily lie outside the optimal ones as they do for the quadratic model.

Notice that the equilibrium in the presence of the advertising caps is at the location at which the cap is binding. This means that the cap could be judiciously set so as to induce equilibrium format choices at exactly the socially optimal level.[20]

4   Content restrictions

The restrictions on the products that are not allowed to be advertised can be understood by reference to the economics of externalities and government paternalism. Perhaps surprisingly, banning or restricting advertising may also increase industry profits under some circumstances. This section explores these themes along with the particular case of prescription drug advertising to consumers.

4.1   Paternalistic altruism and merit goods

Cigarette advertising is widely banned - even sponsorship of motor-racing by cigarette firms was recently illegal in Belgium, for example. Goods that impart negative externalities on others (e.g., second-hand smoke effects) can traditionally be treated with Pigouvian taxes on their consumption, and/or direct quantity regulations (banning smoking in bars, banning smoking by those under-age). Alcohol also may be associated with negative externalities (drunk-driving, and violent behavior towards others). Consumption of these goods is also often viewed as addictive. Economists usually prefer taxation to outright bans in cases of negative externalities: the preferences of individuals are respected al-

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[19] See though Beebe (1977) for a contrary appraisal.

[20] However, the advertising level itself may be suboptimal. Under the current specification, in which consumers always watch one of the two channels and advertisers are willing to pay a constant amount per viewer reached, the optimal level of advertising is zero if $\gamma > \beta$, and is infinite if $\gamma < \beta$.

beit under the modification that the full price paid reflects all harm done to others.

However, it may be that a consumer who is deterred from consumption may not become addicted or may give up or reduce the habit, and may later be thankful for having been induced to moderation. If people care about the consumption levels of other individuals of such "dangerous" goods, they may support regulations or taxes. In the earlier literature, the concept of "merit goods" (like education) corresponded to goods that were to be encouraged according to an implicit governmental welfare function. Cigarettes, alcohol, gambling, etc., fall in the opposite category of demerit goods that are to be discouraged. The encouragement or discouragement reflects paternalism by the Government or, indeed, on behalf of the individuals who elect the Government to act on their behalf. Why then are bans used instead of further taxes? Instead of banning cigarette advertising, taxes could be levied on advertising tobacco products, and/or the product could itself be taxed still more. Perhaps the decision by the authorities is made without full consideration of the range of available options for reducing consumption; and the symbolism may be more significant with a ban than with a higher tax (where, after all, one might suspect the Government of wanting higher consumption to raise more revenue). It may be viewed as inherently rather contradictory for the product's makers to be persuading people to smoke on the one hand (and the Government collecting revenues from that activity), and the Government on the other hand spending money persuading them not to smoke.

4.2 The effects of an advertising ban on industry profits

Banning advertising of some products also has direct economic consequences in the industries affected. The Economics of Advertising traditionally separates informative advertising from forms of persuasion. If the prime role of the advertising is informative (telling people where and how to buy the product, and informing them of new products) then a ban in advertising through some channels (cigarettes may still be advertised in magazines in the U.S., for example) may be analyzed rather like an increase in the costs of advertising. Then, some surprising results by Grossman and Shapiro (1984) suggest that oligopolists might actually see their profits rise as costs rise.[21] This is because prices rise substantially after the reduced level of information transmitted in equilibrium decreases the overlap of informed consumers and so reduces competition. Another form of informative advertising, sometimes attributed to many television advertisements, is quality signalling (see e.g., Nelson, 1974, and Milgrom and Roberts, 1986). Eliminating this role for advertising could either cause firms to switch to other forms of signalling (product price reductions, or sponsorship of sporting events, perhaps) or else could shut down signalling completely. In the latter case, one would expect it very difficult to launch new products: in

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[21]See also the discussion in Tirole (1988) for a simple exposition of their model. Bagwell (2002) provides a fine survey of the overall Economics of Advertising.

such industries one might expect only mature brands without new ones being contemplated.

Some advertising is sometimes proffered as an example of a zero-sum game. Insofar as cigarette advertising only serves to reshuffle consumers without corresponding new consumers being drawn in, then all advertising expenditures are "wasted" and firms' profits would be higher if the Government would do them all a favor by eliminating what they cannot avoid competing over, and ban advertising completely. The welfare economics of persuasive advertising are already quite controversial (even before we get to demerit goods!) because, aside from the informative context where it is clear how to proceed with evaluating the effects of more information (through advertising), there is not much agreement of whether or how advertising affects tastes. For economists in the Chicago tradition (Stigler and Becker, 1977, and Becker and Murphy, 1993) tastes are fundamental and advertising can be viewed as contributing a complementary consumption enjoyment. Banning advertising would close this down: although it is still a reasonable question to ask if closing down a device that promotes "smoking is cool" could possibly be viewed as a cause for concern! Lastly, Dixit and Norman (1979) take an agnostic stand on whether the right welfare measure to evaluate quantity changes induced by advertising is to be based on the demand before or after the advertising. Insofar as they claim that advertising is already excessive without social preferences over goods, then, in the context of demerit goods, reducing advertising (by banning TV advertising, say) must presumably be beneficial.

4.3 Direct-to-Consumer (DTC) Prescription Drug Advertising

Advertising of prescription drugs directly to consumers is prohibited all over the world except for the United States and New Zealand. In U.S., the Wheeler-Lea Act 1938 granted the FTC jurisdiction over all drug advertising.[22] However, in 1962, authority over prescription drug advertising was transferred to the FDA (Federal Drug Administration) while the FTC retained regulatory authority over over-the-counter (OTC) drug advertising. According to the FDA regulations on prescription drug advertising, the advertisement must comply with two major requirements. First, the ad must include a "brief summary", which includes providing the drug's side effects, contra-indications, warnings and precautions and the indications for use. Second, the ad must comply with the "fair balance doctrine", meaning that the ad must provide a balanced account of all clinically relevant information, the risks and the benefits.

The FDA recognizes three different types of prescription drug advertisements, which are regulated differently. The first category is "reminder advertisements", which call attention to the name of the drug product, but do not include the specification of the drug product. Second, help-seeking ads (or disease oriented advertisements), which are generally broadcast with the head-

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[22]I thank Jayani Jayawardhana for this material.

ing "see your doctor", describe the symptoms of a disease or condition, and encourage consumers to consult their physician to discuss treatment options, but do not mention the drug's name. Finally, "product claim" (or "indication" advertisements) reveal both the drug's name and the indication. While product claim ads are subject to brief summary requirement and the fair balance doctrine, reminder advertisements and help-seeking advertisements are exempt from the brief summary and fair balance requirements, as they do not reveal information about the effectiveness of a drug.

Although the brief summary requirement can be easily met by print advertisements, it can be impractical for a broadcast advertisement (which normally lasts for only about 30 seconds). In August 1997, the FDA issued the "Draft guidance for industry, consumer-directed broadcast advertisements" allowing sponsors of broadcast advertisements to make "adequate provision" of approved product labeling (known as a major statement) instead of the brief summary. After receiving the comments on the draft guidance, the final guidance was issued by the FDA in August 1999. The FDA requires that a broadcast ad through media such as television, radio, or telephone communications systems to disclose the product's major risks in either the audio or visual parts of the ad. This disclosure of risks is known as the "major statement".[23]

This recent change in the FDA guidance on DTC advertising of prescription drugs, introduced in 1997 and finalized in 1999, has opened the door to a flood of TV advertisements in the U.S. There are, of course, proponents on both sides of the debate over whether the effective legalization of TV advertising of prescription drugs is socially desirable.

On one side, patients may be induced to clamor for drugs that are inappropriate for their conditions. At the same time, patients may be "persuaded" by an advertisement that they have some condition that can be alleviated, which in turn would increase the number of visits to the doctor, allowing for discussions on the drug they are exposed to. This may be seen as undermining doctor's authority in prescription, and wasting her time on unnecessary discussions. Some argue that due to these patients demand, doctors may over-prescribe, or prescribe something costly or inappropriate, which in turn would bring negative effects on the patient.

On the other hand, DTC ads may be seen as an information source that informs the consumer about new drugs and treatments for various conditions, hence increasing the number of visits to the doctor. If the consumer was diagnosed with a condition and was prescribed a medically justified treatment, it could be welfare improving as many diseases are under diagnosed. DTC ads can

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[23]The adequate provision requirements include: 1) Disclosure in the advertisement of an operating toll-free telephone number, through which the consumer can choose to have the labeling information mailed or have the labeling information read over the phone. 2) Reference in the advertisement to an alternative mechanism, such as reference to a print advertisement, to provide package labeling to consumers with restricted access to the Internet or those who are uncomfortable actively requesting additional information. 3) Disclosure in the advertisement of an Internet web page address that provides access to the package labeling. 4) Disclosure in the advertisement that pharmacists, or healthcare providers, may provide additional information.

also increase the awareness of certain conditions and the available treatments for these conditions among the consumers. This may help improve the communication between the doctor and the patient, which in turn would help the doctor to choose the best treatment choice for the patient.

Empirical results from the study conducted by Iizuka and Jin (2002) on patient and doctor behavior suggest that DTC advertising leads to a large increase in outpatient visits but no impact on doctor's choice of drug within a therapeutic class.[24] However, the study by Wosinska (2002) on the role of DTC advertising and the cholesterol reducing drug demand suggests that DTC advertising has a significant positive effect on the demand of an individual brand for the drugs that have preferential status with the insurer (are listed on the formulary). The debate on what ought to be (not) advertised on TV will remain an active one.

5   Conclusions

The regulations on Commercial Length are broadly as follows. The EU directive allows for 9 minutes of commercials on average, with a maximum of 12 minutes in any given hour. In Australia, broadcast channels must carry at most 13 minutes of commercials on average, with a maximum of 15 minutes in any given hour. As a matter of comparison, some programs on the major networks in the United States have recorded advertising levels in excess of 20 minutes. The only length restrictions in the United States concern advertisements during children's programs, where the rules allow 10.5 minutes an hour, which rises to 12 minutes during week-days.

The economic analysis of commercial length restrictions (advertising caps) should be sited in a full-fledged two-sided market model of the broadcasting sector. If the quality, number, and types of programs are all treated as constant, the market equilibrium delivers too little advertising for low nuisance costs. Conversely, it delivers too many advertising messages for high nuisance costs to viewers. This constitutes the economic efficiency argument for regulatory length restrictions. Careful structural empirical work of the two-sided market structure in TV broadcasting can determine the crucial parameter values of nuisance cost and advertiser benefits.[25] These values can then be used to see if ad-caps are desired, and the appropriate level. However, because ad caps reduce profits, they may cause a reduction in the variety (number) of programs provided. They may also decrease differentiation among existing program types, and decrease the quality of programs (at least, if viewer demand is not "too" convex). This means that empirical work needs to account for these other performance dimensions too.

Turning now to Commercial Content Regulations, EU, US, and Australian regulations are quite similar in the broader scheme of things. All prohibit ciga-

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[24]Iizuki (2004) finds higher advertising for drugs that are new, of high quality, for under-treated diseases, and in more concentrated industries. He argues that DTCA expands markets but involves little business-stealing.

[25]See Rysman (2004) and Wilbur (2004).

rette advertising, for example. There are typically restrictions ensuring ads are not indecent (relative to current community standards), subliminal, or broadcast at higher volume than surrounding programming. The general codes regarding advertising are also applicable to TV advertising – for example, restrictions that ads not be misleading are covered by FTC rules in the US. There are some interesting anomalies in certain countries. For example, France prohibits ads for tobacco, weapons, employment, prescription medicines, alcohol, literary print, press, and movies (with some exceptions). In the UK, ads must not interrupt religious ceremonies or programs in which members of the royal family appear. In Sweden, no ads are allowed before children's programs. In the US and New Zealand, Direct To Consumer Advertising (DTCA) of prescription drugs is allowed, but this is not permissible elsewhere.

The Advertising Content Restrictions observed in practice might be ascribed in most cases to Paternalistic Altruism, and the goods so restricted could be described as demerit goods. One issue is why such goods are not taxed more directly. The answer perhaps lies in the limited horizons of the policy makers.

Banning TV commercials for certain products increases the costs of advertising (or indeed eliminates it). When the product industry equilibrium involves too much advertising (from the standpoint of the welfare accruing directly in the industry), then raising advertising costs may reduce over-advertising. For demerit goods, this must be socially beneficial. In the ("money-burning") theory of advertising to signal product quality, eliminating the possibility of signaling might be expected to make it difficult to successfully launch new brands. It might then be expected that only mature brands survive (in the cigarette industry, for example). Finally, prescription drugs advertising remains controversial. On the one hand, it may be helpful in getting patients to go to doctors to have the conditions properly diagnosed. On the other hand, doctors might be deluged with hypochondriacs and respond by over-prescribing inappropriate medicines.

There are many important future research directions for this subject. One big gap in the theoretical literature is that public television is not modeled, and most systems have a mixture of public and private broadcasting. Indeed, there are frequently other ingredients in the mixture of broadcast offerings, such as pay television, that survive alongside the commercial broadcasters. While it is reasonably straightforward to model a market environment with both pay television and commercial television (see Anderson, 2003, for a mixed market model, and Peitz and Valletti, 2005, for a model comparing the two "pure" systems), a major challenge is to convincingly model the objectives of public broadcasters. Only with a reasonable description of their objectives can we proceed to determine the performance of the overall industry, and only then will we get closer to the full economics of the desirability of advertising caps. Careful empirical work will also be most useful in evaluating proper policy. For example, some measure of the nuisance cost of ads to viewers is crucial. Work by Wilbur (2005) gives some estimates from a structural empirical model of the industry, taking full account of its two-sided nature. Wilbur is also able to address the effects on industry equilibria of devices (such as "TiVo") that allow

viewers to by-pass ads.

Another area for further research is the economics of advertising itself. Themes and empirical regularities already described in the marketing literature could be usefully brought into the mainstream of economics of the product. While the welfare economics of informative advertising is quite well understood conceptually (at least in terms of how to perform welfare analysis, although perhaps not in terms of what information is contained in ads), other forms of advertising (e.g., "persuasive" advertising) pose a greater challenge in describing benefits and how they accrue. Since ads are crowded out by caps, it especially important to determine the welfare costs and benefits from advertising. Structural empirical work again can provide estimates for some important magnitudes.

There are several messages here for students of Industrial Organization and students of media economics. First, the economics of television requires a separate analysis that specifically embodies its two-sided structure. Namely, advertisers want to contact prospective customers, and do so by accessing a "platform" (the broadcaster), which bundles together advertising that viewers dislike with entertainment content that they do like. In this context, advertising caps may have a direct beneficial effect on viewers, but they may have indirect effects given the business model: it may be that less variety is supported, and perhaps lower quality of broadcasts. Second, understanding the other types of advertising regulation means looking at categories of goods like merit and demerit goods.

The message for policy-makers follows from the two above. Specifically, media markets are different because of their two-sided structure: the basic business model is unlike that in traditional markets because advertising finances programming content. There is no presumption that market forces should deliver excessive advertising, and careful empirical work is needed in evaluating nuisance costs to viewers and the social desirability of ads. It should be recognized that advertising finances the media, and curtailing it may reduce both program quality and program variety by reducing the incentive to compete for advertisers and reducing revenues overall. The surplus accruing to advertisers is another part of the total benefits created, and this is typically not included in discussions of television regulation (or indeed, other policy aspects, such as merger analysis), but ought to be. To do so properly means also taking into account the possible divergence between the private and the social demand for advertising. Structural empirical work can be helpful in measuring various costs and benefits.

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