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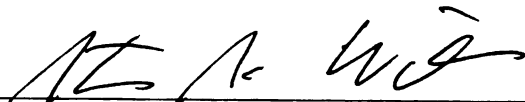
SEARCHING FOR IMPLICIT MARKET PRICES
FOR KOREAN BROADCAST ADVERTISING TIME:
A HEDONIC APPROACH

presented by

MYENG JA YANG

has been accepted towards fulfillment
of the requirements for the

Ph. D. degree in Mass Media


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SEARCHING FOR IMPLICIT MARKET PRICES
FOR KOREAN BROADCAST ADVERTISING TIME:
A HEDONIC APPROACH

By

Myeng Ja Yang

A DISSERTATION

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ABSTRACT

SEARCHING FOR IMPLICIT MARKET PRICES FOR KOREAN BROADCAST ADVERTISING TIME: A HEDONIC APPROACH

By

Myeng Ja Yang

Korea Broadcast Advertising Corporation (KOBACO), the public media representative established by the Korean government in 1981, monopolizes the sale of broadcast advertising time for all terrestrial TV and radio stations in South Korea. In setting prices for advertising time, the public media representative has been alleged by industry participants to have behaved as an industry coordinator subsidizing public interest programs carried by TV and radio broadcasters. Hence, it is suspected that KOBACO has tied under-priced advertising time in regular programs with over-priced advertising time favored by regulators (Jung, 2005; Kim, 2006). However, discussions on issues of price distortion and subsidy in the Korean broadcast advertising market have not been supported by well-designed empirical studies.

Using actual transaction data, this study estimates implicit market prices for Korean broadcast advertising time. Those prices were estimated using the hedonic regression approach where price was assumed to be determined by the characteristics of advertising time including audience size, demographic compositions, and parts of day when programs were broadcast (i.e., daypart). This dissertation's empirical challenge is to find and construct market valuations of advertising spots in the Korean broadcast advertising market where published rate cards might not reflect market values. Drawing upon the bundling literature, the proposed model assumed that package prices reflect

market values for advertising spots although individual spot prices might not. However, actual package data were not available for the study. Alternatively, package prices were constructed in terms of advertising budgets spent by an advertiser in a network through a particular advertising agency.

This study found evidence for price distortion and subsidy in the Korean broadcast advertising market. However, the size of distortion or subsidy was smaller than estimations made by previous studies. Implicit market prices for most types of advertising time in the major TV programs were estimated to be higher than the KOBACO set prices while implicit market prices for most types of advertising time in religious broadcasters' programs were estimated to be lower than KOBACO set prices. In terms of overall revenue, major networks should earn 1.42 % more, while religious broadcasters should earn 36.36% less, at implicit market prices, than they earned at KOBACO prices.

As the first econometric analysis using actual transaction data, this study contributes to KOBACO's exploration to improve its pricing formula. In addition, the reform of Korean broadcasting policy and efficient decision-making by industry participants will be assisted by the study. Beneficiaries may include content providers, broadcasters, advertisers, and other media firms. The study also contributes to the design of an explicit subsidy system should policymakers decide such a policy is appropriate. Particularly, estimated market value deviations from corresponding entries in published rate cards provide estimates of the size of rate restructuring that will occur when competition is introduced.

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This dissertation is dedicated to
my husband, Michael Lee, for his unconditional love and support,
my son, Hyun-seok Lee, for his patience awaiting my return from the library,
and God, for making all this possible.

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CHAPTER 1

INTRODUCTION

In the Korean broadcasting market, the system for selling advertising time is unique. The Korea Broadcasting Advertising Corporation (hereafter, KOBACO), the public media representative established by government in 1981, is a monopoly intermediary coordinating the sales of broadcast advertising time for all terrestrial TV and radio stations. Officially, the reason for founding KOBACO was to protect public interest and ensure content diversity, likely to be suboptimal in a competitive ad-supported market for audience with limited competition. This is consistent with the predictions of numerous program choice studies (e.g., Beebe, 1977; Owen and Wildman, 1992; Spence and Owen, 1977; Steiner, 1952). It also has been said by researchers that regulators have considered a balanced allocation of advertising budgets throughout the media to be an important policy goal. Restrictions on the prices of broadcast advertising time have been perceived as contributing to financial stability of other competitive media such as newspapers (Choi, 2005; Jung, 2005).

In addition to establishing a monopoly in the sale of broadcast advertising time, the Korea Broadcast Law has regulated quantity as well as format and frequency of broadcast advertising (Clause 73). Advertising time per program cannot exceed 10%¹ of

¹ The 10% rule applies to the program advertising broadcast right before or right after programming. Other types of ads are also available, including station break ads, caption type ads, and ads associated with time announcements (see Page 11 for details). In sum, 16.7% of program airtime is available for advertising.

TV program time and it is not permissible to insert commercials into programs (The Order of Korea Broadcast Law, 2006, Clause 59).²

Under this monopoly system, KOBACO has been at the center of criticism regarding the issues of packaged sale of advertising time and an inefficient pricing formula (Park and Lee, 2007). As KOBACO sells multi-entity and multi-program advertising time concurrently, the organization has been alleged to tie under-priced regular program spots with over-priced spots in programs favored by the regulator (Choi, 2005; KFTC, 2004; Jung, 2005; Yoo, 2005). Summarizing the problems ascribed to the monopolized broadcast advertising sales market, Yoo (2005), a director of the Korean Fair Trade Commission (KFTC), identified tying as one of KOBACO's monopolistic behaviors likely to distort advertising prices and to cause inefficient allocation of resources. Proponents of the current monopoly system, such as non-governmental organizations (NGOs), newspapers, and financially weak broadcasters, have argued that abolishing the current KOBACO system would increase the prices for ad time on the major TV networks while causing a financial crisis for minor broadcasters (Choi, 2005; Jung, 2005). Previous studies (Jeon, 2004; Jung, 2005) claimed that KOBACO's packaging practice has been tolerated or, in a sense, facilitated by the regulators to promote their policy goals: subsidizing financially weak broadcasters and "public interest" programming within the major networks (Park and Lee, 2007). Packaging can be a mechanism for implementing a subsidy as it forces advertisers to purchase ad time for public interest programs at a higher price than its value while purchasing ad time in regular programs at a lower price than its value.

² In many countries, TV and radio commercials are delivered within and between programs. Those broadcast between programs are called "adjacencies." If this terminology is used, only "adjacencies" are permitted in Korea.

More clearly, a recently published paper (Park and Lee, 2007) describes the existence of a packaging system in the Korean broadcast ad time market as a fact. In the paper (of which the first author is a KOBACO researcher) the authors argue that, although there is a tendency for the prices not to be determined in the market, demand and supply are equated in the market through the packaging practice where ad time in programs whose values are higher than KOBACO set prices is sold in combination with ad time in programs whose values are lower than KOBACO set prices. So, prices for packages are market prices but component prices may not be.

Despite all the policy and academic debates, however, there has been no explicit evidence of such subsidies in the market except a recent paper (Park and Lee, 2007). Officially, KOBACO has set prices for ad time based on a published formula and each contract is recorded as if individual spots were sold independently at the price specified by the formula. What has been conducted in the market is the profit regulation of the major networks³ and the implicit obligation imposed on KOBACO to sell advertising time for programs believed to provide an important public service, such as traffic safety, education, religious or local programming, regardless of technology. As the government granted TV or radio licenses for the public broadcasting, it required KOBACO to secure the minimum revenues necessary for public interest programs to be produced continuously (Park and Lee, 2007). In a situation where there is no explicit subsidy system available for the public broadcasting services, an implicit subsidy mechanism tends to be accepted as reasonable by the industry as well as the public. The implicit

³ Profits of the major networks have been regulated in many countries as their advertising prices have significant impacts on those of other firms within or outside of broadcasting industry (Lee, 2000). For example, in the U.K., Channel 4 revenues are regulated not to exceed 14% of total advertising revenue, and 50% of excessive revenue is to be remitted to ITV (Min, 1995). In Netherlands, public broadcaster's advertising revenues are regulated to maintain balance with other media (Lee, 1995*).

subsidy system is believed to operate by forcing advertisers to buy packages of both commercial and religious slots whose prices are arguably biased downward for the commercial programs but upward for the public interest programs (Park, 2005; Kim, 2006). However, KOBACO's pricing mechanism has never been tested formally. For in-depth discussion, however, it is necessary to understand the Korean broadcast market structure and pricing mechanism.

Market Structure and Pricing Mechanism

The Korean terrestrial broadcast market is composed of three national broadcasters, ten local broadcasters networked with each other for national broadcasting, and eight independent broadcasters established to support religious and local programming. Each of the national and networked local broadcasters owns both TV and radio stations while the independent broadcasters operate only radio stations,⁴ with the exception of iTV from 1997 to 2004⁵. The three national broadcasters including KBS, MBC, and EBS are non-profit entities owned by government-created public institutions. KBS owns and operates 18 local stations and MBC has 19 local subsidiaries. EBS utilizes KBS facilities to transmit its signal nationally. Ten networked local broadcasters are all privately owned and one of them, SBS, is licensed to cover the Seoul region, produces and provides programs to the other nine local broadcasters while each produces its own local programming. Despite the gap in the number of local stations, the disadvantage of SBS in audience reach has been mostly offset by cable carriage of over-the-air

⁴ Whereas some public broadcasters have cable TV channels, they are not licensed for OTA TV broadcasting. Hence, OTA radio stations are included in my analysis.

⁵ iTV is the only independent broadcaster operating both over-the-air TV and radio stations. It covers Incheon, the western area of Gyeonggi, and the Gangseo-gu district of Seoul, the capital of Korea. Its license had been suspended from 2004 to 2007 due to failing to fulfill requirements set by the government.

broadcasters. Cable penetration in Korea is approximately 80%. Regarding the number of channels, KBS has two channels, KBS1 and KBS2, while the other broadcasters have only one channel.

To fund programming, KBS1 levies an obligatory signal reception fee⁶ but the others, including KBS2, MBC, SBS, EBS, and religious broadcasters, sell advertising time. For this reason, KBS1 is more strictly regulated by the government than are other major broadcasters. KBS2 programming is similar to that of MBC and SBS. On the other hand, EBS, established exclusively for the TV delivery of educational content, receives 3% of the obligatory signal reception fee collected by KBS (The Order of Korea Broadcast Law, 2006, Clause 49). At the same time, EBS is supported by the Korea Broadcast Development Fund (KBDF) which the Korea Broadcast Commission (KBC) levies on commercial broadcasters. In 2004, approximately 15% of the fund (KW 17.3 of 116.2 billion) was spent to support EBS (KBC, 2005). In addition, EBS sells commercial time to advertisers through KOBACO, but its dependency on ad revenues is not as strong as that of the religious broadcasters due to explicit support from government.

While the costs of KBS1 and EBS have been supported explicitly via the obligatory signal reception fee (The Korea Broadcast Law, 2006, Clause 64) and the KBDF, it is a general interpretation that the losses of religious broadcasters have been implicitly subsidized by KOBACO through the packaged sale of their ad time with the major TV networks' ad time. This implies that an important policy goal of diversity, arguably represented by religious programming, has been left in the hands of KOBACO

⁶ Clause 64 of the Korea Broadcast Law (2006) reads: "Anyone who owns a TV set to receive broadcasting signal should register its ownership of TV set and pay the signal reception fee to KBS." However, referring to the clause 67 (2) of the same law, KBS has appointed Korean Electronic Power Company (KEPCO), the government owned monopoly, to collect the fee on behalf of KBS, which adjusts the fee with the permission of House of Representatives.

which may have no means to support them other than to package commercial programs in the major TV networks with public interest programs in the religious broadcasters.

Until recently, however, KOBACO did not distinguish public interest programs from commercial programs in calculating prices⁷ or in constructing packages (Park and Lee, 2007, p. 338). Instead, KOBACO has set target revenues assumed to be sufficient for each broadcaster to sustain its operation. Broadcasters typically identified as subsidy recipients are religious broadcasters including BBS (Buddhism, FM Radio), FEBC (Christian, AM Radio), CBS (Christian, AM and FM Radios), PBC (Catholic, FM Radio), and WBC (Traditional Korean Religion, FM Radio). Despite the roles of EBS in delivering educational TV content to audience, it has not been mentioned in the literature as subsidized via packaged sale of ad slots. Exclusion of EBS from the list of subsidy recipient seems to be because EBS has other sources of subsidy such as the obligatory signal reception fee and the KBDF. EBS's need for packaged sale of ads might not be as strong as religious broadcasters. On the other hand, the omission of independent local TV or radio stations such as iTV and SunnyFM covering Incheon area and KFM covering Suwon area from the list of presumed subsidy recipient seems to be attributed to their ownership structure. They were established by private companies with the purpose of profit maximization by delivering commercial content to the particular areas.

In addition to these, public service obligations have been undertaken by the major TV networks as well. The Korea Broadcast Law (2006, Clause 50) requires the major TV networks to maintain the proportion of entertainment programming under 50% of their air time. The regulated networks are required to fill the rest of their airtime with educational

⁷ KOBACO introduced a public interest program index to its pricing formula in 2005. This gives 5% premium to the ad time in the designated public interest programs.

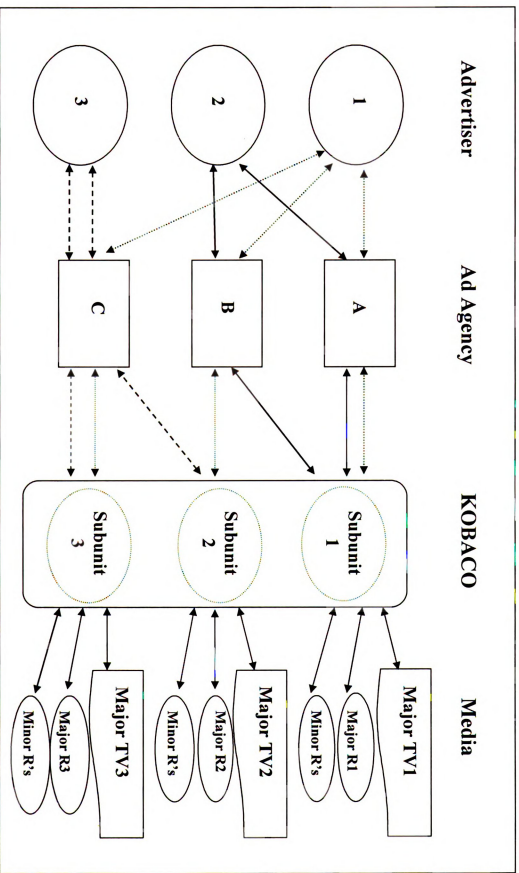
and cultural programming. Hence, the public broadcasting services should be defined in a rather broader term in Korea to include the public service programming of the major TV networks as well as the religious broadcasters.

Regarding sales of broadcast ad time, four institutions are involved in ad time transactions: advertisers, ad agencies, KOBACO, and broadcasters (see figure 1). Advertisers buy ad time through ad agencies which in turn go to KOBACO to buy the time. KOBACO represents all the terrestrial TV and radio stations. But KOBACO organizations are divided into three subunits to represent one of the three major TV networks, its radio subsidiary, and its associated minor broadcasters including religious and local broadcasters. In order for an ad agency to buy ad time in programs of three different major TV networks, it must buy it separately through each KOBACO subunit. An advertiser can work with one or more ad agencies to buy ad time.

Two advertising sales markets exist in Korea, defined in terms of contract duration: upfront⁸ and scatter. The longer-term contracts (generally, longer than six months but shorter than a year) are made in the upfront market while the shorter-term contracts (generally, shorter than six months) are made in the scatter markets. The upfront market is held twice a year, April and October. Spots sold in the upfront market begin to air in May and November respectively. Among slots sold in the April upfront market, those contracted for greater than six months are excluded from sales in the October upfront market as they are still on the air. KOBACO generally sets a target of selling 50% of ad time inventory in the upfront market. Ad time not sold in the upfront

⁸ The term of “upfront” is used differently in Korea than in the US. Upfront in USA is associated with sales that take place substantially in advance of a television season, while scatter market sales can occur any time. However, the distinction between upfront and scatter in Korea is more related to contract duration than to timing.

Figure 1. Transactional Relationships Between Organizations



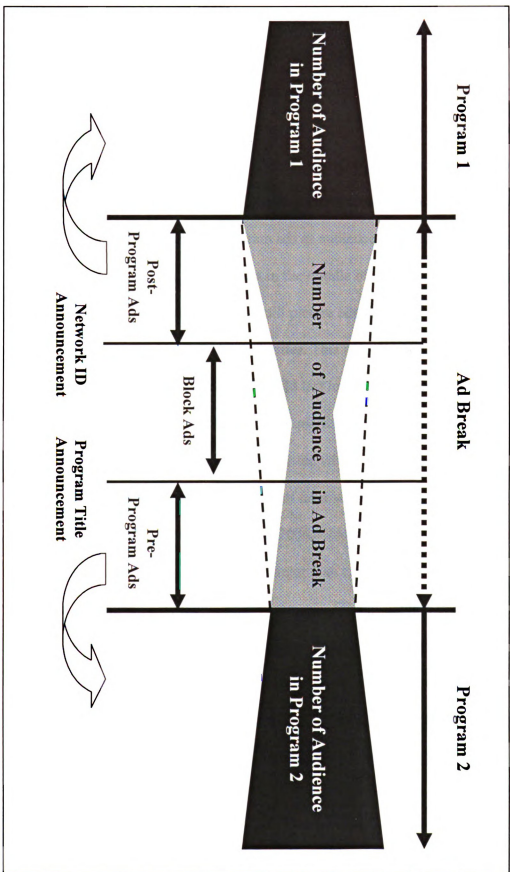
market is sold in the scatter market. Depending on length of contract, the scatter market is divided into two sub-markets: one for commercials being aired for three to six months and one for commercials airing less than three months.

In general, there are two types of ad slots available in the market: slots for program ads and for block ads. The ad break has been divided into three parts. The part in the middle of the ad break is a block ad, and the two separate parts on each side of the ad break are program ads (see figure 2). As Korean broadcast regulation prevents broadcasters from inserting ads within a program, all the ads are broadcast between two programs. However, while the reported audience ratings are those for the adjacent programs, the values of ad time to advertisers are different depending on their placement within the ad break. The gap between the size of a program's audience and the size of the audience during adjacent ad time is largest in the middle of the break. Hence, KOBACO has divided the ad break into three parts and charged lower prices for block ads than program ads.

Program ads are the most abundant and most preferred advertising resource in Korea. While there is a restriction on total program ad minutes per program (10% of program duration), there is no regulation on per spot ad length. However, the most popular are 15-second commercials for TV and 20-second commercials for radio. Within the time allowed for program ads, half (5% of program minutes) are delivered before the program (i.e., pre-program ads), and the remainder after the program (i.e., post-program ads).

Block ads are further divided into three sub-types. Station break (SB) refers to ad slots placed between pre-program and post-program ads. Seemingly, this type of ad is

Figure 2. Types of Advertising Time



indistinguishable from program ads. Technically, SB is separated from the post-program ads of the preceding program by a network ID announcement and from the pre-program ads of the following program by its title announcement. Five percent of program airtime is allowed for SB ads. Specifically, they are limited to two broadcasts an hour and four commercials per SB within 1.5 minutes. Radio can air SB commercials up to four times an hour. Each radio SB is allowed to have four commercials within 1.2 minutes. SB ad slots tend to have less value than program ads as audience size decreases by the distance from a program, having the lowest point in the middle of the commercial break.

Caption-type ads refer to text or still picture ads delivered during the announcement of network ID or program titles. This type of advertising is allowed up to six times an hour only on TV. Each ad should last less than ten seconds. The size of this type of advertisement cannot be bigger than a quarter of screen size.

Finally, there are commercials associated with time announcements. Broadcasters announce the time at every hour or every half hour while inserting ads during the announcement. The Korea Broadcast Act (2006, Clause 59) limits this type of ad to not more than two an hour. Each can last no longer than ten seconds, ten times a day. In sum, maximum advertising time including program ads, SB ads, caption type ads, and ads associated with time announcements, comprises 16.7% of total program airtime.

All individual advertising units are sold at prices determined by a formula published by KOBACO no matter whether they are sold in the upfront market or in the scatter market. Park and Lee (2007, pp. 337-338) describe the formula as follows (footnotes added):

Standard price for an advertising spot = required revenues per second of a network⁹ × length of an advertising spot¹⁰ × index of an expected audience rating of a program¹¹ × index of the program's environment¹²

As presented above, the pricing formula for TV during these periods incorporates several factors such as spot length, expected audience rating, and market environment. Expected audience rating is a product of genre and past performance of daypart,¹³ time of day divided into four categories reflecting the size of overall television audience predicted for those times (see figure 3). Scholars accept these factors as important determinants of ad time prices (Fournier and Martin, 1983; Park, 1996) and they are applied widely in the industry. Prices set by the formula become the bases from which rate adjustments are calculated.

⁹ Required revenues per second for each network are calculated by dividing total required revenues for a network by its total commercial time allowed.

¹⁰ The length of an advertising spot varies depending on demand from advertisers. However, 15 seconds are most common for TV commercials and 20 seconds for radio commercials.

¹¹ Expected audience rating of a program is a product of the expected audience rating of a daypart and an index of genre of the program. The first term represents the simple average of long-term (past two years) and short-term (past 3 months) audience ratings of a daypart in each network. The multiplier index for a genre reflects the relative average of past ratings in a time period for different genres. The genre is assigned one of seven index levels. Regardless of the network, drama/movie/entertainment receives the highest multiplier index while composites and unclassifieds receive the lowest. Expected audience rating is then transformed into the multiplier index.

¹² The index of expected audience rating of a program, in turn, is multiplied by the index of market environment, which represents the demand/supply ratio (D/S ratio) for advertising spots of a specific program. The D/S ratio assigned one of 13 index levels within a range of 150% to 40% where 150% indicates that demand for ad time is 1.5 times of its supply while 40% indicates that demand for ad time is 40% of its supply. While all other factors considered are not program specific, the index of market environment represents expectations of the performance of a particular program. The D/S ratio is influenced by the advertisers' preferences for a particular program. What advertisers consider most is the actual audience rating of the program. Thus, this factor reflects the gap between audience ratings calculated by the formula and those anticipated by advertisers at contract time. In this sense, the index provides feedback from the audience rating of a program to its net profits, and therefore creates incentives for the networks to invest in program production budgets. In reality, the ratio is subjectively determined by KOBACO sales personnel using intuitive calls based on years of experience.

¹³ A television day is divided into 4 dayparts based on the size of the overall audience. Dayparts are categorized as SA, A, B, and C in TV depending on advertisers' preference, where daypart SA is equivalent to prime time in the US broadcasting system, while daypart C is the time slot in the early morning and late night and is least desirable. Daypart A is in the early or late fringes of daypart SA while daypart B is between daypart A and C (KOBACO, 2006). Radio divides dayparts into three: A, B, and C in order of most valued to least valued.

Figure 3. Dayparts for TV and Radio Programs

TV															
Weekday															
07:00		08:30		09:30		12:00		17:00		19:00		20:00	23:00	24:00	24:30
C	B	A	B	C	B	A	SA	A	B	C					
Saturday															
07:00		08:30		09:30		17:00		19:00		23:00		24:00		24:30	
C	B	A	B	A	B	A	SA	A	B	C					
Sunday															
07:30		08:30		19:00		23:30		24:00		24:30					
C	B	A		A	SA	A	B	C							
Radio															
Weekday/Weekend															
06:00		07:00		16:00		18:00		21:00		24:00					
C	B	A	B	A	B	C									

Examples of such adjustments include preemption¹⁴, designation for ad placement¹⁵, seasonal premiums or discounts¹⁶, and discounts for venture firms eligible for daytime advertising spots at around 30% of formula prices (KOBACO, 2006).

The pricing formula used for TV block ads is similar to that for TV program ads but uses different indexing factors. The formula for radio ad slots is basically the same except that the audience rating factor is excluded from the formula because radio audience ratings are not reported as comprehensively as or as regularly as TV ratings. While TV audience ratings are reported daily by two well-known audience research companies (Nielsen and TNS), there is no formal audience research company for radio programs. KOBACO subscribes to HRC radio audience reports published quarterly. To fill the gap, research companies such as Lee's PR and ACR irregularly survey radio audiences at the request of broadcasters, advertisers, or other interest groups (Park, 2005). Due to the lack of organizational support and low reliability, radio audience ratings have been disregarded in KOBACO's ad pricing formula (Kim, 1999).

It has been known that there is no volume discount in practice, or published on the rate cards. This fact indicates that calculated spot prices are applied to spots purchased in the package. Informal interviews with advertisers reveal that package price is simply the

¹⁴ Preemption offers advertisers the right to acquire certain previously sold ad spots if they pay higher prices than the previous buyers. Preemptible spots are generally announced in advance. All spots in preemptible programs are sold only on a preemption basis. For example, if 24 spots are available for a 60-minute program, all 24 spots are available for preemption if any are. Preemption contracts generally last for a month but are guaranteed up to six months if the offered prices are higher than thrice the formula price (KOBACO, 2007).

¹⁵ Advertisers can designate the location of ad slots purchased at extra costs. Concerning the placement of the commercial, a slot is selected from the slots available before or after programs (Note that ad messages cannot be inserted within a program in Korea.) As audience size tends to decrease closer to the middle of the commercial break, advertisers generally prefer placement closer to a program.

¹⁶ The formula prices are adjusted seasonally to take into account the seasonal fluctuations of audience size and demand for ad time. At least, 10% of the formula prices are discounted for the purchase of ad time during the off-peak season while premiums of around 10% of are applied during peak season. In 2006, peak season included September, October, May, and June while off-peak season included July, August, January, and February.

sum of individual spot prices in a package. Many industry observers believe that the formula itself is biased downward for programs with high commercial value and upwards for programs with low commercial value. If, as alleged, prices on rate cards were distorted, it is natural for the previous studies not to find empirical evidence of price efficiency in the broadcast advertising market as presented in the literature review.

Rationale for the Study

These pricing practices raise two interrelated issues to be investigated. One is that KOBACO cannot know how well its posted prices compare to implicit market prices and no one knows whether KOBACO has approximated market prices well. This study tests if there are distortions built into their pricing formula, more specifically, whether the factors they employ to determine prices appropriately reflect true market values. The second issue is whether there are subsidy flows from other programs to programs favored by regulators. Selling ad time in favored programs in a package with other programs' ad time and setting prices for the other programs' ad units lower than their market values while selling time in favored programs at above market rates is the mechanism whereby subsidies could be implemented.

Because ad units are sold in packages, market prices for ad time in different programs from different providers cannot be observed directly. If package prices are determined by market forces, however, we can assume market values for the ad units comprising packages are implicit in the package price. Given the lack of empirical knowledge of implicit market prices, regulatory bodies must sit as puzzled arbiters of conflicting claims made by various private and public interest groups. For example, Park

and Lee (2007) argue that the current KOBACO pricing system has been improved to reflect the market values of ad time, while others claim that the distortion is still significant. Expanding the pricing issues to the policy concerns, some (i.e., Park, 2004; Jeon, 2004) state that policy change from monopoly to competition will cause a significant price increase for major networks and financial distress for public broadcasters while Jung (2005) and others claim that there will be little price impact from regulatory regime change. Depending on the methods employed, predictions of likely price increases range from 10% (Jung, 2005) to 400% (Park, 2004) for the major networks.

In either case, however, previous studies have substantial shortcomings. Studies using published rate cards (e.g., Lee, 1995; 1997; 2004; Kim and Lee, 2004; Park, 2004) are flawed because advertising spots are sold in packages, and there is no way to know whether advertisers value the spots in the packages at their published rates. Even the study employing a survey method to estimate advertisers' willingness to pay (Jung, 2005) contains limitations: (1) surveys may systematically under-estimate market prices as advertisers report their willingness to pay more conservatively in response to a survey than their behavior in the market would indicate (Monroe, 1990, p. 107–112); at the same time, (2) translating survey results into demand and supply curves requires a number of *a priori* assumptions such as frequency of advertising purchase by advertisers and the number of spots supplied to these survey participants. The assumptions tend to render the results arbitrary and unreliable.

Hence, this study develops a model to estimate implicit market prices for Korean broadcast advertising time using actual transaction data, which enables estimation of the

level of price distortion under the KOBACO system and of the cross-subsidies alleged to exist due to packaging practices. Implicit market prices are estimated using the hedonic approach where price is determined by characteristics of component advertising time. Factors assumed to influence market value include audience size, demographic composition, and daypart (Fournier and Martin, 1983; Napoli, 2003; Wildman, 2003).

The empirical challenge of this study is to find and construct market valuations of ad spots in the Korean broadcast market where published rate cards may not reflect market values. Drawing on bundling theory see e.g. Venkatesh and Kamakura, 2003; Adams and Yellen, 1976; Schmalensee, 1984; McAfee, McMillan, and Whinston, 1989; the proposed model assumes that package prices reflect market values for the ad spots although the individual spot prices may not. This assumption implies that a buyer's reservation price for the package is equal to the sum of his or her separate reservation prices for component ad spots. However, actual package data were not available for the study. Therefore, composite package prices were constructed from the ad budgets spent by an advertiser on a network through a particular ad agency. Constructed composite packages for individual advertisers were comprised of all ad time all packages purchased by an advertiser through a specific ad agency. Composite package prices were measured as each advertiser's purchases from the agencies. This approach reflects the actual transaction practices where individual packages purchased by advertisers did not mix ad slots across agencies or networks.

This dissertation is organized as follows: Chapter I introduces the background and goals for the study. Chapter II reviews related literature. First, the studies of prices for Korea broadcast advertising time are reviewed. Second, the theoretical and empirical

aspects of the hedonic model are reviewed to develop the model for this study. Third, three different viewpoints on the valuation of packages are reviewed briefly from the perspective of the bundling literature. Chapter III describes a hedonic model developed to estimate implicit market prices for Korean broadcast advertising time. Chapter IV describes the data and methodologies for measuring individual variables. Chapter V reports regression results. Chapter VI discusses the dissertation's contributions and limitations and its implications for future studies.

CHAPTER 2

LITERATURE REVIEW

Studies on Prices for Korean Broadcast Advertising Time

The transaction system for Korean broadcast advertising time has been studied mostly from the perspective of policy change (Kim, 2004; Kim, 2006; Yang, 2007; Jung, 2007). These studies equate the monopoly transaction system with inefficient ad time pricing in the market and they assume that the most popular programs are under-priced to sell protected types of programs at higher prices than their market values. However, these assumptions have never been empirically tested with sufficient evidence. Nevertheless, studies undertaken by Lee (1995; 1997; 2004) and Jung (2005) should be acknowledged for their contributions to the understanding of the Korean broadcast ad pricing system and exposition of the level of possible price distortion, which also is a goal of this dissertation.

Lee has conducted several empirical studies to investigate relationships between broadcast ad time prices and program performance. In a study published in 1995, he analyzed 391 television programs aired in the first half of 1995 and found that ad time prices were not determined by program performance. For example, while ad time prices for the programs delivered during the same daypart were fixed at KW 4,788,000 in a particular week of May 1995, audience ratings ranged from 5.8% to 32.5% for these programs.

In an extended study of the four major media, TV, radio, newspapers and magazines, Lee (1997) stated that the study confirmed his previous findings that Korean

broadcast ad time prices are not well explained by audience ratings. In 2004, the author replicated his 1995 study to evaluate the reform of KOBACO's pricing system in 2000 when the "global standard (GS)" ad pricing system was introduced with the goal of setting prices based on audience ratings, market environment, and required ad revenues for the networks. The author concluded that audience ratings were still not reasonably taken into account for ad time pricing. His conclusion was based on the facts that only 55% of price variation was explained by audience ratings and that comparative ratios of average price to average audience rating were inconsistent across the dayparts and networks.

However, Lee does not explain why he sees 55%, the variation in rate card price explained by audience seconds, as too low to interpret KOBACO prices as efficient. Generally, ad time prices are not fully explained by audience seconds, as uncertainties are involved with the prediction of audience ratings at the point of contract (Fournier and Martin, 1983). Only 57% of USA ad time prices, believed to be efficient market prices, was explained by the number of viewers, the number of viewing males aged 18-49, and the number of viewing females aged 18-49 exposed to the 30-second spot (Fournier and Martin, 1983, p.49). More fundamentally, however, studies such as Lee's (1995; 1997; 2004) using published rate cards are flawed because advertising spots are sold in packages, and whether advertisers value spots in the packages at their published rates is indeterminable. His studies have been cited without criticism in subsequent discussions of KOBACO's pricing system (e.g., Kim and Lee, 2004).

While attempts are made by Lee (1995; 1997; 2004) to find evidence for inefficient ad time pricing in the Korean broadcast ad market, others explain causes and

effects of inefficient ad time pricing. For example, Kim, et al. (2003) argued that, due to packaging practices, KOBACO's pricing system has caused loss of social surplus in both types of programs, subsidizing and subsidized. Kim and Lee (2004) also claim that investment efficiency and program quality cannot be improved until a strong relationship is established among investment, audience rating, and return on program production. Studies indicating packaging practices as a reason for price distortion include Choi (2005), Jeon (2004) and Jung (2005). Especially, Park and Lee (2007), clearly posit the existence of a packaging transaction system in Korean broadcast ad time market. In the paper, the authors argue that although there is a tendency for prices not to be determined in the market, demand and supply are cleared in the market through the packaging practice where ad time in high valued programs is sold in combination with ad time in low valued programs.

Accepting KOBACO's packaging practice as a fact, Jung (2005) attempts to estimate the implicit market prices for Korean broadcast advertising time. In a survey of the 100 largest advertising agencies, the author found that current, posted prices deviated significantly from willingness to pay for the programs showing the equivalent performance. He found that willingness to pay for programs with a 25% audience rating, typical for popular primetime dramas assigned to daypart SA, was KW 20-million, which was 26% higher than MBC's published price, 34% higher than SBS's published price, and 42% higher than KBS's published price. As for prices for ad time in daypart A, estimated market prices are KW 8-million for MBC and KW 7-million for SBS and for KBS. These estimates are higher than the published price by 22%, 25%, and 10%, respectively. On the other hand, willingness to pay for ad time in dayparts B and C was

estimated to be lower than the published prices by 13% to 23% depending on the networks. On average, ad revenue was estimated to increase by 14.8%. The author also estimated implicit market prices for religious broadcasting while admitting limitations of prediction. Employing the same method used in the prediction of TV ad slots, he claimed that religious broadcasters' revenues would decrease by at least two thirds.

The findings, if the employed methodology is deemed reasonable, provide evidence of the existence of price distortions caused by packaging practices. Otherwise, it is difficult to explain KOBACO's charging lower prices than those advertisers are willing to pay for time in popular programs. Also, it would be impossible for KOBACO to sell time in dayparts B and C as well as in the religious broadcaster's programs at prices above what advertisers would be willing to pay if purchasing time in these programs on a stand-alone basis.

Nonetheless, the survey method using advertisers' self-stated willingness to pay (Jung, 2005) has the limitation that advertisers tend to report their willingness to pay more conservatively in surveys than in the market (Monroe, 1990, p. 107–112). Moreover, assumptions made for the study contain serious limitations. Jung (2005) administered a survey to the 100 largest advertisers and drew a demand curve by quoting the willingness to pay indicated by 82 subjects who returned questionnaires. Then he adjusted the supply for the ad time in each daypart referring to the average program hour, the number of respondents, and the probability that the 100 largest advertisers would buy more than one ad slot and that other advertisers would purchase the particular ad slot. The study estimated prices for the ad time in daypart SA by assuming that the supply for the ad time on a one-hour program was 24, the total number of ad slots allowed for a one hour

program (24 = 10% of 60 minutes / 15 seconds). However, the study increased the supply of ad slots to 42 in daypart A, to 72 in daypart B, and to 72 in daypart C, assuming an increasing probability that the 100 largest advertisers would buy more than one ad slot and that advertisers would also purchase the particular ad time. But he did not provide any supporting arguments why these particular assumptions are employed. Small changes in these assumptions could produce significant changes in the estimated market price.

Hence, it is meaningful to explore implicit market prices using actual transaction data reflecting advertisers' purchasing patterns. Consumers, including advertisers, basically react to the market based on their demands for products and substitutes for them. In the advertising market, it is reasonable to assume that advertisers would pay no more for ad time than its value to them as buyers are well-informed by advertising agencies about prices and substitute products. Even when ad time is sold in packages due to regulation or for other reasons, there should be indicators that reflect market demand. Hence, the present study proposes a hedonic model to investigate the following research questions:

RQ1. What are the implicit market prices for advertising spots?

RQ2. Are there cross-subsidies flowing from some types of programs to other types of program?

RQ3. If subsidies exist, how large are they?

Hedonic Price Estimation Studies and Advertising Time Prices

Significant research has been conducted to estimate ad time prices for different media. Especially, the hedonic approach has provided an empirical framework for studies assessing the relationship between ad time prices and the characteristics of media audiences upon which ad prices are based (Fisher, McGowan, and Evans, 1980; Fournier and Martin, 1983; Waterman and Yan, 1999; Koschat and Putsis, 2002). In the hedonic model, measures of audience demographics have been treated in the same way product attributes are treated in studies of demand for other products and services. This logic is stated most explicitly, perhaps, by Fournier and Martin (1983) in their article on the price of station-sold time in local television markets, who characterize their econometric model as a hedonic model.

The theoretical exploration of the relationship between product characteristics and the demand for a product was pioneered by Lancaster (1966, 1971). Different from traditional economic theory of consumer demand, the author assumes that utility or satisfaction from goods is derived from product characteristics, not from the product itself (Ratchford, 1975). While it has been acknowledged as a “revolutionary” change of perspective, Lancaster's assumption of infinite divisibility makes his model difficult to apply to some goods, especially, to “expensive and infrequently purchased goods” (Ratchford, 1975, p.71). A rather convenient solution for empirical modeling was developed by Rosen (1974) following initial modeling by Griliches (1971). Rosen assumes that “the various goods sold in a market are indivisible, and that a consumer buys only one brand of the goods per year” (Ratchford, 1975, p.71). Hedonic price functions suggested by Rosen have been acknowledged as “empirical summaries of the

relationship between the prices and the characteristics of goods sold in differentiated product markets” (Pakes, 2003, p. 1580).

While a series of papers investigated the theoretical issues of the relationship between characteristics and prices for the differentiated products (Rosen, 1974, Epple, 1987, Anderson et al., 1992, Berry et al. 1995; Feenstra, 1993; Pakes, 2003), hedonic analysis achieved its popularity by providing a convenient empirical framework for industry members and researchers. To design an empirical model based on the hedonic approach, it is therefore important to define characteristics correctly, although, as Lancaster himself admits (1971, Ch. 9-10), there may be “severe difficulties in defining characteristics operationally”.

In the context of ad time pricing, Webster and Lichty (1991) suggest numerous factors affecting broadcasts’ advertising revenues. Included are audience size, demographic composition, and daypart. Gensch and Ranganathan (1974) found significant mean differences among demographic groups in their preferences for program types and it is generally believed that advertisers value age group 18-49 more than others (CAB, 1989, p 22; Barnes, 1990, p. 32). Napoli (2003) also asserts that firms advertising products for a target group aged 18-49 pay relatively higher prices for spots reaching a higher proportion of viewers in the category. Fournier & Martin (1983) and Park (1996) also assumed that the market equilibrium value of audiences exposed to commercial messages will differ between age groups and found evidence supporting this assumption.

Even among the same age group, however, a study by Koschat and Putsis (2002, p. 267) found that increasing the fraction of women has a negative effect on the price. This indicates that advertisers prefer male audience members to female audience

members and therefore a relative increase in the female proportion of the audience will reduce price after controlling for other factors. Fournier and Martin, (1984, p. 49) also found that the fraction of an audience comprised of women aged 19-49 had smaller effect on price than the fraction of men aged 19-49. Hence, including demographic characteristics of audience, such as age and gender, should improve the accuracy of predictions of ad time prices. However, the effects of audience segments on prices for broadcast ad time can differ depending on cultural context. Difference in viewing patterns among demographic groups should be larger in countries where individualism dominates than in countries where family-oriented norms dominate. If all family members watch the same programs, then demographic segmentation does not have much impact on in ad time prices.

In an empirical study, Fisher, McGowan, and Evans (1980) also found that daypart has an effect on audience revenues in the broadcasting programs. This seems to be a reflection of reality (Waterman and Yan, 2001; Lee, 2004). In the context of the Korean broadcast market, KOBACO defines daypart as “a central factor determining prices for the broadcast ad time” as it “reflects life style and size of audience in specific hours of broadcasting” (Lee, 2004). Currently, the broadcast day in Korea are divided into four parts for TV: SA (8pm-11pm), A (8:30am-9:30am, 7:00pm-8:00pm, 11pm-midnight), B (7:00am-8:30am, 9:30am-noon, 5:00pm-7:00pm, midnight-0:30am), and C (noon-5:00pm, 0:30am-7:00am). The time slots mentioned above apply to weekdays. Weekends have different time schedules.¹⁷ Radio divides its broadcast day into three

¹⁷ On Saturday it is SA (7:00pm-11pm), A (8:30am-9:30am, 5:00pm-7:00pm, 11pm-12:pm), B(7:00am-8:30am, 9:30am-5:00pm), C (0:30am-7:00am); On Sunday it is SA (7:00pm-11:30pm), A (8:30am-7:pm, 11:30pm-midnight), B (7:30am-8:30am, midnight-0:30am), C (0:30am-7:30am)

components regardless of day of the week: A (7am-4pm, 7pm-9pm), B (6am-7am, 4pm-6pm, 9pm-midnight), and C (midnight-6am).

While audience size and dayparts tend to co-vary, they have been considered as different variables. While dayparts are fixed before contracts are made, knowing the exact size and the composition of the subset of an audience composed of an advertisers' potential customers is extremely difficult or impossible as no one in the industry can make perfect predictions. Even the viewers themselves do not know exactly what they will watch or listen to before they actually choose (Napoli, 2003). Furthermore, even after media consumption is complete, audience research firms, and thus media operators and advertisers, do not know the exact composition of an audience due to statistical problems of audience measurement. The uncertainty involved in estimating audience size affects pricing decisions and thus the revenues of a media firm. As such, daypart has merit in determining ad time prices but does not incorporate the unique characteristics of programs. The performance of a program differs depending on genre, plot, scenario, director, actor/actress, and many other factors even within the same daypart. Despite difficulty in prediction, audience rating captures the variance which is not captured by daypart.

Although the hedonic model is acknowledged to be a convenient method to estimate valuation of ad time attributes, its theoretical and methodological weaknesses have been addressed by many researchers. Especially, Garrod and Willis (1999) point out that the hedonic model only can estimate consumption benefits, while Garrod's previous work (1994) addresses more analytical problems such as omissions of important characteristics and incorrect mathematical specification of the model. However,

Vanslebrouck et al. (2003, p.19) claim these limitations can be taken into account adequately. Referring to Palmquist (1991) and Freeman (1993), they argue that “ignoring the producer side does not create theoretical or econometric problems” when the focus is on buyers’ valuation of product characteristics. This is applicable to the Korean broadcast ad time market as the supply of the ad slots is fixed by regulation. This implies that all advertisers make their profit-maximizing choices given the prices of ad time (Wildman, 2003) as prices reflect the existing market given the supply of ad time and its characteristics.

Despite the abundance of empirical studies utilizing the hedonic method, few studies have been conducted to explore empirically the implicit market prices for a bundle of products. However, the pervasive use of bundling strategy in reality to sell products, specifically ad spots (Park, 2004; Tankard and Henry, 1993), increases the need to explore implicit market prices for component products sold in bundles. Meeting the need with the hedonic approach is the central focus of this study. Closest to the present study is research conducted by Koschat and Putsis (2002) who interpret the advertising space as a product that bundles different audience demographics and attempts to find implicit market prices for each unbundled (targeted) audience, by decomposing the value of each demographic group from the bundled audience. In a strict sense, however, every hedonic model for advertising price has a bundling component in it. For example, Fournier and Martin (1983) looked at bundled prices of audience demographics, since they viewed the price for a television spot as the sum of the values of the audience segments sold. However, Koschat and Putsis (2002) advance the logic to estimate the

implicit market prices for component demographics. Their argument is summarized in the following statement (Koschat and Putsis, 2002, p. 264):

Because market price is expressed as a function of a product's characteristics, the availability of objective measures of a product's characteristics combined with observations on market prices enables a researcher to estimate the implicit price of each characteristic. Therefore, market price can be broken down into the components that correspond to the characteristics of the product.

However, the present study differs from the work by Koschat and Putsis (2002) in terms of research purpose and methods employed: they explored the bundling of audience segments, not bundling of different ad units. They intended to explore networks' revenues expected to be generated by the targeting strategy given that current spot prices are the market price for an audience given its demographic composition. This study, however, explores implicit market prices for the individual ad spot comprising a package where package prices, defined as the ad budgets spent by an advertiser through a particular ad agency in a network, are assumed to reflect market values. Despite the lack of literature exploring prices for the bundled ad spots from the hedonic perspective, the prior studies using the hedonic model provide a theoretical and empirical foundation for the present study.

In order to use the hedonic approach, it is critical to have market prices as a dependent variable in the model. However, published rate cards in the Korean broadcast ad market are known not to reflect market values. Hence, it is important to find an alternative variable reflecting market values for advertising slots. The proposed model assumes that package prices are the sums of true market values for each component ad slot in the package regardless of prices on the published rate card. This is an especially salient issue for this study because, if the package price is the sum of market prices for the component programs, it should respond to the sum of their quality characteristics as

well. While the mathematical presentation of this argument is reserved for Chapter III, the bundling literature provides theoretical support for the rationale.

Implicit Market Prices for the Bundled Products

Regarding relationships between the value of the bundle and the stand-alone values of the components, bundling literature, specifically the theory of reservation prices, suggests three different possibilities: super-additive, sub-additive, and strictly-additive (Venkatesh and Kamakura, 2003). Super-additivity occurs when a consumer's valuation for a bundle is larger than the sum of the stand-alone values for the component products, while sub-additivity describes the opposite condition where a consumer's valuation is smaller than the sum of the stand-alone values for the component products. Strict-additivity refers to the middle position where a consumer's valuation for the bundle is equal to the sum of his or her separate valuations for the component products.

The difference in the consumer's valuation for the bundle compared to the stand-alone products is attributed to the unique relationships among bundled products. Super-additivity arises when products complement each other in the bundle while sub-additivity arises when products substitute for each other in the bundle as Venkatesh and Kamakura (2003) explain:

When products are complements, a consumer's reservation price for the bundle is superadditive in those for the component products. Guiltinan (1987) suggests that complementarity arises because of search economies (e.g., oil and filter changes at the same gas station), enhanced customer satisfaction (e.g., ski rental accompanied by a lessons package), and improved total image (e.g., offering lawn care and shrub care services). Alternatively, when the products are substitutes, a consumer's reservation price for the bundle would be subadditive in those for the components. This is likely when the products offer (some) overlapping benefits (e.g., "Coke" and "Pepsi") or when they compete for similar resources such as a consumer's time.

On the other hand, strict additivity arises when the component products are independent of each other (Venkatesh and Kamakura, 2003). Venkatesh and Kamakura (2003) conclude that many bundling articles develop their arguments based on this strict additivity assumption after surveying key papers including Adams and Yellen (1976), Schmalensee (1984), McAfee, McMillan, and Whinston (1989). The empirical analysis is simplified considerably by strict additivity. Hence, this paper will follow convention and rely on the strict additivity assumption.

CHAPTER 3

EMPIRICAL MODEL OF IMPLICIT MARKET PRICES

Estimation of Implicit Market Prices

A hedonic model is developed to predict implicit market prices on the basis of audience demographics and other characteristics of programs to which advertising messages are attached. Past hedonic studies have suggested many factors affecting rates that broadcast television networks and stations charge advertisers (Webster and Lichty, 1991; Fournier and Martin, 1983; Levin, 1980; Poltrack, 1983; Wirth and Bloch, 1985). Among variables found to affect ad time prices, the proposed model includes audience size, demographic composition, and daypart as independent variables.

While the proposed model is constructed drawing upon previous studies, it is not relevant to directly apply previous approaches to the Korean market as there is no evidence that published rate cards approximate market prices (Lee, 1995; 1997; 2004; Kim and Lee, 2004; Jung, 2005). Hence, it is important to find a reasonable, alternative variable that reflects market price. A model is constructed based on the assumption that the package price (P_i) is the market price for the bundle of ad units in package i

($P_i = p_1 \times x_1^i + p_2 \times x_2^i + p_3 \times x_3^i \dots$), where p_j and x_j represent market values and ad units sold respectively for advertising units in program j , for $j = 1, 2, 3, \dots, J$ where J is the number of programs in the bundle as well as the last program listed.

This assumption is reasonable because advertisers would not pay more than their willingness to pay for the packaged products. According to Venkatesh and Mahajan

(1993), an individual who expects to buy J products is likely to buy the bundled products if the bundled price (P_i) or the mean price per product (P_i / J) is less than or equal to his/her total or mean reservation price. Bundling articles commonly assume that a consumer's reservation price for the bundle is equal to the sum of his or her separate reservation prices for the component products.

In the context of the Korean broadcast ad market, the package price is the sum of the products of the prices set by KOBACO and the corresponding quantities of ad units in the package ($P_i = k_1 \times x_1^i + k_2 \times x_2^i + k_3 \times x_3^i + \dots$). The necessary equality of the two sums of prices and quantities can be represented as follows:

$$P_i = p_1 \times x_1^i + p_2 \times x_2^i + p_3 \times x_3^i + \dots = k_1 \times x_1^i + k_2 \times x_2^i + k_3 \times x_3^i + \dots \quad (3.1)$$

where KOBACO set prices ($k_1, k_2, k_3 \dots$) can differ from their corresponding implicit market values ($p_1, p_2, p_3 \dots$) if KOBACO's prices are determined by the factors other than market value.

If the package price is the sum of market prices for the ad units in the component programs indexed by j , it should respond to the sum of their quality characteristics. To illustrate the argument, a simple formula is created where the market price for a spot in program j in package (p_{ij}) is a linear function of audience size (A_{ij}) and a dummy for the program's daypart (D_{ij}). Audience size is the total number of viewers watching a particular program while dummies for daypart indicate the categorical variables for the dayparts, SA, A, B, and C where daypart B is treated as a base case. Thus, we have:

$$\hat{p}_{ij} = \alpha + \beta_1 A_{ij} + \beta_2 D_{ij}^{SA} + \beta_3 D_{ij}^A + \beta_4 D_{ij}^C \quad (3.2)$$

If individual market prices are summed up across ad units in a package, the left side of the equation becomes the package price (P_i) and the right side of the function becomes the sum of the products of the coefficients and the independent variables which now are the sum of the viewing audiences ($\sum_j A_{ij}$) and the sum of ad spots in each daypart ($\sum_j D_{ij}^{SA}, \sum_j D_{ij}^A, \sum_j D_{ij}^C$) in the package. The sum of ad spots in each daypart is the total number of ad spots the advertiser purchased in each daypart, which could include multiple spots in some programs. As the sum of dummy values in each daypart becomes the number of ad spots in each daypart, the notation of the sum of daypart dummy, " $\sum_j D_{ij}$ ", is transformed into the number of ad spots in each daypart, " $\sum_j N_{ij}$ ", to minimize confusion. While the function with dummy variables (3.2) has the base case as daypart B and the coefficient for each dummy is interpreted as each daypart's incremental effect relative to the base case, an equation with $\sum_j N_{ij}$ does not need to have a base case and the coefficients for $\sum_j N_{ij}^{SA}, \sum_j N_{ij}^A, \sum_j N_{ij}^B, \sum_j N_{ij}^C$ indicates their own effects on the package price. Thus, interpretation of the constant term (α) also changes. While α in equation (3.2) represents the original intercept and includes the effect of the base case, the corresponding term ($\bar{\alpha}$) in an equation with $\sum_j N_{ij}$ represents the old intercept term without the effect of daypart B. ($\bar{\alpha}$) is thus replaced by $((\bar{\alpha}) \sum_j N_{ij}^T)$. Thus, we have:

$$\begin{aligned} \sum_j P_{ij} = & \bar{\alpha} \sum_j N_{ij}^T + \beta_1 \sum_j A_{ij} + \delta_1 \sum_j N_{ij}^{SA} + \delta_2 \sum_j N_{ij}^A \\ & + \delta_3 \sum_j N_{ij}^B + \delta_4 \sum_j N_{ij}^C = P_i \end{aligned} \quad (3.3)$$

However, reality is more complex than this. Advertisers buy advertising spots reflecting demographic characteristics of consumers of their products and the effects of spot duration on consumer behavior. Hence, the preferred specification is where P_i is the package price, A_{ij}^{m2049} is the number of viewing males aged 20-49 in the package, A_{ij}^{f2049} is the number of viewing women aged 20-49 in the package, and A_{ij}^{other} is the number of male and female audience aged other than 20-49 weighted by the length of ad spots in the package. For simplicity, the number of viewers weighted by the spot seconds is called audience seconds. Total audience seconds are calculated by multiplying the ad time purchased in each program times the size the program's audience size and then summing the resulting products over all programs in the package. N_{ij}^{SA} is the number of ad spots in daypart SA, N_{ij}^A is the number of ad spots in daypart A, N_{ij}^B is the number of ad spots in daypart B, N_{ij}^C is the number of ad spots in daypart C weighted by the lengths of individual ad spots in the package. The weighted number of ad spots is called the number of ad units. Hence, $\sum_j N_{ij}^T$ is now the total number of ad units in the package.

The relationship can be represented as follows:

$$P_i = \bar{\alpha} \sum_j N_{ij}^T + \beta_1 \sum_j A_{ij}^{m2049} + \beta_2 \sum_j A_{ij}^{f2049} + \beta_3 \sum_j A_{ij}^{other}$$

$$+ \delta_1 \sum_j N_{ij}^{SA} + \delta_2 \sum_j N_{ij}^A + \delta_3 \sum_j N_{ij}^B + \delta_4 \sum_j N_{ij}^C + e_{ij} \quad (3.4)$$

Where P_i is a nonnegative dependent variable and e_{ij} are the sum of independent random errors with a mean of zero.

Reality adds more complexity to the model. Packages are constructed with various types of ad slots including program ad slots and block ad slots for the major TV networks (KBS-TV, MBC-TV, and SBS-TV) as well as for the subsidized radio broadcasters (FEBC-AM, CBS-AM, CBS-FM, PBC-FM, WBS-FM). Hence, the product should be specified further by identifying TV-program ads, TV-block ads, radio-program ads, and radio block ads where radio indicates those subsidized. In the final model, the package price (P_i) is modeled as a function of TV audience seconds for each ad type and

each demographic specification ($\sum_j A_{TVij}^{PGm2049}$, $\sum_j A_{TVij}^{PGf2049}$, $\sum_j A_{TVij}^{PGother}$;

$\sum_j A_{TVij}^{BLm2049}$, $\sum_j A_{TVij}^{BLf2049}$, $\sum_j A_{TVij}^{BLother}$, where superscript “PG” and “BL” represent

program ads and block ads respectively), radio audience seconds described by the ad

types and demographics ($\sum_j A_{Rij}^{PGm2049}$, $\sum_j A_{Rij}^{PGf2049}$, $\sum_j A_{Rij}^{PGother}$; $\sum_j A_{Rij}^{BLm2049}$,

$\sum_j A_{Rij}^{BLf2049}$, $\sum_j A_{Rij}^{BLother}$), number of TV ad units in each daypart ($\sum_j N_{TVij}^{PGSA}$,

$\sum_j N_{TVij}^{PGA}$, $\sum_j N_{TVij}^{PGB}$, $\sum_j N_{TVij}^{PGC}$; $\sum_j N_{TVij}^{BLSA}$, $\sum_j N_{TVij}^{BLA}$, $\sum_j N_{TVij}^{BLB}$, $\sum_j N_{TVij}^{BLC}$), and

number of radio ad units in each daypart ($\sum_j N_{Rij}^{PGA}$, $\sum_j N_{Rij}^{PGB}$, $\sum_j N_{Rij}^{PGC}$; $\sum_j N_{Rij}^{BLA}$,

$\sum_j N_{R_{ij}}^{BL_B}, \sum_j N_{R_{ij}}^{BL_C}$). There is no commonly accepted, complete or accurate information

on radio audience size available. Hence, the audience second variables related to the radio ad time are removed from the proposed model. A complete listing of the variables with their definitions appears in Table 1. The model can be represented as follows:

$$\begin{aligned}
P_i = & \bar{\alpha} \sum_j N_{ij}^T + \beta_1 \sum_j A_{TV_{ij}}^{PG_{m2049}} + \beta_2 \sum_j A_{TV_{ij}}^{PG_{f2049}} + \beta_3 \sum_j A_{TV_{ij}}^{PG_{other}} \\
& + \beta_4 \sum_j A_{TV_{ij}}^{BL_{m2049}} + \beta_5 \sum_j A_{TV_{ij}}^{BL_{f2049}} + \beta_6 \sum_j A_{TV_{ij}}^{BL_{other}} \\
& + \delta_1 \sum_j N_{TV_{ij}}^{PG_{SA}} + \delta_2 \sum_j N_{TV_{ij}}^{PG_A} + \delta_3 \sum_j N_{TV_{ij}}^{PG_B} + \delta_4 \sum_j N_{TV_{ij}}^{PG_C} \\
& + \delta_5 \sum_j N_{TV_{ij}}^{BL_{SA}} + \delta_6 \sum_j N_{TV_{ij}}^{BL_A} + \delta_7 \sum_j N_{TV_{ij}}^{BL_B} + \delta_8 \sum_j N_{TV_{ij}}^{BL_C} \\
& + \delta_9 \sum_j N_{R_{ij}}^{PG_A} + \delta_{10} \sum_j N_{R_{ij}}^{PG_B} + \delta_{11} \sum_j N_{R_{ij}}^{PG_C} \\
& + \delta_{12} \sum_j N_{R_{ij}}^{BL_A} + \delta_{13} \sum_j N_{R_{ij}}^{BL_B} + \delta_{14} \sum_j N_{R_{ij}}^{BL_C} + e_{ij}
\end{aligned} \tag{3.5}$$

Table 1. Variables and Data

Variable	Definition	Source
P_{abc}	Package Price: Sum of KOBACO set prices for different ad time purchased by advertiser a through ad agency b from network c	KOBACO
$\sum_j A_{TV,abcj}^{PG_{m2049}}$	Total TV audience seconds for the male 20-49 group revealed to program ads in a package abc	KOBACO, The Korea Statistical Yearbook 2004
$\sum_j A_{TV,abcj}^{PG_{f2049}}$	Total TV audience seconds for the female 20-49 group revealed to program ads in a package abc	KOBACO, The Korea Statistical Yearbook 2004
$\sum_j A_{TV,abcj}^{PG_{other}}$	Total TV audience seconds for other than male/female 20-49 group revealed to program ads in a package abc	KOBACO, The Korea Statistical Yearbook 2004
$\sum_j A_{TV,abcj}^{BL_{m2049}}$	Total TV audience seconds for the male 20-49 group revealed to block ads in a package abc	KOBACO, The Korea Statistical Yearbook 2004
$\sum_j A_{TV,abcj}^{BL_{f2049}}$	Total TV audience seconds for the female 20-49 group revealed to block ads in a package abc	KOBACO, The Korea Statistical Yearbook 2004
$\sum_j A_{TV,abcj}^{BL_{other}}$	Total TV audience seconds for other than male/female 20-49 group revealed to block ads in a package abc	KOBACO, The Korea Statistical Yearbook 2004
$\sum_j N_{abcj}^T$	Total number of ad units among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{PG_{SA}}$	Total number of TV program ad units in daypart SA among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{PG_A}$	Total number of TV program ad units in daypart A among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{PG_B}$	Total number of TV program ad units in daypart B among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{PG_C}$	Total number of TV program ad units in daypart C among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{BL_{SA}}$	Total number of TV block ad units in daypart SA among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{BL_A}$	Total number of TV block ad units in daypart A among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{BL_B}$	Total number of TV block ad units in daypart B among programs (j) in a package abc	KOBACO
$\sum_j N_{TV,abcj}^{BL_C}$	Total number of TV block ad units in daypart C among programs (j) in a package abc	KOBACO

Table 1 (cont'd)

$\sum_j N_{R_{abcj}}^{PGA}$	Total number of religious broadcasters' program ad units in daypart A among programs (j) in a package abc	KOBACO
$\sum_j N_{R_{abcj}}^{PGB}$	Total number of religious broadcasters' program ad units in daypart B among programs (j) in a package abc	KOBACO
$\sum_j N_{R_{abcj}}^{PGC}$	Total number of religious broadcasters' program ad in daypart C among programs (j) in a package abc	KOBACO
$\sum_j N_{R_{abcj}}^{BLA}$	Total number of religious broadcasters' block ad units in daypart A among programs (j) in a package abc	KOBACO
$\sum_j N_{R_{abcj}}^{BLB}$	Total number of religious broadcasters' block ad units in daypart B among programs (j) in a package abc	KOBACO
$\sum_j N_{R_{abcj}}^{BLC}$	Total number of religious broadcasters' block ad units in daypart C among programs (j) in a package abc	KOBACO

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However, this model could suffer from multicollinearity among variables because the total number of ad units in the package ($\sum_j N_{ij}^T$) is correlated, with a varying degree, to all other variables in the model. That is, adding another unit into the package also increases audience size as well as ad units in one of dayparts. It is possible that $\sum_j N_{ij}^T$ swamp everything else in the regression with this model. Hence, it is necessary to divide the formula by $\sum_j N_{ij}^T$ to focus on per commercial unit price rather than package price.

This treatment produces a model where average price per unit in the package ($P_i / \sum_j N_{ij}^T$) is explained by average audience seconds per unit for each demographic

characteristic in TV ($[\sum_j A_{TVij}^{PGm2049} / \sum_j N_{ij}^T], [\sum_j A_{TVij}^{PGf2049} / \sum_j N_{ij}^T],$

$[\sum_j A_{TVij}^{PGother} / \sum_j N_{ij}^T], [\sum_j A_{TVij}^{BLm2049} / \sum_j N_{ij}^T], [\sum_j A_{TVij}^{BLf2049} / \sum_j N_{ij}^T],$

$[\sum_j A_{TVij}^{BLother} / \sum_j N_{ij}^T])$ and the fraction of each daypart in TV and radio

$([\sum_j N_{TVij}^{PGSA} / \sum_j N_{ij}^T], [\sum_j N_{TVij}^{PGA} / \sum_j N_{ij}^T], [\sum_j N_{TVij}^{PGB} / \sum_j N_{ij}^T], [\sum_j N_{TVij}^{PGC} / \sum_j N_{ij}^T],$

$[\sum_j N_{TVij}^{BLSA} / \sum_j N_{ij}^T], [\sum_j N_{TVij}^{BLA} / \sum_j N_{ij}^T], [\sum_j N_{TVij}^{BLB} / \sum_j N_{ij}^T], [\sum_j N_{TVij}^{BLC} / \sum_j N_{ij}^T],$

$[\sum_j N_{Rij}^{PGA} / \sum_j N_{ij}^T], [\sum_j N_{Rij}^{PGB} / \sum_j N_{ij}^T], [\sum_j N_{Rij}^{PGC} / \sum_j N_{ij}^T], [\sum_j N_{Rij}^{BLA} / \sum_j N_{ij}^T],$

$[\sum_j N_{Rij}^{BLB} / \sum_j N_{ij}^T], [\sum_j N_{Rij}^{BLC} / \sum_j N_{ij}^T]$). As the sum of the fraction terms equals to 1,

however, one needs to remove a fraction term (say, fraction of TV program ads in daypart B) from the following model as a base case.

$$\begin{aligned}
P_i / \sum_j N_{ij}^T = & \hat{\alpha} + \hat{\beta}_1 (\sum_j A_{TVij}^{PGm2049} / \sum_j N_{ij}^T) + \hat{\beta}_2 (\sum_j A_{TVij}^{PGf2049} / \sum_j N_{ij}^T) \\
& + \hat{\beta}_3 (\sum_j A_{TVij}^{PGother} / \sum_j N_{ij}^T) + \hat{\beta}_4 (\sum_j A_{TVij}^{BLm2049} / \sum_j N_{ij}^T) \\
& + \hat{\beta}_5 (\sum_j A_{TVij}^{BLf2049} / \sum_j N_{ij}^T) + \hat{\beta}_6 (\sum_j A_{TVij}^{BLother} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_1 (\sum_j N_{TVij}^{PGSA} / \sum_j N_{ij}^T) + \hat{\delta}_2 (\sum_j N_{TVij}^{PGA} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_3 (\sum_j N_{TVij}^{PGC} / \sum_j N_{ij}^T) + \hat{\delta}_4 (\sum_j N_{TVij}^{BLSA} / \sum_j N_{ij}^T) + \hat{\delta}_5 (\sum_j N_{TVij}^{BLA} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_6 (\sum_j N_{TVij}^{BLB} / \sum_j N_{ij}^T) + \hat{\delta}_7 (\sum_j N_{TVij}^{BLC} / \sum_j N_{ij}^T) + \hat{\delta}_8 (\sum_j N_{Rij}^{PGA} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_9 (\sum_j N_{Rij}^{PGB} / \sum_j N_{ij}^T) + \hat{\delta}_{10} (\sum_j N_{Rij}^{PGC} / \sum_j N_{ij}^T) + \hat{\delta}_{11} (\sum_j N_{Rij}^{BLA} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_{12} (\sum_j N_{Rij}^{BLB} / \sum_j N_{ij}^T) + \hat{\delta}_{13} (\sum_j N_{Rij}^{BLC} / \sum_j N_{ij}^T) + e_{ij} \tag{3.6}
\end{aligned}$$

Once estimation is complete, implicit market prices for individual ad units can be computed by using regression coefficients. As per equations (3.2) and (3.3), coefficient estimates are the same for the individual spot prices and the package prices and they remain the same for the average package prices per unit in formula (3.6) where both sides of the package price equation are divided by the total number of ad units in the package.

The coefficients of average audience seconds per spot in formula (3.6) can be interpreted as the unit price increase attributable to a one unit increase of audience seconds in the particular ad slot. The coefficients for the fraction terms of dayparts can be interpreted as if they are coefficients for dummy variables for the respective dayparts in the package. To explain the logic, let us assume one of the fraction terms turns out to be 1. This means the package is composed of a single product (say, TV program spots in daypart SA) and the average spot price of the package is merely the average spot price of that particular type of spot (i.e., TV program spots in daypart SA). The constant term in the model can be interpreted as the coefficient of the base case.

Hence, the implicit market price for an individual ad unit can be estimated by applying the coefficients estimated with the package prices to the individual characteristics of the purchased ad time: $\hat{\beta}_1, \hat{\beta}_2$, and $\hat{\beta}_3$ respectively are multiplied times the male 20-49 audience seconds, female 20-49 audience seconds, and audience seconds of male and female aged other than 20-49 for the individual spot of TV program ads. $\hat{\beta}_4, \hat{\beta}_5$, and $\hat{\beta}_6$ are multiplied times the male 20-49 audience seconds, female 20-49 audience seconds, and audience seconds of male and female aged other than 20-49 for the individual spot of TV block ads. As the coefficients for the fraction terms of dayparts can be interpreted as if they are coefficients for dummy variables for the respective dayparts in the package, as noted above, $\hat{\delta}_1, \hat{\delta}_2, \hat{\delta}_3, \hat{\delta}_4, \hat{\delta}_5, \hat{\delta}_6, \hat{\delta}_7, \hat{\delta}_8, \hat{\delta}_9, \hat{\delta}_{10}, \hat{\delta}_{11}, \hat{\delta}_{12}$, and $\hat{\delta}_{13}$, respectively are multiplied to the dummy value for each daypart. To the dummy value for daypart B, which is the base case, constant term is multiplied.

Estimation of Price Distortion

Price distortion is defined as the gap between estimated implicit market price and the KOBACO set price for the particular ad slot. Hence, it is calculated by subtracting the estimated implicit market price from KOBACO-set price. For presentational purposes, however, average differences between KOBACO set prices and estimated implicit market prices are compared for each category (TV program ads in daypart SA; TV program ads in daypart A; TV program ads in daypart B; TV program ads in daypart C; TV block ads in daypart SA; TV block ads in daypart A; TV block ads in daypart B; TV block ads in daypart C; radio program ads in daypart A; radio program ads in daypart B; radio program ads in daypart C; radio block ads in daypart A; radio block ads in daypart B; radio block ads in daypart C) and for each broadcaster (BBS-FM; FEBC-AM; CBS-AM; CBS-FM; PBC-FM; WBC-FM). A comparison is also made between expenditures on ad units in each daypart calculated with the implicit market prices and those calculated with the KOBACO set prices.

Estimation of Subsidies

There can be two types of subsidy flows in the market. First, the external subsidy flowing among broadcasters, and they are estimated by subtracting each broadcaster total expenditures with KOBACO set prices from the estimates of what expenditures for the same units would be, with the implicit market prices estimated for each broadcaster. The internal subsidies flowing from commercial programs to public interest programs within a major TV network should be estimated by comparing expenditures for each program type. However, the estimation of internal subsidies cannot be completed unless public

interest programs are clearly identified. No one has undertaken this exercise and I will follow precedent and ignore this type of subsidy in this study. However, the method employed here could be used to examine internal subsidies.

CHAPTER 4

METHODOLOGY

Data

To test the proposed model, actual transaction data for the 100 largest Korean broadcasting advertisers were obtained from KOBACO for the one-year period May 2003 to April 2004. The large number of small advertisers (yearly, more than 6,500 advertisers bought at least one ad spot in terrestrial broadcasting programs) makes the task of gathering and processing data for all of them infeasible. However, expenditures by the largest 100 advertisers account for 64.3% of all terrestrial broadcast advertising revenues and dominate in the determination of ad time prices. So it is unlikely that restricting the sample in this way is a source of significant bias in the estimates. Furthermore, I assume this introduces no bias to the estimates as I can't think of reasons why advertisers smaller than the 100 largest should value the ad slots differently at the margin than do major advertisers. Plus, if there is competitive bidding among all advertisers for access to ad time slots, then the same competitive implicit market prices should apply to all of them.

The sample period is concurrent with the upfront markets where contracts for ad slots with duration longer than six months, airing May 2003 to April 2004, were negotiated.

From the data, advertisers and advertising agencies were identified by randomly allocated numeric codes preserving anonymity. Other information in the data included spot prices set by KOBACO, airing seconds of the ad slots, and contract duration of each

ad slot. The data also included the audience ratings of programs to which the purchased ad slots were attached. Audience ratings of TV programs were subdivided into those for males aged 20-49, females aged 20-49, and males and females of ages other than 20-49. In the sampling period, Nielsen Media Research (NMR) and Taylor Nelson Sofres (TNS) conducted audience research on 1550 and 1200 TV household panels respectively, employing people meter technique (Lee, 2004). NMR audience ratings were used for this study. However, the reporting format of SBS audience ratings differed from those of KBS and MBC audience ratings. While audience ratings for KBS and MBC programs were averaged nationally, those for SBS programs were reported separately for each region covered by networked local broadcasters. Hence, locally surveyed audience ratings of SBS programs were averaged by weights of audience size in each region, to calculate national average audience ratings for networked programs.

The original data contained 102,080 contracts made with major TV networks (23,681 with KBS TV; 38,099 with MBC TV; 40,300 with SBS TV) and 16,246 contracts made with religious broadcasters (2,658 with BBS-FM; 4,214 with CBS-AM; 1,975 with CBS-FM; 1,680 with FEBC-AM; 2,925 with PBC-FM; 2,794 with WBS-FM). The data did not include ad contracts for “yearly sports” programs that presented the major sporting events held through the year. Advertisers deposited certain amount of their ad budgets in advance for the ad time attached to those programs. Due to this transaction pattern, ads on the yearly sports programs were regarded as not packaged with other programs. In addition, data did not include local ad spots as they tend not to be packaged with ads broadcast nationwide.

However, the original data contained errors or missing values. A major source of errors is incorrect record-keeping of contract periods. The data included starting and ending dates for the supply of commercial time in a program, but in some instances, end dates were recorded prior to starting dates. I acquired the number of ad slots purchased by an advertiser for a particular program by counting the number of aired days for the ad slot within the contract period. Hence, errors in contract dates made it impossible to count the number ad slots during the contract periods. For example, if an ad slot in a program was filled by a commercial message every Monday for a three-week period, the particular advertiser was assumed to buy three ad slots for the program. Also, audience ratings were missing in some instances. Those observations with obvious errors or missing values were removed from the data.

After excluding all problematic observations the data set included 98,558 contract cases, made with major TV networks (22,864 with KBS TV; 36,946 with MBC TV; 38,748 with SBS TV) and 10,585 contract cases with religious broadcasters (1,978 with BBS-FM; 3,162 with CBS-AM; 1,714 with CBS-FM; 1,264 with FEBC-AM; 1,432 with PBC-FM; 1,035 with WBS-FM).

Measurements

Package Price: Package price is operationalized as the amount an advertiser spent on ad time sold by a network (and its associated religious broadcasters), through a specific ad agency, during the sample period. As each of the KOBACO sub-units¹⁸ sold ad time for one of the three major TV networks and its associated religious radio broadcasters to ad agencies (see figure 1), it is reasonable to assume that packages were

¹⁸ Three KOBACO subunits exist: one to represent KBS-TV, KBS radio stations, EBS-TV, FEBC-AM, and Sunny FM; one to represent MBC-TV, MBC radio stations, CBS-FM, CBS-AM, PBC, and KFM; one to represent SBS-TV, SBS radio stations, BBS-FM, WBS-FM.

constructed per ad agency per advertiser for broadcasters represented by each of the KOBACO sub-units. In figure 1, the separate arrows represent individual packages. This implies that a package created for an advertiser by one agency was not combined with the package created for the same advertiser by the second agency. Also, this implies that a package was not created by combining ad slots across the major networks (and their associated religious broadcasters) represented by each of the KOBACO sub-units.

While this method is a way of dealing with the absence of data identifying individual packages, it has the limitation of treating all purchases by an ad agency for an advertiser as a single package, when multiple packages may have been purchased. However, this does not violate the logic of the package-price regression approach outlined above, as KOBACO prices are the same for all packages. The downside of treating all purchases by an advertiser through a particular ad agency as the purchase of a single package is that it reduces the number of observations. Nevertheless, if there is enough variation among the constructed packages bought by different advertisers through different ad agencies, it becomes possible to estimate significant coefficients identifying impacts of audience demographics and other characteristics of component programs on the package prices which, in turn, makes it possible to estimate implicit market prices for individual programs. While it is desirable to use observed market prices according to economic theory, using a proxy variable for prices causes no problem from an estimation perspective.

Package prices were calculated by adding all the KOBACO prices for ad spots purchased by an advertiser (a) through a particular ad agency (b) from a network (and

its associated religious and local radio stations) (c). This definition can be presented via the following formula:

$$P_{abc} = \sum_j k_j x_{abcj} \quad (4.1)$$

Where a is advertiser, b is advertising agency, c is network (henceforth, I will use “network” to include a network’s affiliated religious broadcasters), and j is a program on the network. k_j is a KOBACO set price for an ad spot attached to program j and x_{abcj} is the number of ad spots associated with program j , purchased by advertiser a through advertising agency b from network c . While the data set contained prices set by KOBACO, the numbers of ad slots purchased at these prices were not provided. Hence I have assumed the number of ad spots aired during the contract period to be the same as the number of days a commercial was aired during the contract period in the network or the associated religious broadcasters whose time was purchased.

Audience Size per Demographic Characteristic: Audience size of a package is operationalized in terms of total audience seconds of the component programs in a package. Individual audience seconds for TV program ads in a particular demographic

($A_{TV_{abcj}}^{PG_{m2049}}$ for males 20-49, $A_{TV_{abcj}}^{PG_{f2049}}$ for females 20-49, $A_{TV_{abcj}}^{PG_{other}}$ for males and

females with ages other than 20-49) were calculated by multiplying the audience rating of

the program ($R_j^{PG_{m2049}}, R_j^{PG_{f2049}}, R_j^{PG_{other}}$) times the total population of the

corresponding demographic group ($P_{TV}^{m2049}, P_{TV}^{f2049}, P_{TV}^{other}$), and the length of a

commercial measured in seconds of each ad slot purchased by an advertiser for a

particular program (S_{abcj}). x_{abcj} is the number of ad slots attached to program j purchased by advertiser a through advertising agency b from broadcaster c during the sample period. Hence, total audience seconds of program ads per demographic group in a package ($\sum_j A_{TV_{abcj}}^{PG_{m2049}}, \sum_j A_{TV_{abcj}}^{PG_{f2049}}, \sum_j A_{TV_{abcj}}^{PG_{other}}$) is the sum of audience seconds calculated for the component programs, as the following formula shows.

$$\begin{aligned}\sum_j A_{TV_{abcj}}^{PG_{m2049}} &= \sum_j (R_j^{PG_{m2049}} \times P_{TV}^{m2049} \times S_{abcj} \times x_{abcj}) \\ \sum_j A_{TV_{abcj}}^{PG_{f2049}} &= \sum_j (R_j^{PG_{f2049}} \times P_{TV}^{f2049} \times S_{abcj} \times x_{abcj}) \\ \sum_j A_{TV_{abcj}}^{PG_{other}} &= \sum_j (R_j^{PG_{other}} \times P_{TV}^{other} \times S_{abcj} \times x_{abcj})\end{aligned}\tag{4.2}$$

However, as no published data are available for TV population specified by the demographic characteristics, the calculation was made with the assumption that 100% of the population in each demographic group watched TV. The Korea Statistical Yearbook 2004 provides the number of Koreans by gender and age. All the measures for males 20-49, females 20-49, and the others are counted as the potential viewers in each demographic category. S_{abcj} is the length in seconds of every ad spot purchased by an advertiser. x_{abcj} is the number of ad slots attached to program j purchased by an advertiser through a particular advertising agency from a broadcaster during the sample period.

Audience seconds for TV block ads were calculated following the same process used for TV program ads except the audience ratings of the program

$(R_j^{BL_{m2049}}, R_j^{BL_{f2049}}, R_j^{BL_{other}})$ were measured differently. As block ads are located in the middle of two programs, it was hard to associate the block ads with the audience ratings of either program. Hence, audience ratings of two adjacent programs are averaged for the block ads.

Daypart: TV dayparts are classified as SA, A, B, and C as described above. SA is equivalent to the primetime daypart in the USA broadcasting system, A to primetime fringe period, C to early morning and late night, and B to other times. For program ads, dayparts were first dummy-coded for daypart SA, A, B and C and then weighted by the length of ad spot ($D_{TV_j}^{PG_{SA}}, D_{TV_j}^{PG_A}, D_{TV_j}^{PG_B}$, and $D_{TV_j}^{PG_C}$). By setting a 15 second ad spot as a base case for TV ads, weights were calculated by dividing total ad seconds for each spot by 15. Then, the weighted dummy values were multiplied by the number of ad slots in program j (x_{abcj}) and summed for each package bought by an advertiser through a particular ad agency. As the sum of weighted dummies are the same as the total number of ad units, as discussed above, notation for dummy “ D ” was replaced with the number of spots “ N ” here, as shown by the following formula:

$$\begin{aligned}
\sum_j N_{TV_{abcj}}^{PG_{SA}} &= \sum_j (D_{TV_{abcj}}^{PG_{SA}} \times x_{abcj}) \\
\sum_j N_{TV_{abcj}}^{PG_A} &= \sum_j (D_{TV_{abcj}}^{PG_A} \times x_{abcj}) \\
\sum_j N_{TV_{abcj}}^{PG_B} &= \sum_j (D_{TV_{abcj}}^{PG_B} \times x_{abcj}) \\
\sum_j N_{TV_{abcj}}^{PG_C} &= \sum_j (D_{TV_{abcj}}^{PG_C} \times x_{abcj})
\end{aligned} \tag{4.3}$$

This process was applied in the same way to TV block ads and radio ads for both program ads and block ads. Weights were calculated by dividing ad seconds of each spot by 20 for radio ads as radio ad time was generally sold in 20 second units.

Construction of Packages: Using the pivot function in Microsoft Office Excel 2003, individual contracts are summed over the advertisers and ad agencies. It returned 467 package cases. This means that the 100 largest advertisers bought ad time through three different KOBACO sub-units and that some advertisers made deals through more than one ad agency. Among the 467 cases, 151 cases were made through the KOBACO subunit representing KBS-TV and its associated religious broadcasters, while 161 cases were made through the subunit representing MBC-TV and its associated broadcasters and 155 cases were made through the subunit representing SBS-TV and its associated broadcasters.

CHAPTER 5

RESULTS

This chapter reports regression results obtained using package prices, defined as advertisers' annual ad budgets spent in a particular network (and its associated broadcasters) through a particular advertising agency. By this definition, 467 package cases originally were constructed. However, due to missing values in the data, 12 cases were automatically dropped from the analysis and 455 cases were used for estimation where the average price per unit in the package (APPU) was KW 3,172,547 million, and each component of the advertising types comprises packages in proportions shown in Table 2. The columns values of minimum, maximum and mean for the fraction variables represent the proportions composing the package. On average, program advertising in daypart A with religious broadcasters comprised the largest proportion, 21% of the total spots in package, while program advertising in dayparts A and B with the major TV networks comprised 18% each. Program advertising in daypart SA and daypart C in the major networks comprised 14% and 9% each. Program advertising in daypart B in religious broadcasters comprised 7%. In sum, 86% of the total package spots comprised these six types of advertising and the remaining 14% were comprised of block advertising in the major TV networks and religious broadcasters plus program advertising in daypart C in the major TV networks. Average audience seconds per unit (AASPU) for TV program advertising were 14,709,000 while those for TV block advertising were 2,698,000. AASPU for both program and block advertising on radio were not taken into

Table 2. Descriptive Statistics _ Before Outlier Removed

	N	Minimum	Maximum	Mean	Std. Deviation
Average Package Price Per Spot	455	18,627	10,005,000	3,172,547	1,501,459
Average F2049 Audience Seconds of TV Program Ads	455	0	21,416	4,787	2,395
Average M2049 Audience Seconds of TV Program Ads	455	0	10,341	3,090	1,538
Average Other's Audience Seconds of TV Program Ads	455	0	26,205	6,826	3,480
Fraction of TV Program Ads in Daypart SA	455	0	1.00	0.14	0.11
Fraction of TV Program Ads in Daypart A	455	0	0.83	0.18	0.12
Fraction of TV Program Ads in Daypart B	455	0	0.83	0.18	0.14
Fraction of TV Program Ads in Daypart C	455	0	0.73	0.09	0.10
Average F2049 Audience Seconds of TV Block Ads	455	0	15,310	880	1,287
Average M2049 Audience Seconds of TV Block Ads	455	0	13,147	559	941
Average Other Audience Seconds of TV Block Ads	455	0	25,802	1,259	1,878
Fraction of TV Block Ads in Daypart SA	455	0	0.91	0.04	0.07
Fraction of TV Block Ads in Daypart A	455	0	0.48	0.02	0.05
Fraction of TV Block Ads in Daypart B	455	0	0.60	0.03	0.05
Fraction of TV Block Ads in Daypart C	455	0	0.20	0.01	0.02
Fraction of Religious Radio's Program Ads in Daypart A	455	0	1.00	0.21	0.20
Fraction of Religious Radio's Program Ads in Daypart B	455	0	0.63	0.07	0.10
Fraction of Religious Radio's Program Ads in Daypart C	455	0	0.14	0.01	0.02
Fraction of Religious Radio's Block Ads in Daypart A	455	0	0.90	0.03	0.08
Fraction of Religious Radio's Block Ads in Daypart B	455	0	0.16	0.01	0.02
Fraction of Religious Radio's Block Ads in Daypart C	455	0	0.11	0.00	0.01

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account in this analysis due to lack of data. However, advertisers work with the same lack of data. Therefore, this treatment is believed not to cause a bias.

Model Re-specification

Before the main analyses were conducted, data were screened for outliers. However, outlier presence is unrelated to sampling error or incorrect data entry by a researcher, as population data provided by KOBACO were used in the analysis. Referring to the Tabachnick and Fidell's (1996) definition of outlier, two strategies were employed to remove potential outlier impacts: remove cases more than 3 standard deviations from the mean in the dependent variable and another ten cases having highest residuals in the regressions from the visual inspection of the residuals plot. With this measure, 12 cases were removed from the data and 443 cases were left out of 455.¹⁹ A complete data description is presented in Table 3.

After outliers were removed, Pearson correlations among the variables were checked, as Table 4 showed. It was found that, while correlations between other independent variables are .79 at the highest, correlations between the audience seconds of demographic groups were extremely high, .92 to .98. Three possible reasons exist for such high correlations. First, this could be the nature of the original data. Due to certain cultural reasons, Koreans may watch TV with little variation across demographic groups, hence, audience ratings reported by Nielsen Media Research may have originally high correlations. If this is the case, the logic of employing demographic composition as a variable affecting advertising prices does not apply to the Korean broadcast market and

¹⁹ I also ran a regression with outliers and found that exclusion of outliers did not change the qualitative nature of my findings.

Table 3. Descriptive Statistics _ After Outlier Removed

	N	Minimum	Maximum	Mean	Standard Deviation
Average Package Price Per Spot	443	18,627	7,275,000	3,078,250	1,378,650
Average F2049 Audience Seconds of TV Program Ads	443	0	11,437	4,655	2,095
Average M2049 Audience Seconds of TV Program Ads	443	0	8,276	3,017	1,423
Average Other's Audience Seconds of TV Program Ads	443	0	18,104	6,671	3,204
Fraction of TV Program Ads in Daypart SA	443	0	0.58	0.13	0.10
Fraction of TV Program Ads in Daypart A	443	0	0.83	0.17	0.12
Fraction of TV Program Ads in Daypart B	443	0	0.83	0.18	0.14
Fraction of TV Program Ads in Daypart C	443	0	0.73	0.09	0.10
Average F2049 Audience Seconds of TV Block Ads	443	0	9,534	841	1,086
Average M2049 Audience Seconds of TV Block Ads	443	0	7,266	529	733
Average Other Audience Seconds of TV Block Ads	443	0	12,115	1,193	1,464
Fraction of TV Block Ads in Daypart SA	443	0	0.65	0.04	0.05
Fraction of TV Block Ads in Daypart A	443	0	0.48	0.02	0.05
Fraction of TV Block Ads in Daypart B	443	0	0.60	0.03	0.06
Fraction of TV Block Ads in Daypart C	443	0	0.20	0.01	0.02
Fraction of Religious Radio's Program Ads in Daypart A	443	0	1.00	0.21	0.19
Fraction of Religious Radio's Program Ads in Daypart B	443	0	0.63	0.07	0.10
Fraction of Religious Radio's Program Ads in Daypart C	443	0	0.14	0.01	0.02
Fraction of Religious Radio's Block Ads in Daypart A	443	0	0.90	0.03	0.08
Fraction of Religious Radio's Block Ads in Daypart B	443	0	0.16	0.01	0.02
Fraction of Religious Radio's Block Ads in Daypart C	443	0	0.11	0.00	0.01

Table 4. Pearson Correlations of Package Data

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Average Package Price Per Spot	1																			
2. Average F2049 Audience Seconds of TV Program Ads	0.92	1																		
3. Average M2049 Audience Seconds of TV Program Ads	0.93	0.96	1																	
4. Average Other's Audience Seconds of TV Program Ads	0.92	0.95	0.92	1																
5. Fraction of TV Program Ads in Daypart SA	0.80	0.69	0.70	0.70	1															
6. Fraction of TV Program Ads in Daypart A	0.69	0.70	0.68	0.70	0.27	1														
7. Fraction of TV Program Ads in Daypart C	0.17	0.12	0.20	0.05	0.00	0.04	1													
8. Average F2049 Audience Seconds of TV Block Ads	0.07	-0.03	-0.01	-0.05	-0.03	-0.10	-0.01	1												
9. Average M2049 Audience Seconds of TV Block Ads	0.09	-0.02	0.02	-0.04	0.00	-0.10	0.00	0.97	1											
10. Average Other Audience Seconds of TV Block Ads	0.10	-0.01	0.02	-0.02	-0.01	-0.09	-0.01	0.98	0.96	1										
11. Fraction of TV Block Ads in Daypart SA	0.13	-0.01	0.03	-0.01	0.08	-0.07	-0.03	0.77	0.79	0.78	1									
12. Fraction of TV Block Ads in Daypart A	0.01	-0.02	-0.02	-0.04	-0.04	-0.07	0.03	0.64	0.59	0.63	0.14	1								
13. Fraction of TV Block Ads in Daypart B	-0.08	-0.10	-0.11	-0.10	-0.16	-0.08	-0.02	0.55	0.45	0.53	0.23	0.33	1							
14. Fraction of TV Block Ads in Daypart C	-0.16	-0.16	-0.17	-0.19	-0.16	-0.15	0.01	0.27	0.21	0.25	0.02	0.24	0.54	1						
15. Fraction of Religious Radio's Program Ads in Daypart A	-0.62	-0.60	-0.58	-0.61	-0.35	-0.47	-0.31	-0.23	-0.26	-0.29	-0.20	-0.22	-0.23	-0.09	1					
16. Fraction of Religious Radio's Program Ads in Daypart B	-0.39	-0.38	-0.36	-0.36	-0.25	-0.23	-0.19	-0.21	-0.19	-0.22	-0.16	-0.15	-0.14	-0.05	0.15	1				
17. Fraction of Religious Radio's Program Ads in Daypart C	-0.18	-0.18	-0.17	-0.16	-0.05	-0.15	-0.10	-0.09	-0.08	-0.09	-0.04	-0.06	-0.10	-0.06	0.12	0.19	1			
18. Fraction of Religious Radio's Block Ads in Daypart A	-0.29	-0.28	-0.28	-0.29	-0.20	-0.20	-0.13	-0.07	-0.07	-0.09	-0.09	-0.05	-0.04	0.00	0.01	-0.05	-0.04	1		
19. Fraction of Religious Radio's Block Ads in Daypart B	-0.20	-0.18	-0.17	-0.20	-0.15	-0.14	-0.08	-0.05	-0.04	-0.06	-0.06	-0.04	-0.05	0.01	0.00	-0.05	-0.01	0.49	1	
20. Fraction of Religious Radio's Block Ads in Daypart C	-0.11	-0.10	-0.10	-0.10	-0.08	-0.06	-0.07	-0.04	-0.04	-0.05	-0.04	-0.02	-0.05	-0.02	-0.07	-0.06	-0.04	0.44	0.57	1

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the three different audience-demographics should be combined into one for the purpose of regression estimation. Otherwise, they will generate a multicollinearity problem in estimation. Second, this might be attributed to the measurement process of summing multiple spots into one package. In this case, how to measure audience size should be reconsidered. Third, it may just reflect possibility that the relative sizes of demographic groups in audiences don't change nearly as much as their absolute sizes, even though they do vary.

Table 5 shows that high correlation between demographic groups is not due to the measurement process. Correlations between individual programs' audience ratings for each demographic group were high (for program ads, .93, .91, .91 in KBS; .96, .97, .95 in MBC; .98, .92, .90 in SBS between female 20-49 and male 20-49, female 20-49 and other, male 20-49 and other respectively; for block ads, .95, .93, .93 in KBS; .89, .94, .87 in MBC; .90, .94, .91 in SBS respectively). This implies that audience segmentation in Korea does not have such critical weight as it does in USA. Reflecting on these findings, the regression model proposed in chapter 3 was re-specified as presented in equation (5.1). R^2 remained almost the same when audience demographic groups were combined into one (.96 in the model having three specified demographic groups; .95 for the model with them combined).

$$\begin{aligned}
P_i / \sum_j N_{ij}^T = & \hat{\alpha} + \hat{\beta}_1 (\sum_j A_{TVij}^{PGSUM} / \sum_j N_{ij}^T) + \hat{\beta}_2 (\sum_j A_{TVij}^{BLSUM} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_1 (\sum_j N_{TVij}^{PGSA} / \sum_j N_{ij}^T) + \hat{\delta}_2 (\sum_j N_{TVij}^{PGA} / \sum_j N_{ij}^T) + \hat{\delta}_3 (\sum_j N_{TVij}^{PGC} / \sum_j N_{ij}^T) \\
& + \hat{\delta}_4 (\sum_j N_{TVij}^{BLSA} / \sum_j N_{ij}^T) + \hat{\delta}_5 (\sum_j N_{TVij}^{BLA} / \sum_j N_{ij}^T) + \hat{\delta}_6 (\sum_j N_{TVij}^{BLB} / \sum_j N_{ij}^T)
\end{aligned}$$

Table 5. Pearson Correlations of Audience Ratings in the Major TV Networks

			Program Ads			Block Ads		
			Female 2049	Male 2049	Other	Female 2049	Male 2049	Other
KBSTV	Program Ads	Female 2049	1					
		Male 2049	0.93	1				
		Other	0.91	0.91	1			
	Block Ads	Female 2049				1		
		Male 2049				0.95	1	
		Other				0.93	0.93	1
MBCTV	Program Ads	Female 2049	1					
		Male 2049	0.96	1				
		Other	0.97	0.95	1			
	Block Ads	Female 2049				1		
		Male 2049				0.89	1	
		Other				0.94	0.87	1
SBSTV	Program Ads	Female 2049	1					
		Male 2049	0.98	1				
		Other	0.92	0.90	1			
	Block Ads	Female 2049				1		
		Male 2049				0.90	1	
		Other				0.94	0.91	1

$$\begin{aligned}
& + \hat{\delta}_7 \left(\sum_j N_{TVij}^{BLC} / \sum_j N_{ij}^T \right) + \hat{\delta}_8 \left(\sum_j N_{Rij}^{PGA} / \sum_j N_{ij}^T \right) + \hat{\delta}_9 \left(\sum_j N_{Rij}^{PGB} / \sum_j N_{ij}^T \right) \\
& + \hat{\delta}_{10} \left(\sum_j N_{Rij}^{PGC} / \sum_j N_{ij}^T \right) + \hat{\delta}_{11} \left(\sum_j N_{Rij}^{BLA} / \sum_j N_{ij}^T \right) + \hat{\delta}_{12} \left(\sum_j N_{Rij}^{BLB} / \sum_j N_{ij}^T \right) \\
& + \hat{\delta}_{13} \left(\sum_j N_{Rij}^{BLC} / \sum_j N_{ij}^T \right) + e_{ij}
\end{aligned} \tag{5.1}$$

Estimation of Implicit Market Prices

Table 6 shows regression results where average price per unit (APPU) is a dependent variable and average audience seconds per unit (AASPU) for program and block ads in TV, and fractions of ad units in each daypart for TV and radio programs comprising a package, are independent variables. All variables except fraction terms of TV block advertising in daypart C, and radio block advertising in dayparts A, B, and C were statistically significant at .05 level. Consistent with other literature, the estimate for daypart SA had the highest value (KW 6,325,037, which as for the other dayparts is the sum of the regression constant term and the daypart's program ads coefficient) followed by daypart A (KW 3,535,512), daypart C (KW 1,708,524), and daypart B (KW 516,695) for program ad slots.. As audience seconds increase, the value of a TV program ad slot should also increase as much as KW 84 per audience second. On the other hand, daypart indicators for block ads generally commanded negative values (KW -1,176,806 for daypart SA, KW -2,117,404 for daypart A, KW -858,411 for daypart B, and KW 396,266 for daypart C). Negative coefficients for dayparts for block advertising should be interpreted as indicating block advertising was valued less than was program advertising even during the same dayparts.

Table 6. Regression Estimates for Average Package Price

	Unstandardized Coefficients	Standard Error	Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B		Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	516,695	112,693		4.58	0.00					
Average Audience Seconds of TV Program Ads	84	6	0.40	14.82	0.00	0.94	0.58	0.14	0.12	8.66
Fraction of TV Program Ads in Daypart SA	5,808,342	221,365	0.41	26.24	0.00	0.80	0.79	0.24	0.35	2.86
Fraction of TV Program Ads in Daypart A	3,018,817	175,502	0.26	17.20	0.00	0.69	0.64	0.16	0.38	2.65
Fraction of TV Program Ads in Daypart C	1,191,829	161,627	0.08	7.37	0.00	0.17	0.34	0.07	0.65	1.53
Average Audience Seconds of TV Block Ads	102	15	0.24	6.77	0.00	0.09	0.31	0.06	0.07	15.00
Fraction of TV Block Ads in Daypart SA	-1,693,501	672,775	-0.07	-2.52	0.01	0.13	-0.12	-0.02	0.12	8.56
Fraction of TV Block Ads in Daypart A	-2,634,099	598,750	-0.09	-4.40	0.00	0.01	-0.21	-0.04	0.22	4.62
Fraction of TV Block Ads in Daypart B	-1,375,106	368,221	-0.05	-3.73	0.00	-0.08	-0.18	-0.03	0.39	2.57
Fraction of TV Block Ads in Daypart C	-120,429	785,860	0.00	-0.15	0.88	-0.16	-0.01	0.00	0.66	1.53
Fraction of Religious Radio's Program Ads in Daypart A	-393,467	125,738	-0.06	-3.13	0.00	-0.62	-0.15	-0.03	0.27	3.76
Fraction of Religious Radio's Program Ads in Daypart B	-425,339	167,343	-0.03	-2.54	0.01	-0.39	-0.12	-0.02	0.55	1.80
Fraction of Religious Radio's Program Ads in Daypart C	-1,215,291	629,873	-0.02	-1.93	0.05	-0.18	-0.09	-0.02	0.90	1.11
Fraction of Religious Radio's Block Ads in Daypart A	-345,956	209,995	-0.02	-1.65	0.10	-0.29	-0.08	-0.02	0.54	1.86
Fraction of Religious Radio's Block Ads in Daypart B	-476,343	714,969	-0.01	-0.67	0.51	-0.20	-0.03	-0.01	0.59	1.70
Fraction of Religious Radio's Block Ads in Daypart C	372,072	1,461,498	0.00	0.25	0.80	-0.11	0.01	0.00	0.63	1.59

Dependent Variable: APPU

 R^2 (15,427) = .96 (Sig. F Change = .00)

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The marginal value per audience second of block advertising in major TV networks was estimated higher (KW 102) than that for program ads. However, interpretation of block advertising estimates requires special caution, as the VIF indicator raised concerns regarding multicollinearity, especially for average block advertising seconds in TV where its VIF value is 15, which is higher than the cutoff value of 10 (Montgomery et al., 2001). The coefficient of VIF is obtained when a predictor variable of interest is regressed on the remaining predictor variables. Any variable whose VIF exceeds 10 is recommended to be deleted, or an alternative method should be used instead of OLS. However, it is important to diagnose where and why the problem arose before the variable is excised. When other independent variables were regressed on AASPU of TV block advertising, it was found that, as Table 7 shows, AASPU of TV block advertising were affected mainly by block advertising dayparts. Hence, stepwise regression was run to see the pure effect of daypart on the value of AASPU of TV block advertising. Of 95% of the variation explained by the model, 56% was attributed purely to its TV block advertising dayparts (see Table 8) while other independent variables added only 0.3% in R^2 (see Table 9). As noted above, it is natural for the audience size of a program to covary with its daypart. As long as the covariation does not affect coefficient estimates for other types of ad time, however, it seems safe to use these coefficients for the price estimation.

The finding that daypart C has a larger coefficient than does daypart B in TV ad time differs from the KOBACO formula where daypart B had a higher weight than did daypart C. Although surprising, this may be a reflection of the fact that the programs in daypart C attract a larger than average fraction of a particular demographic group valued

Table 7. Regression Estimates for Average Audience Seconds of TV Block Ads

	Unstandardized Coefficients	Standard Error	Standard Coefficients Beta	t	Sig.	Correlations			Collinearity Statistics	
	B					Zero-order	Partial	Part	Tolerance	VIF
(Constant)	-682	416		-1.64	0.10					
Average Audience Seconds of TV Program Ads	0	0	0.18	5.02	0.00	-0.02	0.24	0.06	0.12	8.18
Fraction of TV Program Ads in Daypart SA	-3,324	852	-0.10	-3.90	0.00	-0.01	-0.19	-0.05	0.24	4.09
Fraction of TV Program Ads in Daypart A	-1,931	713	-0.07	-2.71	0.01	-0.09	-0.13	-0.03	0.24	4.23
Fraction of TV Program Ads in Daypart C	-604	519	-0.03	-1.16	0.25	-0.05	-0.06	-0.01	0.31	3.21
Fraction of TV Block Ads in Daypart SA	40,503	886	0.68	45.71	0.00	0.78	0.91	0.57	0.70	1.44
Fraction of TV Block Ads in Daypart A	33,293	1,064	0.46	31.29	0.00	0.63	0.83	0.39	0.71	1.41
Fraction of TV Block Ads in Daypart B	12,353	1,019	0.21	12.12	0.00	0.52	0.51	0.15	0.53	1.90
Fraction of TV Block Ads in Daypart C	3,416	2,547	0.02	1.34	0.18	0.25	0.06	0.02	0.65	1.55
Fraction of Religious Radio's Program Ads in Daypart A	545	457	0.03	1.19	0.23	-0.28	0.06	0.01	0.21	4.81
Fraction of Religious Radio's Program Ads in Daypart B	639	581	0.02	1.10	0.27	-0.21	0.05	0.01	0.47	2.11
Fraction of Religious Radio's Program Ads in Daypart C	-1,404	2,023	-0.01	-0.69	0.49	-0.09	-0.03	-0.01	0.91	1.10
Fraction of Religious Radio's Block Ads in Daypart A	790	712	0.02	1.11	0.27	-0.08	0.05	0.01	0.48	2.07
Fraction of Religious Radio's Block Ads in Daypart B	2,390	2,322	0.02	1.03	0.30	-0.05	0.05	0.01	0.58	1.73
Fraction of Religious Radio's Block Ads in Daypart C	-1,635	4,690	-0.01	-0.35	0.73	-0.04	-0.02	0.00	0.63	1.58

Dependent Variable: AASPU of TV Block Ads

 $R^2(14,428) = .93$ (Sig. F Change = .00)

Table 8. Hierarchical Regression of Average Audience Seconds of TV Block Ads: Daypart of TV block ads in the 2nd Stage

		Unstandardized Coefficients	Standard Error	Standard Coefficients Beta	t	Sig.	Correlations			Collinearity Statistics	
		B					Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	12,765	718		17.77	0.00					
	Average Audience Seconds of TV Program Ads	0	0	-0.62	-6.28	0.00	-0.02	-0.29	-0.24	0.15	6.69
	Fraction of TV Program Ads in Daypart SA	1,185	2,106	0.04	0.56	0.57	-0.01	0.03	0.02	0.37	2.68
	Fraction of TV Program Ads in Daypart A	-5,212	1,698	-0.19	-3.07	0.00	-0.09	-0.15	-0.12	0.39	2.57
	Fraction of TV Program Ads in Daypart C	-10,379	1,449	-0.31	-7.16	0.00	-0.01	-0.33	-0.27	0.79	1.27
	Fraction of Religious Radio's Program Ads in Daypart A	-12,689	922	-0.76	-13.77	0.00	-0.28	-0.55	-0.52	0.48	2.09
	Fraction of Religious Radio's Program Ads in Daypart B	-13,324	1,410	-0.42	-9.45	0.00	-0.21	-0.41	-0.36	0.75	1.33
	Fraction of Religious Radio's Program Ads in Daypart C	-15,114	6,108	-0.10	-2.47	0.01	-0.09	-0.12	-0.09	0.93	1.08
	Fraction of Religious Radio's Block Ads in Daypart A	-11,627	1,918	-0.29	-6.06	0.00	-0.08	-0.28	-0.23	0.62	1.61
	Fraction of Religious Radio's Block Ads in Daypart B	-8,054	6,980	-0.06	-1.15	0.25	-0.05	-0.06	-0.04	0.60	1.68
	Fraction of Religious Radio's Block Ads in Daypart C	-17,356	14,303	-0.06	-1.21	0.23	-0.04	-0.06	-0.05	0.63	1.58
	(Constant)	-1,285	357		-3.60	0.00					
	Average Audience Seconds of TV Program Ads	0	0	0.18	5.02	0.00	-0.02	0.24	0.06	0.12	8.18
	Fraction of TV Program Ads in Daypart SA	-2,721	700	-0.08	-3.89	0.00	-0.01	-0.18	-0.05	0.36	2.76
	Fraction of TV Program Ads in Daypart A	-1,327	561	-0.05	-2.37	0.02	-0.09	-0.11	-0.03	0.38	2.61
2	Fraction of TV Program Ads in Daypart C	604	519	0.02	1.16	0.25	-0.01	0.06	0.01	0.66	1.52
	Fraction of Religious Radio's Program Ads in Daypart A	1,149	401	0.07	2.87	0.00	-0.28	0.14	0.04	0.27	3.69
	Fraction of Religious Radio's Program Ads in Daypart B	1,243	535	0.04	2.32	0.02	-0.21	0.11	0.03	0.56	1.78
	Fraction of Religious Radio's Program Ads in Daypart C	-800	2,025	-0.01	-0.40	0.69	-0.09	-0.02	0.00	0.90	1.11
	Fraction of Religious Radio's Block Ads in Daypart A	1,394	672	0.04	2.08	0.04	-0.08	0.10	0.03	0.54	1.84
	Fraction of Religious Radio's Block Ads in Daypart B	2,994	2,295	0.02	1.30	0.19	-0.05	0.06	0.02	0.59	1.69
	Fraction of Religious Radio's Block Ads in Daypart C	-1,031	4,700	0.00	-0.22	0.83	-0.04	-0.01	0.00	0.63	1.59
	Fraction of TV Block Ads in Daypart SA	41,107	856	0.69	48.03	0.00	0.78	0.92	0.60	0.75	1.34
	Fraction of TV Block Ads in Daypart A	33,897	1,011	0.47	33.52	0.00	0.63	0.85	0.42	0.78	1.27
	Fraction of TV Block Ads in Daypart B	12,957	1,005	0.22	12.89	0.00	0.52	0.53	0.16	0.54	1.85
	Fraction of TV Block Ads in Daypart C	4,020	2,520	0.02	1.60	0.11	0.25	0.08	0.02	0.66	1.52

Dependent Variable: Average Audience Seconds of TV Block Ads

Model 1: $R^2(10,432) = .39$ (Sig. F Change = .00)Model 2: $R^2(4,428) = .93$ (Sig. F Change = .00)

Table 9. Hierarchical Regression of Average Audience Seconds of TV Block Ads: Other than TV block dyparts in the 2nd Stage

		Unstandardized Coefficients	Std. Error	Stand. Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B		Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-66	55		-1.20	0.23					
	Fraction of TV Block Ads in Daypart SA	39.713	785	0.67	50.60	0.00	0.78	0.92	0.65	0.93	1.08
	Fraction of TV Block Ads in Daypart A	33.044	977	0.46	33.82	0.00	0.63	0.85	0.43	0.88	1.14
	Fraction of TV Block Ads in Daypart B	12.348	953	0.21	12.96	0.00	0.52	0.53	0.17	0.63	1.59
	Fraction of TV Block Ads in Daypart C	2.251	2,511	0.01	0.90	0.37	0.25	0.04	0.01	0.69	1.44
2	(Constant)	-1.285	357		-3.60	0.00					
	Fraction of TV Block Ads in Daypart SA	41,107	856	0.69	48.03	0.00	0.78	0.92	0.60	0.75	1.34
	Fraction of TV Block Ads in Daypart A	33,897	1,011	0.47	33.52	0.00	0.63	0.85	0.42	0.78	1.27
	Fraction of TV Block Ads in Daypart B	12,957	1,005	0.22	12.89	0.00	0.52	0.53	0.16	0.54	1.85
	Fraction of TV Block Ads in Daypart C	4,020	2,520	0.02	1.60	0.11	0.25	0.08	0.02	0.66	1.52
	Average Audience Seconds of TV Program Ads	0	0	0.18	5.02	0.00	-0.02	0.24	0.06	0.12	8.18
	Fraction of TV Program Ads in Daypart SA	-2,721	700	-0.08	-3.89	0.00	-0.01	-0.18	-0.05	0.36	2.76
	Fraction of TV Program Ads in Daypart A	-1,327	561	-0.05	-2.37	0.02	-0.09	-0.11	-0.03	0.38	2.61
	Fraction of TV Program Ads in Daypart C	604	519	0.02	1.16	0.25	-0.01	0.06	0.01	0.66	1.52
	Fraction of Religious Radio's Program Ads in Daypart A	1,149	401	0.07	2.87	0.00	-0.28	0.14	0.04	0.27	3.69
	Fraction of Religious Radio's Program Ads in Daypart B	1,243	535	0.04	2.32	0.02	-0.21	0.11	0.03	0.56	1.78
	Fraction of Religious Radio's Program Ads in Daypart C	-800	2,025	-0.01	-0.40	0.69	-0.09	-0.02	0.00	0.90	1.11
	Fraction of Religious Radio's Block Ads in Daypart A	1,394	672	0.04	2.08	0.04	-0.08	0.10	0.03	0.54	1.84
	Fraction of Religious Radio's Block Ads in Daypart B	2,994	2,295	0.02	1.30	0.19	-0.05	0.06	0.02	0.59	1.69
	Fraction of Religious Radio's Block Ads in Daypart C	-1,031	4,700	0.00	-0.22	0.83	-0.04	-0.01	0.00	0.63	1.59

Dependent Variable: Average Audience Seconds of TV Block Ads

Model 1: $R^2(4,438) = .93$ (Sig. F Change = .00)Model 2: $R^2(10,428) = .93$ (Sig. F Change = .00)

by advertisers not taken into account by the formula used by KOBACO.

Once estimation was complete, implicit market prices for the individual ad times and types were computed using the coefficient estimates presented in Table 6. As per equations (3.2) and (3.3), coefficient estimates are the same for individual prices and package prices. Hence, implicit market prices for individual ad times (and types) were estimated by applying coefficients estimated with package prices.

Implicit Market Prices

Implicit market prices for program ads in the major TV networks were estimated to be higher for dayparts SA, A, and C but lower for daypart B than KOBACO set prices. The only exception was daypart A for KBS where the estimated market price was 0.96% lower than KOBACO set prices. Block advertising time on KBS and MBC showed a similar pattern: implicit market prices for dayparts SA, A, and B were estimated to be lower than the KOBACO set prices while implicit market prices for daypart C were estimated to be higher than KOBACO prices. For SBS, the implicit market prices for dayparts SA, B, and C were estimated to be higher than the KOBACO set prices, the implicit market prices for daypart A were estimated to be lower than the KOBACO set prices. Details are in Table 10.1.

For religious broadcasters, implicit market prices for program advertising showed two different patterns: in BBC-FM, CBS-AM, and PBC-FM, the implicit market prices were estimated to be lower for all three dayparts while in the CBS-FM, FEBC-AM, and WBS-FM, implicit market prices were estimated to be higher for dayparts A and B but lower for daypart C. On the other hand, implicit market prices for block advertising were estimated to be lower for daypart B while higher for daypart C. For daypart A, the

Table 10.1. Implicit Price Estimation for the Major TV Networks

(Unit: KW/Second)

		Program Ads					Block Ads				
		Daypart C	Daypart B	Daypart A	Daypart SA	Total	Daypart C	Daypart B	Daypart A	Daypart SA	Total
KBSTV	(1) Average Household Audience Rating (%)	3.31	5.99	8.64	13.76	8.18	2.92	4.91	8.33	14.04	9.44
	(2) Average Unit Price_KOBACO	150,323	200,244	380,804	633,235	347,777	43,442	77,567	206,600	368,306	227,217
	(3) Average Unit Price_Estimated	165,520	127,898	377,160	669,487	334,637	80,866	35,727	22,632	224,385	121,538
	(4) Gap of Unit Price (3) - (2)	15,197	-72,346	-3,644	36,253	-13,139	37,424	-41,840	-183,968	-143,920	-105,680
	(5) % of Gap (4)/(2)	10.11%	-36.13%	-0.96%	5.72%	-3.78%	86.15%	-53.94%	-89.05%	-39.08%	-46.51%
MBCTV	(1) Average Household Audience Rating	2.76	6.03	9.76	19.39	8.95	2.54	5.32	9.56	13.20	7.75
	(2) Average Unit Price_KOBACO	105,209	171,643	355,593	723,980	319,040	28,263	52,338	134,388	263,145	117,334
	(3) Average Unit Price_Estimated	156,079	127,584	402,083	780,430	346,632	70,758	41,166	44,222	204,229	82,787
	(4) Gap Unit Price (3) - (2)	50,869	-44,059	46,490	56,450	27,592	42,495	-11,172	-90,166	-58,916	-34,547
	(5) % Gap (4)/(2)	48.35%	-25.67%	13.07%	7.80%	8.65%	150.36%	-21.35%	-67.09%	-22.39%	-29.44%
SBSTV	(1) Average Household Audience Rating	2.91	5.34	9.73	12.55	7.66	1.98	4.20	8.44	10.79	6.34
	(2) Average Unit Price_KOBACO	141,701	160,949	379,798	644,113	329,970	8,483	16,494	58,115	128,511	53,378
	(3) Average Unit Price_Estimated	159,607	118,665	403,531	645,673	329,100	61,118	21,335	15,574	153,518	64,955
	(4) Gap of Unit Price (3) - (2)	17,906	-42,284	23,733	1,560	-871	52,634	4,841	-42,541	25,007	11,577
	(5) % of Gap (4)/(2)	12.64%	-26.27%	6.25%	0.24%	-0.26%	620.43%	29.35%	-73.20%	19.46%	21.69%

implicit market prices for block advertising in BBS-FM and PBS-FM were estimated to be lower but higher in CBS-AM, CBS-FM, and FEBC-AM. There were no data for dayparts A and C for WBS-FM. Details can be found in Table 10.2. It should be noted that difference in audience size for radio programs was not taken into account in the model. Audience size not taken into account in the model seems to cause inconsistency between broadcasters.

Revenues estimated with Implicit Market Prices

Overall, revenues from program advertising in the major TV networks were estimated to be larger at implicit market prices than at KOBACO set prices. The difference accounted for 3.28% (KW 46,026 million) of the total major TV networks' program advertising revenue covered by the study (KW 1,403,615 million). Meanwhile, revenues at implicit market prices from block ads in the major TV networks were estimated to be 25.94% lower than revenues earned at KOBACO prices (KW 95,634 million versus KW 70,828 million). In sum, it was estimated that revenues in the major TV networks should be 1.42% larger at the market prices (KW 1,520,470 million) than at the KOBACO prices (KW 1,499,249 million). On the other hand, religious broadcasters' revenues estimated with implicit market prices were reduced by 36.36% (reduced to KW 29,338 million from the KW 46,103 million which was covered by the study). The findings imply that religious broadcasters were subsidized by the major TV networks, primarily by the program advertising in the major TV networks. Details are shown in Table 11.1 for major TV networks and in Table 11.2 for religious broadcasters.

Table 10.2. Implicit Price Estimation for the Religious Broadcasters

(Unit: KW/Second)

		Program Ads				Block Ads			
		Daypart C	Daypart B	Daypart A	Total	Daypart C	Daypart B	Daypart A	Total
BBC_FM	(1) Average Unit Price A*	3,948	5,504	9,585	8,614	3,220	5,540	9,032	7,819
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,118	44,438	2,018	8,537	8,261
	(3) Gap of Unit Price (2) - (1)	-38,878	-936	-3,424	-3,496	41,218	-3,522	-495	443
	(4) % of Gap (3)/(1)	-984.64%	-17.01%	-35.72%	-40.59%	1280.07%	-63.58%	-5.48%	5.67%
CBS_AM	(1) Average Unit Price A*	6,768	13,426	21,008	19,007	7,733	7,831	6,381	6,620
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,155	44,438	2,018	8,537	8,301
	(3) Gap of Unit Price (2) - (1)	-41,697	-8,858	-14,847	-13,851	36,705	-5,813	2,156	1,681
	(4) % of Gap (3)/(1)	-616.13%	-65.98%	-70.67%	-72.88%	474.65%	-74.24%	33.78%	25.39%
CBS_FM	(1) Average Unit Price A*	817	2,088	3,853	3,529	1,135	2,795	3,782	3,134
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,509	44,438	2,018	8,537	11,746
	(3) Gap of Unit Price (2) - (1)	-35,747	2,480	2,308	1,980	43,303	-778	4,755	8,612
	(4) % of Gap (3)/(1)	-4373.63%	118.74%	59.89%	56.10%	3815.27%	-27.82%	125.73%	274.84%
FEBC_AM	(1) Average Unit Price A*	850	1,991	3,954	3,695	1,156	2,312	3,630	3,114
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,848	44,438	2,018	8,537	8,676
	(3) Gap of Unit Price (2) - (1)	-35,780	2,577	2,208	2,153	43,282	-294	4,907	5,563
	(4) % of Gap (3)/(1)	-4209.39%	129.47%	55.85%	58.28%	3743.32%	-12.73%	135.19%	178.66%
PBC_FM	(1) Average Unit Price A*	2,850	5,400	10,311	9,313	3,420	5,516	11,030	8,992
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,317	44,438	2,018	8,537	10,404
	(3) Gap of Unit Price (2) - (1)	-37,780	-832	-4,150	-3,996	41,018	-3,498	-2,493	1,412
	(4) % of Gap (3)/(1)	-1325.61%	-15.41%	-40.25%	-42.91%	1199.37%	-63.42%	-22.60%	15.70%
WBS_FM	(1) Average Unit Price A*	3,405	3,450	6,034	5,057		3,176		3,176
	(2) Average Unit Price B**	-34,930	4,568	6,161	832		2,018		2,018
	(3) Gap of Unit Price (2) - (1)	-38,335	1,118	128	-4,225		-1,159		-1,159
	(4) % of Gap (3)/(1)	-1125.75%	32.40%	2.12%	-83.55%		-36.48%		-36.48%

* Average Unit Price A was estimated with KOBACO set prices

** Average Unit Price B was estimated with implicit market prices for the programs provided only by the major TV and religious radios

Table 11.1. Revenue Estimation for the Major TV Networks

(Unit: KW, Million/Year)

		Program Ads					Block Ads					SUM
		Daypart C	Daypart B	Daypart A	Daypart SA	Total	Daypart C	Daypart B	Daypart A	Daypart SA	Total	
KBS TV	(1) Revenues at Price A*	19,500	57,027	154,636	171,469	402,633	369	3,372	5,631	24,923	34,295	436,928
	(2) Revenues at Price B**	20,545	40,664	149,883	187,940	399,032	713	1,157	552	15,478	17,901	416,933
	(3) Gap of Revenues (2) - (1)	1,045	-16,364	-4,753	16,471	-3,601	344	-2,215	-5,079	-9,445	-16,394	-19,995
	(4) % Gap (3)/(1)	5.36%	-28.69%	-3.07%	9.61%	-0.89%	93.26%	-65.68%	-90.19%	-37.90%	-47.80%	-4.58%
MBC TV	(1) Revenues at Price A*	30,545	64,894	195,296	245,834	536,568	1,472	7,562	12,683	24,275	45,992	582,560
	(2) Revenues at Price B**	46,721	53,691	223,186	247,644	571,243	3,935	5,562	6,035	20,334	35,866	607,109
	(3) Gap of Revenues (2) - (1)	16,177	-11,203	27,890	1,811	34,675	2,463	-2,000	-6,648	-3,941	-10,125	24,549
	(4) % Gap (3)/(1)	52.96%	-17.26%	14.28%	0.74%	6.46%	167.32%	-26.45%	-52.41%	-16.23%	-22.02%	4.21%
SBS TV	(1) Revenues at Price A*	31,929	62,726	144,163	225,596	464,414	184	1,159	3,334	10,670	15,347	479,761
	(2) Revenues at Price B**	37,795	52,587	157,338	231,646	479,367	1,388	1,075	763	13,836	17,061	496,428
	(3) Gap of Revenues (2) - (1)	5,866	-10,138	13,174	6,050	14,952	1,204	-85	-2,571	3,166	1,714	16,667
	(4) % Gap (3)/(1)	18.37%	-16.16%	9.14%	2.68%	3.22%	654.91%	-7.31%	-77.11%	29.67%	11.17%	3.47%
SUM	(1) Revenues at Price A*	81,974	184,647	494,096	642,899	1,403,615	2,025	12,093	21,648	59,868	95,634	1,499,249
	(2) Revenues at Price B**	105,062	146,942	530,406	667,231	1,449,641	6,036	7,793	7,351	49,648	70,828	1,520,470
	(3) Gap of Revenues (2) - (1)	23,088	-37,705	36,311	24,332	46,026	4,011	-4,299	-14,297	-10,220	-24,805	21,221
	(4) % Gap (3)/(1)	28.17%	-20.42%	7.35%	3.78%	3.28%	198.08%	-35.55%	-66.04%	-17.07%	-25.94%	1.42%

* Price A is KOBACO set prices

** Price B is the implicit market prices estimated with the model including only the major TV and religious radios

Table 11.2. Revenue Estimation for Religious Broadcasters

(Unit: KW, Million/Year)

		Program Ads				Block Ads				SUM
		Daypart C	Daypart B	Daypart A	Total	Daypart C	Daypart B	Daypart A	Total	
BBS_FM	(1) Revenues at Price A*	75	1,266	6,395	7,736	17	93	466	576	8,311
	(2) Revenues at Price B**	-624	1,024	4,215	4,614	230	26	383	638	5,253
	(3) Gap of Revenues (2) - (1)	-699	-242	-2,180	-3,121	213	-67	-83	62	-3,059
	(4) % Gap (3)/(1)	-931.91%	-19.13%	-34.09%	-40.35%	1280.07%	-72.13%	-17.88%	10.85%	-36.80%
CBS_AM	(1) Revenues at Price A*	23	3,272	16,183	19,479	152	796	3,281	4,229	23,708
	(2) Revenues at Price B**	-120	1,124	4,734	5,738	976	166	4,095	5,237	10,975
	(3) Gap of Revenues (2) - (1)	-143	-2,148	-11,450	-13,741	823	-630	815	1,008	-12,733
	(4) % Gap (3)/(1)	-617.23%	-65.65%	-70.75%	-70.54%	540.22%	-79.13%	24.84%	23.84%	-53.71%
CBS_FM	(1) Revenues at Price A*	8	237	1,687	1,932	24	83	208	315	2,247
	(2) Revenues at Price B**	-320	541	2,859	3,080	904	62	445	1,411	4,491
	(3) Gap of Revenues (2) - (1)	-328	303	1,172	1,148	879	-21	238	1,096	2,244
	(4) % Gap (3)/(1)	-4224.97%	127.99%	69.50%	59.43%	3592.48%	-25.16%	114.41%	347.37%	99.86%
FEBC_AM	(1) Revenues at Price A*	0	221	1,811	2,033	23	78	337	438	2,471
	(2) Revenues at Price B**	-14	507	2,884	3,377	811	60	758	1,630	5,007
	(3) Gap of Revenues (2) - (1)	-14	286	1,073	1,345	789	-18	421	1,192	2,536
	(4) % Gap (3)/(1)	-4209.39%	128.99%	59.26%	66.14%	3470.74%	-23.11%	124.87%	271.90%	102.63%
PBC_FM	(1) Revenues at Price A*	51	923	5,724	6,698	13	71	323	406	7,104
	(2) Revenues at Price B**	-621	780	3,420	3,579	163	22	250	435	4,014
	(3) Gap of Revenues (2) - (1)	-672	-142	-2,305	-3,119	150	-48	-73	29	-3,090
	(4) % Gap (3)/(1)	-1325.61%	-15.41%	-40.26%	-46.56%	1199.37%	-68.26%	-22.60%	7.09%	-43.49%
WBS_FM	(1) Revenues at Price A*	247	414	1,570	2,231		30		30	2,262
	(2) Revenues at Price B**	-2,582	549	1,603	-431		29		29	-401
	(3) Gap of Revenues (2) - (1)	-2,829	134	33	-2,662		-1		-1	-2,663
	(4) % Gap (3)/(1)	-1143.54%	32.40%	2.10%	-119.30%		-3.01%		-3.01%	-117.75%
SUM	(1) Revenues at Price A*	404	6,333	33,370	40,108	229	1,152	4,614	5,995	46,103
	(2) Revenues at Price B**	-4,281	4,524	19,714	19,957	3,084	367	5,931	9,381	29,338
	(3) Gap of Revenues (2) - (1)	-4,685	-1,809	-13,656	-20,151	2,855	-786	1,317	3,386	-16,764
	(4) % Gap (3)/(1)	-1158.56%	-28.57%	-40.92%	-50.24%	1247.75%	-68.17%	28.54%	56.48%	-36.36%

* Price A is KOBACO set prices

** Price B is the implicit market prices estimated with the model including only the major TV and religious radios

However, as the revenues covered by the study are 64.3% of the total market size, the estimate of the total subsidy amounts has to be adjusted to reflect ad time purchases by advertisers not included in the sample. The total revenues predicted for increase in the major TV networks is KW 33,003 million at implicit market prices while the total revenue reduction predicted for the religious broadcasters is KW 26,072 million.

Further Analysis

Package Size Effect

To design a model based on the assumption that the package price is the sum of components' market prices, no package discounts should be available. Otherwise, any package discount becomes part of the error term. The concern might be that this violates the independence of errors if discounts are not distributed randomly among independent variables. Hence, it is necessary to check that there are no explicit package discounting practices in the Korean advertising market. While there is no evidence that KOBACO provides higher discounts for larger packages, it is possible for KOBACO to construct packages in a way to favor bigger packages (i.e., constructing packages with better performing programs for bigger packages). If it does, a package size variable should affect average package price per spot negatively. Package size effect was tested by including a package size dummy (1 for those packages with higher than average package price, 0 for the others) into the regression where the dependent variable is average package price and independent variables are average audience seconds per spot and the fractions of each daypart for the package. Table 12.1 shows that the coefficient for the package size dummy is negative but not statistically significant (significance $p = .39$).

Also, as Table 12.2 shows, the effect of package size on the price per audience second (equivalent to CPM) was checked with the regression where price per audience second is a dependent variable and package price is an independent variable. Again, the correlation was close to zero and its estimator was insignificant (significance $p=.93$). The results provide evidence for no package discounts available in the market.

Effect of Demographic Composition

Although audience size variables specified by demographic characteristics were dropped from the model estimating implicit market prices due to multicollinearity concern, it is still possible to check the effect of demographic composition by adding a proportional term for gender in the analysis. However, data did not include gender fraction across all demographics. Only the 20-49 age groups are divided into gender. Hence, assuming audiences other than 20-49 age groups are also composed in the same gender proportions, the fraction variable of female 20-49 audience seconds out of total 20-49 audience seconds were added to the model (3.5).

As Table 13 shows, the female fraction has a negative effect (KW -1,873,068) on the average package price. This implies that the advertising slot in a program whose audience contains only females, commands a KW 1,873,068 lower price than one whose audience has only males. That is, advertisers prefer male viewers to female viewers at least among those aged 20-49. This finding is consistent with previous finding by Fournier and Martin (1983) and Koschat and Putsis (2002) where female viewers were less valued in terms of advertising price.

Table12.1. Package Size Effect on APPU

	Unstandardized Coefficients	Standard Error	Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	1,706,114	129,925		13.13	0.00					
Average Audience Seconds of TV Program Ads	84	6	0.40	14.81	0.00	0.94	0.58	0.14	0.11	8.80
Fraction of TV Program Ads in Daypart SA	4,601,530	270,168	0.32	17.03	0.00	0.80	0.64	0.16	0.24	4.25
Fraction of TV Program Ads in Daypart A	1,818,243	223,918	0.15	8.12	0.00	0.69	0.37	0.07	0.23	4.31
Fraction of TV Program Ads in Daypart C	-1,194,645	161,711	-0.12	-7.39	0.00	0.14	-0.34	-0.07	0.31	3.22
Average Audience Seconds of TV Block Ads	102	15	0.24	6.77	0.00	0.09	0.31	0.06	0.07	15.00
Fraction of TV Block Ads in Daypart SA	-2,889,073	668,496	-0.12	-4.32	0.00	0.13	-0.20	-0.04	0.12	8.45
Fraction of TV Block Ads in Daypart A	-3,824,825	600,115	-0.13	-6.37	0.00	0.01	-0.30	-0.06	0.22	4.64
Fraction of TV Block Ads in Daypart B	-2,567,538	367,455	-0.10	-6.99	0.00	-0.08	-0.32	-0.06	0.39	2.56
Fraction of TV Block Ads in Daypart C	-1,264,626	795,754	-0.02	-1.59	0.11	-0.16	-0.08	-0.01	0.64	1.56
Fraction of Religious Radio's Program Ads in Daypart A	-1,571,981	143,339	-0.22	-10.97	0.00	-0.62	-0.47	-0.10	0.20	4.88
Fraction of Religious Radio's Program Ads in Daypart B	-1,612,818	181,181	-0.12	-8.90	0.00	-0.39	-0.40	-0.08	0.47	2.11
Fraction of Religious Radio's Program Ads in Daypart C	-2,314,537	638,997	-0.04	-3.62	0.00	-0.18	-0.17	-0.03	0.88	1.14
Fraction of Religious Radio's Block Ads in Daypart A	-1,520,729	222,675	-0.09	-6.83	0.00	-0.29	-0.31	-0.06	0.48	2.09
Fraction of Religious Radio's Block Ads in Daypart B	-1,599,893	727,667	-0.03	-2.20	0.03	-0.20	-0.11	-0.02	0.57	1.76
Fraction of Religious Radio's Block Ads in Daypart C	-734,397	1,462,598	-0.01	-0.50	0.62	-0.11	-0.02	0.00	0.63	1.59
Package Size Dummy (1 for larger than Average)	-25,349	29,629	-0.01	-0.86	0.39	-0.12	-0.04	-0.01	0.88	1.13

Dependent Variable: APPU

 R^2 (16,426) = .96 (Sig. F Change = .00)

Table12.2. Package Size Effect on Average Price per Audience Second

	Unstandardized Coefficients	Standard Error	Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	185	2		83.88	0.00					
Total Package Price	0	0	0.00	-0.09	0.93	0.00	0.00	0.00	1.00	1.00

Dependent Variable: Average Price per Audience Second

 R^2 (1,436) = .00 (Sig. F Change = .93)

Table13. Demographic Composition Effect

	Unstandardized Coefficients	Standard Error	Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B		Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	1,819,948	382,987		4.75	0.00					
Average Audience Seconds of TV Program Ads	81	6	0.39	14.41	0.00	0.94	0.57	0.13	0.12	8.33
Fraction of TV Program Ads in Daypart SA	5,685,741	222,104	0.40	25.60	0.00	0.79	0.78	0.24	0.35	2.87
Fraction of TV Program Ads in Daypart A	2,930,960	175,671	0.25	16.68	0.00	0.68	0.63	0.16	0.38	2.63
Fraction of TV Program Ads in Daypart C	874,591	183,218	0.06	4.77	0.00	0.15	0.23	0.04	0.51	1.98
Average Audience Seconds of TV Block Ads	97	15	0.23	6.47	0.00	0.07	0.30	0.06	0.07	15.03
Fraction of TV Block Ads in Daypart SA	-1,855,840	668,620	-0.08	-2.78	0.01	0.11	-0.13	-0.03	0.12	8.57
Fraction of TV Block Ads in Daypart A	-2,552,323	593,766	-0.09	-4.30	0.00	0.00	-0.21	-0.04	0.22	4.61
Fraction of TV Block Ads in Daypart B	-1,261,480	366,584	-0.05	-3.44	0.00	-0.10	-0.17	-0.03	0.39	2.58
Fraction of TV Block Ads in Daypart C	-269,645	780,598	0.00	-0.35	0.73	-0.18	-0.02	0.00	0.65	1.53
Fraction of Religious Radio's Program Ads in Daypart A	-559,153	133,515	-0.08	-4.19	0.00	-0.61	-0.20	-0.04	0.25	3.96
Fraction of Religious Radio's Program Ads in Daypart B	-610,310	173,633	-0.05	-3.51	0.00	-0.40	-0.17	-0.03	0.51	1.95
Fraction of Religious Radio's Program Ads in Daypart C	-1,326,924	626,921	-0.02	-2.12	0.03	-0.19	-0.10	-0.02	0.90	1.12
Fraction of Religious Radio's Block Ads in Daypart A	-341,038	270,631	-0.02	-1.26	0.21	-0.27	-0.06	-0.01	0.53	1.90
Fraction of Religious Radio's Block Ads in Daypart B	-723,578	724,382	-0.01	-1.00	0.32	-0.19	-0.05	-0.01	0.58	1.71
Fraction of Religious Radio's Block Ads in Daypart C	-188,744	1,554,273	0.00	-0.12	0.90	-0.11	-0.01	0.00	0.55	1.83
Female Percentage in the Audience	-1,873,068	527,127	-0.04	-3.55	0.00	-0.20	-0.17	-0.03	0.67	1.50

Dependent Variable: APPU

 R^2 (16,421) = .96 (Sig. F Change = .00)

Selling Major Radio Time in Packages with Major TV and Religious Radio Time

Although previous literature mainly focuses on major TV and religious broadcasters in the context of price distortion attributed to packaging or other factors such as lack of information, it is also meaningful to test how well the other advertising resources sold by KOBACO approximate implicit market prices in the framework of package price. However, this approach has both pros and cons. If they were sold as part of packages, including them in the packages fixes the problem regarding model misspecification. Conversely, if not, including them in the packages could cause additional bias when there is correlation between the number of ad units for other media programs and the number of ad units for major radio programs. Hence, results should be interpreted cautiously.

Table 14 shows regression results where the program and block advertising for major radio broadcasters (major TV networks' radio subsidiaries) was added to the model (3.5). By this addition, the variation explained by the model (R^2) increases by .02 from .96 to .98 and major radio's total ad revenues estimated at implicit market prices remained about the same (-0.76%) although the budget estimation for the major TV networks decreased by a little (0.02%) compared to the model without major radio. By including major radio in the model, the revenues for the religious broadcasters were estimated to be KW 21,977 million, which is a 52.33% reduction from KW 46,103 million at KOBACO prices. The revenues estimated at the implicit market prices with the model before major radio was added to the model were KW 29,338, which is a 36.36% reduction from the corresponding revenues at KOBACO prices. Tables 15.1 to 15.3 show

Table 14. Regression Output including Major Radio

	Unstandardized Coefficients	Standard Error	Standard Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B		Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	589,514	111,272		5.30	0.00					
Average Audience Seconds of TV Program Ads	84	6	0.40	15.01	0.00	0.96	0.59	0.11	0.08	12.87
Fraction of TV Program Ads in Daypart SA	5,692,204	220,406	0.36	25.83	0.00	0.82	0.78	0.19	0.29	3.40
Fraction of TV Program Ads in Daypart A	2,859,017	168,161	0.23	17.00	0.00	0.74	0.64	0.13	0.32	3.17
Fraction of TV Program Ads in Daypart C	1,096,662	152,352	0.07	7.20	0.00	0.37	0.33	0.05	0.54	1.86
Average Audience Seconds of TV Block Ads	88	16	0.17	5.57	0.00	0.25	0.26	0.04	0.06	15.82
Fraction of TV Block Ads in Daypart SA	-1,216,548	766,459	-0.03	-1.59	0.11	0.28	-0.08	-0.01	0.13	7.72
Fraction of TV Block Ads in Daypart A	-2,369,850	614,693	-0.07	-3.86	0.00	0.15	-0.18	-0.03	0.19	5.38
Fraction of TV Block Ads in Daypart B	-882,507	373,618	-0.03	-2.36	0.02	0.06	-0.11	-0.02	0.34	2.91
Fraction of TV Block Ads in Daypart C	-853,774	789,265	-0.01	-1.08	0.28	-0.05	-0.05	-0.01	0.57	1.76
Fraction of Major Radio's Program Ads in Daypart A	-347,043	128,783	-0.04	-2.69	0.01	-0.38	-0.13	-0.02	0.24	4.14
Fraction of Major Radio's Program Ads in Daypart B	-241,385	170,498	-0.01	-1.42	0.16	-0.24	-0.07	-0.01	0.56	1.79
Fraction of Major Radio's Program Ads in Daypart C	-875,815	355,874	-0.02	-2.46	0.01	-0.19	-0.12	-0.02	0.79	1.26
Fraction of Major Radio's Block Ads in Daypart A	-366,279	207,633	-0.02	-1.76	0.08	-0.18	-0.09	-0.01	0.55	1.82
Fraction of Major Radio's Block Ads in Daypart B	-372,642	462,202	-0.01	-0.81	0.42	-0.11	-0.04	-0.01	0.78	1.28
Fraction of Major Radio's Block Ads in Daypart C	-434,901	782,373	0.00	-0.56	0.58	-0.10	-0.03	0.00	0.76	1.31
Fraction of Religious Radio's Program Ads in Daypart A	-506,061	125,443	-0.07	-4.03	0.00	-0.53	-0.19	-0.03	0.21	4.72
Fraction of Religious Radio's Program Ads in Daypart B	-581,535	167,194	-0.04	-3.48	0.00	-0.34	-0.17	-0.03	0.55	1.83
Fraction of Religious Radio's Program Ads in Daypart C	-1,104,008	603,632	-0.01	-1.83	0.07	-0.17	-0.09	-0.01	0.90	1.11
Fraction of Religious Radio's Block Ads in Daypart A	-286,847	248,613	-0.01	-1.15	0.25	-0.23	-0.06	-0.01	0.48	2.09
Fraction of Religious Radio's Block Ads in Daypart B	-832,808	721,777	-0.01	-1.15	0.25	-0.23	-0.06	-0.01	0.49	2.02
Fraction of Religious Radio's Block Ads in Daypart C	298,793	1,598,865	0.00	0.19	0.85	-0.08	0.01	0.00	0.45	2.21

Dependent Variable: APPU

 $R^2(21,421) = .98$ (Sig. F Change = .00)

Table15.1. Price Estimation for the Major TV Including Major Radio
(Unit: KW/Second)

		Program Ads					Block Ads				
		Daypart C	Daypart B	Daypart A	Daypart SA	Total	Daypart C	Daypart B	Daypart A	Daypart SA	Total
KBS TV	(1) Average Household Audience Rating	3.31	5.99	8.64	13.76	8.18	2.92	4.91	8.33	14.04	9.44
	(2) Average Unit Price A*	150,323	200,244	380,804	633,235	347,777	43,442	77,567	206,600	368,306	227,217
	(3) Average Unit Price B**	165,520	127,898	377,160	669,487	334,637	80,866	35,727	22,632	224,385	121,538
	(4) Average Unit Price C***	164,249	133,148	371,961	667,649	333,673	29,497	60,900	23,022	220,243	124,137
	(5) Gap of Unit Price (3) - (2)	15,197	-72,346	-3,644	36,253	-13,139	37,424	-41,840	-183,968	-143,920	-105,680
	(6) Gap of Unit Price (4) - (2)	13,926	-67,096	-8,843	34,415	-14,104	-13,946	-16,667	-183,578	-148,063	-103,081
	(7) % Gap (5)/(2)	10.11%	-36.13%	-0.96%	5.72%	-3.78%	86.15%	-53.94%	-89.05%	-39.08%	-46.51%
	(8) % Gap (6)/(2)	9.26%	-33.51%	-2.32%	5.43%	-4.06%	-32.10%	-21.49%	-88.86%	-40.20%	-45.37%
MBC TV	(1) Average Household Audience Rating	2.76	6.03	9.76	19.39	8.95	2.54	5.32	9.56	13.20	7.75
	(2) Average Unit Price A*	105,209	171,643	355,593	723,980	319,040	28,263	52,338	134,388	263,145	117,334
	(3) Average Unit Price B**	156,079	127,584	402,083	780,430	346,632	70,758	41,166	44,222	204,229	82,787
	(4) Average Unit Price C***	154,767	132,833	396,989	779,063	345,631	20,750	65,606	41,721	202,801	80,282
	(5) Gap of Unit Price (3) - (2)	50,869	-44,059	46,490	56,450	27,592	42,495	-11,172	-90,166	-58,916	-34,547
	(6) Gap of Unit Price (4) - (2)	49,558	-38,810	41,396	55,082	26,591	-7,513	13,268	-92,667	-60,343	-37,053
	(7) % Gap (5)/(2)	48.35%	-25.67%	13.07%	7.80%	8.65%	150.36%	-21.35%	-67.09%	-22.39%	-29.44%
	(8) % Gap (6)/(2)	47.10%	-22.61%	11.64%	7.61%	8.33%	-26.58%	25.35%	-68.95%	-22.93%	-31.58%
SBS TV	(1) Average Household Audience Rating	2.91	5.34	9.73	12.55	7.66	1.98	4.20	8.44	10.79	6.34
	(2) Average Unit Price A*	141,701	160,949	379,798	644,113	329,970	8,483	16,494	58,115	128,511	53,378
	(3) Average Unit Price B**	159,607	118,665	403,531	645,673	329,100	61,118	21,335	15,574	153,518	64,955
	(4) Average Unit Price C***	158,311	123,877	398,443	643,734	328,438	12,408	48,447	16,932	158,922	68,282
	(5) Gap of Unit Price (3) - (2)	17,906	-42,284	23,733	1,560	-871	52,634	4,841	-42,541	25,007	11,577
	(6) Gap of Unit Price (4) - (2)	16,610	-37,072	18,645	-379	-1,533	3,925	31,953	-41,183	30,411	14,904
	(7) % Gap (5)/(2)	12.64%	-26.27%	6.25%	0.24%	-0.26%	620.43%	29.35%	-73.20%	19.46%	21.69%
	(8) % Gap (6)/(2)	11.72%	-23.03%	4.91%	-0.06%	-0.46%	46.26%	193.72%	-70.86%	23.66%	27.92%

* Average Unit Price A was estimated with KOBACO set prices

** Average Unit Price B was estimated with implicit market prices for the programs provided only by the major TV and religious radios

*** Average Unit Price C was estimated with implicit market prices for the programs provided by the major TV, religious radios, and major radios

Table15.2. Price Estimation for the Religious Broadcasters Including Major Radio
(Unit: KW/Second)

		Program Ads				Block Ads			
		Daypart C	Daypart B	Daypart A	Total	Daypart C	Daypart B	Daypart A	Total
BBS_FM	(1) Average Unit Price A*	3,948	5,504	9,585	8,614	3,220	5,540	9,032	7,819
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,118	44,438	2,018	8,537	8,261
	(3) Average Unit Price C***	-25,725	399	4,173	2,853	44,415	-12,165	15,133	8,829
	(4) Gap of Unit Price (3) - (2)	-38,878	-936	-3,424	-3,496	41,218	-3,522	-495	443
	(5) Gap of Unit Price (4) - (2)	-29,673	-5,105	-5,412	-5,761	41,195	-17,704	6,102	1,010
	(6) % Gap (4)/(1)	-984.64%	-17.01%	-35.72%	-40.59%	1280.07%	-63.58%	-5.48%	5.67%
	(7) % Gap (5)/(1)	-751.51%	-92.75%	-56.47%	-66.88%	1279.36%	-319.60%	67.56%	12.92%
CBS_AM	(1) Average Unit Price A*	6,768	13,426	21,008	19,007	7,733	7,831	6,381	6,620
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,155	44,438	2,018	8,537	8,301
	(3) Average Unit Price C***	-25,725	399	4,173	2,826	44,415	-12,165	15,133	11,725
	(4) Gap of Unit Price (3) - (2)	-41,697	-8,858	-14,847	-13,851	36,705	-5,813	2,156	1,681
	(5) Gap of Unit Price (4) - (2)	-32,492	-13,027	-16,835	-16,181	36,682	-19,996	8,752	5,104
	(6) % Gap (4)/(1)	-616.13%	-65.98%	-70.67%	-72.88%	474.65%	-74.24%	33.78%	25.39%
	(7) % Gap (5)/(1)	-480.11%	-97.03%	-80.14%	-85.13%	474.35%	-255.34%	137.15%	77.10%
CBS_FM	(1) Average Unit Price A*	817	2,088	3,853	3,529	1,135	2,795	3,782	3,134
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,509	44,438	2,018	8,537	11,746
	(3) Average Unit Price C***	-25,725	399	4,173	3,260	44,415	-12,165	15,133	11,580
	(4) Gap of Unit Price (3) - (2)	-35,747	2,480	2,308	1,980	43,303	-778	4,755	8,612
	(5) Gap of Unit Price (4) - (2)	-26,542	-1,689	319	-269	43,280	-14,960	11,351	8,447
	(6) % Gap (4)/(1)	-4373.63%	118.74%	59.89%	56.10%	3815.27%	-27.82%	125.73%	274.84%
	(7) % Gap (5)/(1)	-3247.39%	-80.90%	8.28%	-7.62%	3813.25%	-535.18%	300.14%	269.57%
FEBC_AM	(1) Average Unit Price A*	850	1,991	3,954	3,695	1,156	2,312	3,630	3,114
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,848	44,438	2,018	8,537	8,676
	(3) Average Unit Price C***	-25,725	399	4,173	3,611	44,415	-12,165	15,133	8,945
	(4) Gap of Unit Price (3) - (2)	-35,780	2,577	2,208	2,153	43,282	-294	4,907	5,563
	(5) Gap of Unit Price (4) - (2)	-26,575	-1,592	219	-84	43,259	-14,477	11,504	5,831
	(6) % Gap (4)/(1)	-4209.39%	129.47%	55.85%	58.28%	3743.32%	-12.73%	135.19%	178.66%
	(7) % Gap (5)/(1)	-3126.44%	-79.96%	5.54%	-2.26%	3741.33%	-626.19%	316.92%	187.28%
PBC_FM	(1) Average Unit Price A*	2,850	5,400	10,311	9,313	3,420	5,516	11,030	8,992
	(2) Average Unit Price B**	-34,930	4,568	6,161	5,317	44,438	2,018	8,537	10,404
	(3) Average Unit Price C***	-25,725	399	4,173	3,080	44,415	-12,165	15,133	11,423
	(4) Gap of Unit Price (3) - (2)	-37,780	-832	-4,150	-3,996	41,018	-3,498	-2,493	1,412
	(5) Gap of Unit Price (4) - (2)	-28,575	-5,001	-6,139	-6,233	40,995	-17,681	4,103	2,430
	(6) % Gap (4)/(1)	-1325.61%	-15.41%	-40.25%	-42.91%	1199.37%	-63.42%	-22.60%	15.70%
	(7) % Gap (5)/(1)	-1002.62%	-92.61%	-59.53%	-66.93%	1198.69%	-320.54%	37.20%	27.02%

Table15.2. (cont'd)

WBS_FM	(1) Average Unit Price A*	3,405	3,450	6,034	5,057	3,176	3,176
	(2) Average Unit Price B**	-34,930	4,568	6,161	832	2,018	2,018
	(3) Average Unit Price C***	-25,725	399	4,173	-374	-12,165	-12,165
	(4) Gap of Unit Price (3) - (2)	-38,335	1,118	128	-4,225	-1,159	-1,159
	(5) Gap of Unit Price (4) - (2)	-29,130	-3,051	-1,861	-5,432	-15,341	-15,341
	(6) % Gap (4)/(1)	-1125.75%	32.40%	2.12%	-83.55%	-36.48%	-36.48%
	(7) % Gap (5)/(1)	-855.43%	-88.44%	-30.85%	-107.40%	-482.99%	-482.99%

* Average Unit Price A was estimated with KOBACO set prices

** Average Unit Price B was estimated with implicit market prices for the programs provided only by the major TV and religious radios

*** Average Unit Price C was estimated with implicit market prices for the programs provided by the major TV, religious radios, and major radios

Table15.3. Price Estimation for the Major Radio Broadcasters Including Major Radio
(Unit: KW/Second)

		Program Ads				Block Ads			
		Daypart C	Daypart B	Daypart A	Total	Daypart C	Daypart B	Daypart A	Total
KBS_AM	(1) Average Unit Price A*	6,530	12,923	20,057	17,947	3,601	5,739	10,640	8,828
	(2) Average Unit Price C**	-14,315	17,406	12,124	12,605	7,731	10,844	11,162	10,949
	(3) Gap of Unit Price (2) - (1)	-20,845	4,484	-7,933	-5,343	4,130	5,105	522	2,120
	(4) % Gap (3)/(1)	-319.23%	34.70%	-39.55%	-29.77%	114.68%	88.96%	4.90%	24.02%
KBS_FM	(1) Average Unit Price A*	985	3,100	5,611	4,752	1,478	3,014	3,852	3,315
	(2) Average Unit Price C**	-14,315	17,406	12,124	10,884	7,731	10,844	11,162	10,557
	(3) Gap of Unit Price (2) - (1)	-15,301	14,306	6,513	6,131	6,253	7,830	7,310	7,241
	(4) % Gap (3)/(1)	-1552.64%	461.50%	116.07%	129.02%	423.05%	259.80%	189.78%	218.41%
MBC_AM	(1) Average Unit Price A*	9,600	20,881	27,255	24,916	12,835	15,193	14,972	14,766
	(2) Average Unit Price C**	-14,315	17,406	12,124	13,017	7,731	10,844	11,162	10,675
	(3) Gap of Unit Price (2) - (1)	-23,915	-3,474	-15,132	-11,900	-5,104	-4,350	-3,810	-4,091
	(4) % Gap (3)/(1)	-249.12%	-16.64%	-55.52%	-47.76%	-39.77%	-28.63%	-25.45%	-27.70%
MBC_FM	(1) Average Unit Price A*	9,870	15,581	17,397	16,107	10,081	14,213	9,022	9,827
	(2) Average Unit Price C**	-14,315	17,406	12,124	10,666	7,731	10,844	11,162	10,744
	(3) Gap of Unit Price (2) - (1)	-24,185	1,825	-5,274	-5,442	-2,350	-3,370	2,140	917
	(4) % Gap (3)/(1)	-245.04%	11.71%	-30.31%	-33.78%	-23.31%	-23.71%	23.71%	9.33%
SBS_AM	(1) Average Unit Price A*	1,200	2,767	6,055	4,921	1,487	3,016	5,109	4,263
	(2) Average Unit Price C**	-14,315	17,406	12,124	11,586	7,731	10,844	11,162	10,809
	(3) Gap of Unit Price (2) - (1)	-15,515	14,639	6,069	6,665	6,243	7,828	6,053	6,546
	(4) % Gap (3)/(1)	-1292.92%	529.00%	100.24%	135.45%	419.77%	259.56%	118.49%	153.55%
SBS_FM	(1) Average Unit Price A*	2,906	4,785	8,250	7,076	1,292	2,301	3,580	3,061
	(2) Average Unit Price C**	-14,315	17,406	12,124	11,010	7,731	10,844	11,162	10,822
	(3) Gap of Unit Price (2) - (1)	-17,221	12,622	3,874	3,934	6,439	8,543	7,582	7,761
	(4) % Gap (3)/(1)	-592.59%	263.79%	46.96%	55.60%	498.28%	371.30%	211.82%	253.54%

* Average Unit Price A was estimated with KOBACO set prices

** Average Unit Price C was estimated with implicit market prices for the programs provided by the major TV, religious radios, and major radios

price estimation results for major TV networks, religious broadcasters, and major radio broadcasters respectively, while Tables 16.1 to 16.3 show revenue estimates.

Significance of Difference Between KOBACO Prices and Implicit Market Prices

Tables 17.1 to 17.4 show the results of testing for the significance of differences between KOBACO prices and implicit market prices. Due to the large number of cases, most tests were conducted twice with total cases and randomly sampled cases with around 200 cases in the test as a large number of cases tends to render non-significant differences significant. In some dayparts whose number of cases in the data was less than 200, sampled tests were not conducted. For the major TV networks, the differences between KOBACO prices and implicit market prices were statistically significant except for KBS's daypart A program ads, SBS's daypart SA program ads, and SBS's daypart B block ads. For the religious radio broadcasters, implicit market prices for both program ads and block ads whose sample sizes were larger than 100 were statistically different from KOBACO prices in all the dayparts. However, daypart C for religious broadcasters' block ads contained too few cases to have statistical meaning.

Comparison of present findings to those of the other studies

Previous studies have attempted to estimate implicit market prices for broadcast ad time in two ways: comparing ratios of TV ad CPMs to newspaper ad CPMs in Korea and in other countries (Joo, et al., 2001; Park, 2004; Shin, 2002), or measuring the advertisers' willingness to pay for broadcast ad time (Jung, 2005). While the studies comparing CPMs found that overall levels of TV ad time prices in a competitive market ranged up to 200% (Shin, 2002) to 400% (Park, 2004) of the current prices, Jung (2005) estimated implicit market prices to be 114.8% of the current prices. Jung's (2005)

Table 16.1. Revenue Estimation for the Major TV Networks Including Major Radio
(Unit: KW, Million/Year)

		Program Ads					Block Ads					SUM
		Daypart C	Daypart B	Daypart A	Daypart SA	Total	Daypart C	Daypart B	Daypart A	Daypart SA	Total	
KBS TV	(1) Revenues at Price A*	19,500	57,027	154,636	171,469	402,633	369	3,372	5,631	24,923	34,295	436,928
	(2) Revenues at Price B**	20,545	40,664	149,883	187,940	399,032	713	1,157	552	15,478	17,901	416,933
	(3) Revenues at Price C***	20,387	42,559	147,908	187,475	398,329	284	2,224	570	15,115	18,193	416,522
	(4) Gap of Revenues (3)-(2)	1,045	-16,364	-4,753	16,471	-3,601	344	-2,215	-5,079	-9,445	-16,394	-19,995
	(5) Gap of Revenues (4)-(2)	887	-14,468	-6,728	16,006	-4,303	-85	-1,147	-5,062	-9,808	-16,102	-20,406
	(6) % Gap (5)/(2)	5.36%	-28.69%	-3.07%	9.61%	-0.89%	93.26%	-65.68%	-90.19%	-37.90%	-47.80%	-4.58%
	(7) % Gap (6)/(2)	4.55%	-25.37%	-4.35%	9.33%	-1.07%	-23.05%	-34.03%	-89.88%	-39.35%	-46.95%	-4.67%
MBC TV	(1) Revenues at Price A*	30,545	64,894	195,296	245,834	536,568	1,472	7,562	12,683	24,275	45,992	582,560
	(2) Revenues at Price B**	46,721	53,691	223,186	247,644	571,243	3,935	5,562	6,035	20,334	35,866	607,109
	(3) Revenues at Price C***	46,326	55,985	220,537	247,055	569,904	1,188	9,337	5,594	20,196	36,316	606,219
	(4) Gap of Revenues (3)-(2)	16,177	-11,203	27,890	1,811	34,675	2,463	-2,000	-6,648	-3,941	-10,125	24,549
	(5) Gap of Revenues (4)-(2)	15,781	-8,908	25,241	1,221	33,335	-284	1,776	-7,089	-4,079	-9,676	23,659
	(6) % Gap (5)/(2)	52.96%	-17.26%	14.28%	0.74%	6.46%	167.32%	-26.45%	-52.41%	-16.23%	-22.02%	4.21%
	(7) % Gap (6)/(2)	51.67%	-13.73%	12.92%	0.50%	6.21%	-19.29%	23.48%	-55.89%	-16.80%	-21.04%	4.06%
SBS TV	(1) Revenues at Price A*	31,929	62,726	144,163	225,596	464,414	184	1,159	3,334	10,670	15,347	479,761
	(2) Revenues at Price B**	37,795	52,587	157,338	231,646	479,367	1,388	1,075	763	13,836	17,061	496,428
	(3) Revenues at Price C***	37,478	55,077	155,361	230,939	478,855	360	3,001	836	14,389	18,586	497,440
	(4) Gap of Revenues (3)-(2)	5,866	-10,138	13,174	6,050	14,952	1,204	-85	-2,571	3,166	1,714	16,667
	(5) Gap of Revenues (4)-(2)	5,549	-7,649	11,197	5,343	14,440	176	1,842	-2,498	3,719	3,239	17,679
	(6) % Gap (5)/(2)	18.37%	-16.16%	9.14%	2.68%	3.22%	654.91%	-7.31%	-77.11%	29.67%	11.17%	3.47%
	(7) % Gap (6)/(2)	17.38%	-12.19%	7.77%	2.37%	3.11%	95.82%	158.84%	-74.94%	34.86%	21.10%	3.68%
SUM	(1) Revenues at Price A*	81,974	184,647	494,096	642,899	1,403,615	2,025	12,093	21,648	59,868	95,634	1,499,249
	(2) Revenues at Price B**	105,062	146,942	530,406	667,231	1,449,641	6,036	7,793	7,351	49,648	70,828	1,520,470
	(3) Revenues at Price C***	104,191	153,621	523,806	665,469	1,447,088	1,832	14,563	6,999	49,700	73,094	1,520,182
	(4) Gap of Revenues (3)-(2)	23,088	-37,705	36,311	24,332	46,026	4,011	-4,299	-14,297	-10,220	-24,805	21,221
	(5) Gap of Revenues (4)-(2)	22,217	-31,025	29,711	22,570	43,472	-193	2,470	-14,648	-10,168	-22,539	20,933
	(6) % Gap (5)/(2)	28.17%	-20.42%	7.35%	3.78%	3.28%	198.08%	-35.55%	-66.04%	-17.07%	-25.94%	1.42%
	(7) % Gap (6)/(2)	27.10%	-16.80%	6.01%	3.51%	3.10%	-9.52%	20.42%	-67.67%	-16.98%	-23.57%	1.40%

* Price A is KOBACO set prices

** Price B is the implicit market prices estimated with the model including only the major TV and religious radios

*** Price C is the implicit market prices estimated with the model including the major TV, religious radios, and major radios

Table 16.2. Revenue Estimation for the Religious Broadcasters Including Major Radio
(Unit: KW, Million/Year)

		Program Ads				Block Ads				SUM
		Daypart C	Daypart B	Daypart A	Total	Daypart C	Daypart B	Daypart A	Total	
BBS_FM	(1) Revenues at Price A*	75	1,266	6,395	7,736	17	93	466	576	8,311
	(2) Revenues at Price B**	-624	1,024	4,215	4,614	230	26	383	638	5,253
	(3) Revenues at Price C***	-459	89	2,854	2,484	230	-157	678	751	3,235
	(4) Gap of Revenues (3)-(2)	-699	-242	-2,180	-3,121	213	-67	-83	62	-3,059
	(5) Gap of Revenues (4)-(2)	-534	-1,176	-3,541	-5,251	213	-250	212	175	-5,076
	(6) % Gap (5)/(2)	-931.91%	-19.13%	-34.09%	-40.35%	1280.07%	-72.13%	-17.88%	10.85%	-36.80%
	(7) % Gap (6)/(2)	-712.67%	-92.94%	-55.37%	-67.89%	1279.36%	-268.03%	45.57%	30.42%	-61.08%
CBS_AM	(1) Revenues at Price A*	23	3,272	16,183	19,479	152	796	3,281	4,229	23,708
	(2) Revenues at Price B**	-120	1,124	4,734	5,738	976	166	4,095	5,237	10,975
	(3) Revenues at Price C***	-88	98	3,206	3,216	975	-1,002	7,260	7,233	10,449
	(4) Gap of Revenues (3)-(2)	-143	-2,148	-11,450	-13,741	823	-630	815	1,008	-12,733
	(5) Gap of Revenues (4)-(2)	-112	-3,174	-12,978	-16,263	823	-1,798	3,979	3,004	-13,259
	(6) % Gap (5)/(2)	-617.23%	-65.65%	-70.75%	-70.54%	540.22%	-79.13%	24.84%	23.84%	-53.71%
	(7) % Gap (6)/(2)	-480.93%	-97.00%	-80.19%	-83.49%	539.89%	-225.86%	121.30%	71.03%	-55.93%
CBS_FM	(1) Revenues at Price A*	8	237	1,687	1,932	24	83	208	315	2,247
	(2) Revenues at Price B**	-320	541	2,859	3,080	904	62	445	1,411	4,491
	(3) Revenues at Price C***	-236	47	1,936	1,748	903	-376	789	1,316	3,064
	(4) Gap of Revenues (3)-(2)	-328	303	1,172	1,148	879	-21	238	1,096	2,244
	(5) Gap of Revenues (4)-(2)	-243	-190	249	-184	879	-460	581	1,001	817
	(6) % Gap (5)/(2)	-4224.97%	127.99%	69.50%	59.43%	3592.48%	-25.16%	114.41%	347.37%	99.86%
	(7) % Gap (6)/(2)	-3137.91%	-80.09%	14.79%	-9.52%	3590.57%	-551.24%	280.08%	317.15%	36.35%
FEBC_AM	(1) Revenues at Price A*	0	221	1,811	2,033	23	78	337	438	2,471
	(2) Revenues at Price B**	-14	507	2,884	3,377	811	60	758	1,630	5,007
	(3) Revenues at Price C***	-10	44	1,953	1,987	811	-363	1,344	1,791	3,779
	(4) Gap of Revenues (3)-(2)	-14	286	1,073	1,345	789	-18	421	1,192	2,536
	(5) Gap of Revenues (4)-(2)	-11	-177	142	-45	788	-442	1,007	1,353	1,308
	(6) % Gap (5)/(2)	-4209.39%	128.99%	59.26%	66.14%	3470.74%	-23.11%	124.87%	271.90%	102.63%
	(7) % Gap (6)/(2)	-3126.44%	-80.00%	7.86%	-2.24%	3468.89%	-563.58%	298.63%	308.76%	52.92%
PBC_FM	(1) Revenues at Price A*	51	923	5,724	6,698	13	71	323	406	7,104
	(2) Revenues at Price B**	-621	780	3,420	3,579	163	22	250	435	4,014
	(3) Revenues at Price C***	-457	68	2,316	1,927	163	-136	443	470	2,396
	(4) Gap of Revenues (3)-(2)	-672	-142	-2,305	-3,119	150	-48	-73	29	-3,090
	(5) Gap of Revenues (4)-(2)	-508	-854	-3,408	-4,771	150	-207	120	64	-4,707
	(6) % Gap (5)/(2)	-1325.61%	-15.41%	-40.26%	-46.56%	1199.37%	-68.26%	-22.60%	7.09%	-43.49%
	(7) % Gap (6)/(2)	-1002.62%	-92.61%	-59.54%	-71.23%	1198.69%	-291.38%	37.20%	15.66%	-66.27%

Table16.2. (cont'd)

WBS_FM	(1) Revenues at Price A*	247	414	1,570	2,231		30		30	2,262
	(2) Revenues at Price B**	-2,582	549	1,603	-431		29		29	-401
	(3) Revenues at Price C***	-1,902	48	1,085	-768		-177		-177	-946
	(4) Gap of Revenues (3)-(2)	-2,829	134	33	-2,662		-1		-1	-2,663
	(5) Gap of Revenues (4)-(2)	-2,149	-366	-484	-3,000		-208		-208	-3,207
	(6) % Gap (5)/(2)	-1143.54%	32.40%	2.10%	-119.30%		-3.01%		-3.01%	-117.75%
	(7) % Gap (6)/(2)	-868.53%	-88.44%	-30.85%	-134.43%		-684.75%		-684.75%	-141.81%
SUM	(1) Revenues at Price A*	404	6,333	33,370	40,108	229	1,152	4,614	5,995	46,103
	(2) Revenues at Price B**	-4,281	4,524	19,714	19,957	3,084	367	5,931	9,381	29,338
	(3) Revenues at Price C***	-3,153	395	13,351	10,593	3,082	-2,212	10,513	11,384	21,977
	(4) Gap of Revenues (3)-(2)	-4,685	-1,809	-13,656	-20,151	2,855	-786	1,317	3,386	-16,764
	(5) Gap of Revenues (4)-(2)	-3,557	-5,938	-20,019	-29,515	2,853	-3,364	5,900	5,389	-24,126
	(6) % Gap (5)/(2)	-1158.56%	-28.57%	-40.92%	-50.24%	1247.75%	-68.17%	28.54%	56.48%	-36.36%
	(7) % Gap (6)/(2)	-879.59%	-93.76%	-59.99%	-73.59%	1247.05%	-291.90%	127.87%	89.89%	-52.33%

* Price A is KOBACO set prices

** Price B is the implicit market prices estimated with the model including only the major TV and religious radios

*** Price C is the implicit market prices estimated with the model including the major TV, religious radios, and major radios

Table16.3. Revenue Estimation for the Major Radio Broadcasters including Major Radio
(Unit: KW, Million/Year)

		Program Ads				Block Ads				SUM
		Daypart C	Daypart B	Daypart A	Total	Daypart C	Daypart B	Daypart A	Total	
KBS_AM	(1) Revenues at Price A*	201	2,465	9,120	11,786	46	384	1,662	2,092	13,878
	(2) Revenues at Price C**	-473	3,660	5,788	8,975	87	652	1,819	2,559	11,533
	(3) Gap of Revenues (2) - (1)	-674	1,195	-3,333	-2,811	41	268	157	466	-2,345
	(4) % Gap (3)/(1)	-335.75%	48.49%	-36.54%	-23.85%	88.66%	69.92%	9.46%	22.30%	-16.89%
KBS_FM	(1) Revenues at Price A*	23	229	1,542	1,794	11	59	212	282	2,076
	(2) Revenues at Price C**	-305	1,465	3,703	4,862	57	210	610	876	5,738
	(3) Gap of Revenues (2) - (1)	-328	1,235	2,161	3,068	46	151	397	594	3,662
	(4) % Gap (3)/(1)	-1436.09%	538.66%	140.17%	171.03%	403.94%	257.70%	187.34%	210.66%	176.41%
MBC_AM	(1) Revenues at Price A*	113	3,751	12,673	16,536	219	478	1,133	1,830	18,367
	(2) Revenues at Price C**	-168	2,828	5,394	8,054	127	297	1,051	1,475	9,529
	(3) Gap of Revenues (2) - (1)	-281	-923	-7,279	-8,482	-93	-181	-82	-356	-8,837
	(4) % Gap (3)/(1)	-249.12%	-24.60%	-57.43%	-51.29%	-42.19%	-37.95%	-7.20%	-19.42%	-48.12%
MBC_FM	(1) Revenues at Price A*	449	2,098	8,307	10,855	92	133	992	1,217	12,072
	(2) Revenues at Price C**	-722	2,659	5,946	7,884	71	192	1,430	1,693	9,577
	(3) Gap of Revenues (2) - (1)	-1,171	561	-2,361	-2,971	-22	59	439	476	-2,495
	(4) % Gap (3)/(1)	-260.70%	26.73%	-28.42%	-27.37%	-23.37%	44.43%	44.23%	39.12%	-20.67%
SBS_AM	(1) Revenues at Price A*	105	587	2,679	3,370	35	163	474	671	4,042
	(2) Revenues at Price C**	-1,247	3,656	5,408	7,816	158	561	976	1,695	9,511
	(3) Gap of Revenues (2) - (1)	-1,352	3,070	2,728	4,446	123	399	502	1,023	5,469
	(4) % Gap (3)/(1)	-1292.92%	523.27%	101.83%	131.91%	350.66%	245.19%	106.04%	152.49%	135.33%
SBS_FM	(1) Revenues at Price A*	189	718	3,935	4,842	28	143	434	604	5,446
	(2) Revenues at Price C**	-949	2,676	5,755	7,482	174	606	1,307	2,087	9,569
	(3) Gap of Revenues (2) - (1)	-1,138	1,958	1,820	2,640	147	463	873	1,483	4,123
	(4) % Gap (3)/(1)	-601.17%	272.72%	46.26%	54.52%	532.73%	324.49%	201.27%	245.47%	75.70%
SUM	(1) Revenues at Price A*	1,079	9,848	38,256	49,183	432	1,358	4,907	6,697	55,880
	(2) Revenues at Price C**	-3,865	16,944	31,993	45,073	673	2,517	7,194	10,384	55,457
	(3) Gap of Revenues (2) - (1)	-4,944	7,097	-6,263	-4,110	242	1,159	2,287	3,688	-423
	(4) % Gap (3)/(1)	-458.10%	72.06%	-16.37%	-8.36%	56.02%	85.30%	46.61%	55.07%	-0.76%

* Price A is KOBACO set prices

** Price C is the implicit market prices estimated with the model including the major TV, religious radios, and major radios

Table 17.1 Mean Difference Test for Major TV Program Ads
(Unit: KW/Second)

			Program Ads										
			Mean Prices		Mean Differences	SD	SE	95% CI		t	df	Sig. (2-tailed)	
			KOBACO	Market			Lower	Upper					
KBS TV	DP_SA	Total	633,235	669,487	(36,253)	102,678	1,561	(39,314)	(33,191)	(23.22)	4,323	0.00	
		Random Sample (4%)	620,740	648,677	(27,937)	86,955	6,536	(40,836)	(15,038)	(4.27)	176	0.00	
	DP_A	Total	380,804	377,160	3,644	98,113	1,087	1,513	5,775	3.35	8,148	0.00	
		Random Sample (2%)	389,006	385,644	3,363	87,943	6,974	(10,412)	17,138	0.48	158	0.63	
	DP_B	Total	200,244	127,898	72,346	65,324	823	70,733	73,959	87.93	6,303	0.00	
		Random Sample (3%)	199,296	120,998	78,298	68,023	4,948	68,537	88,058	15.82	188	0.00	
	DP_C	Total	150,323	165,520	(15,197)	65,387	1,213	(17,576)	(12,818)	(12.52)	2,903	0.00	
		Random Sample (7%)	149,771	165,537	(15,767)	68,375	4,935	(25,500)	(6,033)	(3.20)	191	0.00	
	MBC TV	DP_SA	Total	723,980	780,430	(56,450)	264,020	3,351	(63,019)	(49,881)	(16.85)	6,207	0.00
			Random Sample (3%)	733,110	791,047	(57,937)	268,258	20,051	(97,504)	(18,370)	(2.89)	178	0.00
DP_A		Total	355,593	402,083	(46,490)	105,547	999	(48,448)	(44,531)	(46.52)	11,156	0.00	
		Random Sample (2%)	361,643	408,529	(46,886)	102,231	6,908	(60,501)	(33,271)	(6.79)	218	0.00	
DP_B		Total	171,643	127,584	44,059	77,332	861	42,372	45,746	51.19	8,073	0.00	
		Random Sample (2%)	168,876	130,259	38,617	67,634	5,281	28,189	49,046	7.31	163	0.00	
DP_C		Total	105,209	156,079	(50,869)	33,562	373	(51,600)	(50,138)	(136.39)	8,097	0.00	
		Random Sample (2%)	103,425	152,519	(49,094)	32,143	2,510	(54,050)	(44,138)	(19.56)	163	0.00	
SBS TV		DP_SA	Total	644,113	645,673	(1,560)	117,778	1,258	(4,025)	905	(1.24)	8,770	0.21
			Random Sample (2%)	650,369	652,930	(2,561)	98,960	7,546	(17,456)	12,333	(0.34)	171	0.73
	DP_A	Total	379,798	403,531	(23,733)	126,640	1,316	(26,313)	(21,152)	(18.03)	9,256	0.00	
		Random Sample (2%)	387,067	410,553	(23,486)	120,315	8,616	(40,479)	(6,493)	(2.73)	194	0.01	
	DP_B	Total	160,949	118,665	42,284	72,070	729	40,855	43,712	58.02	9,779	0.00	
		Random Sample (2%)	164,282	117,261	47,021	68,630	4,902	37,353	56,689	9.59	195	0.00	
	DP_C	Total	141,701	159,607	(17,906)	79,952	877	(19,626)	(16,186)	(20.41)	8,304	0.00	
		Random Sample (2%)	145,088	159,272	(14,184)	82,279	6,348	(26,717)	(1,651)	(2.23)	167	0.03	

Table 17.2. Mean Difference Test for Major TV Block Ads
(Unit: KW/Second)

			Block Ads									
			Mean Prices		Mean Differences	SD	SE	95% CI		t	df	Sig. (2-tailed)
			KOBACO	Market				Lower	Upper			
KBS TV	DP_SA	Total	368,306	220,243	148,063	157,552	6.831	134,644	161,482	21.68	531	0.00
		Random Sample (30%)	354,410	221,162	133,248	153,451	11,839	109,874	156,621	11.25	167	0.00
	DP_A	Total	207,471	21,007	186,464	111,034	7,972	170,741	202,187	23.39	193	0.00
		Random Sample	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
	DP_B	Total	77,567	35,727	41,840	48,557	2,511	36,903	46,778	16.66	373	0.00
		Random Sample (50%)	78,327	34,679	43,648	50,845	3,632	36,486	50,811	12.02	195	0.00
MBC TV	DP_C	Total	43,442	80,866	(37,424)	45,198	4,991	(47,355)	(27,493)	(7.50)	81	0.00
		Random Sample										
	DP_SA	Total	263,145	204,229	58,916	156,154	5,744	47,639	70,193	10.26	738	0.00
		Random Sample (30%)	252,571	196,997	55,574	144,474	9,547	36,762	74,385	5.82	228	0.00
	DP_A	Total	134,388	44,222	90,166	99,212	3,163	83,959	96,372	28.51	983	0.00
		Random Sample (20%)	122,721	34,878	87,844	87,431	6,106	75,804	99,884	14.39	204	0.00
SBS TV	DP_B	Total	52,338	41,166	11,172	39,934	1,224	8,771	13,573	9.13	1,064	0.00
		Random Sample (20%)	55,247	39,747	15,500	41,496	2,736	10,108	20,891	5.66	229	0.00
	DP_C	Total	28,263	70,758	(42,495)	17,834	716	(43,900)	(41,090)	(59.38)	620	0.00
		Random Sample (30%)	28,387	71,347	(42,960)	18,790	1,342	(45,607)	(40,313)	(32.01)	195	0.00
	DP_SA	Total	128,511	153,518	-25,007	125,479	4,594	-34,026	-15,988	(5.44)	745	0.00
		Random Sample (30%)	124,102	149,093	-24,991	111,666	7,363	-39,499	-10,483	(3.39)	229	0.00
SBS TV	DP_A	Total	58,115	15,574	42,541	50,881	2,489	37,649	47,433	17.09	417	0.00
		Random Sample (50%)	58,195	16,106	42,088	47,982	3,242	35,698	48,479	12.98	218	0.00
	DP_B	Total	16,494	21,335	-4,841	42,759	1,352	-7,494	-2,188	(3.58)	999	0.00
		Random Sample (20%)	16,678	20,062	-3,384	41,415	2,858	-9,018	2,250	(1.18)	209	0.24
	DP_C	Total	8,483	61,118	-52,634	17,763	818	-54,243	-51,026	(64.31)	470	0.00
		Random Sample (50%)	8,260	59,476	-51,216	15,176	986	-53,158	-49,274	(51.96)	236	0.00

Note: Random sampling was not made in case the number of observation is smaller than 260

Table 17.3. Mean Difference Test for Religious Radio Program Ads
(Unit: KW/Second)

			Program Ads									
			Mean Prices		Mean Differences	SD	SE	95% CI		t	df	Sig. (2-tailed)
			KOBACO	Market				Lower	Upper			
BBS_FM	DP_A	Total	9,585	6,161	3,424	645	17	3,391	3,457	204.61	1,483	0.00
		Random Sample (12%)	9,587	6,161	3,425	586	46	3,334	3,516	74.42	161	0.00
	DP_B	Total	5,504	4,568	936	1,174	58	823	1,050	16.22	413	0.00
		Random Sample (50%)	5,608	4,568	1,040	1,317	89	864	1,216	11.63	216	0.00
CBS_AM	DP_C	Total	3,948	(34,930)	38,878	1,212	211	38,448	39,308	184.20	32	0.00
		Random Sample (13%)	21,008	6,161	14,847	1,686	41	14,765	14,928	358.62	1,657	0.00
	DP_B	Total	20,889	6,161	14,727	1,810	121	14,489	14,965	122.06	224	0.00
		Random Sample (35%)	13,426	4,568	8,858	2,232	98	8,666	9,050	90.49	519	0.00
CBS_FM	DP_C	Total	13,575	4,568	9,007	2,493	184	8,643	9,371	48.87	182	0.00
		Random Sample (10%)	6,768	(34,930)	41,697	154	26	41,644	41,751	1577.01	33	0.00
	DP_A	Total	3,853	6,161	(2,308)	687	19	(2,345)	(2,271)	(121.93)	1,316	0.00
		Random Sample (15%)	3,833	6,161	(2,329)	741	51	(2,430)	(2,228)	(45.43)	208	0.00
FEBC_AM	DP_B	Total	6,648	4,568	2,080	4,594	106	1,872	2,289	19.56	1,865	0.00
		Random Sample (10%)	6,328	4,568	1,760	4,519	332	1,105	2,416	5.30	184	0.00
	DP_C	Total	3,737	(34,930)	38,666	2,138	142	38,387	38,946	272.49	226	0.00
		Random Sample	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
PBC_FM	DP_A	Total	3,954	6,161	(2,208)	178	6	(2,219)	(2,197)	(387.88)	974	0.00
		Random Sample (20%)	3,947	6,161	(2,214)	179	13	(2,239)	(2,189)	(176.85)	203	0.00
	DP_B	Total	1,991	4,568	(2,577)	66	5	(2,588)	(2,566)	(470.32)	142	0.00
		Random Sample	850	(34,930)	N/C	N/C	N/C	N/C	N/C	N/C	3*	N/C
WBS_FM	DP_C	Total	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
		Random Sample	10,311	6,161	4,150	1,017	30	4,090	4,209	137.42	1,133	0.00
	DP_A	Total	10,262	6,161	4,101	982	67	3,969	4,232	61.51	216	0.00
		Random Sample (18%)	5,400	4,568	N/C	N/C	N/C	N/C	N/C	N/C	258*	N/C
WBS_FM	DP_B	Total	2,850	(34,930)	N/C	N/C	N/C	N/C	N/C	N/C	19*	N/C
		Random Sample	6,034	6,161	(128)	205	8	(144)	(112)	(15.77)	640	0.00
	DP_C	Total	6,037	6,161	(124)	183	13	(150)	(99)	(9.66)	201	0.00
		Random Sample (30%)	3,450	4,568	N/C	N/C	N/C	N/C	N/C	N/C	263*	N/C
WBS_FM	DP_B	Total	3,405	(34,930)	38,335	2,004	181	37,977	38,693	212.18	122	0.00
		Random Sample	3,405	(34,930)	38,335	2,004	181	37,977	38,693	212.18	122	0.00

Note: Radom sampling was not made in case the number of observation is smaller than 260

N/C: Not Computable because the standard error of the difference is 0.

* total number of cases in the data

Table 17.4. Mean Difference Test for Religious Radio Block Ads
(Unit: KW/Second)

			Block Ads									
			Mean Prices		Mean Differences	SD	SE	95% CI		t	df	Sig. (2-tailed)
			KOBACO	Market				Lower	Upper			
BBS_FM	DP_A	Total	9,032	8,537	495	3,011	532	(591)	1,580	0.93	31	0.36
	DP_B	Total	5,540	2,018	3,522	3,545	983	1,380	5,664	3.58	12	0.00
	DP_C	Total	3,220	44,438	N/C	N/C	N/C	N/C	N/C	N/C	2*	N/C
CBS_AM	DP_A	Total	6,381	8,537	(2,156)	7,262	258	(2,662)	(1,649)	(8.35)	791	0.00
		Random Sample (25%)	4,906	8,537	(3,631)	5,704	407	(4,434)	(2,827)	(8.91)	195	0.00
	DP_B	Total	7,831	2,018	5,813	6,587	559	4,709	6,918	10.41	138	0.00
	DP_C	Total	7,733	44,438	(36,705)	4,100	941	(38,681)	(34,729)	(39.02)	18	0.00
CBS_FM	DP_A	Total	3,782	8,537	(4,755)	350	43	(4,841)	(4,669)	(110.37)	65	0.00
	DP_B	Total	2,795	2,018	778	890	157	457	1,098	4.95	31	0.00
	DP_C	Total	1,135	44,438	(43,303)	412	103	(43,523)	(43,084)	(420.47)	15	0.00
FEBC_AM	DP_A	Total	3,630	8,537	(4,907)	309	32	(4,970)	(4,844)	(154.10)	93	0.00
	DP_B	Total	2,312	2,018	294	804	126	40	548	2.34	40	0.02
	DP_C	Total	1,156	44,438	(43,282)	414	146	(43,628)	(42,936)	(295.95)	7	0.00
PBC_FM	DP_A	Total	11,030	8,537	N/C	N/C	N/C	N/C	N/C	N/C	14*	N/C
	DP_B	Total	5,516	2,018	3,498	3,859	1,726	(1,294)	8,291	2.03	4*	0.11
	DP_C	Total	3,420	44,438	N/C	N/C	N/C	N/C	N/C	N/C	2*	N/C
WBS_FM	DP_A	Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	DP_B	Total	3,176	2,018	1,159	2,521	891	(949)	3,266	1.30	7	0.23
		Random Sample	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
	DP_C	Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Random sampling was not made in case the number of observation is smaller than 260

N/C: Not Computable because the standard error of the difference is 0.

N/A: Not Available

* total number of cases in the data

estimation is specified by the dayparts. Table 18 compares my findings to those of other studies.

Diagnostic Analysis

Reliable estimates from the regression can be obtained only via close examination of data from the perspective how well the data fit the assumptions of regression analysis. Regression is fairly robust, but the level of robustness varies with the assumptions. Normality, linearity, homoscedasticity and independence of residuals are assumptions to be examined.

Normality

Multivariate normality is the underlying assumption of statistical tests of multiple regression. This assumption maintains that “each variable and all linear combinations of the variables are normally distributed.” The first check of normality assumption is to “investigate residuals of the analysis and to determine whether they are normally distributed and independent” (Tabachnick and Fidell, 1996, p.70). For the present regression results, as Figure 4 shows, the multivariate residual was normally distributed, and minimum and maximum residuals were within 3.35 standard deviations of the mean (see Table 19). According to Tabachnick and Fidell (1996), it is acceptable not to further screen individual variables for normality if the residual plot looks normal. Appendix A shows the Cook’s distance of the model, which “measures the effect of deleting a given observation. Observations with larger Cook’s distance (D) values than the rest of the data are those which have unusual influence” (Garson, 2007, p. 30). Referring to Fox (1991), Garson suggests as “a cut-off for detecting influential cases, values of D greater than $4/(n$

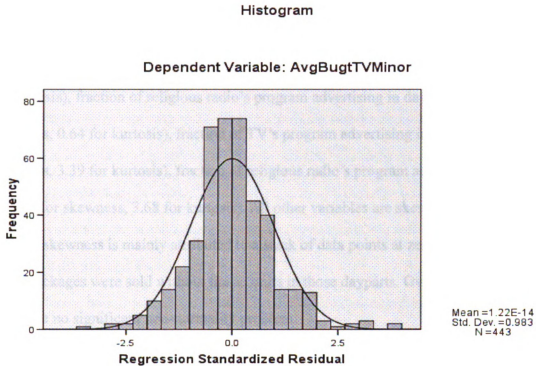
Table 18. Comparison of Findings with those of Previous Studies

			Major TV											Religious Broadcasters	
			Program Ads									Block Ads	Total		Total
			SA_25%	SA_15%	SA_10%	SA_Avg.	A_Avg.	B_Avg.	C_Avg.	SUM	Total				
Shin (2002)	%Gaps	ALL									N/E	N/E	200%	N/E	
Park (2004)	%Gaps	ALL									N/E	N/E	400%	N/E	
Jung(2005)	Current Prices	KBS TV				9,293,000	6,382,000	2,591,000	1,559,000			14.80%	N/E	N/E	-66.60%
	Implicit Market Prices		20,000,000	15,000,000	10,000,000	13,182,000	7,000,000	2,000,000	1,000,000						
	Gaps					3,889,000	618,000	-591,000	-559,000						
	%Gaps					41.85%	9.68%	-22.81%	-35.86%	13.00%					
	Current Prices	MBC TV				10,571,000	6,575,000	2,376,000	1,266,000						
	Implicit Market Prices		20,000,000	15,000,000	10,000,000	13,333,000	8,000,000	2,000,000	1,000,000						
	Gaps					2,762,000	1,425,000	-376,000	-266,000						
	%Gaps					26.13%	21.67%	-15.82%	-21.01%	13.60%					
	Current Prices	SBS TV				9,320,000	5,606,000	2,391,000	1,113,000						
	Implicit Market Prices		20,000,000	15,000,000	10,000,000	12,500,000	7,000,000	2,000,000	1,000,000						
	Gaps					3,180,000	1,394,000	-391,000	-113,000						
	%Gaps					34.12%	24.87%	-16.35%	-10.15%	18.90%					
Present Study	Current Prices	KBS TV	10,579,873	10,191,196	9,199,721	9,498,518	5,712,059	3,003,655	2,254,840	5,216,653		3.28%	-25.94%	1.42%	-36.36%
	Implicit Market Prices		14,697,105	11,500,460	9,537,183	10,042,307	5,657,399	1,918,465	2,482,797	5,019,562					
	Gaps		4,117,232	1,309,264	337,461	543,789	-54,660	-1,085,191	227,958	-197,091					
	%Gaps		38.92%	12.85%	3.67%	5.72%	-0.96%	-36.13%	10.11%	-3.78%					
	Current Prices	MBC TV	12,380,398	9,825,620	10,491,609	10,859,703	5,333,902	2,574,638	1,578,139	4,785,603					
	Implicit Market Prices		19,723,644	11,322,113	9,514,379	11,706,457	6,031,248	1,913,757	2,341,179	5,199,477					
	Gaps		7,343,245	1,496,493	-977,230	846,754	697,347	-660,882	763,039	413,874					
	%Gaps		59.31%	15.23%	-9.31%	7.80%	13.07%	-25.67%	48.35%	8.65%					
	Current Prices	SBS TV	10,078,085	10,991,486	9,568,651	9,661,695	5,696,977	2,414,237	2,125,521	4,949,557					
	Implicit Market Prices		16,989,982	11,655,460	9,548,748	9,685,097	6,052,966	1,779,980	2,394,111	4,936,493					
	Gaps		6,911,897	663,974	-19,903	23,401	355,989	-634,258	268,590	-13,063					
	%Gaps		68.58%	6.04%	-0.21%	0.24%	6.25%	-26.27%	12.64%	-0.26%					

N/E: No Equivalent Data

- $k - 1$), where n is the number of cases and k is the number of independent variables”
(Garson, 2007, p. 30).

Figure 4. Histogram of Regression Standardized Residual



Note: AvgBugtTVMinor stands for Average Unit Price

Table 19. Residual Statistics

	Minimum	Maximum	Mean	Standard Deviation	N
Predicted Value	114,268	7,617,768	3,078,250	1,353,698	443
Residual	-940,296	1,059,599	0	261,110	443
Std. Predicted Value	-2	3	0	1	443
Std. Residual	-4	4	0	1	443

Although not required, it is meaningful to check distributions of individual variables as “inconsistent direction of skewness among variables raises concerns” (Tabachnick and Fidell, 1996, p.73). Frequency statistics showed that variables in this study were either normally or positively distributed (see Table 20). Variables which turned out to be normal include average package price (.66 for skewness, .00 for kurtosis), average audience second of TV’s program advertising (.68 for skewness, 0.40 for kurtosis), fraction of TV’s program advertising in daypart SA (1.31. for skewness, 2.47 for kurtosis), fraction of religious radio’s program advertising in daypart A (.77 for skewness, 0.64 for kurtosis), fraction of TV’s program advertising in daypart A (1.51 for skewness, 3.39 for kurtosis), fraction of religious radio’s program advertising in daypart B (1.68 for skewness, 3.68 for kurtosis). All other variables are skewed positively. This positive skewness is mainly attributed to a stack of data points at zero. This means that many packages were sold without the ad units in those dayparts. Overall, it seems that data have no significant non-normality problem.

Table 20. Skewness and Kurtosis

	Skewness	Kurtosis
Average Package Price	0.66	0.00
Average Audience Seconds of TV Program Ads	0.68	0.40
Fraction of TV Program Ads in Daypart SA	1.31	2.47
Fraction of TV Program Ads in Daypart A	1.51	3.39
Fraction of TV Program Ads in Daypart B	1.68	3.68
Fraction of TV Program Ads in Daypart C	2.22	6.96
Average Audience Seconds of TV Block Ads	3.51	20.36
Fraction of TV Block Ads in Daypart SA	4.47	37.91
Fraction of TV Block Ads in Daypart A	4.53	31.36
Fraction of TV Block Ads in Daypart B	4.02	28.42
Fraction of TV Block Ads in Daypart C	4.69	31.12
Fraction of Minor Radio Program Ads in Daypart A	0.77	0.64
Fraction of Minor Radio Program Ads in Daypart B	2.43	7.50
Fraction of Minor Radio Program Ads in Daypart C	3.92	15.82

Table 20 (cont'd)

Fraction of Minor Radio Block Ads in Daypart A	5.39	40.76
Fraction of Minor Radio Block Ads in Daypart B	4.36	20.54
Fraction of Minor Radio Block Ads in Daypart C	7.64	58.92

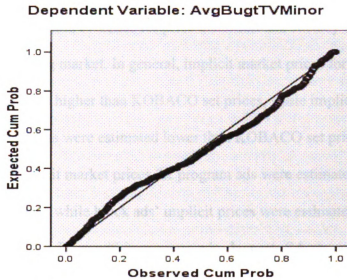
Linearity and Homoscedasticity

The assumption of linearity means the effects of independent variables on the dependent variable are constant. Linearity is important practically because “Pearson’s r only captures linear relationships among variables.” On the other hand, the assumption of homoscedasticity is that “the variability in scores for one continuous variable is roughly the same at all values of another continuous variable” (Tabachnick and Fidell, 1996, p. 70). Homoscedasticity is related to the assumption of normality because “relationships between variables are homoscedastic when the assumption of multivariate normality is met” (Tabachnick and Fidell, 1996, p. 70).

Hence, both linearity and homoscedasticity are diagnosed from residuals plots in analyses involving a predicted variable. “In plots where standardized residuals are plotted against predicted values, nonlinearity and heteroscedasticity is indicated when most of the residuals are above the zero line on the plot at some predicted values and below the zero line at other predicted values” (Tabachnick and Fidell, 1996, 70). Figure 5 (Normal P-P Plot of Regression Standardized Residual) shows there is no indication for nonlinearity or heteroscedasticity.

Figure 5. Normal P-P Plot of Regression Standardized Residual

Normal P-P Plot of Regression Standardized Residual



Note: AvgBugtTVMinor stands for Average Unit Price

CHAPTER 6

DISCUSSION AND CONCLUSION

This study found evidence for price distortion and subsidy in the Korean broadcast advertising market. In general, implicit market prices for major TV networks were estimated to be higher than KOBACO set prices, while implicit market prices for religious broadcasters were estimated lower than KOBACO set prices. Within the major TV networks, implicit market prices for program ads were estimated higher than KOBACO set prices while block ads' implicit prices were estimated lower than KOBACO set prices. Even within program ads, dayparts SA, A, and C were under-priced by KOBACO while daypart B was over-priced. Revenues for major radio broadcasters remained the same overall, although their implicit program ad time prices were estimated to be lower and implicit market block ad spot prices were estimated to be higher than KOBACO set prices.

Table 21.3 shows that price distortion was attributed mainly to weight difference assigned to pricing formula factors. KOBACO generally assigned a higher weight to daypart than to audience size. Viewed by daypart, dayparts SA, A, and C for major TV networks were under-priced while daypart B for major networks was over-priced by KOBACO. At the same time, religious broadcasters were over-priced by KOBACO. To approximate implicit market prices, KOBACO should assign higher weight to dayparts SA, A, and C but a lower weight to daypart B for major TV networks. At the same time, KOBACO may need to charge less for ad time in religious broadcasters' programs to sell all their ad time without resorting to packaging. It seems evident that religious

broadcaster programs were subsidized by major TV network programs through packaging. Otherwise, over-priced ad slots in religious broadcaster programs might not have been sold.

It remains unclear whether ad time in major radio broadcaster programs was sold as a part of packages (Informal interviews with advertisers indicate that major radio ad time is infrequently packaged with major TV ad time but is more frequently packaged within major radio programs). There was only a 0.76% difference between estimated advertiser payment at implicit market prices and advertiser expenditures at KOBACO prices. Nevertheless, there were significant differences in average prices between KOBACO set prices and implicit market prices depending on dayparts and ad types. Dayparts A and C for program ads were over-priced while daypart B was under-priced. On the other hand, time for block ads on major radio broadcasters was under-priced throughout dayparts.

It was also found that, while coefficients for radio block ad dayparts explaining package prices were not statistically significant, estimates of KOBACO set prices for radio ad time were not explained by factors employed in the implicit market price estimation (i.e., dayparts) either. Table 21.2 shows that the R^2 's of the regressions, where KOBACO prices were dependent variables and dayparts were independent variables, were extremely low for both program ads and block ads for radio programs. Dayparts explained only 0% to 7% of variation in KOBACO prices. Conversely, more than 81% of KOBACO set prices for TV program ads were explained by factors in the model (81% for KBS-TV and SBS-TV; 84% for MBC-TV) while 40% (SBS-TV) to 71%

(KBS-TV) of KOBACO set prices for TV block ads were explained by the factors (see Table 21.1).

In addition, no evidence was found of discounts for larger packages in the Korean broadcast ad time sales market. There is literature on advertising prices indicating the existence of volume discounts and some suspect price discrimination effect against small advertisers (Blake and Blum, 1965; Blank, 1968). However, in the Korean advertising sales market, data shows that no such practice was undertaken. The package size variable turned out to be non-significant in models where either the package price or the price per audience second (a concept equivalent to CPM) was a dependent variable.

The current study also confirmed previous studies finding that advertisers prefer male viewers to female viewers. When the female fraction variable was included in the model, its coefficient had a statistically significant negative effect on average package price.

As the first econometric analysis using actual transaction data, this study is believed to contribute to KOBACO's exploration of ways to improve its pricing formula. Reform of Korean broadcasting policy and efficient decision-making by industry participants can be assisted by the study. Beneficiaries may include content providers, broadcasters, advertisers and other media firms. The study also contributes to the design of an explicit subsidy system should policymakers decide such is appropriate. Particularly, estimated market value deviations from corresponding entries in the published rate card provide estimates of the size of rate restructuring that will occur when competition is introduced. Cross-subsidies flowing from major TV networks to religious radio broadcasters were explored also. Specific implications of the study are discussed below.

Table 21.1. Comparison between the Estimators of Implicit Market Prices and KOBACO Set Prices for Major TV
(Unit: KW/Second, KW/Unit)

	Major TV									
	Program Ads					Block Ads				
	Implicit Market Price 1	Implicit Market Price 2	KOBACO (KBS-TV)	KOBACO (MBC-TV)	KOBACO (SBS-TV)	Implicit Market Price 1	Implicit Market Price 2	KOBACO (KBS-TV)	KOBACO (MBC-TV)	KOBACO (SBS-TV)
(Constant)	516,695***	589,514***	2,088,034***	2,238,967***	1,573,595***	516,695***	589,514***	1,317,969***	(729,696)***	416740***
Audience Second	84***	84***	54***	20***	55***	102***	88***	(-8)***	3**	(-10)***
Daypart SA	5,808,342***	5,692,204***	5,000,755***	7,334,590***	5,860,910***	(-1,693,501)***	(-1,216,548)*	4,683,284***	3,063,694***	2,003,444***
Daypart A	3,018,817***	2,859,017***	2,248,128***	2,499,018***	2,452,107***	(-2,634,099)***	(-236,985)***	2,032,074***	1,184,291***	791,439***
Daypart B						(-1,375,106)***	(-882,507)**			
Daypart C	1,191,829***	1,096,662***	(353,048)***	(-814,699)***	90,308***	-120,429	-853,774	(-567,143)***	(-331,279)***	(-221,522)***
R squared	0.96	0.98	0.81	0.84	0.81	0.96	0.98	0.71	0.57	0.40

Implicit Market Price 1: Estimated with the Model constituted only with Major TV and Minor Radio

Implicit Market Price 2: Estimated with the Model constituted with Major TV, Minor Radio, and Major Radio

KOBACO: Estimated with KOBACO prices for each of broadcasters' programs (i.e., KBS-TV, MBC-TV, and SBS-TV)

Table 21.2. Comparison between the Estimators Implicit Market Prices and KOBACO Set Prices for Minor Radio and Major Radio
(Unit: KW/Second, KW/Unit)

	Minor Radio						Major Radio			
	Program Ads			Block Ads			Program Ads		Block Ads	
	Implicit Market Price 1	Implicit Market Price 2	KOBACO (Minor Radio)	Implicit Market Price 1	Implicit Market Price 2	KOBACO (Minor Radio)	Implicit Market Price 2	KOBACO (Major Radio)	Implicit Market Price 2	KOBACO (Major Radio)
(Constant)	516,695***	589,514***	56,049	516,695***	589,514***	59,879***	589,514***	77,191***	589,514***	83,942***
Audience Second										
Daypart SA										
Daypart A	(-393,467)***	(-506,061)***	96,980	(-345,956)*	-286,847	31,628**	(-347,043)***	152,768***	(-366,279)*	45,829***
Daypart B	(-425,339)***	(-581,535)***	43,669	-476,343	-832,808	28,214*	-241,385	97,106***	-372,642	9,060
Daypart C	(-121,5291)**	(-1,104,008)*		372,072	298,793		(-875,815)***		-434,901	
R squared	0.96	0.98	0.07	0.96	0.98	0.00	0.98	0.10	0.57	0.03

Implicit Market Price 1: Estimated with Model constituted only with Major TV and Minor Radio

Implicit Market Price 2: Estimated with Model constituted only with Major TV, Minor Radio, and Major Radio

KOBACO: Estimated with KOBACO prices for each of broadcasters' programs (i.e., Minor Radio and Major Radio)

Table 21.3. Estimator Comparison

(Unit: KW/Second, KW/Unit)

		Estimators_KOBACO Prices	Estimators_Implicit Market Price 1	Estimators_Implicit Market Price 2	GAP 1	GAP 2
KBSTV Program Ads	Audience Second	54	84	84	30	30
	Daypart SA	7,088,789	6,325,037	6,281,718	-763,752	-807,071
	Daypart A	4,336,162	3,535,512	3,448,531	-800,650	-887,631
	Daypart B	2,088,034	516,695	589,514	-1,571,339	-1,498,520
	Daypart C	1,734,986	1,708,524	1,686,176	-26,462	-48,810
MBCTV Program Ads	Audience Second	20	84	84	64	64
	Daypart SA	9,573,559	6,325,037	6,281,718	-3,248,522	-3,291,841
	Daypart A	4,737,987	3,535,512	3,448,531	-1,202,475	-1,289,456
	Daypart B	2,238,969	516,695	589,514	-1,722,274	-1,649,455
	Daypart C	1,424,270	1,708,524	1,686,176	284,254	261,906
SBSTV Program Ads	Audience Second	55	84	84	29	29
	Daypart SA	7,434,505	6,325,037	6,281,718	-1,109,468	-1,152,787
	Daypart A	4,025,703	3,535,512	3,448,531	-490,191	-577,172
	Daypart B	1,573,595	516,695	589,514	-1,056,900	-984,081
	Daypart C	1,663,903	1,708,524	1,686,176	44,621	22,273
Minor Radio Program Ads	Daypart A	153,029	123,228	83,453	-29,801	-69,576
	Daypart B	99,718	91,356	7,979	-8,362	-91,739
	Daypart C	56,049	-698,596	-514,494	-754,645	-570,543
Major Radio Program Ads	Daypart A	229,960		242,471	-229,960	12,511
	Daypart B	174,298		348,129	-174,298	173,831
	Daypart C	77,191		-286,301	-77,191	-363,492
KBSTV Block Ads	Audience Second	-8	102	88	110	96
	Daypart SA	6,001,253	-1,176,806	-627,034	-7,178,059	-6,628,287
	Daypart A	3,350,043	-2,117,404	352,529	-5,467,447	-2,997,514
	Daypart B	1,317,969	-858,411	-292,993	-2,176,380	-1,610,962
	Daypart C	750,826	396,266	-264,260	-354,560	-1,015,086
MBCTV Block Ads	Audience Second	3	102	88	99	85
	Daypart SA	3,793,391	-1,176,806	-974,077	-4,970,197	-4,767,468
	Daypart A	1,913,987	-2,117,404	5,486	-4,031,391	-1,908,501
	Daypart B	729,696	-858,411	-640,036	-1,588,107	-1,369,732
	Daypart C	398,417	396,266	-611,303	-2,151	-1,009,720
SBSTV Block Ads	Audience Second	-10	102	88	112	98
	Daypart SA	2,420,184	-1,176,806	-864,019	-3,596,990	-3,284,203
	Daypart A	1,208,179	-2,117,404	115,544	-3,325,583	-1,092,635
	Daypart B	416,740	-858,411	-529,978	-1,275,151	-946,718
	Daypart C	195,219	396,266	-501,245	201,047	-696,463
Minor Radio Block Ads	Daypart A	91,506	170,739	302,667	79,233	211,161
	Daypart B	88,093	40,352	-243,294	-47,741	-331,387
	Daypart C	59,879	888,767	888,307	828,888	828,428
	Daypart A	129,772		223,235	-129,772	93,463
Major Radio Block Ads	Daypart B	93,002		216,872	-93,002	123,870
	Daypart C	83,942		154,613	-83,942	70,671

Implications

Implications for Media Policy and Industry. Since 1998, the Korean government continuously has tried to introduce competition into the market. However, it has been delayed by conflicting claims on the effect of market liberalization. The claims are twofold: one, that there will be a price increase by major TV networks and, two, there will be financial distress for minor radio stations. On one hand, some argue there will be significant price increase by major TV networks while causing financial crisis for minor broadcasters. On the other hand, opposite claims are made. Disagreement on the effect of market liberalization is attributed mainly to a paucity of empirical evidence on how much price regulation and the KOBACO monopoly system distorts prices from market values. Were a study to provide estimates of implicit market prices based on a theoretically and empirically reasonable model, discussion on policy change could proceed on the basis of sound empirical knowledge.

The current study was designed to address this need. By providing reasonably estimated implicit market prices, this study contributes to faster market liberalization and the establishment of alternative mechanisms such as rate-restructuring schedules and fundraising methods to support minor broadcasters. The current empirical study furnishes answers for the following two questions raised by Kim (2001): one, would market liberalization cause rapid increases in advertising prices?; two, would revenue gaps between major TV networks and minor broadcasters increase?

Regarding the first question, the findings described above indicate the possibility of price increase in major TV networks in average terms. However, individual prices could increase as well as drop, depending on performance. Table 22 shows the ranges of

price variation comparing implicit market prices against KOBACO set prices. Ranges for implicit market prices became larger than those of KOBACO set prices in all ad time types except those in major radio. For TV program ad time, the highest implicit market prices were estimated 20% (KBS-TV) to 60% (MBC-TV) higher than KOBACO maximum prices. For major TV block advertising, maximum implicit market prices were estimated 24% to 55% higher than KOBACO maximum prices. Regarding minima, implicit market prices for major TV program ads also were estimated higher than KOBACO set prices. But price ranges of implicit market prices were still larger than those for KOBACO set prices, as the maximum price increased even further. For major TV block advertising, minimum prices were estimated to have negative values. This means that advertising spots existed that advertisers would never want to buy. Were they bought, it would imply an opportunity to buy other ad time units whose prices were set lower than their values.

For religious broadcasters, ranges of implicit market prices were estimated to be larger than those of KOBACO set prices. However, their minima and maxima all were estimated lower than KOBACO prices. As is the case of block ads in TV, minimum prices for religious broadcasters had negative values and the ad slots having negative prices appear sold by being packaged with others. The same logic applies to interpreting negative prices for major radio. Unique to major radio's block advertising time is estimated minimum ad time prices that were higher than KOBACO set prices. Therefore price ranges were smaller than those for KOBACO set prices.

Table 22. Comparison of Price Ranges
(Unit, KW/Second)

		Range	Minimum	Maximum	Mean	SD	Variance
KBSTV Program Ads	Unit Price _ KOBACO	856,000	41,000	897,000	350,040	194,514	37,835,816,616
	Unit Price _ Implicit Market Price 1	1,033,897	44,893	1,078,791	336,643	213,391	45,535,543,939
	Unit Price _ Implicit Market Price 2	1,028,895	49,792	1,078,687	335,666	211,225	44,615,842,973
MBCTV Program Ads	Unit Price _ KOBACO	966,854	3,146	970,000	320,134	238,670	56,963,162,621
	Unit Price _ Implicit Market Price 1	1,507,336	45,485	1,552,821	347,752	269,466	72,612,039,300
	Unit Price _ Implicit Market Price 2	1,504,339	50,386	1,554,726	346,745	268,185	71,923,247,628
SBSTV Program Ads	Unit Price _ KOBACO	995,366	26,634	1,022,000	331,260	229,525	52,681,887,123
	Unit Price _ Implicit Market Price 1	1,206,074	48,490	1,254,564	330,046	222,273	49,405,241,388
	Unit Price _ Implicit Market Price 2	1,201,801	53,404	1,255,205	329,382	220,168	48,474,032,484
Minor Radio Program Ads	Unit Price _ KOBACO	25,990	360	26,350	9,312	6,286	39,519,312
	Unit Price _ Implicit Market Price 1	41,091	-34,930	6,161	4,840	6,317	39,906,072
	Unit Price _ Implicit Market Price 2	29,897	-25,725	4,173	2,685	4,736	22,431,799
Major Radio Program Ads	Unit Price _ KOBACO	50,300	900	51,200	13,595	8,716	75,976,755
	Unit Price _ Implicit Market Price 2	31,722	-14,315	17,406	11,794	7,042	49,589,753
KBSTV Block Ads	Unit Price _ KOBACO	363,850	19,800	383,650	222,044	137,123	18,802,820,496
	Unit Price _ Implicit Market Price 1	579,829	-59,264	520,565	122,683	129,968	16,891,750,706
	Unit Price _ Implicit Market Price 2	524,350	-47,825	476,526	125,355	117,322	13,764,519,207
MBCTV Block Ads	Unit Price _ KOBACO	362,650	21,000	383,650	129,785	112,134	12,574,123,628
	Unit Price _ Implicit Market Price 1	652,406	-62,890	589,516	83,346	87,368	7,633,243,862
	Unit Price _ Implicit Market Price 2	587,151	-50,962	536,189	80,983	83,710	7,007,298,313
SBSTV Block Ads	Unit Price _ KOBACO	194,850	10,200	205,050	52,646	42,708	1,824,012,568
	Unit Price _ Implicit Market Price 1	404,868	-87,091	317,776	66,759	78,480	6,159,153,176
	Unit Price _ Implicit Market Price 2	372,957	-71,904	301,054	72,923	73,690	5,430,200,705
Minor Radio Block Ads	Unit Price _ KOBACO	194,850	10,200	205,050	52,646	42,708	1,824,012,568
	Unit Price _ Implicit Market Price 1	404,868	-87,091	317,776	66,759	78,480	6,159,153,176
	Unit Price _ Implicit Market Price 2	372,957	-71,904	301,054	72,923	73,690	5,430,200,705
Major Radio Block Ads	Unit Price _ KOBACO	18,350	435	18,785	6,360	4,298	18,472,706
	Unit Price _ Implicit Market Price 2	3,431	7,731	11,162	11,025	437	190,540

KOBACO: Estimated with KOBACO prices for each of broadcasters' programs (i.e., KBS-TV, MBC-TV, and SBS-TV)

Implicit Market Price 1: Estimated with the Model constituted only with Major TV and Minor Radio

Implicit Market Price 2: Estimated with the Model constituted with Major TV, Minor Radio, and Major Radio

Regarding the second question whether revenue gaps between major TV networks and religious broadcasters would increase, it is expected that major TV networks would earn more while religious broadcasters would earn less at implicit market prices. The estimates predict that major TV networks would earn 1.4% more with the implicit market prices than under the current KOBACO system. Specifically, MBC-TV and SBS-TV would earn more (4.2% and 3.5% respectively) while KBS-TV would earn less (4.6%), compared to what they earned under the current KOBACO system. On the other hand, religious broadcasters' revenues at implicit market prices fell by 36% to 52% compared to their values with KOBACO prices. It seems necessary to establish an explicit funding mechanism to support religious broadcasters if the government decides on such support.

Implication for the Studies of Advertising Prices. Previous studies, despite their contribution to understanding Korean broadcast ad time pricing, contain serious limitations. Studies using published rate cards are flawed because advertising spots are sold in packages and it is indeterminable whether advertisers value spots in the packages at their published rates. Even the study employing a survey to estimate advertisers' willingness to pay contains limitations: surveys may systematically under-estimate market prices as advertisers report their willingness to pay more conservatively in response to a survey than their behavior in the market would indicate; at the same time, translating survey results into demand and supply curves requires a number of *a priori* assumptions such as frequency of advertising purchases by advertisers and behaviors of market actors other than survey participants.

The present study achieved a significant improvement for studies of broadcast advertising time in Korea. By estimating implicit market prices for broadcast ad time

using actual transaction data and a theoretically-driven hedonic regression, the study generates more reliable predictions for prices expected to prevail in a competitive market system.

Limitations

This study has several limitations. First, real package data were not used. Instead, package price was operationalized in terms of advertiser ad budgets spent in a network (and its associated religious broadcasters), through an ad agency, during the sample period. This method has the limitation of treating all ad agency purchases for an advertiser as a single package, when multiple packages may have been purchased. However, this does not violate the logic of the package-price regression approach outlined above, as KOBACO prices are the same for all packages. The downside of treating all purchases by an advertiser through a particular ad agency as the purchase of a single package is that it reduces the number of observations. Future studies using actual package prices would improve estimate precisions.

Second, a critical proportion (50% - 70%) of ad contracts with religious broadcasters and major radio broadcasters were removed from the analysis due to unidentified information on dayparts. It was possible to match programs with dayparts for regular programs because their histories were posted on the website. However, it was not possible to obtain schedules for special programs broadcast on holidays or for sporting events. Future studies can improve prediction precision by obtaining broadcast times for special programs on religious and major radio stations. In addition, if audience ratings for radio programs were available, estimation would improve significantly.

Third, a major concern of this study is to predict prices at the edge, or to predict prices outside the boundary of data. The study estimates for dayparts' influence on implicit prices from the regression where average package price per spot is a dependent variable and average audience seconds per spot and fractions of dayparts for several types of programs comprising the package are independent variables. Then, the coefficients for daypart fractions were interpreted as those for dummies because fraction term 1 is theoretically the same as the dummy for the daypart. However, there were few such cases comprising packages with only one type of advertising spot in the data. Hence, prediction of implicit market prices by projecting beyond the range of the data, a method statisticians suggest should be avoided. Future studies including samples, some of which are made up of only one type of ad, would reduce this concern.

Although it was not taken seriously in this study, defining public interest programs is a critical part of package studies. Theoretically, subsidies flow from regular programs to programs favored by regulators. Hence, to estimate subsidy size, categorization of programs with respect to public interest should be precise. The current study approached public interest programs through institutions. That is, all religious broadcaster programs were considered to be public interest programs. To estimate the size of the internal subsidy flowing from commercial programs to public interest programs within a network, a clear definition and categorization of programs, in terms of public interest, is critically important.

Conclusions

Despite the limitations, the present study contributes to KOBACO's efforts to improve its pricing formula. In addition, the reform of Korean broadcasting policy and efficient decision-making by industry participants will be assisted by the study.

Beneficiaries may include content providers, broadcasters, advertisers, and other media firms. The study also contributes to the design of an explicit subsidy system should policymakers decide such a policy is appropriate. Particularly, estimated market value deviations from corresponding entries in published rate cards provide estimates of the size of rate restructuring that will occur when competition is introduced.

Appendix A. Outlier Statistics

Cook's Distance (CD)	Cut-off Value	1 if CD is bigger than Cut-off Value
0.00013	0.00937	0
0.00090	0.00937	0
0.00090	0.00937	0
0.00001	0.00937	0
0.00003	0.00937	0
0.00001	0.00937	0
0.02375	0.00937	1
0.00052	0.00937	0
0.00026	0.00937	0
0.00005	0.00937	0
0.00006	0.00937	0
0.00053	0.00937	0
0.00008	0.00937	0
0.01527	0.00937	1
0.00012	0.00937	0
0.00001	0.00937	0
0.00005	0.00937	0
0.00000	0.00937	0
0.05667	0.00937	1
0.00487	0.00937	0
0.00013	0.00937	0
0.00000	0.00937	0
0.00231	0.00937	0
0.00873	0.00937	0
0.00000	0.00937	0
0.80796	0.00937	1
0.03865	0.00937	1
0.00010	0.00937	0
0.00000	0.00937	0
0.00025	0.00937	0
0.05632	0.00937	1
0.00515	0.00937	0
0.00113	0.00937	0
0.00002	0.00937	0
0.00357	0.00937	0
0.06992	0.00937	1
0.01400	0.00937	1
0.00007	0.00937	0
0.00003	0.00937	0
0.00018	0.00937	0
0.02803	0.00937	1
0.00237	0.00937	0

Appendix A (cont'd)

0.00039	0.00937	0
0.00247	0.00937	0
0.00042	0.00937	0
0.00041	0.00937	0
0.00034	0.00937	0
0.00013	0.00937	0
0.00099	0.00937	0
0.00156	0.00937	0
0.00029	0.00937	0
0.00001	0.00937	0
0.00016	0.00937	0
0.00001	0.00937	0
0.00024	0.00937	0
0.00016	0.00937	0
0.00504	0.00937	0
0.00886	0.00937	0
0.00011	0.00937	0
0.01081	0.00937	1
.	0.00937	1
0.00090	0.00937	0
0.00152	0.00937	0
.	0.00937	1
0.00458	0.00937	0
0.00015	0.00937	0
0.00016	0.00937	0
0.00001	0.00937	0
0.00016	0.00937	0
0.00330	0.00937	0
0.00121	0.00937	0
0.00715	0.00937	0
0.00001	0.00937	0
0.00011	0.00937	0
0.00134	0.00937	0
0.00087	0.00937	0
0.00256	0.00937	0
0.02048	0.00937	1
0.00020	0.00937	0
0.00004	0.00937	0
0.00027	0.00937	0
0.00160	0.00937	0
0.01101	0.00937	1
0.00791	0.00937	0
0.00381	0.00937	0

Appendix A (cont'd)

0.00067	0.00937	0
0.00014	0.00937	0
.	0.00937	1
0.03071	0.00937	1
0.00622	0.00937	0
0.00011	0.00937	0
0.00120	0.00937	0
0.02393	0.00937	1
0.00043	0.00937	0
0.00004	0.00937	0
0.00001	0.00937	0
0.00023	0.00937	0
0.00282	0.00937	0
0.00014	0.00937	0
0.00012	0.00937	0
0.00071	0.00937	0
.	0.00937	1
0.08404	0.00937	1
0.00034	0.00937	0
0.00008	0.00937	0
.	0.00937	1
0.00044	0.00937	0
0.00041	0.00937	0
0.00025	0.00937	0
0.00171	0.00937	0
.	0.00937	1
0.00660	0.00937	0
0.00082	0.00937	0
0.00129	0.00937	0
0.00105	0.00937	0
0.00575	0.00937	0
0.00039	0.00937	0
0.00001	0.00937	0
0.00001	0.00937	0
0.00004	0.00937	0
0.00037	0.00937	0
0.00037	0.00937	0
0.00027	0.00937	0
0.00012	0.00937	0
0.00029	0.00937	0
0.00012	0.00937	0
0.00003	0.00937	0
0.00033	0.00937	0

Appendix A (cont'd)

0.00446	0.00937	0
0.00007	0.00937	0
0.00163	0.00937	0
0.00110	0.00937	0
0.00056	0.00937	0
0.08325	0.00937	1
.	0.00937	1
0.00071	0.00937	0
0.00000	0.00937	0
0.16525	0.00937	1
0.00104	0.00937	0
0.00305	0.00937	0
0.00000	0.00937	0
0.03915	0.00937	1
0.00084	0.00937	0
0.00003	0.00937	0
0.00013	0.00937	0
0.00014	0.00937	0
0.00061	0.00937	0
0.02975	0.00937	1
0.00213	0.00937	0
0.00001	0.00937	0
0.00021	0.00937	0
0.00027	0.00937	0
0.00002	0.00937	0
0.00005	0.00937	0
.	0.00937	1
0.00048	0.00937	0
0.00049	0.00937	0
0.00154	0.00937	0
0.00010	0.00937	0
0.00041	0.00937	0
0.00007	0.00937	0
0.00003	0.00937	0
0.00001	0.00937	0
0.00023	0.00937	0
0.00011	0.00937	0
0.00081	0.00937	0
0.00030	0.00937	0
0.00000	0.00937	0
0.00016	0.00937	0
0.00006	0.00937	0
0.00085	0.00937	0

Appendix A (cont'd)

0.00013	0.00937	0
0.00002	0.00937	0
.	0.00937	1
0.00481	0.00937	0
0.00045	0.00937	0
0.00000	0.00937	0
0.00411	0.00937	0
0.00137	0.00937	0
0.00000	0.00937	0
0.00013	0.00937	0
0.00028	0.00937	0
0.00001	0.00937	0
0.00009	0.00937	0
0.00018	0.00937	0
0.00104	0.00937	0
0.00081	0.00937	0
0.13491	0.00937	1
0.00136	0.00937	0
0.00151	0.00937	0
0.00170	0.00937	0
0.00016	0.00937	0
0.00048	0.00937	0
0.00036	0.00937	0
0.00295	0.00937	0
0.00003	0.00937	0
0.00014	0.00937	0
0.00014	0.00937	0
0.00048	0.00937	0
0.00022	0.00937	0
0.00028	0.00937	0
0.00001	0.00937	0
0.00240	0.00937	0
0.00004	0.00937	0
0.00005	0.00937	0
0.00008	0.00937	0
0.00001	0.00937	0
0.00001	0.00937	0
0.00014	0.00937	0
0.00331	0.00937	0
0.00003	0.00937	0
0.00016	0.00937	0
0.00002	0.00937	0
0.16209	0.00937	1

Appendix A (cont'd)

0.00896	0.00937	0
.	0.00937	1
0.00027	0.00937	0
0.00000	0.00937	0
0.00038	0.00937	0
.	0.00937	1
0.00122	0.00937	0
0.01037	0.00937	1
0.00013	0.00937	0
0.00029	0.00937	0
0.00027	0.00937	0
0.00022	0.00937	0
0.00001	0.00937	0
0.01513	0.00937	1
0.00003	0.00937	0
0.00005	0.00937	0
0.00021	0.00937	0
0.00002	0.00937	0
0.00077	0.00937	0
0.00307	0.00937	0
0.00000	0.00937	0
0.00064	0.00937	0
0.00036	0.00937	0
0.00015	0.00937	0
0.00000	0.00937	0
0.00183	0.00937	0
0.00006	0.00937	0
0.00009	0.00937	0
0.00149	0.00937	0
0.00109	0.00937	0
0.00001	0.00937	0
0.00259	0.00937	0
0.00020	0.00937	0
0.00071	0.00937	0
0.00793	0.00937	0
0.00202	0.00937	0
0.00005	0.00937	0
0.00037	0.00937	0
0.00006	0.00937	0
0.00005	0.00937	0
0.00001	0.00937	0
0.00062	0.00937	0
0.00574	0.00937	0

Appendix A (cont'd)

0.00011	0.00937	0
0.00225	0.00937	0
0.00010	0.00937	0
0.00030	0.00937	0
0.00013	0.00937	0
0.00036	0.00937	0
0.00007	0.00937	0
.	0.00937	1
0.00088	0.00937	0
0.00046	0.00937	0
.	0.00937	1
0.00633	0.00937	0
0.00104	0.00937	0
0.00000	0.00937	0
0.00000	0.00937	0
0.00065	0.00937	0
0.00001	0.00937	0
0.00001	0.00937	0
0.00035	0.00937	0
0.00119	0.00937	0
0.00004	0.00937	0
0.00011	0.00937	0
0.00001	0.00937	0
0.00008	0.00937	0
0.00003	0.00937	0
0.00023	0.00937	0
0.00052	0.00937	0
0.00000	0.00937	0
0.00927	0.00937	0
0.00168	0.00937	0
0.00054	0.00937	0
0.00019	0.00937	0
0.00212	0.00937	0
0.00026	0.00937	0
0.00005	0.00937	0
.	0.00937	1
0.00100	0.00937	0
0.00001	0.00937	0
0.00000	0.00937	0
0.00134	0.00937	0
0.00205	0.00937	0
0.00606	0.00937	0
0.00137	0.00937	0

Appendix A (cont'd)

0.00001	0.00937	0
0.00460	0.00937	0
0.00009	0.00937	0
0.00007	0.00937	0
0.00006	0.00937	0
0.00004	0.00937	0
0.00056	0.00937	0
0.00001	0.00937	0
0.00025	0.00937	0
0.00010	0.00937	0
0.00011	0.00937	0
0.00003	0.00937	0
0.00001	0.00937	0
0.00010	0.00937	0
0.00068	0.00937	0
0.00005	0.00937	0
0.00011	0.00937	0
0.00120	0.00937	0
0.00009	0.00937	0
0.00073	0.00937	0
0.00008	0.00937	0
0.00033	0.00937	0
0.00008	0.00937	0
0.00010	0.00937	0
0.00051	0.00937	0
0.00000	0.00937	0
0.00006	0.00937	0
0.00022	0.00937	0
0.00013	0.00937	0
0.00004	0.00937	0
0.06400	0.00937	1
0.00149	0.00937	0
0.00078	0.00937	0
0.01259	0.00937	1
0.01249	0.00937	1
0.00018	0.00937	0
0.00000	0.00937	0
0.00000	0.00937	0
0.00317	0.00937	0
0.00000	0.00937	0
0.00000	0.00937	0
0.00170	0.00937	0
0.00078	0.00937	0

Appendix A (cont'd)

0.00010	0.00937	0
0.00124	0.00937	0
0.00005	0.00937	0
0.00239	0.00937	0
0.01435	0.00937	1
0.00693	0.00937	0
0.00201	0.00937	0
0.00498	0.00937	0
0.00032	0.00937	0
0.00004	0.00937	0
0.00009	0.00937	0
0.00039	0.00937	0
0.00074	0.00937	0
0.00006	0.00937	0
0.00077	0.00937	0
0.00078	0.00937	0
0.00000	0.00937	0
0.00131	0.00937	0
0.00000	0.00937	0
0.00232	0.00937	0
0.00067	0.00937	0
0.00665	0.00937	0
.	0.00937	1
0.00006	0.00937	0
0.00005	0.00937	0
0.00269	0.00937	0
0.00021	0.00937	0
0.00000	0.00937	0
0.00000	0.00937	0
0.01324	0.00937	1
0.00059	0.00937	0
0.00336	0.00937	0
0.00911	0.00937	0
.	0.00937	1
0.00379	0.00937	0
0.00141	0.00937	0
0.00441	0.00937	0
0.00501	0.00937	0
0.00046	0.00937	0
0.00010	0.00937	0
0.00085	0.00937	0
0.00037	0.00937	0
0.00125	0.00937	0

Appendix A (cont'd)

0.00003	0.00937	0
0.00002	0.00937	0
0.00012	0.00937	0
0.00488	0.00937	0
0.00181	0.00937	0
0.00103	0.00937	0
0.00022	0.00937	0
0.00092	0.00937	0
0.00000	0.00937	0
0.00001	0.00937	0
0.00000	0.00937	0
0.00017	0.00937	0
0.00001	0.00937	0
0.00139	0.00937	0
0.00609	0.00937	0
0.00109	0.00937	0
0.00012	0.00937	0
0.00220	0.00937	0
0.00345	0.00937	0
0.00065	0.00937	0
0.00602	0.00937	0
0.00638	0.00937	0
0.00015	0.00937	0
0.00000	0.00937	0
0.00006	0.00937	0
0.00002	0.00937	0
0.00383	0.00937	0
0.00020	0.00937	0
0.00010	0.00937	0
0.00166	0.00937	0
0.00665	0.00937	0
0.00088	0.00937	0
0.00122	0.00937	0
0.01119	0.00937	1
0.00107	0.00937	0
0.02639	0.00937	1
0.00019	0.00937	0
0.00014	0.00937	0
0.00222	0.00937	0
0.00016	0.00937	0
0.02902	0.00937	1
0.00006	0.00937	0
0.00040	0.00937	0

Appendix A (cont'd)

0.00003	0.00937	0
0.00049	0.00937	0
0.00013	0.00937	0
0.00012	0.00937	0
0.00003	0.00937	0
0.00001	0.00937	0
0.00045	0.00937	0
0.00001	0.00937	0
0.00079	0.00937	0
0.00003	0.00937	0
0.00023	0.00937	0
0.00003	0.00937	0
0.00006	0.00937	0
0.00057	0.00937	0
0.00031	0.00937	0
0.00009	0.00937	0
0.00119	0.00937	0
0.00003	0.00937	0
0.00080	0.00937	0
0.00449	0.00937	0
0.00063	0.00937	0
0.00277	0.00937	0
0.00016	0.00937	0
0.00023	0.00937	0
0.00113	0.00937	0
0.00291	0.00937	0
0.00099	0.00937	0
0.00015	0.00937	0
0.02236	0.00937	1
0.00003	0.00937	0
0.00030	0.00937	0
0.00007	0.00937	0
0.00079	0.00937	0
0.00028	0.00937	0
0.00017	0.00937	0
0.00003	0.00937	0
0.00057	0.00937	0
0.00004	0.00937	0

REFERENCES

- Adams, A. W. and Yellen, J. (1976), Commodity bundling and the burden of monopoly, *Quarterly Journal of Economics* 90: 475 – 498.
- Anderson, S.P., de Palma, A., and Thisse, J.F. (1992). *Discrete Choice Theory of Product Differentiation*, MIT Press, Cambridge.
- Barnes, B. E. (1990). Electronic media audience behavior in the multichannel environment: Patterns of demographic homogeneity and time spent viewing. Unpublished doctoral dissertation, Northwestern University, Evanston, IL.
- Beebe, J. (1977). Institutional structure and program choices in television markets. *Quarterly Journal of Economics* 91: 15-37.
- Berry, S., J. Levinsohn and A. Pakes (1995). Automobile Prices in Market Equilibrium, *Econometrica* 63(4): 841-89.
- Cabletelevision Advertising Bureau (1989). *Cable Television Handbook 1989*. New York: Author.
- Choi, E. K. (2005). Paper on the Regulation on the Broadcast Advertising Market [Bang-Song-Gwang-Go Si-Jang Gyu-Jea-Won-Cheek-ae Gwan-Han So-Go], *Broadcasting Research*, Special Issue 7 (27). downloaded from <http://www.kbc.go.kr/> on June 2, 2006.
- Epple, D. (1987). Hedonic Prices and Implicit Markets: Estimating Demand and Supply Functions for Differentiated Products, *Journal of Political Economy*, University of Chicago Press, vol. 95(1), pages 59-80, February.
- Freeman, A. (1993). *The Measurement of Environmental Resource Values: Theory and Methods*. Washington: Resources for the Future: 516.
- Feenstra, R. (1993). Measuring the Welfare Effect of Quality Change: Theory and Application of Japanese Autos, NBER Working Papers 4401, National Bureau of Economics Research, Inc.
- Fisher, F, McGowan, J., & Evans, D. (1980). The audience-revenue relationship for local television stations. *Bell Journal of Economics* 11: 694-708.
- Garrod, G. (1994). Using the Hedonic Pricing Model to Value Landscape Features. *Landscape Research* 19: 26-28.
- Garrod, G. and Willis, K. (1992). Valuing the Goods Characteristics – An Application of the Hedonic Price Method to Environmental Attributes, *Journal of Environmental Management* 34 (1): 59-76.

- Garson, 2007. Multiple Regression, Downloaded August 20, 2007, from <http://www2.chass.ncsu.edu/garson/PA765/regress.htm>
- Gensch, D. and Ranganathan, B. (1974), Evaluation of Television Program Content for the Purpose of Promotional Segmentation, *Journal of Marketing Research* 11(Nov): 390-398.
- Griliches, Z. (1971). Introduction: Hedonic Price Indexes Revisited in *Price Indexes And Quality Changes: Studies In New Methods Of Measurement* (Ed.) Z. Griliches. Cambridge, pp. 3-15.
- Guiltinan, J. (1987). The price bundling services: a normative framework. *Journal of Marketing* 51(2): 74-85.
- Fournier, G. & Martin, D. (1983). Does government-restricted entry produce market power?: new evidence from the market for television advertising. *The Bell Journal of Economics* 14 (1): 44-56.
- Jeon, B-S. (2004). Research on the Restructuring of the Broadcast Advertising System [Bang-Song-Gwang-Go Je-Do Gae-Sun-Bang-An Yeon-Gu], A Forum for Restructuring of the Broadcast Advertising System, hosted by Korean Broadcasting Commission.
- Jung, H-T. (2005). The Prospectus of Broadcast Advertising Market attributed to the discontinuance of KOBACO monopoly system. presented at KAA Annual Conference 2005. The summary cited from KAA Journal.
- Jung, G-J. (2007). Urgency of Solving the Broadcast Advertising Policy Retrogressive to Market Change [Hwan Kyoung Byun Hwa ae Yeok Hang Ha nun Gwang Go Jung Cheak Hae Gyu Si Gup]. *The Studies of Broadcasting Culture* (January).
- KBC Report 2005.
- KFTC (2004). KOBACO's Monopoly Advertising Sales is A Typical Unfair Trade [KOBACO-eu Dock-Jum-Gwant-Go Pan-Mae-nun Dae-Pyo-Juck Bul-Gong-Jung-Gu-Rae]. KAA.
- Kim, K-W. (2004). Broadcast Advertising: Size is Established but System is Developing [Bang Song Gwang Go: Gyu Mon nun Sun Jin Kook, Jae Do nun Hoo Jin Kook]. *The Studies of Broadcasting Culture* (July).
- Kim, S-K., Kim, J-H., and Lee, S-S. (2003). The Policy for Competition in the Broadcast Advertising Market [Bang Song Gwang Go Si Jang eu Gyung Jaeng Jung Chaek], Seoul National University, Center for Corporate Competitiveness. Report 03-01. Downloaded June 1, 2006, from <http://ccc.snu.ac.kr/>

- Kim, J-H. (2006). The Review on the Broadcast Advertising System Fitting into the Digital Era [Digital Si Dae ae Maat nun Bang Song Gwang Go Jae Do Gum To]. World Media News, April.
- Kim, J-K. (1999). Suggestion: Radio Audience Ratings and the Meaning of The research of Radio Audience. [Jae-eun: Radio Chung-Chuy-Yul-gwa Chung-Chuy-Za Cho-Sa-eu Eu-Mee]. Producer Journal [Bang-Song-Si-Dea], 16. Retrieved February 25, 2007, from http://www.pdnet.or.kr/dataroom/dataroom3_2.asp?volidx=15&idx=122&pagenu m=1.
- Kim, S-H. (2006). Prospering the Media Industry and Advertising Policy in the Terrestrial Broadcasting Market. [Media San Up Hwal Sung Hwa wa Jee Sang Pa Gwang Go Jung Cheak], *Studies of Broadcasting Culture* (October).
- Kim, Y-J. and Lee, W-J. (2004). Media Competition Surrounding the Advertising Market: The Current States and Trends under the Advertising Price Regulation [Gwang-Go-Si-Jang-eul Dul-Ru-San Mae-Che-Gan Gyung-Jang: Gwang-Go-Ryo-Yul Gyu-Jae-System Ha-ae-seo-eu Gwang-Go-Si-Jang Hyun-Hwang-Gwa Byun-Dong-Choo-Yi-rul Jung-Sim-eu-ro], presented at the Transitional Korean Journalism Seminar. Korean Society for Journalism & Communication Studies 2004.
- KOBACO (2006). Introduction to Venture and Inno-biz Broadcasting Advertising [Venture Inno-biz Gwang-Go An-Nae]. Downloaded from http://www.kobaco.co.kr/kor/broadcasting/market/market_venture.asp on July 17, 2006.
- KOBACO (2007). The Types of Broadcast Advertising and Sales [Bang Song Gwang Go Yoo Hyung Mit Pan Mae Bang Sik]. Downloaded from http://www.kobaco.co.kr/businessintro/business/brod_ad_sale.asp on June 9, 2007.
- Koschat, M. and Putsis Jr., W. (2002). Audience Characteristics and Bundling: A hedonic analysis of magazine advertising rates. *Journal of Marketing Research* 39(2), pp. 262-273.
- Lancaster, K. (1966). A New Approach to Consumer Theory," *Journal of Political Economy*, 74(2), pp. 132-157.
- Lancaster, K. (1971). *Consumer Demand: A new approach*. New York: Columbia University Press.
- Lee, G-W. (1995)*, The Broadcast Advertising System in the Netherlands [Netherlands-eu Bang-Song Gwang-Go], *KOBACO Broadcast Advertising Research Series* (6): 190.

- Lee, G-W. (2000). Research on the Advertising price restructuring Considering the changes of media influence [Bang-Song Mae-Che-Ryuk Byun-Hwa-ea Dda-run Gwang-Go Yo-Geum Jo-Jung-Bang-An Yeon-Gu]. KOBACO, Research Project: 28.
- Lee, H. K (1995). Study on the Efficiency of Advertising Price of Television Program [Television Program Gwang-Go-Yo-Gum Hyo-Yul-Sung-ae Gwan-Han Yeon-Gu], *The Korean Journal of Advertising* 6 (1): 225-249.
- Lee, H. K. (1997). Study Comparing the Advertising Price of 4 Major Media [4-Dae Mae-Che Gwang-Go-Yo-Gum Hyo-Yul-Sung Bee-Gyo Yeon-Gu]. *The Korean Journal of Advertising* 8 (1): 171-194.
- Lee, H. K. (2004). Study on the Pricing Structure of Television Advertising [Television Gwang-Go Yo-Gum-Gu-Jo-ae Gwan-Han Yeon-Gu: Shi-Gup-eul Jung-Shim-euro]. *The Korean Journal of Advertising* 15(1): 131-151.
- Levin, H. (1980). Fact and fancy in television regulation: An economic study of policy alternatives. New York, NY: Russell Sage Foundation.
- McAfee, R., McMillan, J. and Whinston, M. (1989). Multiproduct monopoly, commodity bundling, and correlation of values. *Quarterly Journal of Economics* 104(2): 371-383.
- Min, K-S. (1995), Broadcast Advertising in England [Young-Kook-eu Bang-Song Gwang-Go]. *KOBACO Broadcast Advertising Research Series*: 151.
- Monroe, K.B. (1990). Pricing: Marketing Profitable Decisions. McGraw Hill, New York. Recited from Jedidi et al. (2003): Measuring Heterogeneous Reservation Prices for Product Bundles, *Marketing Science* 22 (1): 107-130.
- Napoli, P.M. (2003). *Audience Economics: Media Institutions and the Audience Marketplace*, Columbia University Press.
- Owen, B., and Wildman, S. (1992). *Video economics*. Cambridge, MA: Harvard University Press.
- Park C-P. (2004). The System of Broadcast Advertising Sales. KOBACO.
- Park, J-R. (2005). The Paradigm Shift in Advertising Media and Media Research – What could be a reasonable way to go? [Kwang-Go Media eu Paradigm Byun-Hwa wa Media Research – Ba Ram Jick Han Byun-Hwa nun Moo Eut Il Ka?], *KAA Focus 2005*, Retrieved May 19, 2007 from http://64.233.167.104/search?q=cache:R6UezZx_gL4J:www.kaa.or.kr/k/mag/200

- Park, S-K. (1996). Determinants of renewal and adjustment of license fees of network prime time programs. *The journal of media economics* 9 (3), pp. 1-19.
- Park, W-K. and Lee, G-W. (2007). Study on the Broadcast Ad Pricing and Sales System: Comparative study on Korea and Other Countries. [Bang Song Gwang Go Yo Geum gwa Pan Mae Bang Sik ae Gwan Han Yeon Gu: Gook Nae Wae Bee Gyo rul Jung Sim eu ro], Spring Symposium for Advertising Studies, held on April 6th, 2007.
- Pakes, A. (2003). A Reconsideration of Hedonic Price Indices with an Application to PC's, *American Economic Review* 93 (5): 1578-1596.
- Palmquist, R. (1991). Hedonic Methods, in Braden, J. B. and Kolstad C. D. (Ed.), 1991, *Measuring The Demand For Environmental Quality*, North-Holland, The Netherlands.
- Poltrack, D. (1983). *Television Marketing: Network, Local and Cable*. New York, NY: McGraw-Hill.
- Ratchford, B. (1975). The new economic theory of consumer behavior: an interpretive essay. *The Journal of Consumer Research* 2(2): 65-75.
- Rosen, S. (1974). Hedonic prices and implicit markets: Product differentiation in pure competition, *Journal of Political Economy* 82: 34-55.
- Schmalensee, R. 1984. Gaussian demand and commodity bundling. *Journal of Business* 57: S211-S230.
- Spence, M. and Owen, B. (1977). Television Programming, Monopolistic Competition, and Welfare. *Quarterly Journal of Economics* 91(1):103-126.
- Steiner, W. (1952). Program patterns and preferences and the workability of competition in radio broadcasting. *Quarterly Journal of Economics* 66: 194-233.
- Tabachnick G. and Fidell, L. (1996). *Using Multivariate Statistics*, third ed. New York: HarperCollins.
- Takada, H. and Henry, W. (1993). Analysis of Network TV Commercial Time Pricing for Top-Rated Prime Time Programs. *Journal of Current Issues and Research in Advertising* 15(2): 59-70.
- The Korea Broadcast Law (2006).

The Order of Korea Broadcast Law (2006).

Vanslebrouck, I., Van Huylenbrouck, G. and Verbeke, W. (2002). Determinants of the Willingness of Belgian farmers to Participate in Agri-environmental Measures, *Journal of Agricultural Economics* 53: 489 –511.

Venkatesh, R. and Kamakura, W. (2003). Optimal Bundling and Pricing under a Monopoly: Contrasting Complements and Substitutes from Independently Valued Products. *Journal of Business* 76(2): 211-231.

Waterman, D. and Yan, M. (1999). Cable Advertising and the Future of Basic Cable Networking. *Journal of Broadcasting & Electronic Media* 43 (4): 645.

Webster, J. and Lichty, L. (1991). *Ratings analysis: Theory and practice*. Hillsdale, NY: Lawrence Erlbaum Associates.

Wildman, S. (Spring 2003). Modeling the Ad Revenue Potential of Media Audiences: An Underdeveloped Side of Media Economics, *Journal of Media Economics & Culture* 1(2): 7-37.

Wirth, M. and Bloch, H. (1985). The broadcasters: The future role of local stations and the three networks. In E. Noam (Ed.), *Video media competition: Regulation, economics and technology* (pp. 121-137). New York, NY: Columbia University Press.

Yang, B-H. (2007). It is not an Option but a Must [Bang Song Gwang Go Jae Do Gae Sun eun Sun Taek a nin Sang Zone]. *The Studies of Broadcasting Culture* (March).

Yoo, H-S. (2005). Let the Market determine Broadcast Advertising Time Sales [Bang-Song-Gwang-Go Pan-Mae-nun Shi-Jang-Gyung-Jaeng-Won-Ry-ae Mat-Gye-Ya-Han-Da]. Downloaded from www.advertising.co.kr on June 2, 2006.

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