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PRICE DISCRIMINATION AND COMPETITION IN TWO-SIDED MARKETS: EVIDENCE FROM THE SPANISH LOCAL TV INDUSTRY

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Abstract

In this paper, we empirically test the relation between price discrimination and product market competition in a two-sided market setting using a new data set of Spanish local TV stations that provides information on subscription and advertising prices per station for 1996, 1999 and 2002. During these years, changes in regulation in this sector had a deep impact on the degree of local market competition. We use differences in market structure across markets and across years to study the relation between competition and price discrimination in this setting. Our findings suggest that stations in more competitive markets are less likely to use price discrimination. We also find evidence that stations price discriminating in a market are also more likely to price discriminate on the other market. Finally, cable subscription fees and advertising prices are higher in more competitive markets which suggests that tougher competition may increase market segmentation through station differentiation, driving stations to charge higher uniform prices to more loyal customers. This may indicate that less price discrimination may be associated with lower consumer surplus in all markets.

Keywords: price discrimination, market competition, Local TV Industry, product, subscription, advertising.

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1 Introduction

Mainstream economic theory postulates three necessary conditions for the existence of profit-maximizing price discrimination. Not necessarily in this order, these three conditions are as follows. The first condition states that firms must be able to prevent resale among consumers. The second condition is that firms must be able to identify different willingness to pay among consumers. The third and last condition assumes that firms must have market power. While all three are equally necessary for the success of price discriminating strategies, policy makers, and economists in general, have mostly paid attention to the third condition that relates market power and price discrimination. An early example of this is the Clayton Act of 1914 characterizing price discrimination as an illegal practice. This was later amended by the Robinson-Patman Act of 1936, which narrowed down illegality of price discrimination to intermediate markets. Over the years, much antitrust action has taken place on the basis of price discrimination (2nd degree mostly) facilitated by existing market power and as a way to force competitors out of business (see IBM case in 1969-82 or Microsoft case in 1998-2002 to cite two among many other examples).

The emergence of new technologies and two-sided platforms in new markets has changed the way we view competition between firms. Moreover, it has also changed the understanding that economists and policy makers had about the relation between price discrimination and product market competition. For this reason, there has been a recent academic push to gain further insight into the inner workings of two-sided markets, multi-market platforms and trade-offs faced by firms operating in these new markets and industries. Unfortunately, the empirical literature supporting this theoretical framework has been lacking or at least has not been as numerous as we may hope. Indeed, one of the goals of this paper, is to document the incidence of pricing and price discrimination practices in two-sided markets. Hence, we empirically test the relation between price discrimination and product market competition in the Spanish local TV industry during a

period of time where that industry underwent several changes in regulation, and therefore, we may observe quasi-exogenous changes in the degree of product market competition.

The empirical literature on price discrimination and competition has largely documented the validity of the first condition on resales, but has consistently failed to show a negative relationship between market power and price discrimination. The main goal of this paper is to revisit the empirical relation between price discrimination and competition in the Spanish local television and show that price discrimination is negatively related to the degree of product market competition. Additionally, we test whether median prices are positively or negatively correlated with increases in product market competition to determine whether decreases in price discrimination practices are associated with higher or lower consumer surplus.

For this purpose, we use a new data set collected from three independent issues of the AIMC local TV station Census from Spain in years 1996, 1999 and 2002. This collection of censuses provide information on the number of local TV stations located in each town in Spain in each one of those years, and station-specific data for a sample of all stations. This set of characteristics include information on (among others) whether the station broadcasts its content, whether it sells advertising and whether it price discriminates in either the market of TV content and advertising. In our data, on average, 8% of stations selling advertising report to price discriminate in advertising. Similarly, 5% of stations that do not broadcast content (cable and pay-per-view stations basically) report to price discriminate when charging subscription fees to their viewers. On the other hand, the Spanish local TV industry went through two major changes in regulation between 1996 and 2002 that contracted first and later expanded the number of stations per city from 2.6 in 1996 to 1.98 in 1999, and finally 2.72 in 2002. As a matter of fact, only 31 out of the 499 cities in our data did not see their number of stations vary during the period of time we analyze. In this paper therefore, we empirically examine how the observed variation in price discrimination

practices relates to observed changes in the number of stations per city or the station's coverage area, and therefore, product market competition.

Contrary to results in the previous empirical literature, we find no instances of a positive correlation between price discrimination and product market competition. In fact, we observe repeated evidence that price discrimination is negatively associated with more competitive markets or, at least, markets with more stations. We also observe that stations emitting to larger coverage areas and facing a larger number of competing stations are less likely to price discriminate as well. This finding is true for both the TV content market and the advertising market. On the other hand, we find evidence that price discrimination decisions are correlated across markets. This validates symmetry assumptions across markets in the theoretical literature.

Finally, our last set of results shows that stations facing more competition charge higher subscription fees (if cable TV station) as well as higher prices for advertising spots. Also, more competitive markets have a higher share of stations broadcasting their content and therefore charging a prize of zero. This finding together with our previous results indicates that even though stronger competition may reduce the incidence of price discrimination, it may also increase prices. This could be explained by the fact that when facing stronger competition stations choose to differentiate from each other and market segmentation increases. As a result, stations may charge higher uniform prices to their most loyal customers.

As any other paper studying the impact of competition on economic outcomes, we are concerned about the endogeneity of market structure and firm entry. Traditionally, we may worry that stations in more profitable markets are more likely to price discriminate and more profitable markets may induce more firm entry. This is not the case here, since we find that stations in more competitive markets are also less likely to price discriminate. In any case, we address the endogeneity issue in a number of ways. First, we take advantage that regulation in 1999, as opposed to regulation

in 1996 and 2002, mandated that no city, regardless of population size, would have more than two stations. We restrict our attention to the sample of cities with at most two stations in 1999 and confirm that all our results are robust. We also apply instrumental variables to the number of stations per town and use station and year fixed effects to control for invariant unobservables at the year and station level that may be biasing our results. We find no positive relation between price discrimination and competition. Moreover, in some instances, we observe a negative relation between price discrimination and competition in the advertising market.

Our paper draws from two other papers by Busse and Rysman (2005) and Borzekowski, Taragin and Thomadsen (2005) using a simple reduced form approach to study the empirical relation between price discrimination and competition. This paper also resembles those mentioned above in that our industry is characterized by the fact that differences in costs are either easy to control for or negligible. Therefore, differences in prices are easily attributable to differences in willingness to pay. To the best of our knowledge, our paper is the first contributing to this empirical literature by observing price discrimination on both sides, subsequently providing evidence for both market sides on the empirical association between price discrimination and product market competition in the presence of network effects in the Spanish local TV industry.

The paper is organized as follows. After the introduction, we review the empirical literature on the relation between competition and price discrimination. In section 3, we describe the model by Liu and Serfes (2009) and show that when transportation costs are large (no competition for the marginal consumer) price discrimination is always preferred to uniform pricing. This result shows that overall there is a non-monotonic relation between competition and price discrimination practices. Section 4 details the institutional features of the Spanish local television industry and describes the data we use. In section 5, we describe the empirical methodology and show our results. Also in section 5, we relate our empirical results to existing evidence in the literatue.

Section 6 concludes.

2 Literature Review

Traditional economic theory establishes that two conditions are necessary for price discrimination to take place: the first condition is no re-sale between consumers, while the second is that the firm implementing price discrimination must have market power to do so. Following these simple premises, there is a large theoretical and empirical body of literature studying price discrimination in one-sided markets. We will not cite any of those references here since this paper's contribution is to the empirical literature on price discrimination in two-sided markets.

Recent theoretical literature studied the relation between price discrimination and competition in the context of two-sided markets. Some of these papers (Rochet and Stole (2002), Stole (1995) and Rysman (2004) among others) examine the nature of non-linear pricing under competition and find that under different circumstances prices decline proportionally more at the top of the product range. Other work from Seim and Viard (2004) presents and estimates a model that yields ambiguous predictions about the relationship between price discrimination and competition. Similarly, Katz (1984) and Borenstein (1985) demonstrate that price discrimination is possible in free-entry markets. A separate array of papers in the Marketing literature model firms's incentives to price discriminate when consumers have different brand loyalty sensitivities. Papers such as, Dogan, Haruvy and Rao (2005) and Chen, Narasimhan and Zhang (2001) show that rebating (second-degree price discrimination) and third-degree price discrimination, respectively, can become profitable with increased competition. Closest to the goal of this paper is Liu and Serfes (2009), which particularly studies price discrimination and competition in two-sided markets. They demonstrate the existence of a directly proportional relationship between competition and price discrimination.

The multiple predictions layed out by different models makes the relation between price discrimination and competition still an empirical question. To the best of our knowledge, there are four papers closely related to ours: Busse and Rysman (2004), Borzekowski, Thomadsen and Taragin (2006), Miravete and Röller (2003) and Borenstein (1989). The first paper documents the relation between price discrimination and competition in yellow page directories. The second examines this relation in the market for mailing lists. The third uses a structural approach to quantity discounts in cellular telephone plans; whereas, the fourth paper finds that competition affects low prices more than proportionally. Close to Borenstein (1989), Stavins (2001) observes that the gap between the price of unrestricted and restricted seats increases with competition in the airline industry. Finally, Borenstein and Rose (1994) show that airline routes with greater competition exhibit greater level of price dispersion. Asplund, Eriksson and Strand (2002) show that in the newspaper industry more competitive markets have a higher incidence of third-degree price discrimination. Our paper contributes to this literature with an empirical examination of the relation between price discrimination and competition in the Spanish local television sector. We use panel level data and the two sided market structure of this industry to unravel the effect of unobservables and endogeneity in the relation between price discrimination and competition.

Finally, it is worth mentioning the stream of papers in the industrial organization literature examining price discrimination practices in different industries. Shepard (1991) identifies price discrimination in gas stations providing full and self service; while, Ivaldi and Martimort (1994) analyze price discrimination in electric utilities in France. Similarly, Graddy (1995) documents the existence of third-degree price discrimination in the highly competitive Fulton fish market. Other papers structurally estimate welfare consequences of price discrimination, such as Leslie (1998) at a Broadway Theater, McManus (2000) for specialty coffee, Cohen (2000a) for paper towel, Clerides (2000) in the book publishing industry, Crawford and Shum (2003) in cable television, and Nevo

and Wolfram (2002) for the ready-to-eat cereal industry, respectively. Our paper also contributes to this literature providing a reference to price discrimination practices in two-sided markets and the Spanish local TV industry.

3 Model

In this section, we borrow the model and results in Liu and Serfes (2009) (hereafter LS), adding a simple extension for the monopoly case under very high transportation costs and; therefore, no competition.

In a nutshell, LS start off by characterizing a model with two platforms, A and B. These platforms are present in two different linear-city markets, 1 and 2, of length 1. Platform A locates in both markets at point 0, and platform B locates at the endpoint 1. For simplicity (and a more accurate application to the empirical setting), we assume that marginal cost of production c in both markets is very low and equal to zero such that $c = 0$. Fixed costs for both platforms is the same in both markets and equal to F.

Customers are uniformly distributed along the two linear cities and they choose whether to obtain the good from platform A or B. Customers of a platform in a market value the number of customers of the same platform in the other market, such that their utility of consumption is equal to $v + \alpha n_{lk}$; where v is the direct utility of consumption of good 1 or 2, n_{lk} is the number of consumers in the other market l consuming the good from the same platform k and α is the indirect network utility. To keep algebra simple, we assume the indirect network utility parameter does not vary by platform or market. As it is usual in this type of models, consumers must pay a transportation cost t per distance between their location and the product of their choice. Thus,

net utility of an individual located in x in any of the two markets will be

$$u(A) = v + \alpha n_{lA} - tx - p_A$$

and

$$u(B) = v + \alpha n_{lB} - t(1-x) - p_B$$

where p_A and p_B are prices set by platform A and B, respectively. The consumer located at x will choose to buy product A as long as $u(A) > u(B)$, and buy product B otherwise.

Both platforms consider two possible pricing policies: uniform prices or perfect price discrimination. The former implies charging the same price to all consumers within a market; while the latter implies a different price for each consumer (almost perfect price discrimination). In LS (2009), platforms charge price equal to 0 to customers of other platforms and limit price their closest customers. In the end, they show that profits under uniform pricing and price discrimination are such that

$$\Pi^{UP} = t - \alpha$$

and

$$\Pi^{PD} = \frac{t}{2}$$

once we assume that $c = 0$ and $\alpha_1 = \alpha_2$. When comparing these two profit functions, it is apparent that $\Pi^{UP} > \Pi^{PD}$ as long as $\frac{t}{2} > \alpha$. If t (transportation cost) is a proxy for the intensity of competition, their result implies that as competition decreases (t increases) firms are more likely to use uniform pricing when the entire market is served by both or either firm. This result is contrary to the common notion that firms need market power to price discriminate in a profit-

maximizing manner. LS (2009) explain that this is the case due to the two-sided market structure in their model.

This result is not monotonic on the degree of competition. As t increases and goes beyond a threshold point $t^* = 2v + \alpha$ such that $t > 2v + \alpha$, firms will always find optimal to price discriminate over set uniform prices. This is so because perfect price discrimination no longer implies limit pricing and platforms can charge the full willingness to pay to their customers and zero (under the assumption of non-negative prices) to customers with negative net willingness to pay. In this case, profits for uniform pricing and price discrimination prices are

$$\Pi^{UP} = \frac{1}{2}\frac{v^2}{t - \alpha}$$

and

$$\Pi^{PD} = \frac{tv^2}{(t - \alpha)^2}.$$

Subsequently, $\Pi^{PD} > \Pi^{UP}$ as long as $t > -\alpha$, which is always true.

To summarize both sets of results within a sentence, there is not a monotonic relation between competition and price discrimination in two-sided markets. For low degrees of competition, as competition increases the likelihood of observing price discrimination decreases. If products offered by the two platforms are different enough ($t > 2v + \alpha$) that limit pricing no longer plays a role; then, it is never optimal to set uniform prices and price discrimination becomes the dominant profit-maximizing strategy.

See Figure 1 for a graphical representation of the policy function. This figure shows that as t increases (competition decreases), while holding v and α constant, the area for which uniform pricing (UP) is optimal also increases. Once t goes beyond $t^* = 2v + \alpha$, it becomes optimal to perfectly price discriminate (PD) across consumers regardless of the values of v and α.

Therefore, the empirical implications of this model are mixed since there is no monotonic relation between competition and the likelihood of observing price discrimination practices. If we take the number of firms as a proxy for competition ($\frac{1}{t}$), we should observe a U-shaped relationship between the number of firms and the likelihood of using price discrimination practices. The goal of this paper is to test whether such relation is observed in the data.

4 Institutional Details and Data

Television stations do not differ much from a regular firm as they also maximize profits. The difference lies in the nature of the product they sell and their ability to obtain revenues through two different channels. Television stations operate in a two-sided market and this makes the problem at hand more interesting.

On the one hand, television stations produce content that they sell directly to television consumers. On the other hand, television stations sell television space to advertisers. Since consumers value television content free of advertising whereas advertisers value the number of television viewers, stations face a trade-off on how much to charge consumers to view their content versus the amount of revenues obtained from advertisers. Some stations may broadcast their content for free in order to maximize their advertising revenues by maximizing the number of viewers. Other stations may choose to limit the amount of advertising maximizing profits through a subscription rate to viewers. This is only profitable if these stations have the appropriate technology that allows them to monitor television consumption. When monitoring is not possible, or it is too costly, stations may broadcast (charge price equal to zero) and maximize profits through advertising revenues.

In this regard, advertising and subscription rates are determined by demographic and market characteristics. Whether the stations can charge higher or lower prices will depend on the

consumers willingness to pay and the expected number of viewers, as well as the degree of each station's content differentiation from each other, the degree of each market segmentation and the number of direct competitors faced by each station. It is also well-known that TV stations maximize revenues by price discriminating across viewers and advertisers (second and third degree price discrimination), to the extent that competing stations are not offering the same content and they are not undercutting their prices. In this paper, we precisely document this relation; that is, whether and how the number of competing stations within a well-defined local television market has an impact on the likelihood of observing price discrimination practices for local TV viewership and advertising.

4.1 The Spanish Local Television Industry and its Liberalization

Up to the mid 1980s, Spain had two TV stations, TVE and TVE2. The former was the main Spanish national television station, while the latter emitted from small satellite stations that had little independence on their programming decisions and served as window to minority content and local news. During the mid 1980s, as a consequence of the consolidation of the new democratic regime, the central government granted the right to its regional counterparts to develop regional stations. To this point, the local TV station was not recognized as a legal entity by the existing telecommunication regulation nor by the central and respective regional governments. A number of local stations were created in the late 1980s as a result of the joint effort of local civil associations. Since these local stations were neither prohibited nor recognized by the law, police authorities often did not know what to do as activities of local stations were considered alegal.

The growth in number and importance of the local stations exacerbated the need for a legal framework that would regulate their activities as well as protect them from the abuse of others. As a result of different lobbying pressures, the socialist government approved the law of local TV

stations in 1996 which aimed at highly regulating the composition, commercial activities, ownership and competitive structure of the local TV station industry in Spain. In particular, it limited the number of stations to two per town (regardless of the population size), banned TV networks and restricted stations ownership and control to local government agencies.

The 1996 Spanish national election shook the political arena as the socialist party lost the election. The new party in power, the right-winged Partido Popular, had a very different perspective on how the Spanish local television industry ought to be regulated. In particular, the Partido Popular believed this industry needed to be deregulated and so it initiated a deregulation process that faced more obstacles than originally anticipated.

Even though the Partido Popular won the election, it did not so by parliamentary majority fording the new government to rely on the support of other minor groups implicated in the elaboration of the existing regulation. Consequently, the Partido Popular chose to start a "silent" liberalization. Badillo (2003) documents how the government chose not to enforce the law prepared and passed during the previous socialist government. This changed after the 2000 election when the Partido Popular gained full control of the Parliament and decided to push forward with a full liberalization of the local television industry. The Partido Popular finally passed the law in 2002 overruling the 1996 strict regulation and effectively liberalizing and deregulating the Spanish local television sector. With the new regulation in place, the government no longer limited the number of stations per municipality or the ownership and control structure of each station. In particular, stations were no longer required to be run by a municipal government agency nor public consortium, stations were allowed to be run for profit, and to be part of networks with other local television stations.

These changes in regulation from 1996 to 2002 experienced by this sector had a dramatic change in entry and exit decisions as well as the concentration of market power and business practices.

This paper uses these changes in market structure across different cities and years to study the relation between competition and price discrimination in the Spanish local television industry. In the next section, we describe the data used to establish this empirical relation.

4.2 Data Description

We have assembled a new data set composed by the three censuses of local TV stations collected by AIMC during the years of 1996, 1999 and 2002. Each one of these censuses contains a list of all local TV stations by city in Spain. AIMC sent a questionnaire to each local TV station in the list requesting station-specific information such as address, name and job title of the person answering the questionnaire, coverage area, whether it broadcasts content, subscription fee if pay-per-view and price of advertising among many others. This information detailed in each of these censuses describes well the business decisions of each TV station. For the purpose of this paper, we use the fact that some stations report the use of second and third degree price discrimination in both the content and the advertising market. We merge this information provided by AIMC with annual information from the Business Census published by "La Caixa" to account for differences across markets in demographics. As a result, we collect information for 1,285 station/year observations split in 183 stations in 1996, 457 in 1999 and 645 in 2002.

Before describing summary statistics and features from the data, we define clearly the two measures of price discrimination per market used in this paper. Questionnaire respondents report on prices charged for viewing content and advertising space. In some cases, they report a range of prices that may actually depend on age group of the customer (content market) or quantity (number of advertising spots). When measuring price discrimination, we do not distinguish between second and third degree discrimination, thus, our measures are dummy variables that take value 1 if the questionnaire respondent reports any sort of price discrimination, and 0 otherwise. For that

purpose, we create two price discrimination dummy variables per market. On the TV content side, we have $Content\_PD\_1$ and $Content\_PD\_2$. $Content\_PD\_1$ takes value 1 if a station charges a positive price for viewing their content and reports to price discriminate, and 0 if the station charges a positive price for viewing their content but does not report to price discriminate. Therefore, this variable excludes all stations that broadcast their content. $Content\_PD\_2$ is the same variable as $Content\_PD\_1$ except that the former takes value 0 for all stations that broadcast their content. This characterization makes sense if we think of broadcasting as charging a uniform price of zero for every TV consumer. On the advertising side, we also have two dummy variables that we call Adv_PD_1 and Adv_PD_2. The first variable Adv_PD_1 takes value 1 if the station sells advertising and price discriminates, and 0 if the station sells advertising and reports to set a uniform price policy. This variable does not take into account stations that do not offer advertising. Instead, Adv_PD_2 is basically the same variable as Adv_PD_1 except that the former takes value 0 if a stations does not offer advertising. This characterization of Adv_PD_2 is justified by the fact that not offering advertising is the same as offering advertising at a very high unafordable uniform price. After characterizing the dependent variables used in this paper, we can now proceed to describing summary statistics and cross tabulations presented in Table 1 through Table 8.

Table 1 shows summary statistics of all variables used in our empirical analysis across stations and years. Note that on average, 8% of all stations report to price discriminate in advertising and 5 % report to price discriminate in content viewing. These percentages go down to 7% and 1%, respectively, once we account for the fact that some stations do not offer advertising or do not broadcast their content. This table shows that, on average, stations are located in markets with two other stations and that they compete with 5 other stations in their coverage area. Finally, our data also includes station characteristics, such as the number of days of emission, the average

hours per day, the share of content produced in-house, whether the station is privately owned, whether it belongs to a (horizontal) local TV station network, and the amount in pesetas (old Spanish currency prior to adopting Euros) charged by the station for subscription and advertising spots. If a station is price discriminating, we selected the average of the price range reported by the questionnaire respondent. The data also contains city characteristics, such as population and unemployment rates.

Table 2 offers summary statistics of the data broken up by year. Interestingly enough, price discrimination practices decreased over time in advertising but increased in the TV content market. Most other variables did not change over the course of the 6 years from 1996 to 2002. If anything, the number of hours emitted per day emitted per station increased from 12 to almost 18 hours from 1999 to 2002.

Tables 3 and 4 bring up interesting evidence regarding the number of firms that decided to simultaneously price discriminate in both markets versus set uniform prices in one side of the market and price discriminate in the other. The evidence in these tables is relevant to evaluate the validity of symmetry assumptions across markets used broadly when solving two-sided market models. Table 3 tabulates price discrimination practices for all stations and all years. Just by looking at the 163 stations that do not broadcast and sell advertising, we observe that the symmetry assumption is quite accurate since 136 of those are either setting uniform prices or price discriminating in both markets. On the other hand, when including stations that broadcast or do not sell advertising spots, we observe that these stations are more likely to charge uniform prices than setting price discrimination practices. Finally, Table 4 repeats the exercise in Table 3 breaking up the data by year. Note that the same pattern observed in Table 3 is present in each one of the annual panels in Table 4.

To conclude this section, we detail changes in the number of stations per city across years. Since

this paper empirically examines the relation between price discrimination practices and product market competition, it is central to show that indeed there were changes in the number of stations per city. As explained above in the institutional description section, these changes were driven by changes in the regulatory framework in the Spanish local TV industry; and therefore, can be thought of as exogenous to market conditions specific to any given city in our sample. Table 5 shows the joint distribution of the number of stations per city in 1996 and 1999; while Table 6 and 7 do the same for 1999 and 2002, and 1996 and 2002, respectively. In Tables 5 and 6, we observe that even though the number of stations does not vary in many cities (see the number of cities in the main diagonal), there are many others that observe entry and exit. For this purpose, Table 7 shows the total change in the six years covered in our sample from 1996 to 2002. Of the 499 cities for which we gathered information, only 82 cities did not experience any changes between 1996 and 2002; whereas the rest (417 cities) did so. In particular, it is interesting to mention that 308 cities with no local station in 1996 end up reporting at least one station by 2002. Conversely, 34 cities with stations in 1996 did not have a local station in 2002. Finally, to summarize all changes in Tables 5 and 6, we tabulate changes between 1996 and 1999 to changes between 1999 and 2002 in Table 8. Table 8 shows that only 31 markets (cities) out of 499 did not experience any changes in the number of stations between 1996 and 2002. Note that a few markets increased the number by one (or two) and then decreased the number by one (or two), and viceversa.

In the next section, we describe the empirical methodology and the type of regressions used to explore the empirical relation between price discrimination and product market competition, as well as the way we may address the presence of endogeneity. More profitable markets may actually induce more entry simultaneously providing more incentives for firms to find ways to price discriminate and increase profits. Last, we describe our results and discuss their relation to previous literature.

5 Empirical Methodology and Results

This section details the empirical methodology used in this paper and the potential problems associated. Then, we show results of regressions that do not control for unobservable factors and compare them with those that control for the presence of such factors as well as endogeneity of product market competition. Finally, we frame our results within the existing empirical literature.

5.1 Empirical Methodology

We start our empirical analysis by running simple linear regressions of whether a station price discriminates on the amount of local competition it faces in each market (content and advertising) such that

$$Y\_PD\_\#_{ijt} = \alpha_0 + \alpha_1 Comp_{ijt} + \alpha_2 X_{ijt} + u_{ijt},$$

where $Y\_PD\_\#_{ijt}$ stands for the price discrimination dummy variables defined in the previous section ($Content\_PD\_1$, $Content\_PD\_2$, Adv_PD_1 and Adv_PD_2) for station i located in market j in year t. As independent variables, we have $Comp_{ijt}$ as our two measures of product market competition (the number of stations in station i's coverage area and the number of stations located in station i's market j) and X_{ijt} are market and station characteristics that may or may not vary across stations within a market or across years. We also run probit regressions of $Y\_PD\_\#_{ijt}$ on $Comp_{ijt}$ and X_{ijt} to check that results from our OLS regressions are not driven by the linearity assumption and observations predicted to be out of range (larger than one or smaller than zero). Similarly, we also run seemingly unrelated and biprobit regressions of the decisions of price discrimination in both markets. These specifications allow for the error term across regressions to be correlated. We report such correlation between error terms in our tables. Finally, we include

whether the station price discriminates in the adjacent market as an independent variable in order to estimate partial correlation between these variables after controlling for all other variables in X_{ijt}.

The purpose in this paper is to estimate the parameter α_1, running a simple linear regression will only recover the parameter of interest if the error term u_{ijt} is uncorrelated with the variable $Comp_{ijt}$. There are two possible problems that could cause u_{ijt} and $Comp_{ijt}$ to be correlated; and therefore, making the simple linear regression yield a biased estimate of the parameter α_1. The first potential problem is the endogeneity of firm entry. More profitable markets accommodate a larger number of firms, meanwhile, firms in more profitable markets may be more likely to use price discrimination when maximizing profits. The second potential problem is one of omitted variable bias. There may be year, market or station specific factors not available in our data set, which correlate with measures of product market competition $Comp_{ijt}$.

We address both these problems in different ways. First, we use changes in regulation occurred between 1996, 1999 and 2002 to study how changes in product market competition drive price discrimination practices. Under regulation passed in late 1996, no city was allowed to have more than two local stations. We restrict our sample to those cities abiding by the law and we assume that changes in the number of stations in these markets must have been driven by changes in regulation; hence, by orthogonal reasons to market profitability. Second, we use the panel format of our data to instrument for the number of stations in a market and in the coverage area of each station. Our instrument is the number of stations in each market with a three-year lag. This variable is correlated with the fixed cost of entry in a given market but uncorrelated with the contemporaneous demand conditions determining entry decisions and price discrimination practices. Finally, we incorporate year and province fixed effects to control for unobservable factors that may be driving our estimates of α_1. Moreover, we also create a new variable of changes in price discrimination

practices at the station level and plot those against changes in product market competition at the station level. This is equivalent to setting year and station fixed effects; thus, accounting for all invariant unobservables at the year and station level that may be driving our initial results. Once we have described our methodology, in the next subsection, we present our results.

5.2 Results

This section describes the results of using the methodology detailed above to estimate the empirical correlation between price discrimination practices and product market competition in the presence of two-sided markets. First, we provide the results of running simple OLS and probit regressions assuming that decisions are independent across markets. After that, we allow error terms of both regressions to be correlated while using seemingly unrelated regressions (sureg) and biprobit regressions. We, then, introduce a dummy for price discrimination on the other side of the market as independent variable to estimate a direct partial correlation between price discrimination practices in both markets. Finally, we examine the relation between median prices and product market competition to determine whether less price discrimination translates as well into lower prices and; therefore, higher consumer surplus. We conclude this section addressing the potential problem of market structure endogeneity and discussing the overall empirical results.

5.2.1 OLS and Probit Regressions of Price Discrimination on Competition

We start this section describing results in Table 9. This table shows OLS and probit regressions of the variable $Content\_PD\_1$ on measures of local competition. The table reports marginal effects of probit in columns (4) to (6) and columns (10) to (12). Results across columns and specifications in this table show a quite robust negative correlation between price discrimination practices and competition. This correlation becomes statistically insignificant (and even turns positive in

column (12)) when we introduce variables that control for different station characteristics. This basically means that even though there is a robust negative correlation between price discrimination and product market competition in the TV content market, it is also true that stations in more competitive markets are different than those in less competitive markets and that these different characteristics are also correlated with price discrimination practices in our sample.

Table 10 repeats the same exercise in Table 9 with the difference that the dependent variable is now $Content\_PD\_2$, which includes all stations that broadcast; therefore, charging a uniform price of zero for viewing their content. The marginal probit effects reported in columns (4) to (6) and (10) to (12) are all negligible from an economic and statistic point of view. Results in columns (1) to (3) and (7) to (9) resemble those in the same columns in Table 9. There is a negative correlation between price discrimination and local competition, but this relation disappears when we control for station characteristics. This is so because stations that price discriminate also look quite different from those that do not price discriminate in terms of their programming and ownership structure.

Tables 11 and 12 repeat the exercises in Table 9 and Table 10 with Adv_PD_1 and Adv_PD_2, respectively. Table 11 shows, if anything, a negative relation between price discrimination and the number of stations in each station's coverage area. This relation does not hold when we use the number of stations in the station's city as a measure of local product market competition and the coefficients are all statistically insignificant and some even positive. Results in Table 12 use Adv_PD_2 as a dependent variable. It is worth highlighting here that column (3) displays a negative and statistically significant correlation between price discrimination in advertising and the number of stations in the same city. This is consistent with findings in previous tables but all other results in Table 12 are statistically not different from zero, leaving us with not much to say from this evidence.

As results in Tables 9 to 12 rely on OLS and probit regressions that only include controls, our next step is to regress our four dependent variables on our measures of competition while using a variety of fixed effects controling for invariant factors at the year, province, city and station level. Results of this approach are presented in Tables 13 and 14. Table 13 shows results from running OLS regressions of each one of the four dependent variables defined above on the number of stations within a station's coverage area. We run five regressions for each dependent variable and we use different combinations of fixed effects in each regression, while always clustering the standard errors at the city-year level. In this table, we observe a negative and statistically significant correlation between price discrimination practices and the number of stations in the coverage area in the TV content market. The significance vanishes once we include city and station fixed effects, primarily because price discrimination decisions may be mainly affected by early decisions on whether content will be broadcasted or distributed under subscription.

The second row of results in Table 13 (columns (11) to (20)) examine the empirical relation between price discrimination and the number of stations in the coverage area on the advertising market side. Here the results across the board show a negative correlation. Moreover, both coefficients in columns (15) and (20), once we include year and station fixed effects, are negative and statistically significant. These two columns show that, once we follow stations over time, we observe that these are more likely to price discriminate in the advertising market when the number of stations in their coverage area decreases; and therefore, stations face lower levels of local product market competition.

As mentioned earlier, Table 14 basically repeats the same exercise in Table 13 with the only difference that in the former uses the number of stations in the station's city is used as a measure of local competition. The first row of results (columns (1) to (10)) display a negative correlation between price discrimination in the TV content market and the number of stations per city within

provinces, but this negative correlation disappears once we include city and station fixed effects. As mentioned above, price discrimination decisions in this side of the market may be related to early investment decisions on whether to broadcast content; thus it is not surprising that price discrimination practices in this market are not as sensitive to changes in local competition.

The second row of results in Table 14 (columns (11) to (20)) aims at estimating the empirical relation between price discrimination in the advertising market and the number of stations per city, offering rather disappointing results. Even though all coefficients are negative, displaying a negative correlation between the price discrimination dependent variable and the number of stations in a given city, all these regression coefficients are statistically not different from zero. This contrasts with the rather strong results in the same columns in Table 13. We may attribute the disparity of these results to the fact that this proxy of local competition may measure with error the degree of product market competition faced by each station; possibly making these estimates suffer from attenuation bias. It is also true that all stations in the same city will, then, according to this specification, face the same level of competition. Hence, the lack of variation across stations within cities may be another cause for the lack of significance in these results on the advertising market.

To summarize the results in this section, assuming that decisions in the TV content market and advertising market are independent of each other, we find a marginally negative relation between price discrimination and competition as standard theory would predict. Stations that face stronger competition (more stations located in the same city and more stations located in the station's coverage area) are also less likely to price discriminate in the TV content market or the advertising market.

5.2.2 Sureg and Biprobit Regressions of Price Discrimination on Competition

Since the assumption above that price discrimination decisions within a station across markets are independent from each other may not seem realistic, in this section, we allow for the error term across regression equations to be correlated using seemingly unrelated and biprobit regressions for all four dependent variables used previously in this paper. We start our analysis in this section with Table 15A, where we show results of running seemingly unrelated regressions (sureg hereafter) for Adv_PD_1 and $Content\_PD\_1$ on our two measures of local product market competition. Results in this table do not show any statistical significance in the coefficients of interest. Most regression coefficients on our two measures of local product market competition are negative but lack statistical significance; hence, we cannot infer much from these results. The lack of significance may be due to the fact that the sample here is restricted to stations for which we observe their price discrimination decisions in both markets. This condition limits the sample size to 188 and 145 observations when we introduce station level characteristics as controls, diminishing the power of the empirical analysis.

Table 15B repeats the analysis in Table 15A with our more widely defined dummy variables of price discrimination Adv_PD_2 and $Content\_PD\_2$. Results show that there is a direct negative and statistically significant correlation between price discrimination in the TV content market and our two measures of product market competition. The statistical significance disappears once we introduce station level characteristics. This is consistent with the fact that stations in more competitive markets are quite different from those in less competitive markets.

Finally, Table 16A and Table 16B repeat the same exercise in Table 15A and Table 15B, respectively, using biprobit regressions instead of sureg regressions. The results in the latter tables do not differ much from previous results in this section. Once we allow for the error term across markets to be correlated, we find (if anything) a negative and statistical significant empirical relation

between price discrimination in the TV content market and local product market competition. The results in these tables do not seem to report anything worth mentioning in the advertising market once we allow for the error terms to be correlated. In the next section, we introduce price discrimination decisions in the other market as part of the control variables.

5.2.3 The Direct Correlation of Price Discrimination Across Markets

In this section, we include the price discrimination dummy variable in the "other" market as an independent variable for each specification. We decide to jump directly to probit regressions and skip OLS regressions. First, we take price discrimination decisions as sequential and we assume pricing decisions on the other side of the market as exogenous. This is obviously a strong (and wrong!) assumption, but it is a reasonable starting point since this paper is seeking to understand the empirical correlation between price discrimination and product market competition, and clearly, decisions across both markets matter. Table 17 reports marginal effects of probit regressions of price discrimination in the TV content market and shows a negative and statistically significant coefficients on our measure of competition in only two out of the twelve specifications. Surprisingly, once we control for competition and other station characteristics, there does not seem to be any statistically significant relation between price discrimination in TV content and advertising.

Table 18 shows results of running probit regressions and reports marginal effects of price discrimination in advertising on competition and on price discrimination in TV content. Results are statistically not different from zero across the board, and therefore, there is not much we can infer from the exercise in this table.

Table 19A and Table 19B relax the assumption that the error term across specifications is independent and show results of biprobit specifications using competition and price discrimination in the other market as controls. Table 19A examines biprobit specifications with dependent variables

Adv_PD_1 and $Content\_PD\_1$. Coefficients in this table show that price discrimination in the other market increases the likelihood of price discrimination in any given market. Also, more competition does not seem to have any statistically significant impact on price discrimination. On the other hand, Table 19B uses our more widely defined measures of price discrimination Adv_PD_2 and $Content\_PD\_2$. This table shows positive and significant coefficients between price discrimination decisions across markets and negative and significant coefficients of competition in TV content markets. We observe, no robust relation between price discrimination and competition in the advertising market according to the regression coefficients reported in this table.

5.2.4 Price and Competition

So far we have established, with the empirical work, that there is a negative empirical relation between price discrimination and competition. This result still does not reveal any information about the level of prices. There might be less price discrimination in more competitive markets due to the fact that there is more market segmentation and differentiation across stations, in which case, stations would charge higher uniform prices to a reduced number of loyal customers. For this reason, we examine the empirical relation between price levels and our two measures of product market competition. We define two price variables for the TV content market. $Cable\_Fee$ takes prices reported in the AIMC questionnaire of all stations emitting through cable or charging a positive price. When a station offers a range of prices we take the median price in the range. TV_Fee is the same variable as $Cable\_Fee$, but the former includes those stations that broadcast content; and therefore, charging price equal to zero. Finally, $Advertisement\_Price$ takes values of spots as quoted by the answers in the AIMC questionnaire. Stations that do not sell advertising are not included in this variable.

Table 20 reports results of running OLS regressions of these three prices on our two mea-

sures of competition using year and province fixed effects. Results show that $Cable\_Fee$ and $Advertisement\_Price$ are positively correlated with the number of stations in the coverage area and in the city. Despite this, TV_Fee is negatively correlated with competition. The disparity in results here between $Cable\_Fee$ and TV_Fee springs from the fact that local stations broadcast their content more often in larger and more competitive markets.

Taking into account the fact that pricing decisions in these two markets are not independent from each other, we run sureg regressions that allows for non-zero correlation between the error terms of price regressions for TV_Fee and $Advertisement\_Price$. Results are presented in Table 21 and show the same patterns as those observed in Table 20. TV_Fee is negatively correlated with competition (mainly due to those stations that broadcast their content) and $Advertisement\_Price$ is positively correlated with the number of stations in the coverage area.

Results in this section suggest that even though more competition may decrease the incidence of price discrimination, it may be doing so by segmenting markets through station differentiation and increasing prices for viewers (conditional on paying a positive price) and advertisers. Viewers, though, may observe a large number of stations broadcasting their content due to increasing competition, effectively lowering the average price paid for viewing content emitted by local TV stations. The combination of these results imply that even though less discrimination in the TV content market may translate into lower prices; and therefore, larger viewer surplus. The opposite result occurs in advertising where less discrimination implies higher median prices and lower advertiser surplus.

5.2.5 Dealing with Endogeneity

In this section, we address the potential role of endogeneity biasing our previous estimates of the correlation between price discrimination practices and product market competition. We deal with

this issue taking three different approaches. The first approach takes advantage of the several quasi-exogenous changes in regulation in the Spanish local TV industry between 1996 and 2002. Under existing regulation in 1999, no more than two stations were permitted per city. Since previous and later regulation did not limit the number of stations, we can think of changes in market structure between 1996 and 1999, and between 1999 and 2002 as quasi-exogenous.

The second approach entails instrumenting for the number of stations in the coverage area of a station and the number of stations in a city. We use as an instrument the number of stations in a city three years earlier. This number will be correlated with the invariant fixed costs of entry of each city; yet uncorrelated with current regulation and current market demand conditions that may drive price discrimination practices. Finally, the third approach is one of plotting changes in price discrimination practices per station and changes in product market competition. Computing and plotting these variables is roughly comparable to running regressions with station fixed effects. Therefore, we control for any invariant unobservable factor at the station level that may be correlated with our measures of product market competition, biasing our correlation estimates between price discrimination and competition. We provide results of all three approaches next.

Using Exogenous Changes in Regulation. As detailed in the section above describing the institutional environment in the Spanish local TV industry between 1996 and 2002, changes in regulation in this industry responded more to changes in the Spanish government, due to general elections occurred in 1996 and 2000, rather than changes in the industry itself. This allows us to hypothesize that changes in local product market competition from 1996 to 1999 and changes in local product market competition from 1999 to 2002 were unrelated to changes in viewers taste for local television. Existing regulation in 1999 did not permit cities to have more than two local stations. We focus our attention to cities with two stations or less in 1999 while running the

same empirical analysis above. In order to do so, we use $Content\_PD\_2$ and Adv_PD_2 as dependent variables in the set of tables that restricts the sample to those stations in cities with two or less stations in 1999.

Table 22 shows results of running OLS regressions of the two dummy variables on different measures of competition while using year and province fixed effects to control for year and province level unobservables. We find a robust negative correlation between price discrimination and product market competition across markets within a year and within a province. This result indicates that stations located in markets with more competing stations (or with more highly station-populated coverage areas) are less likely to price discriminate. This is true for price discrimination practices in both the advertising and TV content markets. We also cluster standard errors at the city/year level so that standard errors in our regression account for the fact that price discrimination practices may be correlated across stations within a market and year.

Table 23 displays results of running biprobit regressions for this sample of cities with two or less stations in 1999. Results in columns (1) and (2) show that price discrimination is negatively correlated with our measures of product market competition. These two columns allow for correlation between the error terms in each separate market, finding this to be positive (33%) and statistically significant. Columns (3) and (4) show biprobit regressions now introducing whether the station is price discriminating in the other side of the market as independent variables. We still find a negative and statistically significant correlation between price discrimination in the TV content market and competition; however, this result becomes statistically insignificant in the advertising market. Consistent with the results above, price discrimination decisions in the other market are positively correlated (and statistically significant) with price discrimination decisions in any given market.

Finally, Table 24 and Table 25 examine the robustness of our results above (in Tables 20 and

21) limiting our sample to cities with two or less stations in 1999. Table 24 shows results of running OLS regressions with the reduced sample and finds similar qualitative results. TV_Fee is negatively correlated with the degree of competition due to the increasing number of broadcasting stations in larger markets; while $Advertisement\_Price$ is positively correlated with the number of stations in a station's coverage area or city. On the other hand, Table 25 shows results of running sureg regressions with TV_Fee and $Advertisement\_Price$. We find the exact same qualitative results as those in Table 21, as well as those in the specifications that treat both regression equations as independent (Table 20 and Table 24). As a matter fact, the correlation between error terms is reported positive but statistically insignificant between 1.6% and 3.6%.

Using Past Market Structure to Instrument for Endogenous Entry. Another way to address the potential endogeneity of firm entry contaminating our estimates is to use instrumental variables. A possible mechanism explaining endogeneity would be stations finding stronger incentives to price discriminate in more profitable and larger markets, which may also induce more entry. This potential mechanism would yield a positive correlation between price discrimination practices and the number of stations or the degree of product market competition. Even though we do not observe such positive relation in our empirical analysis above, we are concerned that endogeneity might be at work through some other mechanism that we fail to anticipate.

For that reason, we construct an instrument for the number of stations in the coverage area or in the same city in any given period. We use as instrument the number of stations in any given city three years prior to each observation. We observe this directly for years 2002 and 1999 since we collected information for 1999 and 1996, respectively. To find the value of the instrument for the degree of product market competition in 1996, we use a question in the AIMC questionnnaire requesting information about the first year of emission of each local station. We count those that

respond to have been on the air in 1993 already. This is measured with noise since some stations did not answer the questionnaire, and therefore the instrument will be correlated with prior market structure but not measure it quite accurately for all cities. The assumption behind the validity of this instrument is that it will be correlated with fixed and sunk costs of entry per market and uncorrelated with contemporaneous demand shocks that may be driving recent firm entry decisions.

Table 26 displays the results of the second stage of using this instrumental variable. We use the same instrument for both our measures of product market competition but we do not find any significance in our results in the second stage. As mentioned earlier, it is difficult to conceive an endogeneity story yielding a negative correlation between price discrimination practices and competition. Given the weak results in Table 26, we are inclined to believe that either the instrument is not good or endogeneity, in the traditional sense, is not a problem for our main finding; that is, the negative correlation between price discrimination and competition. The different specifications in this table include year and province fixed effects and clustered standard errors by city and year.

Using Station Fixed Effects to Control for Unobservables. Finally, we are able to observe price discrimination decisions for a subset of stations in two consecutive years out of the three years in our data set. For these stations, we compute changes in price discrimination for both markets (advertising and TV content) across years as well as changes in the number of stations in their coverage area and in their city. To compute changes in price discrimination practices we use measures $Content\_PD\_2$ and Adv_PD_2. Then, we plot changes in price discrimination practices per market against changes in competition for each one of our measures of product market competition. Basically, we are using station fixed effects and eliminating all unobservable invariant factors at the station level that may be biasing our estimates of the correlation between price

discrimination practices and product market competition.

Figure 2 plots changes in price discrimination practices in the advertising market. As we can see, the dependent variable only takes 3 values (-1, 0 and +1), while the independent variable (changes in the number of stations in the same city) takes values that range between -15 and +10. The red line fitting the plotted points shows a slight negative correlation between price discrimination and product market competition. On the other hand, Figure 3 plots changes in price discrimination practices in the TV content market against those changes in the number of stations in the same city. This figure shows almost no changes in price discrimination practices in this market and that most stations do not react to changes in product market competition. This may be due to the fact that these stations make investments as they first enter the market that determine their price discrimination practices from that moment on (broadcasting versus cable). Moreover, there are a few observations that changes price discrimination practices, yet these observations took place under no changes in product market competition as measured in this figure.

Figures 4 and 5 repeat the exercise in Figures 2 and 3 using the change in the number of stations in each station's coverage area as a measure of changes in product market competition. Figure 4 shows a clear negative relation between changes in price discrimination in advertising and those in the number of stations in the station's coverage area. Similarly to results in Figure 3, there does not seem to be any relation in our data between changes in price discrimination practices in the TV content market and those in the number of stations in each station's coverage area. This is mainly due to the fact that we observe almost no variation in the changes of price discrimination practices in this market.

In this section, we find that there is a negative correlation between price discrimination and product market competition in the advertising market. We cannot say much about this relation in the TV content market when using station fixed effects since almost no stations change their

practices in this market during this period of time.

5.2.6 Discussion of Results and Relation to Previous Literature

To summarize our results, we observe that price discrimination is negatively related to product market competition when measured as the number of competing local TV stations in the station's coverage area or same city. This result is at odds with previous results in the empirical literature since other papers find a positive relation between price discrimination and product market competition (see Borzekowski, Thomadsen and Taragin (2009) for an example). These authors justify their findings stating that firms facing more competition use price discrimination to extract surplus from their more loyal customers through high prices and steal business from competing firms offering lower prices to loyal customers of other firms.

Our second finding denotes a positive correlation between prices and the number of stations in each station's coverage area or each station's same city. If we had reported this result alone, it would have been easy to claim that stations in more profitable markets would charge higher profits, and therefore, we would expect to see a higher number of stations. On the one hand, this story relying on the endogeneity of entry is difficult to reconcile with our finding of less price discrimination in more competitive markets. On the other hand, a subset of our results indicates that, once we control for station characteristics in our cross-section, the relation between price discrimination and product market competition vanishes. This may indicate that as product market competition increases stations choose to differentiate in dimensions other than prices, such as the number of days of emission, number of hours of emission per day and the percentage of content produced in-house. As stations differentiate from each other, market segmentation increases. As a result, stations may charge higher prices to both viewers and advertisers since their average customers have a higher willingness to pay for their TV content and advertisers are able to identify their

potential customers better.

The current theoretical literature focuses on price competition and the corresponding price discrimination strategies; the assumption being that the location of firms is constant in the product space. As an example, Liu and Serfes (2009) assume the location of both platforms as constant at the extremes of both markets under consideration. In order to reconcile our results with the current state of the literature, we need to add yet another stage in the game played by firms (or local TV stations in our particular case), such that these firms could choose where to locate in the product spectrum. To the best of our knowledge, no paper in the theoretical literature has yet produced such a model and therefore we hope that our study will foster future research on models which take into account strategic decisions between firms that accomodate product positioning and pricing strategies.

6 Conclusions

In this paper, we empirically examine the relation between price discrimination and competition in a two-sided market setting such as the Spanish local TV industry between 1996 and 2002. Our results indicate that stations in more competitive markets are less likely to price discriminate, yet more likely to charge higher prices. The former result is consistent with market power being a necessary condition for profitable price discrimination, while the latter may suggest that, as more stations enter a market, stations may decide to differentiate, increasing market segmentation. Then, local TV stations may charge higher uniform prices to a smaller set of loyal consumers and customers with higher willingness to pay. Even if market competition increases, consumer surplus may actually decrease if stations find a way to increase market segmentation through product differentiation.

Liu and Serfes (2009) is, to the best of our knowledge, the only paper that directly examines from a theoretical point of view the relation between price discrimination and competition in two-sided markets. From simple early data tabulations and later empirical results, they validate the symmetry assumption used in their paper to solve their model. Despite that, their results indicate that, in the presence of two-sided markets, there may exist a positive relation between price discrimination and product market competition. The empirical results for our specific example of the Spanish local TV industry indicate otherwise. This makes us wonder what is the missing piece in current two-sided markets models. We hope that empirical results in our paper may help future empirical and theoretical work to further the understanding of two-sided markets.

Future research should explore the way changes in competition in two-sided markets may not only change optimal pricing strategies, but also product positioning and competition between firms through dimensions other than pricing. Understanding how non-pricing and pricing competition interact in a multi-market setting may help reconcile empirical evidence from studies like ours, showing a negative correlation between price discrimination and competition, and that from other studies reporting a positive relation between price discrimination and competition.

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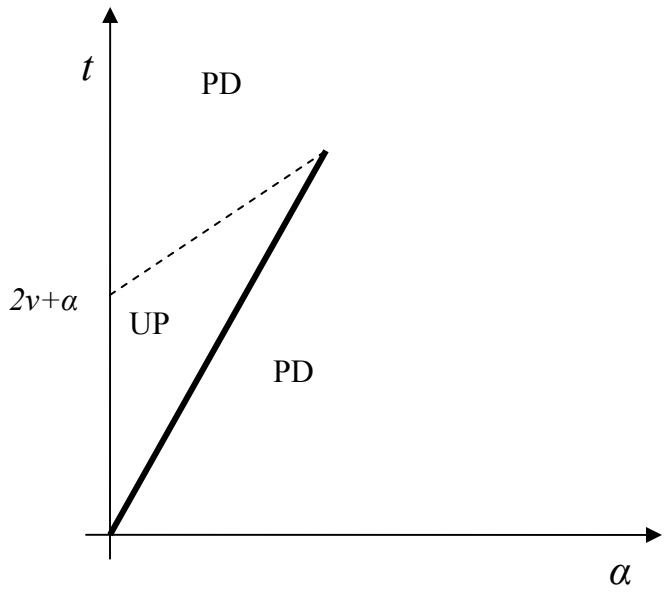
Figure 1. Price Discrimination vs. Uniform Pricing



t = transportation cost, higher *t*, lower product market competition
v = utility from consumption
α = intensity of network effects
PD = Price Discrimination area
UP = Uniform Pricing Area

Figure 2. Changes in Price Discrimination in Advertising and Changes No. Stations Same City

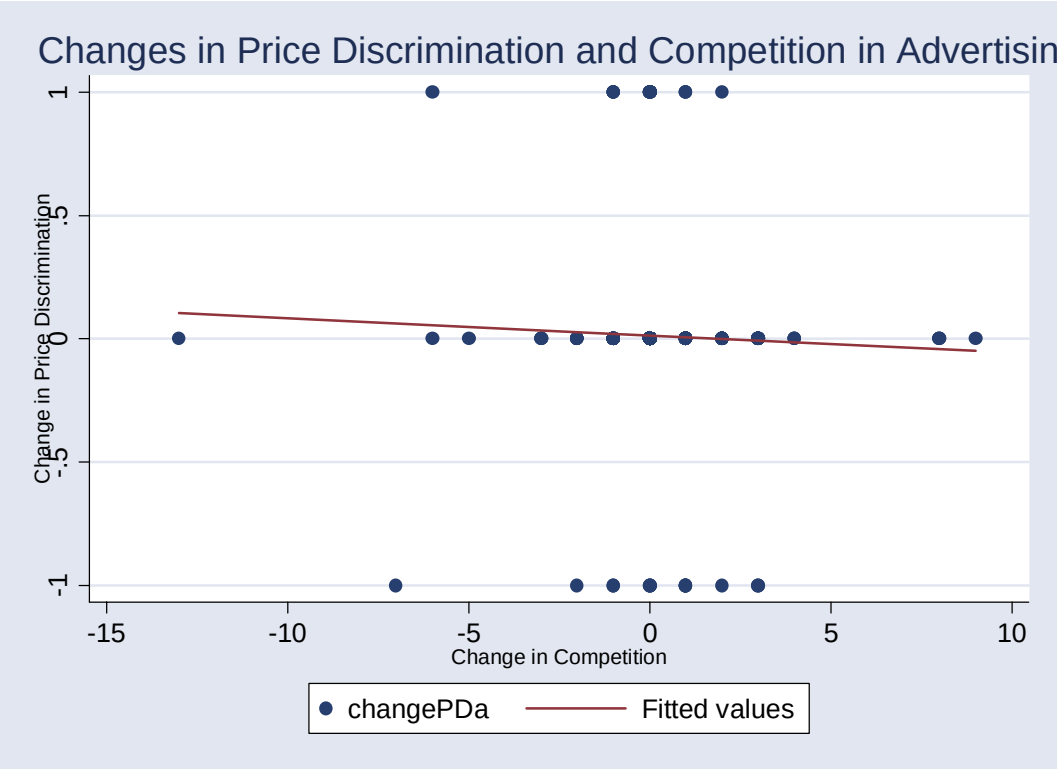


Figure 3. Changes in Price Discrimination in TV Content and Changes No. Stations Same City

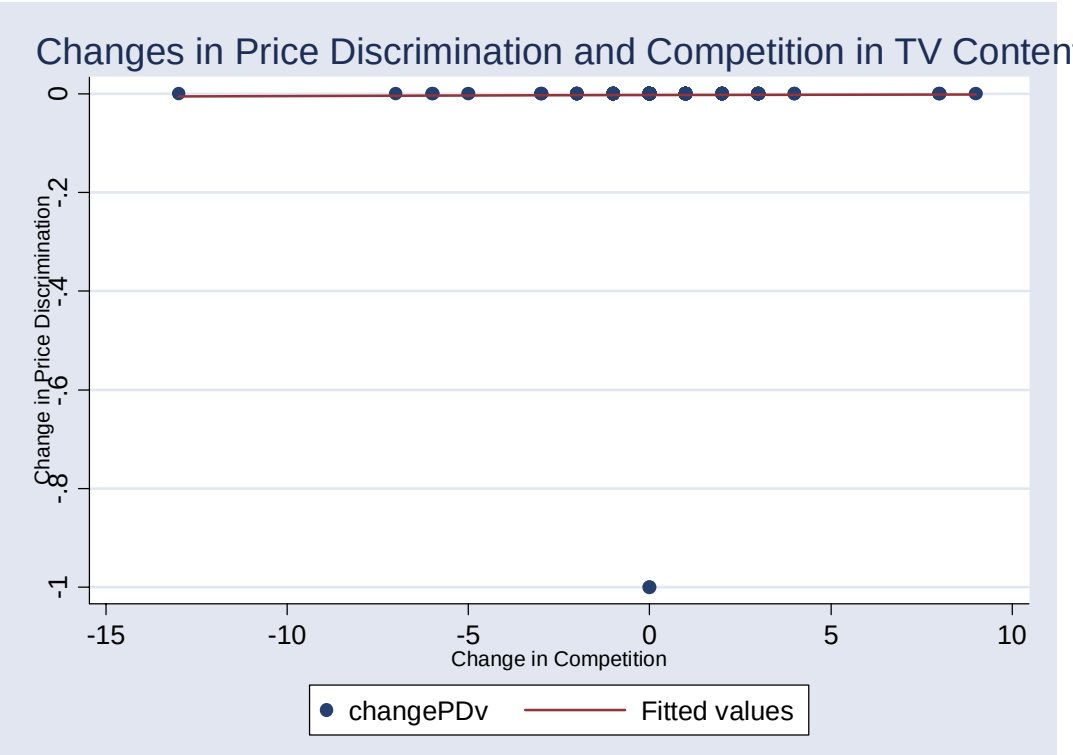


Figure 4. Changes in Price Discrimination in Advertising and Changes No. Stations Reach Area

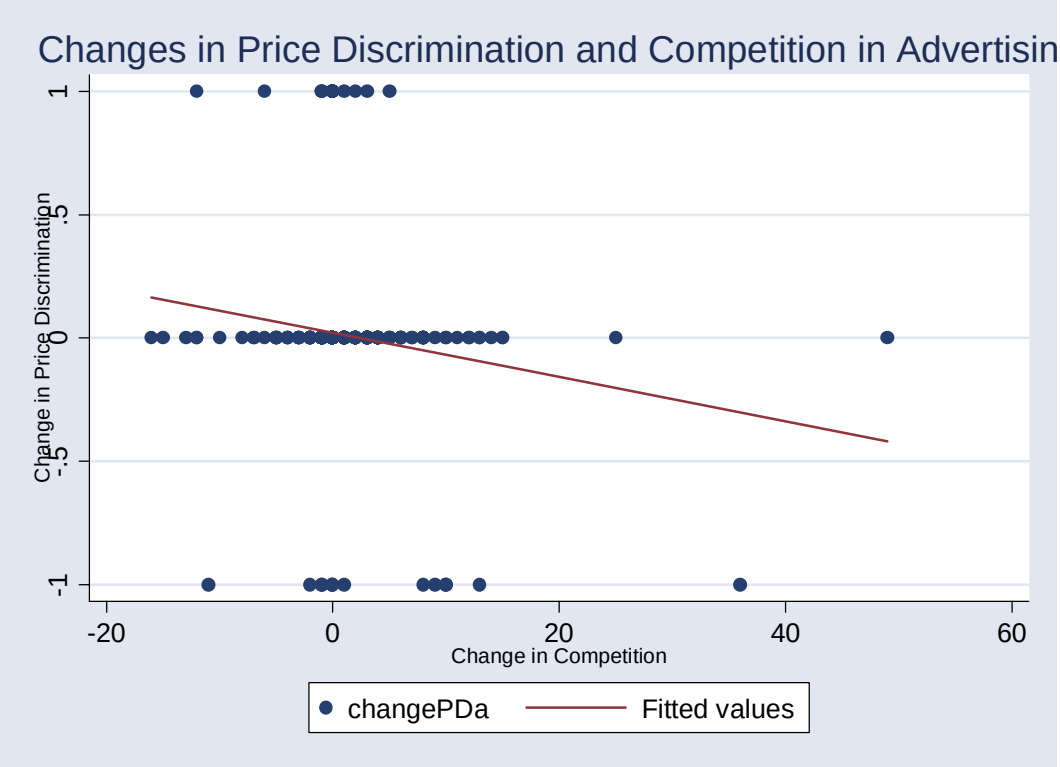


Figure 5. Changes in Price Discrimination in TV Content and Changes No. Stations Reach Area

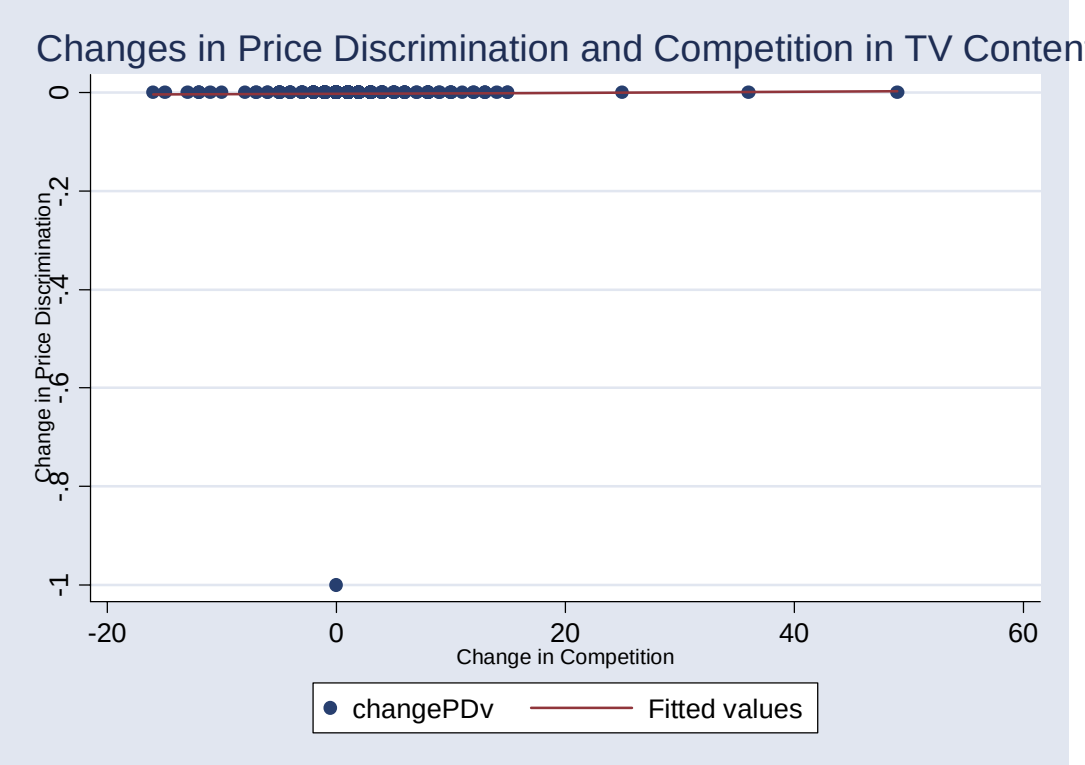


Table 1. Summary Statistics of All Variables Across Years

Variable	Obs	Mean	Std. Dev.	Min	Max
Adv_PD_1	1045	0.08	0.28	0	1
Adv_PD_2	1285	0.07	0.25	0	1
Content_PD_1	276	0.05	0.22	0	1
Content_PD_2	1285	0.01	0.10	0	1
Advertising?	1255	0.81	0.39	0	1
Broadcast?	1261	0.80	0.40	0	1
# Stations Same City	1285	2.46	2.70	1	17
# Stations Reach Area	1285	5.54	7.71	1	69
# Days Emission	1189	6.57	1.16	1	7
# Hours/Day Emission	1131	14.99	8.66	0.5	28
Private Ownership?	1250	0.80	0.40	0	1
% Own Content	1187	0.69	0.30	0	1
Local TV Network	1285	0.58	0.49	0	1
City Population	1269	150803.10	431929.50	1082	3016788
City Unemp Rate	1269	4.21	1.86	0.6	12.2
Cable Fee	263	1758.33	939.16	0	14000
TV Fee	1230	318.86	794.03	0	14000
Adv Price	787	11691.74	17311.47	0	130000

Note: This table provides summary statistics for all main variables used in the empirical analysis of this paper.

Table 2. Summary Statistics of Main Variables by Year

	Year 1996			Year 1999			Year 2002		
Variable	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**
Adv_PD_1	164	0.11	0.31	352	0.10	0.30	529	0.07	0.25
Adv_PD_2	183	0.10	0.30	457	0.07	0.26	645	0.06	0.23
Content_PD_1	36	0.03	0.17	114	0.06	0.24	126	0.05	0.21
Content_PD_2	183	0.01	0.07	457	0.02	0.12	645	0.01	0.10
Advertising?	174	0.89	0.31	448	0.77	0.42	633	0.82	0.39
Broadcast?	178	0.83	0.38	449	0.76	0.43	634	0.82	0.39
# Stations Same City	183	2.62	3.02	457	1.98	2.10	645	2.76	2.92
# Stations Reach Area	183	5.48	6.41	457	4.67	6.68	645	6.17	8.62
# Days Emission	159	6.72	1.06	385	6.50	1.21	645	6.58	1.15
# Hours/Day Emission	159	11.43	7.63	385	12.64	8.27	587	17.50	8.40
Private Ownership?	172	0.81	0.39	450	0.79	0.41	628	0.80	0.40
% Own Content	162	0.69	0.27	425	0.72	0.29	600	0.67	0.31
Local TV Network	183	0.67	0.47	457	0.52	0.50	645	0.60	0.49
City Population	179	180144.80	455363.10	453	131827.00	418793.30	637	156052.80	434449.30
City Unemp Rate	179	6.44	1.67	453	3.96	1.59	637	3.77	1.63

Note: This table breaks the data summarized in Table 1 by year in our sample.

Table 3. Pricing for Advertising and TV Content Across Years

Market for TV Content	Market for TV Advertising			
	No Adv	Adv - No PD	Adv - PD	Total
Broadcast	**152**	**778**	**61**	**991**
PPV - No PD	**77**	**133**	**22**	**232**
PPV - PD	**6**	**5**	**3**	**14**
Total	**235**	**916**	**86**	**1,237**

Note: This table tabulates pricing decisions for the advertising as well as viewership market for the 1,237 TV stations we have information across years.

Table 4. Pricing for Advertising and TV Content per Year

Year 1996

Market for TV Content	Market for TV Advertising: No Adv	Adv - No PD	Adv - PD	Total
Broadcast	**16**	**114**	**14**	**144**
PPV - No PD	**3**	**21**	**4**	**28**
PPV - PD	**0**	**4**	**0**	**4**
Total	**19**	**136**	**18**	**173**

Year 1999

Market for TV Content	Market for TV Advertising: No Adv	Adv - No PD	Adv - PD	Total
Broadcast	**70**	**248**	**21**	**339**
PPV - No PD	**30**	**55**	**11**	**96**
PPV - PD	**3**	**2**	**2**	**7**
Total	**103**	**305**	**34**	**442**

Year 2002

Market for TV Content	Market for TV Advertising: No Adv	Adv - No PD	Adv - PD	Total
Broadcast	**66**	**416**	**26**	**508**
PPV - No PD	**44**	**57**	**7**	**108**
PPV - PD	**3**	**2**	**1**	**6**
Total	**113**	**475**	**34**	**622**

Note: This table tabulates pricing decisions for the advertising as well as viewership market for the 1,237 TV stations we have information for each separate year in our sample.

Table 5. Tabulation of No. Stations per City in 1996 and 1999

	No. Stations per City 1999									
No. Stations per City 1996	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**12**	**13**	**Total**
0	120	180	38	7	4	0	0	0	0	349
1	15	49	10	2	1	0	0	0	0	77
2	6	23	12	1	1	1	0	0	0	44
3	1	4	5	4	0	0	0	0	0	14
4	0	1	0	1	0	1	0	0	0	3
5	0	2	1	0	0	0	0	0	0	3
6	0	0	0	0	2	0	1	0	0	3
7	0	0	1	0	0	0	0	0	0	1
9	0	0	0	1	0	0	0	1	0	2
13	0	0	0	0	0	0	1	0	0	1
15	0	0	0	0	0	0	0	0	1	1
17	0	0	0	0	1	0	0	0	0	1
Total	142	259	67	16	9	2	2	1	1	499

Note: This table tabulates the number of stations per city in 1996 and 1999 within our sample. The 120 cities appearing in (0,0) are cities with a positive number of stations in 2002.

Table 6. Tabulation of No. Stations per City in 1999 and 2002

	No. Stations per City 2002													
No. Stations per City 1999	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**	**13**	**16**	**Total**
0	15	104	16	6	1	0	0	0	0	0	0	0	0	142
1	54	168	25	8	2	2	0	0	0	0	0	0	0	259
2	6	16	28	10	4	2	0	0	0	1	0	0	0	67
3	0	0	6	5	1	3	0	0	0	0	1	0	0	16
4	0	0	1	1	2	2	2	1	0	0	0	0	0	9
5	0	0	0	0	0	1	0	0	1	0	0	0	0	2
6	0	0	0	0	0	0	2	0	0	0	0	0	0	2
12	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	75	288	76	30	10	10	4	1	1	1	1	1	1	297

Note: This table tabulates the number of stations per city in 1999 and 2002 within our sample. The 15 cities appearing in (0,0) are cities with a positive number of stations in 1996.

Table 7. Tabulation of No. Stations per City in 1996 and 2002

	No. Stations per City 2002													
No. Stations per City 1996	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**	**13**	**16**	**Total**
0	41	236	49	18	3	1	1	0	0	0	0	0	0	349
1	25	31	12	4	2	3	0	0	0	0	0	0	0	77
2	8	20	5	4	4	3	0	0	0	0	0	0	0	44
3	1	1	7	3	0	2	0	0	0	0	0	0	0	14
4	0	0	1	0	0	0	0	0	1	0	1	0	0	3
5	0	0	2	1	0	0	0	0	0	0	0	0	0	3
6	0	0	0	0	0	0	2	1	0	0	0	0	0	3
7	0	0	0	0	0	0	0	0	0	1	0	0	0	1
9	0	0	0	0	0	1	0	0	0	0	0	1	0	2
13	0	0	0	0	0	0	1	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	0	0	0	0	0	1	1
17	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	75	288	76	30	10	10	4	1	1	1	1	1	1	499

Note: This table tabulates the number of stations per city in 1996 and 2002 within our sample. The 41 cities appearing in (0,0) are cities with a positive number of stations in 1999.

Table 8. Tabulation of Changes in Number of Stations per City between 1996/1999 and Changes between 1999/2002

Change in No. Stations 1996/1999	Change in No. Stations 1999/2002								
	-2	**-1**	**0**	**1**	**2**	**3**	**4**	**8**	**Total**
-13	0	0	1	0	0	0	0	0	1
-7	0	0	1	0	0	0	0	0	1
-6	0	0	0	0	1	0	0	0	1
-5	0	0	0	0	0	0	0	1	1
-4	0	0	0	2	0	0	0	0	2
-3	0	0	1	2	0	0	0	0	3
-2	0	0	3	4	3	2	1	0	13
-1	0	4	29	5	3	2	0	1	44
0	2	18	31	108	18	7	2	0	186
1	1	40	130	14	5	2	0	0	192
2	3	11	20	5	2	0	0	0	41
3	0	3	5	2	0	0	0	0	10
4	1	1	0	1	1	0	0	0	4
Total	7	77	221	143	33	13	3	2	499

Note: This table tabulates changes in the number of stations across years 1996, 1999 and 2002 in our sample. The unit of observation is the city.

Table 9. OLS and Probit Regressions of Price Discrimination in TV Content Market (Content_PD_1) and Measures of Local Market Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regression Type:	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**
No. Stations Reach Area	-0.0080	-0.0041	-0.0026	-0.0277	-0.0031	-0.0023						
	(0.0028)***	(0.0019)**	(0.0030)	(0.0096)***	(0.0055)	(0.0055)						
No. Stations Same City							-0.0137	-0.0076	-0.0024	-0.0318	-0.0012	0.0010
							(0.0047)***	(0.0061)	(0.0071)	(0.0143)**	(0.0066)	(0.0063)
Population (000,000)		-0.0980	-0.0320		-0.4744	-0.2003		-0.0607	-0.0298		-0.5149	-0.2519
		(0.0384)**	(0.0482)		(0.2229)**	(0.1672)		(0.0615)	(0.0867)		(0.2175)**	(0.1320)*
Unemp Rate		-0.0101	0.0013		-0.0016	0.0013		-0.0106	0.0008		-0.0017	0.0011
		(0.0050)**	(0.0045)		(0.0024)	(0.0017)		(0.0050)**	(0.0042)		(0.0024)	(0.0013)
Days			-0.0126			-0.0028			-0.0133			-0.0026
			(0.0216)			(0.0044)			(0.0213)			(0.0044)
Hours/Day			-0.0013			-0.0007			-0.0014			-0.0007
			(0.0016)			(0.0007)			(0.0016)			(0.0007)
Private?			-0.0145			-0.0036			-0.0098			-0.0022
			(0.0954)			(0.0271)			(0.0920)			(0.0221)
Perc Own Content			0.0027			-0.0002			0.0020			-0.0006
			(0.0447)			(0.0133)			(0.0463)			(0.0124)
Network?			-0.0144			-0.0039			-0.0136			-0.0036
			(0.0253)			(0.0110)			(0.0249)			(0.0109)
Constant	0.0661	0.1064	0.1466				0.0734	0.1117	0.1474			
	(0.0175)***	(0.0323)***	(0.0954)				(0.0197)***	(0.0345)***	(0.0993)			
Observations	276	272	201	276	272	201	276	272	201	276	272	201
R-squared	0.01	0.02	0.02				0.01	0.02	0.02			

Note: The dependent variable in this table is Content_PD_1. That variable takes value 1 if TV stations offer pay-per-view content and price discriminate, and 0 if offer pay-per-view and do not price discriminate. Stations that broadcast their content are not included in these regressions. Robust standard errors in parentheses and clustered at the city and year level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 10. OLS and Probit Regressions of Price Discrimination in TV Content Market (Content_PD_2) and Measures of Local Market Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regression Type:	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**
No. Stations Reach Area	-0.0008	-0.0007	0.0001	-0.00002	0.0000	0.0000						
	(0.0002)***	(0.0002)***	(0.0001)	(0.0001)	(0.0000)	(0.0000)						
No. Stations Same City							-0.0020	-0.0021	0.00002	-0.0041	0.0000	0.0000
							(0.0006)***	(0.0008)***	(0.0003)	(0.0016)**	(0.0000)	(0.0000)
Population (000,000)		-0.0021	-0.0002		0.0000	0.0000		0.0025	0.0003		0.0000	0.0000
		(0.0015)	(0.0007)		-	-		(0.0031)	(0.0017)		-	(0.0000)
Unemp Rate		-0.0023	0.0002		0.0000	0.0000		-0.0023	0.0003		0.0000	0.0000
		(0.0010)**	(0.0009)		-	(0.0000)		(0.0010)**	(0.0009)		(0.0000)	(0.0000)
Broadcast?			-0.0271						-0.0268			
			(0.0123)**						(0.0121)**			
Days			-0.0025			0.0000			-0.0025			0.0000
			(0.0025)			(0.0000)			(0.0025)			(0.0000)
Hours/Day			-0.0001			0.0000			-0.0001			0.0000
			(0.0003)			(0.0000)			(0.0003)			(0.0000)
Private?			-0.0028			0.0000			-0.0026			0.0000
			(0.0072)			(0.0000)			(0.0071)			(0.0000)
Perc Own Content			0.0003			0.0000			0.0003			0.0000
			(0.0094)			(0.0000)			(0.0094)			(0.0000)
Network?			-0.0018			0.0000			-0.0019			0.0000
			(0.0046)			(0.0000)			(0.0046)			(0.0000)
Constant	0.0154	0.0249	0.0476				0.0158	0.0254	0.0473			
	(0.0041)***	(0.0074)***	(0.0239)**				(0.0042)***	(0.0076)***	(0.0239)**			
Observations	1285	1269	1021	1285	1269	1035	1285	1269	1021	1285	1269	1035
R-squared	0	0.01	0.02				0	0	0.02			

Note: The dependent variable in this table is Content_PD_2. That variable takes value 1 if TV stations offer pay-per-view content and price discriminate, and 0 if offer pay-per-view and do not price discriminate, broadcast their content (since price = 0 for everybody). Robust standard errors in parentheses and clustered at the city and year level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 11. OLS and Probit Regressions of Price Discrimination in TV Advertising Market (Adv_PD_1) and Measures of Local Market Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regression Type:	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**
No. Stations Reach Area	-0.00198	-0.00167	-0.00151	-0.00266	-0.00211	-0.00197						
	(0.0007)***	(0.0008)**	(0.0009)	(0.0012)**	(0.0014)	(0.0014)						
No. Stations Same City							-0.0026	0.002765	0.004391	-0.00294	0.0036	0.00396
							(0.0026)	(0.0053)	(0.0059)	(0.0033)	(0.0055)	(0.0051)
Population (000,000)		-0.0174	-0.0088		-0.0426	-0.0165		-0.0455	-0.042		-0.0875	-0.054
		(0.0114)	(0.0139)		(0.0382)	(0.0309)		(0.0281)	(0.0307)		(0.0711)	(0.0503)
Unemp Rate		0.005637	0.006137		0.006017	0.005888		0.004555	0.004865		0.004784	0.004557
		(0.0046)	(0.0051)		(0.0043)	(0.0045)		(0.0046)	(0.0050)		(0.0043)	(0.0045)
Days			-0.00398			-0.00366			-0.00486			-0.00429
			(0.0118)			(0.0110)			(0.0117)			(0.0111)
Hours/Day			-0.00099			-0.00078			-0.00147			-0.00125
			(0.0013)			(0.0012)			(0.0013)			(0.0012)
Private?			0.049796			0.045741			0.046043			0.042918
			(0.0217)**			(0.0186)**			(0.0218)**			(0.0194)**
Perc Own Content			-0.05504			-0.04757			-0.05763			-0.05064
			(0.0364)			(0.0323)			(0.0365)			(0.0324)
Network?			0.018432			0.018075			0.021301			0.021693
			(0.0186)			(0.0179)			(0.0182)			(0.0174)
Constant	0.096537	0.073106	0.083984				0.091093	0.064779	0.090088			
	(0.0109)***	(0.0217)***	(0.0796)				(0.0117)***	(0.0224)***	(0.0793)			
Observations	1045	1040	880	1045	1040	880	1045	1040	880	1045	1040	880
R-squared	0	0.01	0.01				0	0	0.01			

Note: The dependent variable in this table is Adv_PD_1. That variable takes value 1 if TV stations offer advertising and price discriminate, and 0 if offer advertising and do not price discriminate.
Stations that do not offer advertising are not included in these regressions. Robust standard errors in parentheses and clustered at the city and year level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 12. OLS and Probit Regressions of Price Discrimination in TV Advertising Market (Adv_PD_2) and Measures of Local Market Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regression Type:	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**	**OLS**	**OLS**	**OLS**	**Probit**	**Probit**	**Probit**
No. Stations Reach Area	-0.0010	-0.0009	-0.0014	-0.0012	-0.0010	-0.0013						
	(0.0006)	(0.0008)	(0.0008)*	(0.0009)	(0.0011)	(0.0011)						
No. Stations Same City							-0.0005	0.0042	0.0041	-0.0005	0.0044	0.0035
							(0.0024)	(0.0048)	(0.0053)	(0.0026)	(0.0044)	(0.0043)
Population (000,000)		-0.0153	-0.0083		-0.0317	-0.0163		-0.0439	-0.0393		-0.0694	-0.0460
		(0.0103)	(0.0120)		(0.0281)	(0.0253)		(0.0252)*	(0.0271)		(0.0526)	(0.0413)
Unemp Rate		0.0083	0.0056		0.0083	0.0067		0.0072	0.0044		0.0072	0.0056
		(0.0037)**	(0.0044)		(0.0034)**	(0.0037)*		(0.0038)*	(0.0044)		(0.0034)**	(0.0037)
Advertising?			0.0702						0.0671			
			(0.0114)***						(0.0111)***			
Days			-0.0038			0.0015			-0.0040			0.0014
			(0.0068)			(0.0079)			(0.0068)			(0.0079)
Hours/Day			-0.0008			-0.0003			-0.0012			-0.0006
			(0.0011)			(0.0010)			(0.0011)			(0.0010)
Private?			0.0342			0.0430			0.0306			0.0405
			(0.0164)**			(0.0149)***			(0.0164)*			(0.0154)***
Perc Own Content			-0.0451			-0.0351			-0.0472			-0.0373
			(0.0298)			(0.0256)			(0.0299)			(0.0256)
Network?			0.0149			0.0191			0.0175			0.0217
			(0.0156)			(0.0148)			(0.0154)			(0.0145)
Constant	0.0740	0.0417	0.0215				0.0697	0.0353	0.0247			
	(0.0086)***	(0.0160)***	(0.0473)				(0.0094)***	(0.0167)**	(0.0472)			
Observations	1285	1269	1023	1285	1269	1035	1285	1269	1023	1285	1269	1035
R-squared	0	0.01	0.02				0	0.01	0.02			

Note: The dependent variable in this table is Adv_PD_2. That variable takes value 1 if TV stations offer advertising and price discriminate, and 0 if offer advertising and do not price discriminate, or do not offer advertising (since price = infinity for everybody). Robust standard errors in parentheses and clustered at the city and year level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 13. OLS Regressions with Fixed Effects of Price Discrimination on Number of Stations in Coverage/Reach Area

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep Variable:	**Content_PD_1**					**Content_PD_2**				
No. Stations Reach Area	-0.0080	-0.0076	-0.0120	0.0012	0.0006	-0.0008	-0.0008	-0.0006	0.00005	0.0001
	(0.0028)***	(0.0029)***	(0.0051)**	(0.0017)	(0.0012)	(0.0002)***	(0.0002)***	(0.0002)***	(0.00003)	(0.0002)
Constant	0.0661	0.0653	0.0464	0.0513	0.0519	0.0154	0.0152	0.0069	0.0072	0.0106
	(0.0175)***	(0.0174)***	(0.0368)	(0.0066)***	(0.0055)***	(0.0041)***	(0.0041)***	(0.0063)	(0.0036)**	(0.0011)***
FE Year	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
FE Province	No	No	Yes	No	No	No	No	Yes	No	No
FE City	No	No	No	Yes	No	No	No	No	Yes	No
FE Station	No	No	No	No	Yes	No	No	No	No	Yes
Observations	276	276	276	276	276	1285	1285	1285	1285	1285
R-squared	0.01	0.01	0.23	0.93	0.96	0	0	0.08	0.89	0.96

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Dep Variable:	**Adv_PD_1**					**Adv_PD_2**				
No. Stations Reach Area	-0.0020	-0.0018	-0.0014	-0.0013	-0.0124	-0.0010	-0.0009	-0.0005	-0.0008	-0.0114
	(0.0007)***	(0.0007)***	(0.0008)*	(0.0022)	(0.0068)*	(0.0006)	(0.0006)	(0.0007)	(0.0018)	(0.0061)*
Constant	0.0965	0.0957	0.1110	0.0960	0.1361	0.0740	0.0734	0.0950	0.0756	0.1050
	(0.0109)***	(0.0109)***	(0.0258)***	(0.0306)***	(0.0557)**	(0.0086)***	(0.0086)***	(0.0233)***	(0.0277)***	(0.0469)**
FE Year	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
FE Province	No	No	Yes	No	No	No	No	Yes	No	No
FE City	No	No	No	Yes	No	No	No	No	Yes	No
FE Station	No	No	No	No	Yes	No	No	No	No	Yes
Observations	1045	1045	1045	1045	1045	1285	1285	1285	1285	1285
R-squared	0	0.01	0.08	0.52	0.78	0	0	0.07	0.51	0.78

Note: This table shows OLS regressions using fixed effects to control for time invarying unobservables. Columns (1) to (10) have measures of price discrimination on TV content, and columns (11) to (20) have measures of price discrimination on advertising. The independent variable is the number of stations in each station's coverage area.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 14. OLS Regressions with Fixed Effects of Price Discrimination on Number of Stations in Same City

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep Variable:	**Content_PD_1**					**Content_PD_2**				
No. Stations Same City	-0.0137	-0.0132	-0.0122	0.0030	0.0018	-0.0020	-0.0019	-0.0016	0.0014	0.0004
	(0.0047)***	(0.0047)***	(0.0067)*	(0.0027)	(0.0025)	(0.0006)***	(0.0006)***	(0.0007)**	(0.0008)	(0.0006)
Constant	0.0734	0.0726	0.0442	0.0494	0.0505	0.0158	0.0155	0.0075	0.0041	0.0102
	(0.0197)***	(0.0196)***	(0.0377)	(0.0065)***	(0.0051)***	(0.0042)***	(0.0042)***	(0.0064)	(0.0052)	(0.0013)***
FE Year	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
FE Province	No	No	Yes	No	No	No	No	Yes	No	No
FE City	No	No	No	Yes	No	No	No	No	Yes	No
FE Station	No	No	No	No	Yes	No	No	No	No	Yes
Observations	276	276	276	276	276	1285	1285	1285	1285	1285
R-squared	0.01	0.01	0.23	0.93	0.96	0	0	0.08	0.89	0.96

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Dep Variable:	**Adv_PD_1**					**Adv_PD_2**				
No. Stations Same City	-0.0026	-0.0020	0.0003	-0.0033	-0.0179	-0.0005	-0.0002	0.0017	-0.0036	-0.0152
	(0.0026)	(0.0026)	(0.0030)	(0.0119)	(0.0237)	(0.0024)	(0.0024)	(0.0025)	(0.0109)	(0.0195)
Constant	0.0911	0.0896	0.1024	0.0980	0.1187	0.0697	0.0690	0.0879	0.0806	0.0883
	(0.0117)***	(0.0117)***	(0.0258)***	(0.0384)**	(0.0679)*	(0.0094)***	(0.0094)***	(0.0231)***	(0.0336)**	(0.0525)*
FE Year	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
FE Province	No	No	Yes	No	No	No	No	Yes	No	No
FE City	No	No	No	Yes	No	No	No	No	Yes	No
FE Station	No	No	No	No	Yes	No	No	No	No	Yes
Observations	1045	1045	1045	1045	1045	1285	1285	1285	1285	1285
R-squared	0.00	0.00	0.08	0.52	0.77	0.00	0.00	0.07	0.51	0.77

Note: This table shows OLS regressions using fixed effects to control for time invarying unobservables. Columns (1) to (10) have measures of price discrimination on TV content, and columns (11) to (20) have measures of price discrimination on advertising. The independent variable is the number of stations located in each station's same city.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 15A. SU Regressions of Price Discrimination in Advertising and TV Content

	(1)		(2)		(3)		(4)	
Dep Variable:	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**
No. Stations Reach Area	-0.0095	-0.0059	-0.0146	-0.0017				
	(0.0102)	(0.0059)	(0.0114)	(0.0053)				
No. Stations Same City					-0.0028	-0.0115	-0.0130	0.0011
					(0.0190)	(0.0109)	(0.0341)	(0.0158)
Population (000,000)			0.1709	-0.0760			0.1987	-0.0949
			(0.3243)	(0.1511)			(0.4293)	(0.1990)
Unemp Rate			0.0042	0.0016			0.0013	0.0013
			(0.0161)	(0.0075)			(0.0160)	(0.0074)
No. Days			0.0047	-0.0316			0.0031	-0.0318
			(0.0339)	(0.0158)**			(0.0341)	(0.0158)**
Hours/Day			0.0094	0.0002			0.0089	0.0002
			(0.0046)**	(0.0021)			(0.0046)*	(0.0021)
Perc Own Content			0.1052	0.0484			0.0963	0.0484
			(0.0986)	(0.0459)			(0.1000)	(0.0464)
Constant	0.1637	0.0550	-0.0547	0.2063	0.1485	0.0626	-0.0307	0.2053
	(0.0334)***	(0.0192)***	(0.2335)	(0.1088)*	(0.0418)***	(0.0239)***	(0.2397)	(0.1111)*
Correlation	0.1348*		0.0597		0.1387*		0.0624	
Observations	188		145		188		145	

Note: This table reports coefficients from seemingly unrelated regressions of price discrimination in advertising and TV content markets, excluding observations from both stations that broadcast and those that do not offer advertising.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 15B. SU Regressions of Price Discrimination in Advertising and TV Content

	(1)		(2)		(3)		(4)	
Dep Variable:	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**
No. Stations Reach Area	-0.0010	-0.0008	-0.0014	0.0001				
	(0.0009)	(0.0004)**	(0.0011)	(0.0003)				
No. Stations Same City					-0.0005	-0.0020	0.0046	0.0000
					(0.0026)	(0.0011)*	(0.0046)	(0.0013)
Population (000,000)			-0.0073	-0.0002			-0.0397	0.0004
			(0.0189)	(0.0053)			(0.0276)	(0.0078)
Unemp Rate			0.0060	0.0001			0.0048	0.0002
			(0.0043)	(0.0012)			(0.0043)	(0.0012)
No. Days			-0.0035	-0.0027			-0.0035	-0.0027
			(0.0080)	(0.0022)			(0.0080)	(0.0022)
Hours/Day			-0.0003	-0.0002			-0.0007	-0.0002
			(0.0010)	(0.0003)			(0.0010)	(0.0003)
Perc Own Content			-0.0532	0.0003			-0.0547	0.0003
			(0.0269)**	(0.0078)			(0.0269)**	(0.0078)
Constant	0.0740	0.0154	0.0482	0.0459	0.0697	0.0158	0.0487	0.0457
	(0.0087)***	(0.0036)***	(0.0565)	(0.0165)***	(0.0095)***	(0.0039)***	(0.0565)	(0.0165)***
Correlation	0.0589**		0.0252		0.0604**		0.0252	
Observations	1285		1027		1285		1027	

Note: This table reports coefficients from seemingly unrelated regressions of price discrimination in advertising and TV content markets, including observations from both stations that broadcast and those that do not offer advertising.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 16A. Biprobit Regressions of Price Discrimination in Advertising and TV Content

	(1)		(2)		(3)		(4)	
Dep Variable:	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**
No. Stations Reach Area	-0.0660	-0.2883	-0.1436	-0.0426				
	(0.0510)	(0.1599)*	(0.1185)	(0.0471)				
No. Stations Same City					-0.0134	-0.2702	-0.0467	0.2537
					(0.0763)	(0.1686)	(0.1530)	(0.3372)
Population (000,000)			1.2184	-28.6302			0.6770	-36.7651
			(1.5846)	(14.4071)**			(1.6782)	(21.4507)*
Unemp Rate			0.0162	0.1235			0.0099	0.1412
			(0.0690)	(0.1169)			(0.0677)	(0.1332)
No. Days			0.0948	-0.2343			0.0827	-0.2441
			(0.1876)	(0.1541)			(0.1847)	(0.1477)*
Hours/Day			0.0418	-0.0150			0.0368	-0.0238
			(0.0218)*	(0.0169)			(0.0209)*	(0.0204)
Perc Own Content			0.4695	0.9992			0.4458	0.9827
			(0.5101)	(0.6472)			(0.5093)	(0.6294)
Constant	-0.9374	-1.2818	-2.3756	-0.9391	-1.0410	-1.3284	-2.3511	-1.1318
	(0.1508)***	(0.2771)***	(1.3809)*	(1.2578)	(0.1776)***	(0.2836)***	(1.3614)*	(1.3237)
Correlation	0.3574		0.4779		0.3680*		0.5203	
Observations	188		145		188		145	

Note: This table reports coefficients from biprobit regressions of price discrimination in advertising and TV content markets, excluding observations from both stations that broadcast and those that do not offer advertising.
Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 16B. Biprobit Regressions of Price Discrimination in Advertising and TV Content

	(1)		(2)		(3)		(4)	
Dep Variable:	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**
No. Stations Reach Area	-0.0093	-0.5304	-0.0111	-0.2245				
	(0.0070)	(0.1821152367)***	(0.0096)	(0.1685)				
No. Stations Same City					-0.0042	-0.5088	0.0336	-0.0088
					(0.0200)	(0.1975)***	(0.0352)	(0.2965)
Population (000,000)			-0.1522	-12.9364			-0.4300	-17.0207
			(0.2054)	(7.5755)*			(0.3533)	(9.3514)*
Unemp Rate			0.0678	0.0691			0.0584	0.0554
			(0.0322)**	(0.0802)			(0.0325)*	(0.0698)
No. Days			0.0331	-0.0344			0.0313	-0.0243
			(0.0705)	(0.0655)			(0.0702)	(0.0650)
Hours/Day			0.0014	-0.0361			-0.0017	-0.0436
			(0.0081)	(0.0216)*			(0.0080)	(0.0218)**
Perc Own Content			-0.3470	-0.3478			-0.3556	-0.4230
			(0.2239)	(0.6300)			(0.2243)	(0.6397)
Constant	-1.4393	-1.3725	-1.7638	-1.3119	-1.4770	-1.5529	-1.7675	-1.4998
	(0.0655)***	(0.2481)***	(0.4785)***	(0.8279)	(0.0726)***	(0.2596)***	(0.4746)***	(0.8591)*
Correlation	0.3206*		0.3059		0.3274**		0.3119	
Observations	1285		1052		1285		1052	

Note: This table reports coefficients from biprobit regressions of price discrimination in advertising and TV content markets, including observations from both stations that broadcast and observations from stations that do not offer advertising.
Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 17. Probit Regressions of Price Discrimination in TV Content Market on Price Discrimination in Advertising and Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep Variable:	Content_PD_1						Content_PD_2					
No. Stations Reach Area	-0.0172	-0.0004	-0.0001				-0.00002	0.0000	0.0000			
	(0.0085)**	(0.0007)	(0.0001)				(0.0001)	(0.0000)	(0.0000)			
No. Stations Same City				-0.0199	0.0004	0.0003				-0.0033	0.0000	0.0000
				(0.0121)	(0.0017)	(0.0005)				(0.0015)**	(0.0000)	(0.0000)
PD Advertising?	0.0601	0.0149	0.0051	0.0732	0.0144	0.0033	0.0002	0.0000	0.0000	0.0156	0.0000	0.0000
	(0.0520)	(0.0150)	(0.0099)	(0.0587)	(0.0150)	(0.0077)	(0.0005)	(0.0000)	(0.0000)	(0.0143)	(0.0000)	(0.0000)
Population (000,000)		-0.2145	-0.0678		-0.2165	-0.0391		0.0000	0.0000		0.0000	0.0000
		(0.1745)	(0.0787)		(0.1885)	(0.0842)		-	-		-	-
Unemp Rate		0.00002	0.0003		-0.00002	0.0001		0.0000	0.0000		0.0000	0.0000
		(0.0007)	(0.0003)		(0.0007)	(0.0003)		-	(0.0000)		(0.0000)	(0.0000)
Advertising?							0.0000	0.0000	0.0000	-0.0047	0.0000	0.0000
							(0.0001)	-	(0.0000)	(0.0045)	(0.0000)	(0.0000)
No. Days			-0.0006			-0.0003			0.0000			0.0000
			(0.0012)			(0.0008)			(0.0000)			(0.0000)
Hours/Day			-0.0001			-0.00004			0.0000			0.0000
			(0.0001)			(0.0001)			(0.0000)			(0.0000)
Perc Own Content			0.0021			0.0009			0.0000			0.0000
			(0.0040)			(0.0027)			(0.0000)			(0.0000)
Observations	188	188	145	188	188	145	1255	1239	1040	1255	1239	1040

Note: This table reports marginal effects of probit regressions of price discrimination in TV content market on price discrimination in advertising as well as measures of local competition.

Robust standard errors and clustered by year and city in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 18. Probit Regressions of Price Discrimination in Advertising on Price Discrimination in TV Content Market and Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep Variable:	**Adv_PD_1**						**Adv_PD_2**					
No. Stations Reach Area	-0.0126	-0.0228	-0.0288				-0.0005	-0.0003	-0.0006			
	(0.0108)	(0.0186)	(0.0230)				(0.0009)	(0.0010)	(0.0010)			
No. Stations Same City				-0.0002	-0.0111	-0.0104				0.0007	0.0056	0.0049
				(0.0171)	(0.0270)	(0.0336)				(0.0026)	(0.0042)	(0.0040)
PD TV Content?	0.2250	0.2332	0.1734	0.2415	0.2448	0.1841	0.0989	0.1075	0.0793	0.1003	0.1082	0.0786
	(0.1717)	(0.1737)	(0.2508)	(0.1743)	(0.1758)	(0.2580)	(0.0968)	(0.0991)	(0.1387)	(0.0973)	(0.0990)	(0.1382)
Population (000,000)		0.3161	0.2583		0.2320	0.1630		-0.0299	-0.0179		-0.0665	-0.0496
		(0.2561)	(0.3245)		(0.3123)	(0.3697)		(0.0265)	(0.0234)		(0.0481)	(0.0388)
Unemp Rate		-0.0024	0.0034		-0.0041	0.0022		0.0086	0.0077		0.0076	0.0067
		(0.0135)	(0.0143)		(0.0135)	(0.0146)		(0.0034)**	(0.0037)**		(0.0034)**	(0.00378)*
Broadcast?							-0.0294	-0.0278	-0.0420	-0.0332	-0.0319	-0.0480
							(0.0197)	(0.0194)	(0.0247)*	(0.0198)*	(0.0194)*	(0.0254)*
No. Days			0.0234			0.0211			0.0016			0.0011
			(0.0350)			(0.0355)			(0.0081)			(0.0080)
Hours/Day			0.0086			0.0080			0.0007			0.0005
			(0.0043)**			(0.0044)*			(0.0010)			(0.0010)
Perc. Own Content			0.0903			0.0887			-0.0367			-0.0362
			(0.1062)			(0.1098)			(0.0262)			(0.0260)
Observations	188	188	145	188	188	145	1261	1245	1038	1261	1245	1038

Note: This table reports marginal effects of probit regressions of price discrimination in advertising on price discrimination in TV content market as well as measures of local competition. Robust standard errors and clustered by year and city in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 19A. Biprobit Regressions of Price Discrimination in TV Content and Advertising

	(1)		(2)		(3)		(4)	
Dep Variable:	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**	**Adv_PD_1**	**Content_PD_1**
No. Stations Reach Area	-0.0513	-0.2717	-0.1331	-0.0209				
	(0.0472)	(0.2000)	(0.1125)	(0.0547)				
No. Stations Same City					0.0066	-0.2700	-0.0473	0.2141
					(0.0765)	(0.2200)	(0.1504)	(0.2794)
PD Content?	2.8902		2.8629		2.9620		2.6328	
	(0.2357)***		(0.4115)***		(0.2385)***		(0.4387)***	
PD Advertising?		2.8902		2.8314		2.9620		3.0180
		(0.2357)***		(0.4312)***		(0.2385)***		(0.4755)***
Population (000)			0.0013	-0.0297			0.0008	-0.0304
			(0.0016)	(0.0245)			(0.0017)	(0.0228)
Unemp Rate			0.0122	0.0765			0.0098	0.1001
			(0.0677)	(0.1509)			(0.0658)	(0.1597)
No. Days			0.1928	-0.1896			0.1666	-0.2051
			(0.1967)	(0.1588)			(0.1877)	(0.1459)
Hours/Day			0.0407	-0.0371			0.0365	-0.0371
			(0.0213)*	(0.0224)*			(0.0204)*	(0.0246)
Perc Own Content			0.4949	1.3317			0.4657	1.3515
			(0.5027)	(0.6279)**			(0.4998)	(0.6768)**
Constant	-1.0391	-1.5280	-3.0891	-1.3865	-1.1504	-1.5483	-2.9771	-1.6988
	(0.1507)***	(0.3395)***	(1.4233)**	(1.1291)	(0.1819)***	(0.3571)***	(1.3554)**	(1.2626)
Correlation	-1***		-1***		-1***		-1***	
Observations	188		145		188		145	

Note: This table reports correlation coefficients of biprobit regressions of price discrimination in TV content and advertising on measures of local competition and price discrimination on the other side of the market. The dependent variables here exclude stations that broadcast content and those that do not offer advertising.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 19B. Biprobit Regressions of Price Discrimination in TV Content and Advertising

	(1)		(2)		(3)		(4)	
Dep Variable:	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**
No. Stations Reach Area	-0.0037	-0.5216	-0.0024	-0.3652				
	(0.0066)	(0.2221)**	(0.0080)	(0.1953)*				
No. Stations Same City					0.0071	-0.4557	0.0455	-0.1450
					(0.0200)	(0.2318)**	(0.0336)	(0.2858)
PD TV Content?	3.1911		3.1287		3.2427		3.1719	
	(0.2085)***		(0.2151)***		(0.2072)***		(0.2135)***	
PD Advertising		3.4430		3.2271		3.6619		3.3843
		(0.2102)***		(0.2437)***		(0.2002)***		(0.2335)***
Broadcasting?	-0.1972		-0.1891		-0.2248		-0.2212	
	(0.1262)		(0.1272)		(0.1243)*		(0.1250)*	
Advertising?		-0.2519		-0.1032		-0.4192		-0.2192
		(0.2463)		(0.2668)		(0.2352)*		(0.2583)
Population (000)			-0.0002	-0.0192			-0.0005	-0.0236
			(0.0002)	(0.0094)**			(0.0004)	(0.0106)**
Unemp Rate			0.0668	-0.0307			0.0591	-0.0186
			(0.0267)**	(0.0563)			(0.0248)**	(0.0302)
Constant	-1.3248	-1.3410	-1.5969	-1.2168	-1.3402	-1.4540	-1.6264	-1.4966
	(0.1133)***	(0.3102)***	(0.1649)***	(0.3639)***	(0.1173)***	(0.3208)***	(0.1602)***	(0.3720)***
Correlation	-1***		-1***		-1***		-1***	
Observations	1237		1221		1237		1221	

Note: This table reports correlation coefficients of biprobit regressions of price discrimination in TV content and advertising on measures of local competition and price discrimination on the other side of the market.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 20. Prices and Local Competition

	(1)	(2)	(3)	(4)	(5)	(6)
Dep Variable:	**Cable Fee**					
No. Stations Reach Area	6.58	7.38	27.73			
	(21.39)	(21.88)	(12.19)**			
No. Stations Same City				75.33	76.10	77.43
				(21.93)***	(22.96)***	(24.64)***
Constant	1744.01	1742.26	1468.31	1631.74	1630.44	1403.39
	(72.12)***	(71.56)***	(101.46)***	(60.79)***	(60.15)***	(105.14)***
Year FE	No	Yes	Yes	No	Yes	Yes
Province FE	No	No	Yes	No	No	Yes
Observations	263	263	263	263	263	263
R-squared	0	0	0.2	0.01	0.02	0.2

	(7)	(8)	(9)	(10)	(11)	(12)
Dep Variable:	**TV Fee (=0 if broadcasting)**					
No. Stations Reach Area	-20.34	-19.85	-19.42			
	(2.68)***	(2.64)***	(3.54)***			
No. Stations Same City				-32.95	-30.46	-29.93
				(5.17)***	(5.29)***	(9.41)***
Constant	434.03	431.25	387.81	401.29	395.06	358.78
	(32.57)***	(31.93)***	(43.26)***	(30.17)***	(29.28)***	(45.61)***
Year FE	No	Yes	Yes	No	Yes	Yes
Province FE	No	No	Yes	No	No	Yes
Observations	1230	1230	1230	1230	1230	1230
R-squared	0.04	0.04	0.25	0.01	0.02	0.23

	(13)	(14)	(15)	(16)	(17)	(18)
Dep Variable:	**Avertisement Price**					
No. Stations Reach Area	372.29	374.94	283.04			
	(119.49)***	(119.74)***	(98.39)***			
No. Stations Same City				1270.75	1293.92	1087.08
				(305.80)***	(306.73)***	(226.49)***
Constant	9331.70	9314.90	9897.45	8505.98	8447.90	8566.40
	(787.51)***	(788.34)***	(821.68)***	(896.38)***	(900.44)***	(1799.30)***
Year FE	No	Yes	Yes	No	Yes	Yes
Province FE	No	No	Yes	No	No	Yes
Observations	787	787	787	787	787	787
R-squared	0.03	0.03	0.12	0.04	0.04	0.13

Note: This table shows regressions of prices on local competition. Columns (1) to (6) regress prices of pay-per-view television, columns (7) to (12) those of tv content where stations broadcast charge zero price, and columns (13) to (18) those of advertising. For those stations using price discrimination, we picked median reported prices.

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 21. Seemingly Unrelated Regressions of TV and Advertising Prices

	(1)		(2)		(3)		(4)	
Dep Variable:	**TV Fee**	**Adv Price**	**TV Fee**	**Adv Price**	**TV Fee**	**Adv Price**	**TV Fee**	**Adv Price**
No. Stations Reach Area	-16.80	365.85	-18.29	172.35				
	(2.81)***	(76.92)***	(3.16)***	(84.59)**				
No. Stations Same City					-22.80	1269.93	-24.17	-6.14
					(8.65)***	(231.30)***	(14.20)*	(374.02)
Population (000)			0.03	8.70			-0.002	10.13
			(0.06)	(0.002)***			(0.09)	(0.002)***
Unemp Rate			26.00	-765.12			20.70	-686.39
			(12.47)**	(333.93)**			(12.75)	(335.79)**
Constant	351.59	9388.33	243.82	12645.90	301.64	8514.49	216.21	13194.20
	(28.92)***	(791.25)***	(60.39)***	(1617.86)***	(31.80)***	(850.37)***	(63.23)***	(1665.35)***
Correlation	0.0366		0.0393		0.0184		0.0233	
Observations	769		764		769		764	

Note: This table shows sureg estimates. None of the correlations reported are statistically significant.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 22. OLS Regressions of Price Discrimination on Local Market Competition, Sample Cities with Two Stations or Less in 1999

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep Variable:	Content_PD_2						Adv_PD_2					
No. Stations Reach Area	-0.00089	-0.00084	-0.00072				-0.00131	-0.00118	-0.00122			
	(0.0003)***	(0.0003)***	(0.0003)**				(0.0006)**	(0.0006)*	(0.0007)*			
No. Stations Same City				-0.00243	-0.00207	-0.00175				-0.0045	-0.00391	-0.00404
				(0.0008)***	(0.0009)**	(0.0009)*				(0.0018)**	(0.0019)**	(0.0023)*
Constant	0.016662	0.016393	0.006636	0.017318	0.016596	0.007086	0.064706	0.064085	0.064278	0.067556	0.066348	0.066612
	(0.0045)***	(0.0044)***	(0.0068)	(0.0047)***	(0.0046)***	(0.0071)	(0.0084)***	(0.0083)***	(0.0083)***	(0.0089)***	(0.0088)***	(0.0091)***
FE Year	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
FE Province	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1130	1130	1130	1130	1130	1130	1130	1130	1130	1130	1130	1130
R-squared	0	0	0.08	0	0	0.08	0	0.01	0.08	0	0.01	0.08

Note: This table reports OLS regressions of Price Discrimination in TV content (columns (1) to (6)) and advertising market (columns (7) to (12)). We limit our sample to those cities that in 1999 had two stations or less as mandated by law.
Robust standard errors and clustered by year and city in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 23. Biprobit Regressions Price Discrimination in Content and Advertising, Sample Cities with Two or Less Stations in 1999

	(1)		(2)		(3)		(4)	
Dep Variable:	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**	**Content_PD_2**	**Adv_PD_2**
No. Stations Reach Area	-0.5034	-0.0160			-0.5060	-0.0090		
	(0.1878)***	(0.0105)			(0.2291)**	(0.0094)		
No. Stations Same City			-0.4742	-0.0586			-0.4251	-0.0388
			(0.2167)**	(0.0321)*			(0.2531)*	(0.0300)
PD Advertising?					3.5409		3.7479	
					(0.2189)***		(0.2096)***	
PD TV Content?						3.2879		3.3264
						(0.2173)***		(0.2157)***
Advertising?					-0.2530		-0.4215	
					(0.2473)		(0.2361)*	
Broadcast?						-0.1612		-0.1703
						(0.1472)		(0.1444)
Constant	-1.4061	-1.5001	-1.5922	-1.4595	-1.3506	-1.4222	-1.4809	-1.3816
	(0.2538)***	(0.0732)***	(0.2786)***	(0.0831)***	(0.3148)***	(0.1281)***	(0.3375)***	(0.1319)***
Correlation	0.33(**)		0.33(**)		-1(***)		-1(***)	
Observations	1130		1130		1084		1084	

Note: This table uses data only from cities that in 1999 had two or less stations as mandated by law. We show here biprobit regressions.
Robust standard errors and clustered by city and year in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 24. OLS Regressions of Cable and Advertising Price, Using Sample of Cities with Two or Less Stations in 1999

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep Variable:	**TV Fee**						**Advertising Price**					
No. Stations Reach Area	-21.28	-20.46	-17.40				255.37	254.48	206.62			
	(3.87)***	(3.74)***	(4.19)***				(93.76)***	(93.94)***	(96.27)**			
No. Stations Same City				-49.43	-44.41	-43.00				1445.61	1489.51	1669.29
				(9.16)***	(9.09)***	(14.65)***				(629.91)**	(650.55)**	(568.68)***
Constant	419.89	415.91	359.17	417.49	407.14	371.00	9111.99	9116.81	10009.60	7681.77	7596.41	7441.81
	(41.73)***	(40.62)***	(44.87)***	(34.06)***	(32.05)***	(50.42)***	(659.40)***	(658.12)***	(2025.77)***	(1294.11)***	(1329.19)***	(2098.27)***
FE Year	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
FE Province	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1078	1078	1078	1078	1078	1078	669	669	669	669	669	669
R-squared	0.04	0.04	0.26	0.02	0.02	0.25	0.01	0.01	0.13	0.03	0.03	0.15

Note: In this table, we report correlation of prices of pay-per-view and broadcast television and prices of advertising on measures of local competition. We restrict our sample to those cities that had at most two stations in 1999. Prices are measured in pesetas (old Spanish currency before the Euro).
Robust standard errors and clustered by year and city in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 25. SU Regressions Prices of TV Content Advertising, Reduced Sample

	(1)		(2)	
Dep Variable:	**TV Fee**	**Adv Price**	**TV Fee**	**Adv Price**
No. Stations Reach Area	-17.75	245.80		
	(3.34)***	(84.59)***		
No. Stations Same City			-44.56	1448.94
			(13.99)***	(347.61)***
Constant	333.89	9166.14	324.27	7666.21
	(30.43)***	(771.39)***	(36.93)***	(917.36)***
Correlation	0.0366		0.0184	
Observations	651		651	

Note: This table shows results of using seemingly unrelated regressions on the price of pay-per-view TV and advertising per station on local measures of competition. We restrict our sample to those cities that had two or less stations in 1999 as mandated by law. Robust standard errors in parentheses. * significant at 10%; ** at 5%; *** at 1%.

Table 26. OLS Regressions and Instrumental Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep Variable:	**Adv_PD_2**						**Content_PD_2**					
No. Stations Reach Area	0.0287	-0.0032	0.0040				-0.0117	-0.0055	-0.0081			
	(0.0430)	(0.0218)	(0.0196)				(0.0138)	(0.0065)	(0.0081)			
No. Stations Same City				0.0534	-0.0090	0.0114				-0.0217	-0.0158	-0.0230
				(0.0940)	(0.0605)	(0.0586)				(0.0266)	(0.0226)	(0.0264)
Constant	-0.0906	0.1157	0.2172	-0.0630	0.1219	0.1934	0.0757	0.0357	0.0133	0.0644	0.0467	0.0609
	(0.2399)	(0.1204)	(0.1365)	(0.2319)	(0.1597)	(0.2172)	(0.0778)	(0.0392)	(0.0241)	(0.0665)	(0.0613)	(0.0825)
FE Year	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
FE Province	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Note: This table shows OLS regressions using instrumental variables on the number of competitors. The instrumental variable is the number of competitors in that same city three years earlier. This is correlated with fixed costs of entry and not with contemporaneous demand shifters. Each regression contains 1285 observations. The table reports results from the second stage.

Robust standard errors and clustered by year and city in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.