Economic Implications of a Tax on TV Advertising: the New Zealand Case

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This paper is intended to inform debate regarding the possible impact of a proposed tax on television advertising in New Zealand. We review the arguments for and against its introduction and, via standard economic modelling analysis, evaluate the potential implications of the tax implementation. It is demonstrated that in the particular case of the NZ market for TV advertising, buyers and sellers could be expected to share the tax burden somewhat equally, regardless of the way the tax is levied or its purpose. The tax on TV advertising would lead to a fall in profitability of every broadcaster including the public one.

Keywords: Advertising, Tax, Welfare Theory, New Zealand

Introduction

The New Zealand Labour-led coalition government that came to power in late 1999 announced that it intended a wide-ranging review of broadcasting policy. Among the areas to be reviewed were a potential ban of advertising to children (see Eagle & de Bruin 2000) and the replacement of funding that had previously been generated through the payment of an annual television set licence fee. This funding was used primarily for production of 'local programmes'.

The Minister of Broadcasting announced that the taskforce undertaking the review was to consider the possibility of a 'levy' on broadcast advertising (Scherer 2000). Opposition from industry groups has been predictably strong, with expectations of reductions in overall broadcast advertising expenditure and/or complete withdrawal from the New Zealand market by some overseas-based advertisers. If this eventuates, the New Zealand public would incur losses in quality, diversity and scope of programming.

Lately, taxes on advertising, cinema tickets and video have been looked at and rejected by the New Zealand Government on the grounds that the taxes "wouldn't have raised enough and could've crippled creative industries"[1]. However, the discussion concerning the broadcasting taxes continues in this country and overseas, and one can expect more attempts to impose them.

In this paper we focus only on the proposed levy/tax on TV advertising and apply economic modelling to evaluate its potential implications. The economic modelling is based on the assumption of rational (i.e. profit-maximizing) decision-making of the economic agents involved. This assumption enables us to make predictions as to the outcomes of the market process in television advertising before and after the tax.

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[1] See 'Movie tickets escape tax', *The Evening Post*, April 4, 2001, p.13.

First, we provide a brief overview of the relevant literature. Second, we examine specific parameters and structure of the NZ market for TV advertising. Third, we discuss demand and supply characteristics of the market. Some of the assessments are based on our survey of 22 randomly chosen TV advertisers in NZ. Finally, we draw a number of conclusions concerning (1) the impact of an advertising tax on the performance of the market in question and (2) the efficiency of the proposed taxation given its specific objectives.

Literature Overview

A number of studies contain results relevant to our present topic. The view that "ignoring market structure can lead to overestimates or underestimates of the incremental excess burden of a tax" (Katz & Rosen 1985) has broad theoretical and empirical support (see, for example, Tanaka 1993; Hamilton 1999). It is also widely recognized that economic implications of taxation are greatly influenced by demand and supply characteristics of a particular market.

Over the last couple of decades several attempts have been made to estimate parameters of the market for advertising. Bowman (1976) reports price elasticity (i.e. sensitivity) of demand for network television advertising varying from 0.73 to 0.92 but not differing significantly from one. In other words, if the price of advertising increases by 1 percent, the quantity of advertising demanded on the average decreases by nearly 1 percent. Price elasticity of supply of television advertising in his study was found to be nearly zero, which indicates an extremely low responsiveness of quantity of advertising supplied to a given percentage change in price. This was due to the highly inelastic supply of network audience. Bowman's analysis was based on monthly data (1964-1969) for the three U.S. commercial television networks. During that period of time TV advertising was still a relative novelty that definitely affected the parameters of the market under consideration.

Another U.S.-based study (Seldon & Jung, 1993) examined substitutability among the media for the years 1960-1987. The resulting estimates of substitution elasticity of demand (i.e. the percentage change in the relative quantities of advertising messages in two different media per percentage change in the price ratio) and price elasticity of demand for advertising messages suggest that the various media are fairly good substitutes. However, as the authors conclude, "broadcast advertising messages appear to be more effective than other media because the estimated own-price elasticities of demand indicate that broadcast advertising demand is less elastic than demand for advertising in other media."

A more recent empirical study of the demand for commercial television advertising in the Sydney metropolitan market conducted by Masih (1999) suggests that the price elasticity of demand is substantially less than unity in the short run and neighbouring unity in the long run. Put differently, in the short run price sensitivity of demand for commercial television advertising is very low, in the long run it increases but not significantly: the demand drops approximately by 1 percent for every one percentage point of increase in price. These results seem consistent with the findings of Cave and Swann (1986) and Tavakoli, Swann and Cave (1989) for the British TV market, but differ from those of Hendry (1992) who estimated much larger elasticities for the same market.

Clearly, no consensus has been achieved in the economic literature as to the relative elasticity of demand for TV advertising or substitutability of TV and other media of advertising. The results of studies are inevitably time- and location-related. Application of different statistical techniques might also generate opposing points of view. We base our analysis on the assumption that both parameters mentioned above are comparatively low in the New Zealand context (at least in the short run).

Theoretical Development

We start with theoretical development of the model of the NZ market for television advertising. Two questions are crucial in this respect: attributes of the product traded on the market and the particular structure of the market.

What is traded on the market for TV advertising?

In order to apply the standard demand-supply analysis to the market for TV advertising, one should clarify what actually is being traded on this market and how the quantities sold and bought are to be measured. Those who are involved in the advertising industry term the product traded "medium", "broadcasting time" or "national/regional spots".

Whatever the terminology used, for the purposes of economic analysis we can measure the amount of TV advertising (Q) as a sum of n products:

$$Q = \sum_{i=1}^{n} T_i \times A_i,$$

where T_i - broadcasting time of the i-th commercial in seconds;

A_i - average audience of the i-th commercial in thousands of viewers or in percentage points[2];

n – number of commercials in a given period of time.

Accordingly, pricing decisions within the model are assumed to be related to one "unit of advertising", i.e. one second of advertising times one thousand of audience (or one audience rating point). Price per unit of advertising might be considered as a basic rate, whereas actual ratecard values variation (across programmes, time periods/zones and regions) can be explained in terms of the effective reach of the targeted audience.

The structure of the market

The NZ market for TV advertising is dominated by the free-to-air broadcast operations, which is represented by two major broadcasters. One is the New Zealand Government owned Television New Zealand (TVNZ), with two network channels, TV-1 and TV-2. The other is the Canadian Canwest Network (CCN) that operates TV-3 and TV-4.

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[2] Average audience is an average number of people who tuned into the given time selected. It is expressed in thousands of viewers or as a percentage of the total potential audience of the targeted demographic. The latter measurement is also known as a target audience rating point (TARP).

According to recent estimations, TVNZ's share amounts to 68% of all NZ television audience, CCN's share is 21.5%.[3] In addition, there are a number of local/regional free-to-air operators.

Pay television is a growth area, with the leading operator being SKY TV (7.5% of all television audience).[4] Growing competition in this sector is emerging via operators that have started on a regional basis and are progressively extending coverage. The potential impact of technology changes, such as the Internet and digital television, on the market has yet to be determined.

At the current time, the New Zealand market for television advertising with its two dominant broadcasters falls into the category of *duopolistic* (i.e. *oligopolistic* in a broader sense) markets. We consider some important features of oligopoly by comparing it to both monopoly and perfect competition.

Two theoretic aspects of the oligopolistic market that make it very similar to the monopolistic market are worthwhile mentioning here and incorporating into the analysis. First, the supply side of the both types of market is represented by the marginal-cost curve (MC) rather than the supply curve.[5] Hence, an oligopoly, like a monopoly, chooses the profit-maximizing supply based on the intersection of the marginal-cost and marginal-revenue (MR) curves. Second, being a price maker, an oligopoly sets the price simultaneously with the quantity to supply and does this consulting the demand curve (D) it faces. However, an oligopoly deviates from the "monopolistic pattern" because self-interest drives oligopolists closer to competition. As a result, the oligopoly price is set above the marginal cost of production but lower than the monopoly price (in Fig.1 point B is located between points C and A).

The deviation of oligopolistic supply and price from those of monopoly depends on how much the economic behaviour of the oligopolistic firms differs from the monopolistic pattern in a given situation. The number of firms participating in the oligopoly and the extent to which they act together, in turn, determine this. Since only two major broadcasters dominate the NZ market for free-to-air television advertising, its outcomes must be fairly close to those of a monopoly. They could be even closer, if the broadcasters were 'allowed' and manage to cooperate in issues of production and pricing of advertising.

If the market for TV advertising was governed by a monopoly (the latter could comprise more than one TV channel), the overall quantity of advertising produced (Q_m) would be slightly lower while the price (P_m) higher than the same parameters in an oligopolistic situation (Q_o and P_o). By contrast, if the same market was perfectly competitive (another extreme), the level of advertising (Q_c) would be greater and the competitive price (P_c) less than under oligopoly.

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[3] Peak channel shares, average for month of October 2000. Source: TVNZ.

[4] Source: TVNZ.

[5] Neither a monopoly nor an oligopoly has a supply curve. A supply curve shows the quantity that firms choose to supply at any given price. Both a monopoly and an oligopoly set the price and the quantity at the same time. Thus, the concept of supply curve refers only to competitive firms (in the short run the market supply curve reflects the sum of individual firms' marginal-cost curves).
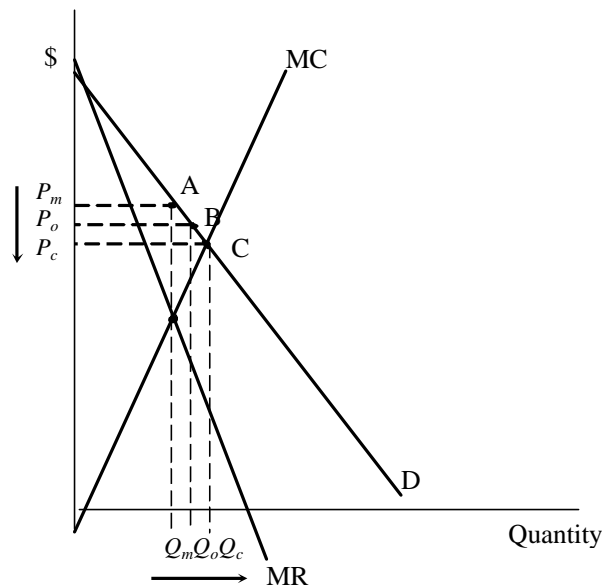
The intersection of the marginal-revenue curve (MR) and the marginal-cost curve (MC) determines the profit-maximizing quantity of advertising under monopoly (Q_m). The quantity of advertising under perfect competition (Q_c) is determined at the intersection of the demand curve (D) and the marginal-cost curve. An oligopolistic quantity (Q_o) falls in between. The demand curve shows the prices (P_m, P_o, P_c) consistent with these quantities. Thus when the number of market participants increases (from monopoly to oligopoly to perfect competition), the price of advertising decreases and the quantity of advertising goes up.

Figure 1. The possible outcomes of the market for TV advertising depending on its structure

Demand and Supply Characteristics of the NZ Market for TV Advertising

Demand and supply characteristics of the NZ market for TV advertising (along with its oligopolistic structure) are crucial for assessing potential implications of a proposed tax on TV advertising. We turn to those characteristics now.

Market demand for TV advertising

Although direct measurements of its price elasticity are unavailable, current market demand for TV advertising in New Zealand can be deemed as being fairly inelastic. This implies that the market demand curve is steep rather than flat (in Fig.1 we assumed relatively low elasticity of both demand and supply of the market concerned). In other words, any given increase (decrease) in price for TV advertising causes only an insignificant decrease (increase) in the quantity of advertising demanded. The major contributing factor is the fact that there are no close substitutes for TV advertising.

To assess the substitution effect between TV and other media of advertising in NZ we randomly chose and approached 35 TV advertisers listed in the telephone directory. We

got response from 22 out of them (which makes the response rate equal to approximately 63 %). The respondents were asked (1) how they assess the degree of substitutability between TV and other media of advertising and (2) how an increase in price of TV advertising would affect their advertising strategy. Fig. 2 illustrates the frequency distribution of answers to the first question. Only 18% of the respondents believe that TV and other media of advertising are close substitutes. The rest perceive TV and other media either as substitutes only to some extent (46%) or as not substitutes at all (36%).

The respondents' answers to the second question are varied ranging form "high cost of TV advertising will preclude us from using TV" to "whatever happens we will stay with TV". The comments of the respondents on the issue indicate that a company's expectations as to the potentially adverse effect of the increasing TV advertising price depend on a number of factors. These factors include the company's size, scope of operation (national, regional or local), specific project or product concerned, targeted audience characteristics, available advertising budget, etc. The differences in the above mentioned characteristics bear on the variations in the TV advertising demand schedules across individual firms. However, a "typical" TV advertiser appears to be a large company with a stable interest in establishing the brand name of its product nationwide and a considerable proportion of advertising budget spent on TV commercials. An advertiser of this type finds TV a "unique visual form of medium", highly cost-efficient with only few or no possibilities for substitution. This evidence leads us to believe that the absolute value of price elasticity of market demand for TV advertising is relatively low.
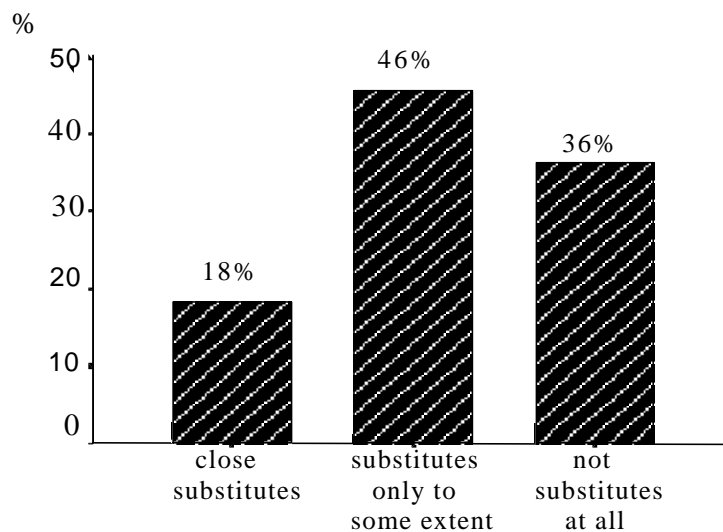
Twenty-two randomly chosen TV advertisers in NZ were asked how they assess the degree of substitutability between TV and other media of advertising. 18% of the respondents believe that TV and other media of advertising are close substitutes. 46% perceive TV and other media as substitutes only to some extent, 36% - as not substitutes at all.

Figure 2.   Frequency distribution of responses as to the degree of substitutability of TV and other media of advertising

The supply side of the TV advertising market

The supply side of the market for TV advertising is represented by a steep, upward sloping marginal-cost curve (see Fig.1). This shape of the MC curve is caused by the scarcity of the two major "resources" used in TV advertising: broadcasting time and potential audience.

The broadcasting time can be deemed 'perishable'. Seasonal peaks and troughs in demand and restrictions on the amount of commercial minutes that can be sold limit the channels' ability to 'stockpile' time. The New Zealand industry self regulates to 14 minutes of advertising and programme promotion per hour. No advertising is permitted in programmes aimed at pre-school aged children; advertising in other children's programmes is restricted to 10 minutes per hour, a move some critics see as an arbitrary restriction on the right of commercial free speech and inconsistent with the total absence of quotas in print media.

On the other hand, any attempt by the supplier to increase the amount of advertising by establishing a new TV channel is subject to the limits of the potential audience size. With increasing number of TV channels the audience would be further diffused among the channels. Besides, attracting one additional unit of targeted audience (one thousand of viewers or one rating point) requires an increasing amount of outlay in terms of producing or buying highly popular TV programmes and shows.

Finally, one can observe that the relatively high slope of the MC curve for TV advertising makes TV advertising very expensive at any given level of demand.[6] The oligopolistic structure of the TV broadcasting market in this country makes it even worse for advertisers as prices are set above the relatively inelastic MC curve.

Analysis of Economic Implications of A Tax on TV Advertising

Having developed a theoretical model of the NZ television advertising market and considered the characteristics of the demand and marginal-cost curves contained in it, we now are in a position to examine possible economic implications of a TV advertising tax.

Taxes on buyers and sellers are equivalent from the economic point of view (as illustrated in Fig.3) although politically one can be preferred over another. Whether the tax is levied on buyers and shifts the D curve downward, as in panel (a), or it is levied on sellers and shifts the MC curve upward, as in panel (b), the result is the same. The tax places a wedge between the price that buyers pay and the price that sellers receive. This means that the buyer's price is higher and the seller's price is lower than the price before taxation, and both parties are worse off. Once the market reaches a new equilibrium after the imposition of the tax (point E'), buyers and sellers start sharing the tax burden. Thus, a tax could be formally levied on buyers or sellers; tax incidence (i.e.

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[6] It is important to note that in the previous discussion we are dealing exclusively with the broadcasting price of TV advertising, which does not include the cost of producing an advertisement.

the distribution of the true burden of tax) cannot be legislated and depends on the forces of supply and demand.

In theory, a tax burden falls more heavily on the side of a market characterized by a significantly more price sensitive (i.e. elastic) curve. As our previous analysis suggests, the MC and D curves are relatively inelastic in the particular case of the NZ market for TV advertising. Hence, buyers (advertisers) and sellers (broadcasters) in this market could be expected to share the tax burden somewhat equally, regardless of how the tax is levied or what the purpose of the tax is. In other words, there would be no conspicuous imbalance in the way the burden of the tax is divided.

Another expected outcome of this analysis is that, up to a certain point, the adverse effect of the size of tax on the amount of TV advertising would be insignificant. This implies that a purely punitive tax is not going to be very effective: there will be little impact on the number of TV commercials screened.
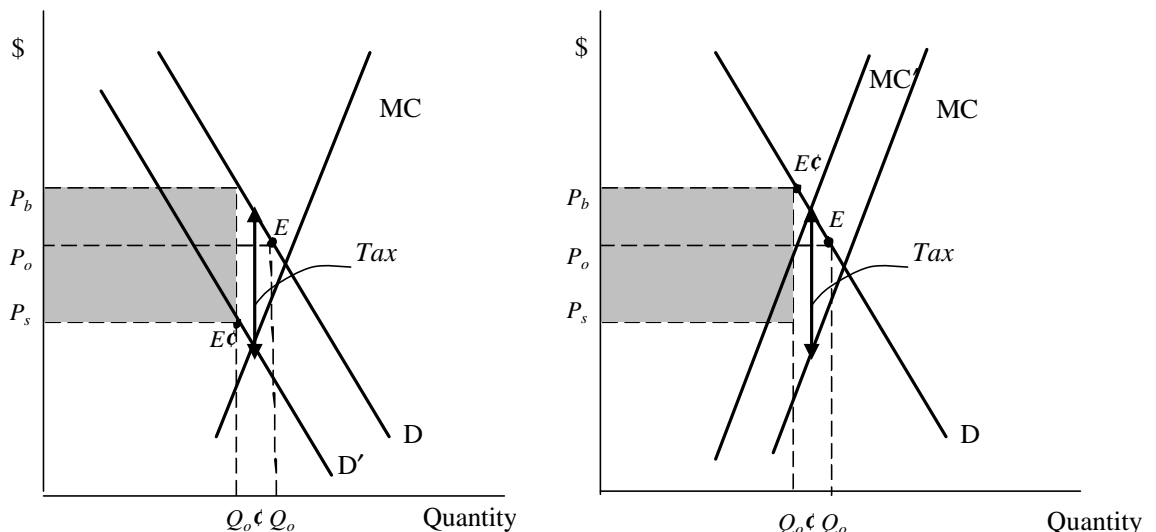
(a) Tax on advertisers   **(b) Tax on broadcasters**

Before tax: P_o – price of advertising, Q_o – amount of advertising, E – market equilibrium.
After tax: P_b – price that advertisers pay, P_s – price that broadcasters receive, $Q_o\phi$- amount of advertising, $E\phi$- market equilibrium. $P_b - P_s$ = Tax size. Tax revenue equals the area of the shaded rectangle.

When the tax is levied on advertisers, the D curve shifts downward, as in panel (a); if the tax is levied on broadcasters, the MC curve shifts upward, as in panel (b). In both cases the result is the same: advertisers and broadcasters start sharing the tax burden. Note that for an oligopoly the point of equilibrium always lies on the D curve and above the MC curve.

Figure 3. Incidence of tax on TV advertising

Alternatively, the government may have the goal of raising revenue by tax. This is plausible as a means of replacing the abolished annual licence fee for television sets.

Here the general rule of taxation economics applies: a larger tax on TV advertising would raise a greater amount of tax revenue. The specific characteristics of the NZ market for TV advertising are favorable for achieving this goal: the less price sensitive the MC and D curves are in this market, the less a tax would distort economic behaviour. However, as the tax increases, the discouragement of economic activity increases and will after some point cause a reduction in the amount of tax revenue collected.

A well-established principle of economics states that a tax of any size causes a deadweight loss in terms of reduction in total buyers' and sellers' surplus (the latter being an equivalent of the economic profit). This principle implies that a tax on TV advertising would lead to a fall in profitability of every broadcaster including the public one, regardless of how the tax is levied. This argument should not be overlooked when considering the imposition of a tax on TV advertising.[7]

Conclusions

Summarizing the discussion of the structure and other characteristics of the NZ television advertising market as well as possible implications of a tax on TV advertising, we can draw the following conclusions.

- The NZ market for free-to-air television advertising, dominated by two major broadcasters, falls into the category of an oligopolistic market. The outcomes of this market must be fairly close to those of a monopoly. In particular, this means that the price per unit of advertising is set above the marginal cost of production.

- The results of a survey of 22 randomly chosen TV advertisers in New Zealand suggest that the market demand for television advertising is fairly inelastic, at least in the short run. This implies that the market demand curve is steep rather than flat. The major contributing factor to this conclusion is the fact that there are no close substitutes for TV advertising.

- The supply-side of the market for TV advertising in NZ may be represented by a steep, upward sloping marginal-cost curve. This shape of the MC curve is caused by the scarcity of the two major "resources" used in TV advertising: broadcasting time and potential audience.

- The burden of the proposed tax on TV advertising might be expressed in terms of a higher price that buyers of broadcasting time would have to pay and a lower price that sellers of it would receive. In the particular case of the NZ television advertising market, with its relatively inelastic MC and D curves, advertisers and broadcasters could be expected to share this burden somewhat equally, regardless of how the tax is levied or what the purpose of the tax is. In other

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[7] As long as TVNZ retains its status as an SOE (state-owned enterprise), the emphasis on its commercial goals is inevitable (although currently the Labour Cabinet seeks to have TVNZ re-focused on its public service role). If, for some reason, TVNZ suffers severe losses to its revenue stream, it would be a major drain on the New Zealand taxpayer (Campbell: 2000).

words, there would be no conspicuous imbalance in the way the burden of the tax is divided.

- Unless the size of the tax is extremely large, its adverse effect on the amount of television advertising would not be significant. A purely punitive tax is not going to be very effective; there will be little impact on the number of TV commercials screened.

- If the goal of taxation is to raise revenue, the specific characteristics of the NZ market for TV advertising are favorable for achieving this goal. A larger tax on TV advertising would raise a greater amount of tax revenue. However, as the tax increases, the discouragement of economic activity in the market increases and will eventually cause a reduction in the amount of tax revenue collected.

- In any of the above scenarios, a tax on TV advertising would lead to a fall in profitability of every broadcaster including the public one, regardless of whether the tax is levied on broadcasters or advertisers. This could seriously offset the potential gains from TV advertising taxation and certainly affect the value of the SOE.

The present study's limitations are caused primarily by the indirect character of supporting evidence. Next steps should include further collection and more detailed analysis of pertinent data as well as quantitative estimates of the current price and substitution elasticities for the NZ advertising market. Therefore the results of future research could be used to test our argument and applied to policy purposes with a greater degree of confidence.

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