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Abstract

The paper's objective is to assess price discrimination in magazine subscriptions in the Brazilian market. Oster and Scott-Morton (2005) had advanced a price discrimination mechanism in which the ratio between subscription and newsstand prices would be positively associated to the extent that a magazine provides long-term benefits. The present conservative application, in a market where subscription is much less widespread, does not provide support for that form of price discrimination after controlling for different characteristics of the magazines in the econometric analysis. Nevertheless, an exploratory analysis based on principal components suggests that a multidimensional price discrimination mechanism that is composed of price and advertising discounts may be occurring.

JEL-Code: D900, L110, L820.

Keywords: magazine subscription, intertemporal discounting, price discrimination.

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1. Introduction

The existence of subscriptions as an established device for selling certain products can be justified on various grounds. For example, one can highlight the reduction of transaction costs due to a reduced role for middlemen, the assurance of a greater provision of variety and primarily usage as a price discrimination mechanism. In fact, Glaser and Hassin (1982) emphasize the latter aspect in a monopolistic setting and theoretically indicate the possibility of the coexistence of subscription and selling of individual issues of a journal. The result largely hinges on imperfect information by the consumer that can reflect general exogenous factors or the suitability of specific contents of a particular issue that are likely to affect the consumer´s expected valuation. Gabszewicz and Sonnac (1999) further elaborate and address the monopolist´s optimal pricing policy; on addition they prove that subscription and sale of specific units can occur simultaneously as a result of price discrimination. Nevertheless, the stringent assumption is that the reading frequency would not be affected by the subscription and the cover prices.

The related empirical literature is also limited to a handful of contributions. Round and Bentick (1997) investigate the prevalence of subscription discounts in Australia using production costs aspects as references. A higher publication frequency of the issues would be associated with less significant demand uncertainty; thus a larger subscription discount would be tenable. Nevertheless, the analysis highlights that discounts can reflect both demand and supply conditions.

A branch of the literature as represented, for example, by Koschat and Putsis (2002), Depken (2004) and Depken and Wilson (2004) focuses on the study of advertising in magazines. The main evidence that emerges is that specific audience characteristics do play a role in the price of advertising; what also emerges is whether consumers consider advertising as good or bad depends on the consumer´s profile and desire for specialized content. It is important to stress, that the literature continues lack a fully integrated model that explicitly considers the role of readers and advertisers in the firm´s profit maximization. In fact, Blair and Romano (1993) note that a substantial share of newspaper´s revenues in the U.S. are generated by advertising. Thus, a general observation for circulation industries is that the optimal profit maximizing problem is composed of multiple dimensions. For example, the assurance of content variety through subscriptions cannot be separated from the willingness to assure convenient advertising exposure.

Oster and Scott-Morton (2005) contribute to the literature pertaining to subscriptions by considering the role of more complex intertemporal discounting. A salient implication of the model with hyperbolic discounting .refers to the relation between newsstand and subscription prices. Thus, a subtle mechanism of price discrimination arises where one charges relatively more for subscriptions for magazines that can be considered long-term investments.

The present paper´s objective is to contribute to the literature in at least two aspects:

(a) By considering a more conservative test for the effect predicted by Oster and Scott-Morton (2005). The Brazilian case is particularly interesting

because subscriptions are far less widespread than in the U.S., In fact, in Brazil it is common to find newsstands on nearly every corner of the more densely populated districts in large cities;

(b) By investigating the subscription horizon as an additional layer of the aforementioned price discrimination mechanism.

The paper is organized as follows. The second section briefly discusses conceptual aspects of intertemporal discounting in the context of subscriptions. The third section discusses the data construction and the empirical evidence. The fourth section provides some final comments.

2. Subscription and Intertemporal Discounting: Some Conceptual Aspects

The rapid dissemination of behavioral economics reflects the growing recognition that more realistic and often heuristic decision mechanisms appear to be relevant for consumers in different economic settings. For example, the limitations of traditional exponential discounting were addressed in terms of hyperbolic discounting that can accommodate the possibility of dynamic inconsistencies in the intertemporal decision problem of the consumer. This discount mechanism assumes that valuations fall sharply for small time intervals but fall slowly for longer time horizons. Thus, a clear contrast emerges in comparison with exponential discounting in which the valuation decreases by a constant factor irrespective of the considered time interval [see Frederick et al. (2002) for an overview]. The hyperbolic discounting mechanism would allow preferences to be “present biased” and therefore enable short-termism in consumer´s decisions. The aforementioned concept also motivated an

approximation for discrete time for the quasi-hyperbolic discount function as advanced by Laibson (1997).

Mathematically it is possible to define hyperbolic discounting for the intertemporal discount rate $\delta(t)$ as a non-linear convex function of t. The convexity of this rate is what engenders *present bias* in which a consumer constantly plans to have a greater level of immediate consumption; a hedonistic temporal consumption planning. According to Laibson (1997, p 449), one way to define this time discount regime is: $\delta(t) = \gamma/(1 + \alpha t)$. Therefore, it is possible to interpret γ as the rate at time zero and α as the speed at which the rate approaches zero. A vice good is a good that usually has a large α parameter for consumers. If potato chips are thought as vice goods, it is quite intuitive that a consumer will allocate most of his consumption in the present and believe that the consumption of that good will vanish as times increases.

Another form of inconsistent time discounting is the *quasi*-hyperbolic discount. In contrast to a constant that changes the rate of discount between all periods of a consumer life, *quasi*-hyperbolic discount as defined by Laibson (1997, p 450) provides an extra incentive for present consumption, but maintains an exponential structure for the future. The q*uasi-hyperbolic* discounts a consumer´s consumption t periods ahead by present consumption at a $\beta\delta^t$ rate and, therefore, at an exponential δ rate between future periods. The application by Oster and Scott-Morton (2005), which inspires the present paper, considers a *quasi-hyperbolic* discounting mechanism. This procedure not only addresses intertemporal inconsistency but addresses present bias; as

related to the β parameter that indicates the gap of present consumption values over any type of future consumption.

This is exactly what generates the referred *bias*: the consumer plans to reduce vice good consumption only in the future and allocates most of the lifetime consumption in the present. However, non-vice goods, will have a small β parameter and constant lifetime consumption planning - if β is close to one - or even a lifetime consumption planning increasing over time – if β is less than one. This idea is used by Oster and Scott-Morton to differentiate magazines based on their level of leisureliness, or viciousness. On the one hand, because one decides to subscribe to a magazine based on its temporal consumption planning if a magazine is seen basically as a vice good it should not be bought frequently; therefore a subscription would not be a good deal for the consumer. On the other hand, as a vice good, consumers may purchase most of the issues of that magazine covered by a subscription at a newsstand. If a magazine is evaluated as an investment magazine a consumer may purchase the subscription although she or he will often not read it afterwards. Therefore, magazine publishing houses may use a subscription as a price discrimination mechanism to maximize their profits.

Oster and Scott-Morton (2005) developed a simple model based on the shape of their willingness to pay curve. The authors separate magazines into two types: Investment and leisure magazines. The first has a reading cost (c) at the time they are read and investment benefit of I on the following period. Leisure magazines have an opposite structure in which the cost occurs in the future and a present consumption benefit of (L).

Each magazine has high and low frequency readers. High frequency readers are those who have a constant willingness to pay for all issues of a potential subscription. Conversely, low frequency readers are solely interested in the first *n** issues of the subscription. Without assuming present bias the publisher´s profit maximization and the additional hypothesis that the standard discount rate δ is one[1] should lead to a price structure as follows: $S^{\mathrm{l}} = \mathrm{n}(\mathrm{L} - \mathrm{C}), P^{l} = (L^{*} - C)$, $\mathrm{P}^{\mathrm{l}} = \mathrm{L}^{*} - \mathrm{C}$ e $\mathrm{P}^{\mathrm{l}} = \mathrm{I}^{*} - \mathrm{C}$ where S^{i} is the subscription price of i magazine type and P^{i} their newsstand price for both leisure and investment magazines.

The authors show that because the gain of buying a leisure magazine is in the present and the cost is in a subsequent period consumers with present consumption bias will affect the newsstand purchase and the price structure should change to $S^{l} = \mathrm{n}(\mathrm{L} - \mathrm{C}), P^{l} = (L^{*} - \beta C)$. Because analogously the gain of buying an investment magazine – either by subscription or newsstand by the additional hypothesis – occurs in the future and their cost is in present, the changed price structure should be $\mathrm{P}^{\mathrm{I}} = \beta \mathrm{I}^{*} - \mathrm{C}$ and $S^{\mathrm{I}} = \mathrm{n}(\mathrm{I}^{*} - \mathrm{C})$. Consequently, a greater present consumption bias (smaller β) means that less frequent – with a smaller n^{*} - leisure-magazine-readers would prefer to buy their magazines on newsstands and not to purchase a subscription. Furthermore, greater present consumption bias helps to increase subscriptions for less frequent readers of investment magazines. Therefore, profit maximizing magazine publishers should offer subscription prices such that the relation

[1] This hypothesis is due to the fact that Osten and Scott Morton (2005) worked with a two-period model; hence, β and δ would be indeterminate. For this reason, authors chose to account all subscription discounts as present consumption bias. Such hypothesis is not needed as working with a more-than-two-period model and it has obviously been dropped in order to calculate the empirical β.

between subscription price,S^i, and newsstand prices, P^i, of leisure magazines should be greater than those for investment magazines. Therefore, a salient prediction of this model is that the ratio of the newsstand price of the magazine relative to the subscription price (*SubRatio*) should be positively related to the degree to which the magazine involves investment as previously discussed; in other words, the ratio is related to what extent the magazine provides long-run benefits (*Future gain*). This implication is the base of the empirical study conducted in this paper and within addition of other factors - mainly guided by the importance of a magazine's target audience because of the incentives created by advertising and transactions costs of newsstand purchase – explain variation in the heterogeneity in the consumer willingness-to-pay function.

Oster and Scott-Morton (2005), suggest that other factors also may have an effect on the ratio $S^i \backslash P^i$ for a given magazine. One empirical specification similar to the one considered in the present paper advances the following empirical model:

$$SubRatio = f(circ., \ln(circ), availability, FutureGain, NI, NI * \text{int}.offer, AdRate)$$

This model was estimated in a linear fashion by ordinary least squares and provided evidence on the aforementioned price discrimination mechanism. The control variables portrayed circulation in a non-linear form and those variables together with *availability,* indicating the presence in public libraries, intended to proxy the degree of availability of the different magazines, and the number of issues (NI) indicating how frequently the reader is having access to a particular type of content. The number of issues can also have a joint effect with ,introductory offers, should those exist, so that one can motivate an interactive

term in order to assess whether valuation of subscription is due to the issues themselves or is due to the other product that is being sold together; hence, the use of the variable $NI * \text{int}.offer$. Finally, AdRate, which is the proportion of the cost of purchasing an advertisement page relative to magazine circulation, andmeasures the marginal advertisement income.

Later in the paper, we undertake a similar econometric analysis in Brazil exercising additional care in the use of the FutureGain variable; on addition, we investigate the role of the subscription horizon on subscription discounts.

3. Empirical Analysis

3.1- Data construction

Initially, we used information on the Brazilian magazine market from the list of members of a national association [Associação Nacional de Editores de Revista-ANER] where one could find publishers´ contacts and relevant sites when available. In 2008 we collected information regarding subscriptions that would prevail for subsequent periods. For larger publishing houses, more information was available on their websites; however direct data requests were frequently necessary. Therefore, the majority of the information came directly from the publishing houses. A complementary source was the auditing organization [Instituto Verificador de Circulação-IVC] which provided data on magazine circulation. The study focuses on magazines with a larger circulation circulation – with a minimum annual average of twenty five thousand copies – and a more national scope. The table in the appendix lists the selected magazines and their classification in accordance with expected future gains.

The classification criterion closely followed the one provided by Scott-Morton (2005) and in fact one mostly finds similar magazines. As shown in the Appendix, few magazines are published both in Brazil and the U.S.; in these cases, correspondence between magazines is trivial; such as Scientific American. In addition, there are those cases where the genre is the same correspondence is straightforward. For instance, automobile related magazines based on Oster and Scot Morton´s (2005) classification have a FutureGain between 5 (Super Chevy) and 8 (Automobile); therefore, magazines of this genre have been classified as an intermediate FG value of 7 in correspondence with Autoweek. Brazil´s largest weekly news magazine, such as Veja and Istoé, clearly play the same role in the Brazilian market as Newsweek does in the North American market; therefore, these must have the same placement in both classifications.

It is worth mentioning that our data base is composed of magazines with different subscription periods. Hence, it was possible to evaluate the average price of subscriptions for the case of short-term subscriptions (a maximum of 18 months) and the average price of subscriptions in the case of long-term subscriptions (more than 18 months) and in addition the β coefficient of each magazine subscription policy was evaluated. β's coefficients do not exhibit a strong correlation with future gain classification, as would be expected, thus the need for a more elaborate model is foreseen[2].

[2] Empirical correlation between Future Gain and Beta on data is 3.138% . Sample of 35 different magazines – the same sample of PCA – beta runs from 0.33333 to 1.05263 with an average of 0.70969, standard deviation of 0.2145094 and median value of 0.666667. It is interesting to note that three different magazines have shown beta greater than one.

The paper performs two empirical exercises with more restricted samples that in part reflect data availability for the particular analysis.

First, we consider an exploratory analysis that intends to investigate whether multidimensional price discrimination mechanisms are likely to prevail. In fact, as previously mentioned, one should in principle expect that the magazine´s advertising policy should be related to its pricing policy as part of the general profit maximizing problem of the firm. The prevalence of second order price discrimination (non-linear pricing) in advertising was investigated, for example, by Busse and Rysman (2005) who studied these discounts using Yellow Pages advertising. Nevertheless, it is worth noting that the possibility of mutidimensional price discrimination is absent from the price discrimination literature in general and more specifically it is not addressed in the literature on magazine subscription. An exception is given by Nahata and Ringbom (2007). The next sub-section considers an exploratory analysis using advertising discounts according to page space and subscription discounts according to subscription horizons.

Multidimensional price discrimination and principal components analysis

Principal Components Analysis (PCA) objective is to uncover linear combinations of a set of variables that properly portray the variance structure of the data. PCA is useful as an exploratory procedure to identify common dimensions across different variables; in addition, it constitutes a multivariate statistical technique to reduce the dimensionality of the data [see Manly (2005) for an introduction]. Consider a set of p variables, the first principal component is defined as:

$$Z_1 = \quad a_{11}X_1 + a_{12}X_2 + \ldots\_a_{1p}X_p$$

where a_{ij} denote weights such that Var(Z_1) is maximized subject to the normalization constraint

$$a_{11}^2 + a_{12}^2 + \ldots + a_{1p}^2 = 1$$

The second PC is similarly defined as:

$$Z_2 = \quad a_{21}X_1 + a_{22}X_2 + \ldots + a_{2p}X_p$$

Subject to the nomalization and orthogonality constraints given by :

$$a_{21}^2 + a_{22}^2 + \ldots + a_{2p}^2 = 1 \text{ and } Z_1'Z_2 = 0$$

Similarly, one can obtain a maximum of p PCs that gradually explain a smaller proportion of the data variance and that capture different dimensions of the data set given the orthogonality constraints. In practice, the choice of the number of PCs reflects some criterion regarding a substantial proportion of the variance that is explained [typically above 75 % or retaining PCs with eigenvalues of the correlation matrix that are greater than unity].

The present empirical application considers five variables, where three of those pertain to steps reflecting discounts in advertising prices and the remaining two variables indicate subscription discount according to the subscription horizon Specifically:

. FPTT: price of a full page advertisement relative to a two-thirds page advertisement;

. TTHP: price of a two-thirds page advertisement relative to a half page advertisement;

. HPTP: price of a half page advertisement relative to one-third page advertisement;[3]

. SRS: average price of a subscription divided by the newsstand price for short-term subscriptions (maximum of 18 months);[4]

.SRL: average price of a subscription divided by the newsstand price for long-term subscriptions (more than 18 months);

The results obtained with Stata 13.0 SE are summarized in Tables 1 and 2

INSERT TABLES 1 and 2 AROUND HERE

The evidence from Table 1 suggests that we can retain the first two principal components that capture the variance of the data. Thus this indicates that a significant dimension reduction is possible; in addition, this indicates that important common patterns across different discount indicators appear to exist. This exploratory evidence is suggestive as it is consistent with a multidimensional price discrimination mechanism for magazines. It is possible to improve the interpretation of the retained PCs by obtaining correlations with the original variables as reported in Table 2. The results allow identification of two distinct dimensions in the data; thus it is possible to consider PC_1 as reflecting *subscription discounts* whereas PC_2 is indicative of *advertising discounts*.

[3] The previous variables were normalized so to compare prices with equivalent page spaces

[4] As the number of issues may vary

The exploratory evidence pertaining to the possible prevalence of multidimensional price discrimination in magazines warrants further investigation at the empirical level. Moreover, it is relevant to perform a broader characterization of the profit maximization problem of a publishing house at the theoretical level.

In the next sub-section, we perform an econometric analysis in accordance with Oster and Scott-Morton (2005) as previously mentioned. The analysis explores a more subtle form of price discrimination that encompasses intertemporal aspects of preferences and the expected future gains of subscription. The application to the Brazilian case provides a more conservative assessment of a salient empirical implication of their theoretical model.

Future subscription gains and subscriptions discounts: an econometric assessment

In this sub-section, we perform an econometric investigation of the role of perceived future gains of subscription on magazine discounts by using as a reference the previously mentioned empirical specification suggested by Oster,and Scott-Morton (2005). However, some contrasts prevail in our empirical application:

a) The Brazilian market for magazines is smaller than the one in the U.S.. In the present analysis we focus on larger magazines of national circulation and thus consider titles with average[5] annual circulation above 25000 units. With this restrictive filter for the sample , we did not consider

[5] Average of annual circulation of 2008 and 2009 according to IVC.

controls in the regression for availability as approximated by variables related to circulation;

b) The editorial market in Brazil is dominated by a few publishing houses and the relative importance, can in principle, be relevant for efficient distribution channels. Later, we consider dummy variables pertaining to salient small and large examples of publishing houses;

c) The classification adopted can be considered to be clearer in the more extreme cases, In other words, one should expect a reasonable consensus on magazines that are likely to provide long-term or short-term gains, however intermediate cases could be less clear. Thus, we discard magazines with intermediate value from the sample. The referred variable reported in the appendix ranged from 3 to 12; however, magazines with future gains between 5 and 8 are excluded from our sample;

d) The form of price discrimination advanced by Oster and Scott-Morton (2005) is motivated by intertemporal aspects in the preference for magazines. thus the subscription horizon can, in principle, suggest an additional layer for the price discrimination publishing house´s problem. In the present application, we investigate this effect by using a dummy variable with a stacked sample that considers magazines with different subscription horizons. Because the theoretical model is strongly motivated by subscription as a present consumption bias problem it is very important to realize that while this bias influences a consumer's choice regarding whether to subscribe or not, it does not affect

comparison across different subscription options. Hence, different subscription horizon leads makes us able to do inference over the ordinary discount rate (δ).

Next, we describe the variables used in the regression analysis: **SubRatio**: average subscription price divided by the newsstand price (this variable is expected to be negatively related to subscription discount);

. **FG:** future gain indicated in the magazine classification reported in the appendix - where larger values indicate magazines that provide longer term benefits;

. **AdRate**: advertising intensity measured by the ratio between the price of full page advertisement and magazine circulation and this may be seen as the marginal advertisement income from selling an additional magazine;

. **Week**: dummy variable that assumes a value of 1 for monthly publication and 0 for weekly publication. However, a monthly magazine needa one visit to the newsstand in a month, a weekly magazine needs four; therefore, not only is the monthly cost of transaction quadrupled for those weekly magazine readers that do not have access to newsstands, but they do have a greater risk of not being able to buy some desired issue;

. **NI*GIFT**: number of issues interacted with dummy variable indicating the concession of a gift as an introductory offer associated with a new subscription – an introductory offer being sold with a subscription may be seen as a tying sale mechanism; therefore, this variable reflects how a

discount for an additional month on this type of sale decreases. It is noteworthy that this may be seen as a measure of how tying the sale to the gift is: the better the “gift” good more magazine issues can be sold together.

. **Long**: dummy variable assumes a value of 1 for longer term subscriptions (more than 18 months) and is noteworthy that longer term subscriptions are less affected by present consumption bias;

. **DRICKDAN**: dummy variable that assumes a value of 1 for publishing house Rickdam and 0 otherwise. This smaller publisher house could, in principle, have experience more difficulty with distribution;

The related summary statistics are reported in Table 3 whereas the estimation results appear in Table 4.

INSERT TABLES 3 AND 4 AROUND HERE

The Brazilian editorial market provides a more conservative assessment of the price discrimination advanced by Oster and Scott-Morton (2005) because newsstands are more prevalent and subscriptions are less widespread. The evidence is qualitatively similar with that obtained by those authors in terms of significant coefficients with a negative sign in the case of AdRate and Week and thus favoring magazine subscription discounts. Moreover, a positive effect is exerted by the interactive term between the number of issues and an introductory offer (i.e. gift).

However, important contrasts emerge because no significant effect is detected regarding future gains of the magazine (FG) affecting magazine subscription discounts. Thus, the Brazilian cases´s evidence does not provide support for the sophisticated form of price discrimination

suggested by the aforementioned authors. In fact, this possibility was tenable because newsstands are far more widespread in Brazil than in other countries.

Finally, the subscription horizon could, in principle, provide an additional layer for the price discrimination of the publishing house. However, no significant effect emerges. This result can reflect the limited spectrum of horizons that are available in the Brazilian magazine market.

4. Final Comments

The paper´s objective was to assess a price discrimination mechanism in magazines that was advanced by Oster and Scott-Morton (2005). Specifically, magazine subscription discounts would be positively associated with the degree to which the magazine provides long-term benefits. The application to Brazil is appealing as a conservative assessment because subscriptions are less common in Brazil than in other countries and in fact, newsstands are much more widespread.

The evidence, did not corroborate the prevalence of this sophisticated price discrimination mechanism in Brazil. Nevertheless, an exploratory analysis based on multivariate statistical analysis suggested that complex multidimensional price discrimination processes are likely to occur. In particular, price discounts on magazines and advertising discounts should be considered as part of a more general profit maximizing program by the publishing house.

Different avenues for future research are possible:

a) At the theoretical level, the models for magazine subscription lack a more integrated effort in for of modelling price discrimination in multiple dimensions;

b) At the empirical level, additional investigations on the interrelations between different forms of price discrimination is warranted, Moreover, the growing availability of digital contents over the Internet and the increasing unbundling possibilities for magazine subscriptions merit additional assessments of subscription discounts mechanisms.

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Appendix

Magazine classifications

Magazine (in Brazil)	**Reference magazine (in the U.S.)**	**Future gain**
Aventuras na História[1]	American History	12
História Viva[2]	American History	12
Dinheiro Rural[1,2]	Farmer's Digest	11
Época Negócios[1,2]	Business Week	11
Globo Rural[1,2]	Farmer's Digest	11
Info Exame[1,2]	PC World	11
Isto é Dinheiro[1,2]	Business 2.0 ; Business Week	11
Meu Próprio Negócio	Business Week	11
Pequenas Empresas Grandes Negócios[1]	Business Week	11
Terra Viva	Farmer's Digest	11
Você S.A[1]	Business Week	11
Bravo![1]	Art & Auction	10
Arquitetura & Construção[1,2]	Architectural Digest	9
Época[1,2]	Newsweek	9
Exame[1,2]	Newsweek	9
Istoé[1,2]	Newsweek	9
Men´s Health[1]	Men´s Health	9
Scientific American Brasil	Scientific American	9
Veja[1]	Newsweek	9
Vida Simples[1]	Sierra	9
Women's Health[1]	Men's Health	9
Boa Forma[2]	Muscle and Fitness	8
Corpo a Corpo[2]	Fitness	8
Decoração & Estilo[2]	House Beautiful	8
Galileu[2]	Popular Science	8
Mente & Cérebro	Psychology Today	8
National Geographic Brasil	National Geographic	8
Nova Escola	Scholastic Parent & Child;Psychology Today	8
Planeta	National Geographic	8
Saúde	Health	8
Superinteressante	Popular Science	8
Viva Saúde	Health	8
AUTOesporte[2]	Autoweek	7
Bons Fluídos[2]	Christianity Today	7
Casa Cláudia[2]	House and Garden	7
Casa & Decoração[2]	House and Garden	7
Casa e Jardim[2]	House and Garden	7
Crescer[2]	Parent's Magazine	7
Dieta Já[2]	Shape	7
Faça Fácil[2]	Crafiting Traditions	7

Motor Show	Automobile, Autoweek	7
Pais & Filhos	Parent's Magazine	7
Runner's World	Runner's World	7
Vogue	Vogue	7
Car and Driver[2]	Car and Driver	6
Menu	Bon Appetit	6
Quatro Rodas	Four Wheeler	6
Receita Minuto	Bon Appetit	6
Viagem e Turismo	Travel and Leisure	6
Capricho[2]	Seventeen	5
Criativa[2]	Woman's World	5
Elle[2]	Elle	5
Atrevida[2]	Teen	4
Cláudia[1,2]	Marie Claire	4
Estilo de Vida[1,2]	Glamour	4
Istoé Gente[1,2]	Glamour	4
Manequim[1,2]	In Style	4
Marie Claire[1]	Marie Claire	4
Nova[1]	Cosmopolitan	4
Placar[1]	Sports Illustated	4
Quem[1]	Glamour	4
Todateen[1]	Teen	4
Revista Gloss[1]	Cosmo Girl !	4
Atrevidinha	Teen People	3
Contigo[1,2]	People Magazine	3
Mundo Estranho[1]	Teen People	3
Playboy[1]	Playboy	3
Recreio[1]	Teen People	3
Sexy[1]	Playboy	3
Vip[1]	Playboy	3
Yes! Teen	Teen People	3

Note: the table indicates the equivalence with classifications proposed by Oster and Scott-Morton (2005). Magazines marked with superscript 1 composed the sample used in the econometric estimations and with superscript 2 compose the sample used in Principal Components Analysis.

Table 1

Principal components analysis: advertisement and subscription discounts

principal component	eigenvalue	proportion of variance	cumulative proportion of variance
PC_1	1,894	0.379	0.379
PC_2	1,676	0.335	0.714
PC_3	0.960	0.192	0.906
PC_4	0.286	0.057	0.963
PC_5	0.184	0.037	1.000

Table 2

Principal components analysis: correlation with original variables

	FPTT	**TTHP**	**HPTP**	**SRS**	**SRL**
PC_1	0.236	0.245	0.244	0.935	0.919
PC_2	0.369	0.837	-0.913	-0.006	-0.069

Table 3

Regression analysis: summary statistics

Variables	Mean	Std, dev.	Minimum	Maximum
SubRatio	0.691	0.174	0.467	1.444
FG	7.058	3.320	3	12
AdRate	0.556	0.285	0.197	1.347
Week	0.275	0.450	0	1
Long	0.493	0.504	0	1
DRICKDAN	0.014	0.120	0	1

Table 4

Regression results - Dependent variable: SubRatio

Regressors	**Coefficient**	**p-value**
Constant	0.766	0.000
FG	0.005	0.235
Week	- 0.130	0.000
AdRate	- 0,138	0.008
NI*GIFT	0.001	0.030
Long	- 0.019	0.658
DRICKDAN	0.142	0.000
R^2 = 0.148	no. of observations: 69	

Note; the reported p-values reflect standard errors that are robust to heterocedasticity