"'Make or Buy' as Competitive Strategy: Evidence from the Spanish Local TV Industry"

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D.T.: Nº 119 **Febrero 2015**

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February 2015

Abstract

This paper empirically investigates whether changes in product market competition affect firm boundaries. Exploiting regulation-induced shocks to entry barriers and differences in regulation enforcement across cities to obtain exogenous variation in competition, we establish a negative causal effect of competition (through reduced entry barriers and a larger number of rival firms) on vertical integration in the setting of the Spanish local television industry between 1995 and 2002.

JEL Codes: D22, L22, L24, L82

Keywords: competition, vertical integration, Spanish television

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1 Introduction

Firm boundaries are constantly redefined, as witnessed by the multibillion-worldwide volume of corporate mergers and acquisitions and the sharp increase in outsourcing activity observed in recent years (see, e.g., Abraham and Taylor, 1996; Campa and Goldberg, 1997; Kakabadse and Kakabadse, 2002; and Whittington et al., 1999). Understanding what determines firm boundaries has been a perennial concern in economics and management at least since Coase (1937) posed the "make-or-buy" question nearly 80 years ago, and has led to a vast body of theoretical and empirical research (see, e.g., the recent surveys by Bresnahan and Levin, 2013; Harrigan, 2003; and Lafontaine and Slade, 2007). An explanation for the increasing adoption of new organizational structures and redefinition of firm boundaries that seems to have been largely overlooked by that body of research, and that is now gathering consensus (see Bloom and van Reenen, 2007; Bloom et al., 2009; and Bresnahan and Levin, 2013), relates these changes to changes in the firms' operating environments – prominently, changes in competition in product markets brought about by, for example, local deregulation and international trade liberalization.

Predictions from the leading theories of vertical integration (Transaction Cost Economics [TCE] and Property Rights Theory [PRT]) have focused on the impact of changes in competition, using as proxies changes in the number of parties to a transaction.[1] Although both perspectives share the premise that contracts are incomplete (which leads to ex-post bargaining over the total surplus generated by the relationship between the parties), in PRT, the integration decision determines ex-ante investments and hence total surplus, and in TCE, the integration decision determines ex-post haggling and hence total surplus (Gibbons, 2005).

In TCE, an increase in competition (as measured by the number of competing firms) in either

[1] TCE originated from the works of Williamson (1975, 1985), and the PRT approach dates back to Grossman and Hart (1986) and Hart and Moore (1990).

the product or the input market should lead to less vertical integration, by either limiting the hazards involved in small-numbers bargaining, reducing the overall degree of asset specificity, or reducing the rents over which to haggle. But an increase in competition in the product market could also mean the product market contains more competitors to which a supplier could sell the input, thereby reducing appropriability and fostering vertical integration when defining and enforcing property rights is difficult (Pisano, 1990, ASQ).

In PRT, increased competition in the product market would reduce the likelihood of vertical integration, by increasing the outside option of suppliers, whereas increased competition in the input market would have the opposite effect (Acemoglu et al., 2010). An increase in competition in the product market could also lead to more integration if, for instance, the producer's investment is relatively more important, because competition among producers reduces any given producer's bargaining power and, hence, her investment incentives (Aghion et al., 2006a,b). Therefore, neither theory leads to an unambiguous prediction concerning the impact of increased product market competition on vertical integration decisions, which is ultimately an empirical question.

Despite the theoretical relevance of product market competition as a driver of vertical integration, empirical studies explicitly linking product market competition and firm boundaries are in short supply.[2] Early studies by Balakrishnan and Wernerfelt (1986), Levy (1985), and Tucker and Wilder (1977) report a positive correlation between vertical integration and industry concentration in US manufacturing. More recently, Aghion et al. (2006b) show evidence of a U-shaped relationship between competition and vertical integration in UK manufacturing, whereas Bayo-Moriones et al. (2012) find a positive correlation between service outsourcing and competition in survey data

[2] For instance, the extensive survey of Lafontaine and Slade (2007) on vertical integration does not even include a section addressing the relationship between competition and integration. In Macher and Richman's (2008) survey of approximately 900 empirical articles testing TCE predictions, only two say something about competition and integration, whereas none of the 63 papers and 308 statistical tests of vertical integration reported in David and Han (2004) include a measure of competition as an explanatory variable.

from Spanish manufacturing.

Although some correlations have been documented, much research into this question is still needed to establish causality. This paper contributes to this agenda by proposing a plausible identification strategy to show that increased competition causes a reduction in the degree of vertical integration. Exploiting regulation-induced shocks to entry barriers and differences in regulation enforcement across cities to obtain a source of exogenous variation in the number of rival firms in the product market, we establish a negative causal effect of competition on vertical integration in the setting of the Spanish local television industry between 1995 and 2002. To the best of our knowledge, the only other paper that provides evidence of a causal effect of competition on firm organization is Guadalupe and Wulf (2010), who show that global competition among corporations shapes the internal organization of firms. Using trade liberalization as a quasi-natural experiment and tariff differentials across industries to implement a difference-in-differences (DiD) strategy, they find that increased competition leads firms to flatten, that is, reduce depth (the number of management levels) and increase breadth (the CEO's span of control).

We use a data set composed of three annual censuses of Spanish local television stations published in the years 1996, 1999, and 2002. For each station, the data report the percentage of content produced internally, the city location, as well as other station-level information. More importantly for our purposes, industry regulation and its enforcement experienced several changes that were orthogonal to individual station characteristics during the period of time of our study, thus providing a convenient source of plausible exogenous variation in entry barriers. First, local TV stations were essentially unregulated until December 1995, when the first industry regulation was passed. Second, national election results in 1996 and 2000 changed the degree of enforcement of the 1995 law, which depended to a great extent on the particular party ruling in any given city. To examine the relationship between vertical integration and competition, we begin by using a DiD strategy to

exploit the first source of variation, as stations passed from being in an unregulated to a regulated industry. We then run traditional 2SLS regression models to exploit the second source of variation, using the identity of the political party ruling a city (for whether the existing law was enforced) to instrument competition.

Both empirical approaches find a negative robust effect of increased competition on vertical integration. For example, our findings from the 2SLS approach suggest that an entry of an additional competitor in a market reduces the percentage of in-house production by 4.6 percentage points. Our results are robust to a series of specification checks that control for within-station variation and sample selection. We introduce agency considerations in the decision-making process of station managers when investigating further the mechanisms by which an increase in competition may lead firms to increase outsourcing. Although station managers may be "conservative" and maximize private benefits (over firm profits) in the absence of competition, an increase in the number of competing stations potentially reduces the amount of slack a manager can afford, thus pressuring managers to improve performance through a more competitive programming mix that encompasses increased programming hours, more outsourced content of higher quality (movies, documentaries), and lower prices for advertising spots in prime time. We show evidence consistent with complementary changes in all these variables of a firm's strategy in response to a higher intensity of rivalry.

Our paper is not the first to study the link between market structure and vertical integration, because others have studied this topic before in the strategic management literature (Cachon and Harker, 2002; Nickerson and Vanden Bergh, 1999; Spiller, 1985; and Vroom, 2006), albeit typically with a focus on the opposite direction of causality, namely, on how vertical integration is chosen strategically to influence competitive conditions in the product market.[3] Our work also contributes

[3] See Harrigan (1986) for an exception.

more generally to a recent literature in economics and management that uses non-market dimensions (politics, judicial independence, regulation) as sources of variation in market variables (Chin et al., 2013; Conti and Valentini, 2014; and Fosfuri et al., 2012).

The remainder of the paper is organized as follows. Section 2 describes the institutional details of the Spanish local TV industry between 1995 and 2002, and presents our data. In section 3 we describe our empirical methodology, and show and discuss our findings. Section 4 is devoted to analyzing the mechanisms underlying the causal effect of competition on vertical integration, whereas section 5 discusses the implications of our findings and concludes.

2 Local television in Spain

This section builds on information obtained in personal interviews with industry managers, archival research, and previous work (Nishida and Gil, 2014).[4] In many aspects, the Spanish local television industry is similar to other two-sided markets. A TV station collects revenue from two groups of consumers: it sells content to viewers and advertising space to advertisers. A station's pricing policies must take into account that consumers on either side of the market might react to the presence of the other group: for instance, viewers tend to value television content free of advertising, whereas advertisers value the number of television viewers. Some stations do not charge viewers for their content so as to maximize the number of viewers, while selling advertising space to advertisers at high prices; other stations charge a subscription fee to viewers and limit the amount of advertising.

Therefore, TV station managers must carefully choose the content of their programming to attract both viewers and advertisers, that is, select a competitive product mix and decide on its sources of content. The station has two basic sourcing strategies for content: it can either make

[4] We have consulted several issues in the archives of the journal *Comunicar* (http://www.revistacomunicar.com/) and the proceedings of the June 2004 conference celebrating the 15th anniversary of Televisión Segovia, which was entirely devoted to the local television industry. The entire proceedings can be found in Badillo and Fuertes (2004).

content (in-house production or internal sourcing) or buy it (outsourcing or external sourcing). The TV station managers we have interviewed were clear that outsourced content was cheaper, but that content produced internally allowed for greater differentiation from competitors (see also Monedero, 2005). In-house content is mainly local content (newscasts and local-interest programs), which is predominantly broadcast in prime time (Garcia, 2005; Iglesias, 2005).

Because the high costs of modern production facilities make filling all the slots in a daily schedule with its in-house production unprofitable for a local TV station, we tend to see two typical business models in the local television industry: (i) stations that limit their time on air basically to the number of hours they can fill with their in-house production facilities (e.g., Radio Televisió Cardedeu in Catalonia or Televisió Menorca Ciudadela in the Balearic Islands, which produce 100% of their content in house and broadcast less than three hours per day); and (ii) stations that tap from both content sources (e.g., Tele 7 in Castilla-La Mancha or Tele Plasensia in Extremadura, which outsource 80% of their content and broadcast all day).[5]

A central tenet of this paper is that the optimal sourcing choices of TV station managers are contingent on the competitive conditions they face; thus, vertical arrangements in this industry may change over time as those competitive conditions change. Agency considerations in the decision-making process of TV stations would suggest that managers may care mainly about keeping their private benefits of control, or enjoying a quiet life, subject to firm survival, in the absence of competition (Hart, 1983; Aghion et al., 1997, 1999). As the number of stations competing for viewers and advertisers (the main source of revenue for most stations) increases, the elasticity of the residual demand for each station will also increase, while demand per station shrinks (Vives, 2004). Because the new residual demand the station faces will be flatter and of a smaller potential size, the amount of slack a manager can afford while keeping his firm alive will be reduced. Therefore,

[5] See, e.g., Monedero (2005).

an increase in product market competition will put pressure on managers to cut slack and improve performance.[6]

Based on conversations with industry managers, we posit that the best way for local stations to improve revenues is to increase the number of advertisers, attracting regional as well as national advertisers (see also Badillo and Fuertes, 2004). To do so, local stations need to broadcast more high-quality content, while keeping costs manageable.[7] Given that the cost of high-quality content grows exponentially when produced in house at local stations, station managers must rely on outsourced content to stay competitive. Hence, we would expect increases in competition to be positively associated with increases in outsourcing, content quality, and time on air at the station level. Although we focus our analysis below on the relationship between vertical integration and product market competition, we will show evidence of the impact of competition on all other margins more formally in section 4. To obtain a source of exogenous variation in competitive conditions for our empirical exercise, we will exploit changes in the regulatory environment of local television, to which we turn next.

2.1 Regulation of local television

We can define three phases in the regulation of local television in Spain in the period considered in this paper: (i) no regulation (1980-94), (ii) regulation by law (1994-95), and (iii) de facto deregulation (1996-2002) (Badillo, 2005a). Until the mid-1980s, Spain had just two TV stations, TVE and TVE2. The former was the main station and the latter served as a window to minority content and local news broadcast from small satellite stations that had little independence in their

[6] As Aghion et al. (1999) show, the higher the degree of product market competition, the smaller the gap between profit-maximizing and "quiet-life" behaviors.

[7] Large advertisers (e.g., Coca-Cola) typically require large audiences (hence the need to have more time on air) and a diversity of viewer profiles (which means broadcasting at different times of the day, and general interest content). Those advertisers are also reluctant to advertise in stations whose programs are mostly of the "As Seen on TV" type, fortune tellers, adult content, or other content of similar nature.

programming decisions. The new democratic regime in Spain consolidated during the mid-1980s and, as a consequence, the central government granted its regional counterparts the right to develop regional stations. Still, the law did not recognize local TV stations as legal entities – which did not prevent a number of local stations from emerging in the late 1980s as a result of the joint efforts of local civil associations.

Many local stations were created after those years and, as their economic and cultural significance grew, the need for a legal framework became clear to politicians and regulators.[8] The left-winged Partido Socialista Obrero Español (PSOE) won the 1993 general election but, having lost its majority in Congress, had to yield to the demands of its allies (especially Izquierda Unida and Convergència i Unió – CiU), who were pushing for a regulatory framework for local television. 1994 saw the first regulatory proposals, which announced the end of the no-regulation period. After bargaining with other parties in Congress, the PSOE government finally approved the law of local TV stations in December 1995 (Law 41/1995, BOE 309, 27-12-1995), to be implemented in 1996. With this law, regulators aimed at shaping the composition, commercial activities, ownership, and competitive structure of the Spanish local TV industry. Among other things, the 1995 law limited the market of local stations to their city.[9] Some of the most controversial points of the 1995 law were that it limited the number of stations to two per city (regardless of population), banned TV networks, and restricted local TV stations' ownership and control to local governments and non-profit organizations (the latter was a concession to CiU). Given the nature of the 1995 law and the discussions surrounding its passing, one can safely assume the new regulation was unrelated to vertical integration decisions – indeed, neither the law nor any of the proposals that circulated

[8] According to ratings data published by the Asociación de Investigación de Medios de Comunicación (AIMC), local stations were responsible for a 0.6%, 1.1%, and 1.7% market share for the years 2000, 2002, and 2004, respectively. Although these percentages may seem low, regional stations at the time captured 4.2%, 3.7%, and 4.2%, respectively.

[9] As a consequence, communication scholars have characterized local stations as providers of "proximity television" to differentiate them from the role played by national and regional stations.

contained any disposition concerning the production of content.

The PSOE model for the local television industry would be progressively dismantled in the following years, as the right-winged Partido Popular (PP) rose to power. In March of 1996, the PSOE unexpectedly lost the national election to the PP, which had a very different perspective on how the local TV market should be regulated, if at all. Shortly after winning the election, the PP (which had no majority in Congress) unsuccessfully tried to pass a new law that would lift the restrictions on number of stations and private ownership and management introduced by the 1995 law. The fiercest opposition came from CiU, now an ally to the PP in Congress, which still favored a more regulated environment. Rather than insisting on a new law, the PP government took the alternative route of not implementing the PSOE law – what Badillo (2005a) has termed an "invisible deregulation."

We see evidence of a lack of enforcement of the PSOE law in the relatively low levels of sanctioning activity by the PP administration. According to data from the Asociación de Investigación de Medios de Comunicación (AIMC hereafter) – which most likely underestimates true entry because AIMC only records the date of entry of those stations that respond to its census – 508 stations were created between 1995 and 2002, all of which were, stricto sensu, illegal. The level of sanctioning by the authorities in that period did not match this level of entry: only 115 new files were opened between 1997 and 2002 (with a marked decrease toward the end of the period; see Badillo, 2003, for details).

Lack of enforcement of the 1995 law was more pronounced in cities ruled by the PP. Badillo (2003, 2005a,b, 2011) and Bustamante (2002) provide abundant anecdotal evidence on this differential enforcement of the PSOE law. Coming by more systematic evidence is difficult because information on files opened and sanctions is only available from 1997, and even for this period, public records do not contain information on sanctions at the firm or city level. We were only able to

find information on 28 of the 58 sanctions applied to local stations in 1998, and this (admittedly) partial evidence strongly suggests enforcement was indeed lighter in PP cities: only 20% of the sanctions we observe were applied to stations located in cities ruled by the PP (which represented roughly half of the total cities in that year).[10]

The 2000 election speeded up the (de facto) deregulation of local TV stations, because the PP gained full control of Congress and decided to push forward the (de jure) deregulation that the previous legislature had stopped. The PP took to Congress a revision of the law approved in 1995, which allowed the number of stations to be proportional to the number of inhabitants per city, no longer required local stations to be government owned or managed, allowed stations to be for-profit organizations, and lifted the ban on network formation. The new law was only passed in December of 2002 (Law 53/2002, BOE 313, 12-31-2002), but its main dispositions had been progressively implemented (and affected stations' entry decisions) since the PP took office. We observe further evidence of this de facto deregulation in the emergence of vertical networks such as Localia and Vocento already in 2001 and 2002, even though the 1995 law clearly prevented stations from being part of any network (horizontal or vertical). The complete undoing of the PSOE model of Law 41/1995 was completed in 2004 with the digitization plan for local television approved by the PP government.

Given the above discussion and the fact that the law delegated authority over new entry to local authorities, we would expect entry to be higher in cities ruled by the PP. Table 1 presents evidence consistent with our expectations: entry was indeed greater after the 1995 law in markets (cities) ruled by the PP, even after controlling for market size.

[TABLE 1 ABOUT HERE]

In this paper, we exploit changes in regulation and enforcement from 1995 to 2002 to analyze

[10] The complete list of the 28 stations on which we have information can be found in Badillo (2003: 102).

how changes in market structure affected firms' decisions about their degree of vertical integration in the Spanish local TV industry. But before turning to the empirical exercise, we present and describe our data in the next section.

2.2 Data

The main data set used in this paper comes from three different sources. The first source is the Spanish censuses of local TV stations collected by the Asociación de Investigación de Medios de Comunicación (AIMC) and published in 1996, 1999, and 2002. These censuses collected information on the names and number of local TV stations per city and province for the years 1995, 1998, and 2001.[11] According to the data, 881 stations were operating in 1995, 740 stations in 1998, and 898 in 2001.

To create these censuses, the AIMC sent questionnaires to each of the existing stations in each year and published the responses. One-hundred eighty-three stations responded in 1995, whereas 457 and 645 responded in 1998 and 2001, respectively.[12] In the questionnaire, station managers answered questions regarding the station operations, coverage area, weekly and daily schedules, association memberships, advertising, and broadcasting. The questionnaire also asked managers about the percentage of content in their programming that was internally produced. This variable is informative of the degree of vertical integration in content production for each station that responded to the questionnaire, and it becomes the dependent variable in this study.

The second source of data is the business activity and population census published by "La Caixa." This census contains yearly socioeconomic information at the city, province, and region levels. The census covers $3,209$ cities, all of which at some point had $1,000$ inhabitants or more.

[11] AIMC data do not include sporadic and random emission of television content but rather established entities that emit on a regular basis.

[12] The low response rate in 1995 raises the concern of potential nonrandom sample selection. We deal with this issue formally in section 3, where we show that sample selection is unlikely to be affecting our results.

When we merge both data sets, we lose a few stations that are located in cities of less than 1,000 inhabitants. Of the 3,209 cities, 562, 544, and 592 cities had at least one station in 1995, 1998, and 2001, respectively.

The last source of data that we include in this paper is the electoral outcomes from the May 1991, May 1995, and June 1999 Spanish municipal elections. We obtain these data from the data set "Consulta de Resultados Electorales" of the Subsecretaria de la Direccion General de Politica Interior at Ministerio del Interior in the Spanish Government's website.[13] These data are important because, as argued in section 2.1, entry (and competition) varied with the political affiliation of local government officials. Figure 1 provides a timeline for census data collection, changes in regulation, and elections.

[FIGURE 1 ABOUT HERE]

Table 2 provides summary statistics across years and cities. Information in this table shows that the average station produces 69% of its content in house , is located in a city of 150,000 inhabitants receiving broadcast content from 4.4 stations, broadcasts its content for 101 hours a week (roughly 14 hours per day), and charges 11,770 pesetas (about 70 euros) for a 20-second advertising spot in prime time.[14] Eighty percent of the stations responding to the questionnaire are privately owned and 60% of them belong to a network.

[TABLE 2 ABOUT HERE]

The last entries in Table 2 summarize our political variables, which are further discussed below. *Over 30% PP Votes* is a dummy variable that takes a value of 1 if the PP received at least 30% of votes in a given city in the 1995 municipal election, whereas *PP Max Votes*, *PSOE Max Votes*, and

[13] http://www.infoelectoral.mir.es/min/.

[14] The qualitative analysis remains unaltered if we consider the number of stations located in the same city, or the number of stations in the area covered by a station. The pairwise correlations between these variables are between 0.87 and 0.99. The "La Caixa"data did not contain information on population for 1996, which we proxied with population levels of 1998.

CiU Max Votes are dummies that take a value of 1 if the PP, the PSOE, or CiU were the political parties with the largest number of votes in each local election.

3 Empirical methodology and results

This section describes our empirical approach to causal inference, discusses the potential problems that the analysis may encounter, and presents our results. We first present results from running OLS regressions to highlight the lack of meaningful correlations. Then we continue our analysis, exploiting our plausible source of exogenous variation in both DiD and 2SLS instrumental variable approaches.

3.1 Competition and vertical integration at first glance

The empirical analysis in this paper aims to recover the causal impact of product-market competition on vertical integration in the Spanish local TV industry. For this purpose, we begin by producing traditional ordinary least squares (OLS) estimates of the following relationship:

$$VI_{ijt} = \alpha_0 + \alpha_1 Comp_{jt} + \alpha_2 X_{ijt} + \delta_t + \gamma_i + u_{ijt}, \tag{1}$$

where VI_{ijt} is the percentage of content produced in house by station i located in city j in year t; $Comp_{jt}$ is the number of stations that broadcast their content into city j in year t; X_{ijt} are time-varying station and city characteristics; δ_t are year fixed effects that control for any aggregate factor that might affect vertical integration decisions; and γ_i are station (and city) fixed effects that control for non-varying characteristics of each station.[15]

Table 3 shows OLS estimates of different versions of equation (1). Column (1) contains a simple

[15] Note that our measure of competition varies across cities and years, but not across stations within a city.

regression of vertical integration (*% Content In-house*) on our competition measure (*No Stations Comp*) and controls for market size (city population, *Population*), whether the station belongs to a network (*Belongs to Network?*), and for private ownership (*Private?*). In columns (2) to (5), we include year fixed effects. Column (3) includes province fixed effects, and column (4) considers city fixed effects. These fixed effects account for province and city-specific time-invariant factors, so that only the within-province or the within-city variability in vertical integration contributes to the estimation of the effect of competition.[16] Finally, column (5) exploits within-station changes in vertical integration decisions by including station fixed effects. Standard errors are clustered at the city level in all specifications.

[TABLE 3 ABOUT HERE]

We observe that the coefficient on competition is of little economic significance, has no robust sign, and is statistically significant in just one of the specifications. If anything, the OLS results show that private stations are less likely to source their content internally, but even this correlation disappears once we include station fixed effects. Measurement error and/or endogeneity issues might be biasing our fixed-effects estimates toward zero.

To begin with, our choice of the number of stations broadcasting into a city, over other reasonable options such as the number of stations located in a city or in a station's coverage area, as our competition measure might induce some measurement error in our main explanatory variable. Second, the vertical foreclosure and strategic management literatures suggest reverse causality is a possibility in our setting.[17] Vertical foreclosure arises when a firm that controls an essential input limits access to its input by rival firms. Vertical integration may provide a firm with a

[16] For example, stations with lower costs of internal content production might self-select into larger markets with stronger preferences for differentiated content.

[17] See Hart and Tirole (1990) and Rey and Tirole (2007) on foreclosure. See Cachon and Harker (2002), Nickerson and Vanden Bergh (1999), and Vroom (2006) for models in which vertical integration serves as a strategic device that affects competition.

product differentiation advantage, thus creating an endogenous entry barrier (Balakrishnan and Wernerfelt, 1986), or it may serve as a commitment device to reduce competitive rivalry (Vroom, 2006). Finally, specific, unobservable, time-varying shocks to the local television industry might affect both vertical integration and the number of firms. For example, if markets with more variation in their preference for local content also allow for more market segmentation, we are likely to observe stations in markets with more competition choosing very different levels of in-house production, and therefore find no correlation between vertical integration and competition across markets, because of the underlying variation in the demand for local content.

To address the potential problems of endogeneity and measurement error, in the next section, we exploit the institutional environment described in section 2.1 to pursue two different identification strategies to pin down the causal effect of interest. First, we exploit the 1995 PSOE law to implement a DiD approach, and compare the change in vertical integration in stations located in cities ruled by the PP to the change in vertical integration in stations located elsewhere around the time when the PSOE law was passed. Next, we claim that the political identity of the ruling party in a given city is a valid instrument for competition, and use two-stage least squares (2SLS) as our estimation procedure.

3.2 Addressing endogeneity I: Differences-in-differences estimates

To implement our DiD regressions, we separate PP markets from other markets by means of a dummy variable, $Over30\%PPVotes_j$, that takes a value of 1 if the PP received at least 30% of the vote in city j in the 1991 municipal election.[18] We use observations from before (1995, from the 1996 census) and after (1998, from the 1999 census) the law was passed. We also build a

[18] The last municipal elections before the passing of the 1995 law took place in 1991. Note that the median value in our sample of the PP percentage vote is 27%, whereas the 75th and 90th percentiles are 42% and 52%. Therefore, we choose a cutoff right above the median of the distribution of the PP percentage vote.

dummy $PostLaw_t$ that takes a value of 1 for 1998 observations and 0 for 1995 observations. In this subsample, the local TV station industry went from no regulation to regulation by law; therefore, we should expect a general decrease in competition (because the law limited the number of stations per city to just two). Enforcement of this law, however, was laxer on cities run by PP officials; therefore, we expect the restriction to competition (i.e., the increase in entry barriers) to be more important in non-PP cities. The law also banned TV networks and limited private ownership and control; hence, we include as controls dummies that take a value of 1 if the station belongs to a network, and if it is privately owned.

To sum up, we estimate the following relationship:

$$VI_{ijt} = \beta_0 + \beta_1 PostLaw_t^* Over30\%PPVotes_j + \beta_2 PostLaw_t$$

$$+\beta_3 Over30\%PPVotes_j + \alpha_2 X_{ijt} + \gamma_j + \delta_t + u_{ijt}. \quad (2)$$

The causal effect of interest is β_1, the coefficient on the interaction of the PP and post-law dummies. Table 4 shows the results of our estimation of (2). We find a negative coefficient on the interaction $PostLaw_t^* Over30\%PPVotes_j$, which we ascribe to a negative effect of competition on vertical integration; in this case, a restriction of competition leads firms to integrate more. Our results show that a relative increase in competition in PP markets decreased the degree of vertical integration in content between 12 and 18 percentage points. The result is robust to the inclusion of controls in column (2) and province fixed effects in column (3). When we introduce city and station fixed effects in columns (4) and (5), respectively, the result is robust in sign and magnitude but loses statistical significance. In column (6), the result is again statistically significant and negative at 18 percentage points after using station fixed effects and limiting the sample to those stations that we observe both in 1996 and 1999. Finally, in column (7), we increase the sample used in

column (6) by adding observations from those stations that answered the questionnaire in 1996 and 2002 but not in 1999. The result does not change in terms of sign and magnitude, while gaining in statistical significance. Standard errors in all the specifications are clustered at the city level.

[TABLE 4 ABOUT HERE]

Remember that according to our description of the institutional evolution of this industry, the 1995 law should have implied a larger *reduction* in competition in markets not ruled by the PP, which led to increased vertical integration in stations located in these markets relative to stations located in PP markets. We find in columns (1) to (3) an overall positive increase in vertical integration between 1995 and 1998, although the statistical significance is washed out in columns (4) to (7) once we introduce city and station fixed effects. Other results in this table show again that privately owned stations are less likely to produce content in house (except when we include city and station fixed effects). Stations belonging to a network seem to outsource more content production, though the estimates are not statistically significant. We do not find evidence of a statistically significant relationship between market size (proxied by population) and the degree of vertical integration.

An important concern in the DiD estimation presented in Table 4 is the fact that the response rates in the 1996 and 1999 census were low (21% and 62%, respectively). If selection into the sample (answering the AIMC questionnaire) were correlated with station and city characteristics, our results could be biased toward an overestimation of the impact of competition on vertical integration decisions. If stations with lower costs of answering the questionnaire within a city or a province were also more sensitive to competition, our results would pick changes in the subsample but misrepresent the overall impact of competition on vertical integration decisions. For this reason, we conduct in Table 5 a number of robustness checks that aim to attenuate concerns regarding the

self-selection of stations into the sample.[19] The first three columns in Table 5 drop observations from the sample to equalize the characteristics of cities with more than 30% of PP votes from others, creating three subsamples that we name samples A, B, and C. Sample A is the result of finding out the minimum and maximum values of population, market quota (index of economic weight calculated in the yearbook of "La Caixa"), number of motor vehicles, and other available demographic variables in PP markets, and then dropping those observations in non-PP markets that lie outside of this support. Sample B finds the maximum and minimum of the available demographic variables in non-PP markets and then drops from sample A those stations in PP markets that lie outside these bounds. Thus, whereas sample A drops outliers outside of the support of demographic variables in PP markets, sample B only keeps observations in the intersection support of PP and non-PP markets. By definition, sample B must be smaller than sample A. Finally, sample C repeats the exercise of sample B, taking city population as the only selection criterion because it is the only demographic variable in our regression specifications. Note that our results are robust in sign, magnitude, and significance in Table 5.

[TABLE 5 ABOUT HERE]

In column (4) of Table 5, we conduct a Heckman correction using in the first stage all demographic variables available in the yearbook of "La Caixa" as well as station-level dummy variables that detail whether the station appears in the censuses of 1996, 1999, and/or 2002. Whereas the former set of variables is necessary to pin down differences in the probability of response across cities, the latter is the only information available to estimate differences in the probability of response for different stations within a city and is necessary for the identification of the first-stage regression. Column (4) shows that our result is robust to the first-stage Heckman correction.

[19] Although not shown here, we also regress a dummy variable that takes a value of 1 if a station answers the questionnaire, and 0 otherwise. We find no statistical relation between this dummy and the population and most voted political party in the station town in any of the census years. These results are available upon request.

Finally, we collapse the data at the city level and run the original DiD specification with city fixed effects and with the Heckman sample correction and province fixed effects in columns (5) and (6). The results are again robust in sign, magnitude, and statistical significance to examining the effect of competition on vertical integration at the city level.

3.3 Addressing endogeneity II: Instrumental variables

As discussed in section 2.1, enforcement of the PSOE 1995 law depended strongly on the political party of the local authorities supposed to implement it. The PP, the PSOE, and other Spanish parties (particularly, the CiU in Catalonia) had very different views on how the industry should be regulated. As of 1996, the PP in power began a process of de facto deregulation, which implied, among other things, lower barriers to entry of new local TV stations. As we have argued, one can safely assume that regulatory developments in the industry (both the 1995 law and the ensuing deregulation) were unrelated to vertical integration decisions, thus making the local electoral results good candidates for instruments of competition. The fact that regulation changes and vertical integration decisions were unrelated is our identifying assumption. Table 6, in columns (A) and (B), shows results of different regressions of our competition variable (number of stations broadcasting into a city) on our instruments; that is, electoral dummies that take a value of 1 if the PP (*PP Max Votes?*), the PSOE (*PSOE Max Votes?*), or the CiU (*CiU Max Votes?*) were the political forces with the maximum amount of votes in the previous local election. All coefficients in this first stage have the expected sign and are statistically significant, except for the PP dummy. This is consistent with the fact that nothing much changed in cities ruled by PP before and after the passing of the law as opposed to cities ruled by other parties.

[TABLE 6 ABOUT HERE]

We exploit our instruments to analyze the period of time after the PP won its first election.

We use data from the 1999 and 2002 censuses, and instrument competition with results from the 1995 and 1999 elections (recall Figure 1). Columns (1) and (2) in Table 6 show the second stage. Column (1) contains a simple regression in which the number of stations is the only explanatory variable, whereas column (2) includes the full set of controls. Increased competition (through a larger number of rivals, induced by lower entry barriers) causes firms to reduce the degree of vertical integration: for every new entrant, stations reduce in-house production of content by 4.8 percentage points (a 6.9% reduction from the industry average). From a different angle, a one-standard-deviation increase in the average number of firms broadcasting into a city is related to a reduction (increase) of 15.9 percentage points in in-house production (outsourcing) – roughly 23% of average vertical integration in our sample. We also find that private stations outsource more than their government-owned counterparts.

Similar to the previous section, we must address as well the lack of response to the AIMC questionnaire in the 1999 and 2002 censuses, although response rates are substantially higher in those years than in the 1996 census (72% in 2002 and 62% in 1999 relative to 21% in 1996). For this reason, we apply the same robustness checks to the 2SLS estimation that we applied in Table 5 to the DiD analysis. We show the results of these robustness checks in Table 7. Columns (1) to (3) in Table 7 run the 2SLS specifications for samples A, B, and C with the same criteria explained above in the previous section. The results in these columns are robust in sign and magnitude (ranging between $-.054$ and $-.046$), but only statistically significant in sample A.

[TABLE 7 ABOUT HERE]

In column (4), we correct for sample selection *a la* Heckman, introducing the Mills ratio as an explanatory variable, and find again a negative, statistically significant effect of competition on vertical integration. Finally, columns (5) and (6) in Table 7 repeat the analysis at the city level. These two columns show an effect three times as large ($-.15$ relative to $-.046$) as in previous

columns of Table 7 and those in Table 6. Nonetheless, the results are robust in terms of sign and statistical significance when we perform the robustness check at the city level.

Having established the robustness of our results in both of our empirical approaches, we proceed in the next section to examine the mechanisms behind the negative causal relationship between product market competition and vertical integration.

4 Competition and business models

The previous section documented a robust, negative causal effect of an increase in the number of competing firms on the degree of vertical integration at the firm level. This finding is consistent with several explanations given in the literature. On the TCE side, McLaren (2000), for instance, argues that increased competition (larger numbers of suppliers and buyers) in the market for inputs fosters outsourcing because it reduces the scope for opportunistic behavior, whereas Grossman and Helpman (2002) find that an increase in competition (product substitutability) favors outsourcing when diseconomies of scope are more important than distortions from imperfect contracting. Using the PRT approach, Aghion et al. (2006a,b) predict also a negative relationship between competition and vertical integration when the supplier's effort is relatively important, because the number of buyers and sellers of inputs affects sellers' outside options and incentives. Finally, De Bettignies (2006) shows that in a Hotelling duopoly model, in which outsourcing provides (at a cost) stronger incentives for quality to the downstream party, an increase in competition (product substitutability) makes quality improvements more important, favoring non-integration.

Given the limitations of our data, in this paper, we cannot run a horse race between the different theories above. Instead, we exploit the particularities of the institutional environment to document a causal impact of competition on the degree of vertical integration. In this section, we extend the analysis to the impact of competition on other firm decisions in order to test for the mechanisms

involved as we described them in section 2. That discussion suggests we look at weekly broadcasting hours, content quality, and advertising.

Our first prediction from section 2 is that increases in competition should induce local TV stations to increase their time on air. We test this implication in Table 8, where we reproduce DiD and 2SLS regressions from previous tables, using the number of weekly hours of content as the dependent variable. Columns (1) to (4) show that stations in PP cities increased their on-air time by between 24 and 30 hours a week (around 3.5 hours more per day) relative to stations in non-PP cities after 1995. Columns (5) and (6) reproduce the instrumental variables approach and report that entry of one additional competitor increased the hours of emission by 19 a week.

[TABLE 8 ABOUT HERE]

According to our evidence so far, competition leads stations to increase the number of hours on the air mainly through outsourced content. Our second claim in section 2 was that this new content should be of high quality.[20] We cannot directly test this implication, because we lack hard, systematic data that could measure the quality of programming of each station in our sample. Instead, we have collected schedules for Barcelona TV (BTV hereafter) in 1995, 1998, and 2001 to provide qualitative evidence of this shift in programming due to competition. Figure 2 not only shows that BTV increased its number of hours on the air from a 6 pm to a 9 am starting hour, but also that the share of outsourced content increased substantially. In 1995, only musical programs (twice a week) could be considered outsourced content, whereas all other content was primarily low-quality, local-interest programs (news, debate, local sports, and local culture).[21] By 1998 and 2001, movies and short films were part of the programming, as well as science and history

[20] The positive association between outsourcing and quality may be context-specific. For instance, when coordination is important for quality, the association might be negative (see, e.g., Forbes and Lederman, 2009).

[21] A representative local-interest program would show one or two show hosts against a monocolor background discussing local matters with a local official.

documentaries.[22]

[FIGURE 2 ABOUT HERE]

Finally, an implicit assumption is that the increase in competition forces station managers to economize their resources to offer a competitive product mix because more entry makes the market for advertising more competitive. Therefore, we would expect entry to lower the market price of advertising. To test for this condition, we take advantage of a question in the AIMC questionnaire that asks station managers for the price of a 20-second advertising spot in prime time. Although prime-time advertising space did not increase as much as total space, we test whether stations in PP markets decreased their advertising prices more than stations in other markets following our DiD and 2SLS methodologies used elsewhere in the paper. Table 9 shows a robust negative effect of competition on advertising prices across specifications in columns (1) to (6). Despite the robustness in sign, only column (6) under 2SLS and all controls yields a statistically significant result (at the 10% level). One additional competitor lowered the average price of a 20-second advertising spot in prime time by roughly $3,200$ pesetas (around 19 euros). We also find in column (6) of Table 9 that advertising prices are higher in larger markets (1 euro higher for every additional $7,000$ people), private stations (which we have found to broadcast more hours and to outsource more), and stations that do not belong to networks (which should have a higher cost of content production).[23]

[TABLE 9 ABOUT HERE]

The results of this section illustrate how firms react to changes in their environment by simultaneously adjusting a number of margins in their competitive strategy. Because these changes appear

[22] We were also able to collect information on schedules and programming for TV Girona in 1998 and 2001. We observe there a presence of outsourced content such as movies, documentaries, TV shows, and MTV programming. The schedules for TV Girona are available upon request.

[23] Although not shown here, we also find that private stations are more likely than government-owned stations to change their outsourcing and production levels in reaction to changes in competition. Similarly, incumbent stations seem to react to entry, increasing their content outsourcing, whereas new stations seem to enter already at higher outsourcing levels in more competitive markets. These patterns are consistent with our predictions on vertical integration, hours, and advertising.

to happen simultaneously, they beg the question of whether they are interconnected and therefore their joint adoption is due to existing complementarities among these business dimensions. The theory of complementarities (e.g., Milgrom and Roberts, 1990) provides us with a coherent framework within which to analyze the changes we have documented. Let $\Pi(\mathbf{x};\theta)$ be a performance indicator, where $\mathbf{x} = (x_1, ..., x_n)$ is a vector of activities (in our case, it would include outsourcing, weekly hours on air, (minus) advertising prices, and content quality) and θ is an exogenous parameter measuring competition. A well-known result in the theory of complementarities (see, e.g., Athey and Stern, 1998, and Cassiman and Veugelers, 2006) is that if $\Pi(\mathbf{x};\theta)$ is supermodular and all of its arguments are complements, the optimal choice of each activity is increasing in θ, and the elements of x are positively correlated (conditional on observables).[24] Although joint occurrence is not proof of complementarity (we can only check necessary, not sufficient, conditions), our evidence is consistent with the existence of complementarities (strongest in the case of outsourcing and time on air) – and suggests stations are changing their organizations and strategies to fit the new competitive environment they face and to maximize performance.

5 Discussion and conclusions

Since Coase (1937) posed the Big Question – why transactions are sometimes carried out in markets, and other times within firms – the issue of what determines firm boundaries (what has been traditionally referred to as "the theory of the firm") has garnered the attention of many scholars and businessmen alike; see Holmström and Tirole (1989) and Gibbons (2005) for a survey and discussion of the main theories, and Lafontaine and Slade (2007) for empirical evidence. In this

[24] For example, outsourcing may increase the marginal return of the total number of on-air hours in a station. This complementarity may arise from two potential sources that we have confirmed through interviews with industry managers and anecdotal evidence. On the one hand, syndication lowers the average cost to all stations purchasing syndicated content. On the other hand, stations may acquire content in bundles, which by definition lowers the marginal costs of content. In both cases, we would expect outsourcing and the number of weekly on-air hours to move in the same direction in response to an increase in product-market competition.

paper, we focus on a determinant of make-or-buy decisions that, until recently, both theoretical and empirical work has largely overlooked: product market competition.

To study the relationship between product market competition and vertical integration, we exploit plausibly exogenous variation in competition across markets and years to identify a negative causal effect in station-level data from the Spanish local TV industry between 1995 and 2002. This industry during this period is particularly attractive because regulation was introduced at the end of 1995 that arguably raised entry costs. Additionally, national election results in 1996 and 2000 generated variation in regulation enforcement according to the ruling party at the municipal level, which is arguably orthogonal to a station's decisions on content production.

To the best of our knowledge, this paper is the first to document a causal effect of competition on vertical integration: we find that more competition (through reduced entry barriers and a larger number of rival firms) leads firms to reduce vertical integration. Additional results show that stations located in larger markets are on average more likely to produce their content in-house than stations in smaller markets, and that private stations outsource more than their public counterparts. Finally, we also provide evidence that suggests the existence of a complementarity between outsourcing, broadcasting time at the station level, and high-quality general content. In our setting, because entry lowers advertising revenues for all involved, managers must increase broadcasting time while keeping quality and budget constant. This strategy lowers the percentage of in-house produced content while increasing the number of broadcasting hours and the presence of outsourced content such as movies, high-quality documentaries, and TV shows.

Our findings are relevant to managers and practitioners in media and elsewhere for a variety of reasons. First, our analysis can provide firms with a competitive advantage. The role that price and advertising strategies play in competitor entry is well known, but the literature has largely ignored the importance of vertical integration and outsourcing adjustments by incumbent companies when

competition increases. Although devoting lots of resources to internal production may buffer sudden changes in the competitive environment, overinvestment may also be a costly strategy when the risk of late adaptation is too prominent.

Second, our empirical results underscore the importance that changes in the regulatory framework can have on the internal organization of firms as well as their make-or-buy decisions. Changes in regulation may not only increase or soften competition by affecting the number of competitors, but may also affect their identity, ownership structure, and governance. Changes in the internal organization of a firm of this nature have a direct impact on the firm's ability and willingness to compete aggressively in the product market. Therefore, managers must be able to understand the limits and constraints posed by their own structure, those of their competitors, and those dictated by regulation, in a way that they can strategically respond to entry and keep their competitive advantage.

In summary, in this paper, we have linked changes in regulation to changes in market competition, and studied how the latter affected organizational structure. Although not addressed in this paper, research has recently identified competition-induced organizational change as an important driver of widely documented, large, and persistent differences in firm-level productivity (see Syverson, 2011). Therefore, understanding product market competition as a driver of integration decisions has important implications for managers considering the productivity consequences of government interventions in markets (Mullainathan and Scharfstein, 2001; Syverson, 2011). How our results extend to other industries, however, must await future research.

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Figure 1. Timing of Elections, Regulation Changes and Data Collection

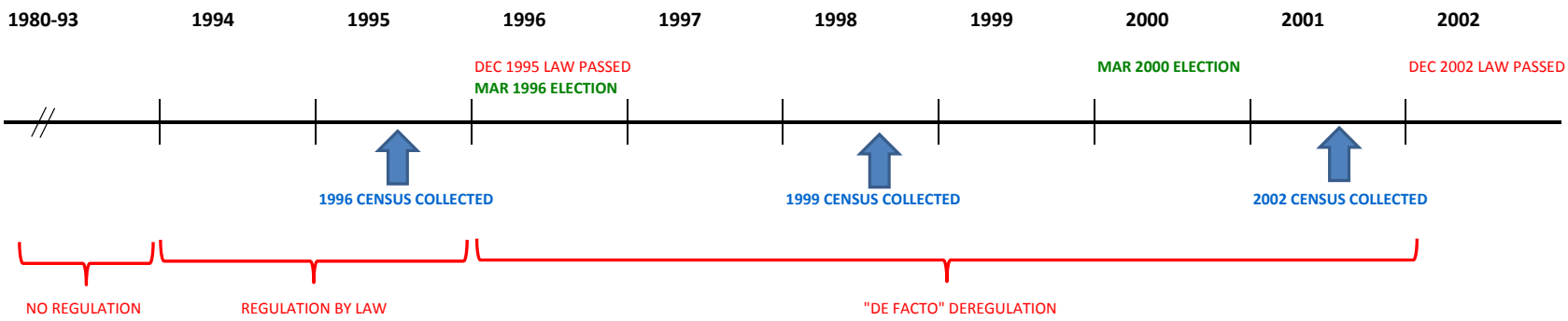

Figure 2. Barcelona TV Schedules Same Week 1995, 1998 and 2001

MON 5/29/1995	TU 5/30/1995	WED 5/31/1995	THU 6/1/1995	FRI 6/2/1995	SAT 6/3/1995	SUN 6/4/1995
	18:00 MUSIC SHOW		18:30 NEIGHBORHOOD NEWS		17:15 LOCAL FOLK DANCE	17:15 DEBATE
	18:15 MOVIE REVIEWS		19:00 MOVIE IN ENGLISH*	19:45 CAR REVIEWS	18:00 AMERICAN FOOTBALL	18:15 CULTURAL CROSSROADS
18:30 NEIGHBORHOOD NEWS	18:30 NEIGHBORHOOD SPORTS	19:00 CITY ROUTES	19:30 NEIGHBORHOOD SHOW	20:00 CITY NEWS 1	18:30 LOCAL DEBATE	18:30 INSIDE BRITAIN
19:00 INTERVIEW PROGRAM	18:45 NEIGHBORHOOD NEWS	19:30 NEIGHBORHOOD NEWS	20:00 CITY NEWS 1	20:30 Informatiu Les Corts	19:00 MUSIC SHOW	19:00 DO AS YOU PLEASE
19:30 TALK SHOW	20:00 CITY NEWS 1	20:00 CITY NEWS 1	20:30 NEIGHBORHOOD NEWS	21:00 MOVIE REVIEWS	19:30 COMIC BOOK REVIEW	20:00 CITY NEWS 1
20:00 CITY NEWS 1	20:30 INTERVIEW CITY MAYOR	21:00 CITY CELEBRITIES	21:00 AMERICAN FOOTBALL	21:30 CITY NEWS 2	19:45 FORMULA RC	20:30 DDD
21:00 MUSIC SHOW*	21:00 NGO PROGRAM	21:30 CITY NEWS 2	21:30 CITY NEWS 2	22:00 NEIGHBORHOOD NEWS	20:00 CITY NEWS 1	21:00 CAR REVIEWS
21:30 CITY NEWS 2	22:00 NEWS	22:00 NEIGHBORHOOD NEWS	22:00 NEIGHBORHOOD NEWS	22:30 COMIC BOOK REVIEW	20:30 ART SHOW	21:15 VHS
22:00 NEIGHBORHOOD NEWS	22:30 SPORT NEWS	22:30 NEGHBORHOOD SHOW	22:30 LOCAL MOVIE INDUSTRY	22:45 WHAT'S NEW IN VHS	21:30 CITY NEWS 2	21:30 CITY NEWS 2
22:30 TALK SHOW	23:00 DEBATE	23:00 CITY LABOR MARKET	23:00 MUSIC SHOW	23:00 DEBATE	22:00 CITY ROUTES	22:00 MOVIE REVIEWS
23:15 SPORTS TALK SHOW	0:00 CITY NEWS 2	0:00 CITY NEWS 2	23:30 LOCAL TALK SHOW	0:00 CITY NEWS 3	22:30 OUR CITY	22:15 MUSIC SHOW
0:00 CITY NEWS 3	0:30 INTERVIEW CITY MAYOR	0:30 CITY AT NIGHT	0:00 CITY NEWS 3	0:30 CITY STREETS	22:45 ECOLOGY PROGRAM	22:30 MONTHLY PROGRAM
			0:30 METAL ROCK SHOW*	0:45 ALTERNATIVE SHOW	23:15 FASHION MAGAZINE	23:00 NIGHT SHOW
					0:00 CITY NEWS 3	23:30 CITY NIGHT SHOW
						0:00 CITY NEWS 3

MON 6/1/1998	TU 6/2/1998	WED 6/3/1998	THU 6/4/1998	FRI 6/5/1998	SAT 6/6/1998	SUN 6/7/1998
9:00 HOLA BARCELONA	8:00 HOLA BARCELONA	8:00 HOLA BARCELONA	8:00 HOLA BARCELONA	8:00 HOLA BARCELONA		9:00 HOLA BARCELONA
9:30 AGENDA (ENGLISH)	8:30 AGENDA (ENGLISH)	8:30 AGENDA (ENGLISH)	8:30 AGENDA (ENGLISH)	AGENDA (ENGLISH)		9:30 AGENDA/MAGAZINE
10:00 NEWS	8:35 HOLA BARCELONA	8:35 HOLA BARCELONA	8:35 HOLA BARCELONA	9:00 NEWS		9:35 AGENDA/MAGAZINE
10:05 AGENDA/MAGAZINE	9:00 NEWS	9:00 NEWS	9:00 NEWS	9:05 AGENDA/MAGAZINE		10:00 NEWS
13:35 NEIGHBORHOOD NEWS	9:05 AGENDA/MAGAZINE	9:05 AGENDA/MAGAZINE	9:05 AGENDA/MAGAZINE	12:30 AGENDA (ENGLISH)	9:00 HOLA BARCELONA	10:05 AGENDA/MAGAZINE
13:47 NEIGHBORHOOD NEWS	13:35 NEIGHBORHOOD NEWS	13:35 NEIGHBORHOOD NEWS	12:30 AGENDA (ENGLISH)	12:35 MAGAZINE	9:30 AGENDA/MAGAZINE	14:00 MIDDAY NEWS
14:00 MIDDAY NEWS	13:47 NEIGHBORHOOD NEWS	13:47 NEIGHBORHOOD NEWS	13:35 NEIGHBORHOOD NEWS	13:35 NEIGHBORHOOD NEWS	9:35 AGENDA/MAGAZINE	14:30 AGENDA/MAGAZINE
14:30 AGENDA/MAGAZINE	14:00 MIDDAY NEWS	14:00 MIDDAY NEWS	13:47 NEIGHBORHOOD NEWS	13:47 NEIGHBORHOOD NEWS	14:00 MIDDAY NEWS	14:35 AGENDA/MAGAZINE
15:00 NEWS	14:30 AGENDA/MAGAZINE	14:30 AGENDA/MAGAZINE	14:00 MIDDAY NEWS	14:00 MIDDAY NEWS	14:30 AGENDA/MAGAZINE	15:00 NEWS
15:05 AGENDA/MAGAZINE	15:00 NEWS	15:00 NEWS	14:30 AGENDA/MAGAZINE	14:35 AGENDA/MAGAZINE	14:35 AGENDA/MAGAZINE	15:05 AGENDA/MAGAZINE
16:35 MOVIE*	15:05 AGENDA/MAGAZINE	15:05 AGENDA/MAGAZINE	15:00 Noticies	19:30 AGENDA (ENGLISH)	21:30 EVENING NEWS	15:30 AGENDA/MAGAZINE
19:35 AGENDA/MAGAZINE	21:00 NEWS	21:00 NEWS	15:05 AGENDA/MAGAZINE	19:35 MAGAZINE	22:00 MOVIE NIGHT*	15:35 AGENDA/MAGAZINE
21:00 NEWS	21:05 INTERVIEW	21:05 INTERVIEW	19:30 AGENDA (ENGLISH)	21:05 INTERVIEW	23:45 HOME VIDEOS	16:00 NEWS
21:05 INTERVIEW	21:30 EVENING NEWS	21:30 EVENING NEWS	19:35 AGENDA/MAGAZINE	21:30 EVENING NEWS	0:15 CLOSING CREDITS	16:05 AGENDA/MAGAZINE
21:30 EVENING NEWS	22:00 NEW RELEASES	22:00 NEW RELEASES	21:00 NEWS	22:00 NEW RELEASES	0:20 SCREEN SAVER	21:00 NEWS
22:00 NEW RELEASES	22:30 ART DEBATE	22:30 DOCUMENTARY	21:05 INTERVIEW	22:30 MOVIE NIGHT*		21:05 AGENDA/MAGAZINE
22:30 MUSIC NIGHT DOC	0:00 EXPERIMENTAL SHOW	0:10 EXPERIMENTAL SHOW	21:30 EVENING NEWS	0:15 EXPERIMENTAL SHOW		21:30 EVENING NEWS
23:00 MUSIC NIGHT DOC	0:05 CLOSING CREDITS	0:15 CLOSING CREDITS	22:00 NEW RELEASES	0:20 CLOSING CREDITS		22:00 SPORTS NEWS
0:15 EXPERIMENTAL SHOW	0:15 SCREEN SAVER	0:20 SCREEN SAVER	22:30 DEBATE	0:30 SCREEN SAVER		22:40 SPORTS DOCUMENTARY
0:20 CLOSING CREDITS			23:40 EXPERIMENTAL SHOW			23:40 SPORTS NEWS
0:25 SCREEN SAVER			23:45 XAT TV (WEB DEBATE)			0:20 CLOSING CREDITS
			SCREEN SAVER			0:30 SCREEN SAVER

MON 5/28/2001	TU 5/29/2001	WED 5/30/2001	THU 5/31/2001	FRI 6/1/2001	SAT 6/2/2001	SUN 6/3/2001
9:35 MAGAZINE	9:05 MAGAZINE	9:05 MAGAZINE	9:05 MAGAZINE	9:35 MAGAZINE	9:35 NEWS (FOREIGNERS)	9:35 NEWS (FOREIGNERS)
13:00 SPECIAL DOCUMENTARY	13:35 NEIGHBORHOOD NEWS	13:35 NEIGHBORHOOD NEWS	13:35 NEIGHBORHOOD NEWS	10:00 CITY HALL SESSION	13:35 NEWS (FOREIGNERS)	10:05 MAGAZINE
14:30 MIDDAY NEWS	13:47 NEIGHBORHOOD NEWS	13:47 NEIGHBORHOOD NEWS	13:47 NEIGHBORHOOD NEWS	14:00 MIDDAY NEWS	14:00 MIDDAY NEWS	13:35 NEWS (FOREIGNERS)
15:05 MAGAZINE	14:00 MIDDAY NEWS	14:00 MIDDAY NEWS	14:00 MIDDAY NEWS	14:35 MAGAZINE	14:30 MAGAZINE	14:00 MIDDAY NEWS
19:15 SPECIAL DOCUMENTARY	14:35 MAGAZINE	14:35 MAGAZINE	14:35 MAGAZINE	20:00 NEWS	21:00 EVENING NEWS	14:35 MAGAZINE
21:05 INTERVIEW	21:05 EVENING NEWS	15:35 LIVE MUSIC	21:05 INTERVIEW	20:05 FLASH FLASH BOX	22:05 ART SHOW	19:30 AGENDA (ENGLISH)
21:30 EVENING NEWS	22:05 NEW RELEASES	16:05 MAGAZINE	21:30 EVENING NEWS	20:35 MAGAZINE	22:35 MOVIE*	19:35 MAGAZINE
22:04 WEATHER NEWS	22:35 TALK SHOW	21:05 INTERVIEW	22:05 FLASH FLASH BOX	21:05 INTERVIEW	0:05 HOME VIDEOS	21:00 EVENING NEWS
22:05 NEW RELEASES	0:10 EXPERIMENTAL SHOW	21:30 EVENING NEWS	22:35 DEBATE	21:30 EVENING NEWS	0:30 CLOSING CREDITS	22:05 SPORT NEWS
22:35 LIVE MUSIC	0:15 DAILY SCIENCE	22:05 NEW RELEASES	0:05 EXPERIMENTAL SHOW	22:05 NEW RELEASES		23:00 SPORT DOCUMENTARY
23:10 MUSIC SHOW		22:35 NIGHT DOCUMENTARY	0:10 XAT BTV	22:35 NIGHT DOCUMENTARY		
		23:00 NIGHT DOCUMENTARY	0:25 CLOSING CREDITS	0:20 EXPERIMENTAL SHOW		
		23:50 SHORT MOVIES*	0:30 SCREEN SAVER			

Table 1. Station Entry Between 1996 and 2002

	(1)	(2)	(3)	(4)
Dep Var:	**# entrants**	**# entrants**	**ln(1+ # en)**	**ln(1+ # en)**
PP Max Votes?	0.218***	0.214***	0.089***	0.086***
	(0.065)	(0.065)	(0.030)	(0.030)
Population (000s)	0.003***	0.003***	0.001***	0.001***
	(0.001)	(0.001)	(0.0002)	(0.0002)
Constant	0.463***	0.465***	0.335***	0.336***
	(0.025)	(0.025)	(0.015)	(0.015)
Year FE	No	Yes	No	Yes
Observations	1,135	1,135	1,135	1,135
R-squared	28%	28.5%	13%	14.5%

Note: Observations are at the city level. We define entrant as a station entering after 1996. PP Max Votes is a dummy that takes value 1 if PP was most voted party in the previous municipal election.
Standard errors in parentheses clustered at the city level.
*** p<0.01, ** p<0.05, * p<0.1.

Table 2. Summary Statistics

Variable	Obs	Mean	Std Dev	Min	Max
% Content In-house	1187	0.69	0.30	0	1
Population (000s)	1172	150.23	431.38	1.08	3016.79
No Stations Comp	1187	4.42	3.32	1	17
Weekly Hours	1067	101.26	61.83	1	168
Adv Prices	761	11770.17	17507.74	0	130000
Belongs to Network?	1187	0.60	0.49	0	1
Private?	1167	0.80	0.40	0	1
Over 30% PP Votes?	1172	0.31	0.46	0	1
PP Max Votes?	1172	0.41	0.49	0	1
PSOE Max Votes?	1172	0.35	0.48	0	1
CiU Max Votes?	1172	0.06	0.23	0	1

This table shows summary statistics of all variables used in this paper and across years. Advertising prices are measured in pesetas (1 Euro = 166 Pesetas). Dummy "Over 30% PP Votes?" measured in 1995 (1991 municipal elections results).

Table 3. OLS Regressions of % Content In-House on Number of Stations Broadcasting into a City

	(1)	(2)	(3)	(4)	(5)
Dep Var:	**% Content In-house**				
No Stations Comp	-0.001	0.001	0.009*	0.007	-0.001
	(0.004)	(0.005)	(0.005)	(0.008)	(0.008)
Population (000s)	0.017	0.008	-0.025	0.397	-0.600
	(0.018)	(0.020)	(0.028)	(0.445)	(0.480)
Belongs to Network?	-0.019	-0.014	0.006	0.017	-0.016
	(0.022)	(0.022)	(0.022)	(0.039)	(0.053)
Private?	-0.161***	-0.163***	-0.128***	-0.086*	-0.167
	(0.023)	(0.023)	(0.022)	(0.047)	(0.118)
Constant	0.832***	0.822***	0.761***	0.673***	0.922***
	(0.025)	(0.026)	(0.031)	(0.076)	(0.134)
Year FE	No	Yes	Yes	Yes	Yes
Province FE	No	No	Yes	No	No
City FE	No	No	No	Yes	No
Station FE	No	No	No	No	Yes
Observations	1,152	1,152	1,152	1,152	1,152
R-squared	0.05	0.06	0.18	0.61	0.90

Robust standard errors in parentheses clustered at the city level.
*** p<0.01, ** p<0.05, * p<0.1

Table 4. DiD for 1996 to 1999 with Various Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Var:	**% Content In-house**						
Post Law?*Over 30% PP?	-0.126**	-0.126**	-0.143***	-0.143	-0.182	-0.182*	-0.189**
	(0.050)	(0.050)	(0.050)	(0.094)	(0.167)	(0.098)	(0.075)
Over 30% PP Votes?	0.025	0.051	0.091*				
	(0.044)	(0.043)	(0.052)				
Post Law?	0.068**	0.061**	0.071**	0.050	0.105	0.105	0.086
	(0.031)	(0.031)	(0.032)	(0.063)	(0.109)	(0.064)	(0.053)
Population (000s)		0.002	-0.008	7.460	6.080	6.080	1.710
		(0.016)	(0.026)	(28.500)	(9.440)	(5.540)	(1.320)
Belongs to Network?		-0.042	-0.022	-0.076	-0.011	-0.011	0.020
		(0.026)	(0.027)	(0.071)	(0.138)	(0.081)	(0.051)
Private?		-0.142***	-0.096***	-0.005	0.026	0.026	-0.148
		(0.027)	(0.025)	(0.055)	(0.150)	(0.088)	(0.129)
Constant	0.681***	0.814***	0.752***	-0.364	-0.252	-0.522	0.457*
	(0.028)	(0.034)	(0.036)	(4.248)	(1.399)	(1.058)	(0.272)
Province FE	No	No	Yes	No	No	No	No
City FE	No	No	No	Yes	No	No	No
Station FE	No	No	No	No	Yes	Yes	Yes
Sample	All 1996 and 1999 obs	All 1996 and 1999 obs	All 1996 and 1999 obs	All 1996 and 1999 obs	All 1996 and 1999 obs	Only obs both 1996 and 1999	Only obs both 1996 and 1999 or 2002
Observations	587	574	574	574	574	197	277
R-squared	0.02	0.07	0.26	0.73	0.91	0.72	0.68

Note: DiD regressions with observations from 1996 and 1999, before and after regulation change.
Robust standard errors in parentheses clustered at the city level. *** p<0.01, ** p<0.05, * p<0.1

Table 5. DiD for 1996 to 1999 - Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)
Dep Var:	**% Content In-house**					
Post Law?*Over 30% PP?	-0.184*	-0.179	-0.173*	-0.145***	-0.144*	-0.173***
	(0.095)	(0.110)	(0.100)	(0.056)	(0.083)	(0.046)
Over 30% PP Votes?				0.104		0.120***
				(0.258)		(0.045)
Post Law?	0.0885	0.0982	0.112*	0.062*	0.065	0.111***
	(0.066)	(0.072)	(0.063)	(0.036)	(0.052)	(0.028)
Population (000s)	0.034	0.020	0.006	0.009	-0.005	0.00003
	(0.028)	(0.032)	(0.026)	(0.017)	(0.025)	(0.00003)
Belongs to Network?	-0.058	-0.080	-0.025	-0.076*	-0.018	0.025
	(0.096)	(0.091)	(0.107)	(0.043)	(0.086)	(0.027)
Private?	0.002	0.008	-0.020	-0.002	-0.065	-0.091***
	(0.068)	(0.067)	(0.082)	(0.033)	(0.077)	(0.025)
Constant	-5.571	-1.048	0.056	0.256	1.393	0.550***
	(5.064)	(2.898)	(2.800)	(1.240)	(3.117)	(0.043)
Fixed Effects	City	City	City	City	City	Province
Sample	Only obs both 1996 and 1999	Only obs both 1996 and 1999	Only obs both 1996 and 1999	All 1996 &1999 obs	Only obs both 1996 and 1999	All 1996 & 1999 obs
Obs Unit & Correction	Station, Sample A	Station, Sample B	Station, Sample C	Station, Heckman	City	City, Heckman
Observations	190	179	191	1,534	252	1,064
R-squared	0.67	0.70	0.68		0.68	

Notes: DiD regressions with observations from 1996 and 1999, before and after regulation change. Sample A restricts all observations to be in the same support of treated stations, sample B restricts all obs to be in the common support of treated and control stations, and sample C only restricts according to population. Heckman correction in columns (4) and (6) is done using other demographic variables such as purchasing weight of the city, mall space, motor vehicles, bank offices, and survival profiles of each station. Robust standard errors in parentheses clustered at the city level. *** p<0.01, ** p<0.05, * p<0.1

Table 6. 2SLS Results for % Content In-House with 1999-2002 Data Set

	(A)	(1)	(B)	(2)
Sample		1999-2002		
	1st Stage	2SLS	1st Stage	2SLS
Dep Var:	**No Stations**	**% In-House**	**No Stations**	**% In-House**
No Stations Comp		-0.041**		-0.048*
		(0.019)		(0.029)
Population (000s)			4.241***	0.211
			(0.171)	(0.129)
Belongs to Network?			-0.455**	-0.0343
			(0.211)	(0.029)
Private?			0.747***	-0.115***
			(0.224)	(0.040)
PP Max Votes?	0.856**		-0.116	
	(0.412)		(0.287)	
PSOE Max Votes?	-.651**		-0.686**	
	(0.277)		(0.270)	
CiU Max Votes?	-1.750***		-1.422***	
	(0.297)		(0.291)	
Constant	4.557***	0.881***	4.020***	0.994***
	(0.244)	(0.080)	(0.281)	(0.105)
Observations	1,014	1,014	995	995
R-squared	0.06		0.34	
F Excl Instr	11.63		7.20	

Note: Columns (A) and (B) are first-stage regressions of (1) and (2) respectively. Instrumental variables are dummies for whether PP, PSOE or CiU were the political forces with the maximum amount of votes in the 1991 election (for census year 1996), the 1995 election (for census year 1999), and the 1999 election (for census year 2002). Clustered standard errors in parentheses at the city level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. 2SLS Results for % Content In-House with 1999-2002 Data Set - Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)
Dep Var:	**% In-House**					
No Stations Comp	-0.054*	-0.049	-0.046	-0.046*	-0.165**	-0.153***
	(0.031)	(0.035)	(0.032)	(0.028)	(0.067)	(0.059)
Population (000s)	0.0003	0.0005	0.0003	0.0002	0.001**	0.001**
	(0.0002)	(0.0004)	(0.0003)	(0.0001)	(0.0003)	(0.0003)
Belongs to Network?	-0.048	-0.052	-0.037	-0.026	-0.120**	-0.110**
	(0.032)	(0.036)	(0.031)	(0.028)	(0.058)	(0.052)
Private?	-0.105**	-0.128***	-0.122***	-0.113***	-0.065	-0.081
	(0.041)	(0.035)	(0.038)	(0.039)	(0.065)	(0.057)
Mills Ratio				-0.112**		-0.176**
				(0.056)		(0.081)
Constant	1.018***	0.997***	0.983***	1.057***	1.403***	1.473***
	(0.110)	(0.121)	(0.111)	(0.111)	(0.224)	(0.234)
Fixed Effects	City	City	City	City	City	Province
Obs Unit & Correction	Station, Sample A	Station, Sample B	Station, Sample C	Station, Heckman	City	City, Heckman
Observations	973	932	975	995	734	734
R-squared	0.26	0.24	0.20	0.35	0.14	0.15
F Excl Instr	6.73	3.73	5.15	7.19	3.51	3.99

Note: First-stage regressions of all specifications are omitted in interest of space. First-stage R-squared and F-statistics are reported for each specification. Instrumental variables are dummies for whether PP, PSOE or CiU were the political forces with the maximum amount of votes in the 1991 election (for 1996), the 1995 election (for 1999), and the 1999 election (for 2002). Sample A restricts all observations to be in the same support of treated stations, sample B restricts all obs to be in the common support of treated and untreated stations, and sample C only restricts according to population. Mills ratio was calculated through Heckman correction in columns (4) and (6) using other demographic variables such as purchasing weight of the city, mall space, motor vehicles, bank offices, and survival profiles of each station.
Clustered standard errors in parentheses at the city level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8. DiD and 2SLS Results for Weekly Hours on Air per Station

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	1996-1999	1996-1999	1996-1999	1996-1999	1999-2002	1999-2002
	DiD	DiD	DiD	DiD	2SLS	2SLS
Dep Var:	**Weekly Hours**					
Post Law?*Over 30% PP?	29.67***	30.10***	25.58**	24.55		
	(9.90)	(10.05)	(10.81)	(17.82)		
Over 30% PP?	-9.36	-16.79*	-10.22			
	(8.87)	(9.25)	(10.73)			
Post Law?	-1.39	-4.08	-4.05	6.96		
	(5.93)	(6.00)	(6.38)	(12.14)		
No Stations Comp					22.39***	18.91**
					(7.34)	(7.59)
Population (000s)		0.01	0.02**	-2.46		-0.06*
		(0.01)	(0.01)	(4.56)		(0.03)
Belongs to Network?		-0.94	5.27	-3.86		17.79**
		(5.50)	(5.84)	(14.36)		(7.79)
Private?		33.95***	27.15***	-0.05		26.99**
		(6.08)	(6.67)	(27.67)		(10.86)
Constant	81.51***	57.53***	57.21***	476.30	-0.47	-6.93
	(5.46)	(6.92)	(8.17)	(735.50)	(30.33)	(27.40)
Fixed Effects	No	No	Province	City	No	No
Observations	547	529	529	529	963	944
R-squared	0.02	0.08	0.22	0.76	0.06	0.36
F Excl Instr					13.21	9.49

Note: Columns (1) to (4) are DiD regression with Weekly Hours as dependent variable. Columns (5) and (6) are IV regressions where instrumental variables are dummies for whether PP, PSOE or CiU were the political forces with the maximum amount of votes in the 1991 election (for census year 1996), the 1995 election (for 1999) and the 1999 election (for 2002). First-stage regressions are not reported here in the interest of space, but we report their R-squared and F-statistic. Clustered standard errors in parentheses at the city level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9 . DiD and 2SLS Regressions of Advertising Prices on Number of Stations

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	1996-1999	1996-1999	1996-1999	1996-1999	1999-2002	1999-2002
	DiD	DiD	DiD	DiD	2SLS	2SLS
Dep Var:	**Adv Prices**					
Post Law?*Over 30% PP?	-727	-1141	-1373	-2944		
	(3480)	(3601)	(3755)	(7081)		
Over 30% PP?	1228	-932	363			
	(3801)	(3489)	(3173)			
Post Law?	493	1098	924	2050		
	(2010)	(1994)	(2060)	(4604)		
No Stations Comp					-640	-3178*
					(1440)	(1900)
Population (000s)		10.27***	9.50***	-9.77		24.54***
		(1.268)	(2.378)	(1543)		(8.089)
Belongs to Network?		522	673	2224		-4732**
		(1652)	(1918)	(5400)		(2149)
Private?		4104**	4483*	6140		5251*
		(2029)	(2420)	(5746)		(2857)
Constant	11300***	6227**	5678**	6302	14639**	21234***
	(1860)	(2439)	(2767)	(264581)	(6519)	(7383)
Fixed Effects	No	No	Province	City	No	No
Observations	405	397	397	397	661	646
R-squared	0.02	0.08	0.22	0.76	0.06	0.30
F Excl Instr					13.21	9.25

Note: Columns (1) to (4) are DiD regression with Weekly Hours as dependent variable. Columns (5) and (6) are IV regressions where instrumental variables are dummies for whether PP, PSOE or CiU were the political forces with the maximum amount of votes in the 1991 election (for census year 1996), the 1995 election (for 1999) and the 1999 election (for 2002).
First-stage regressions are not reported here in the interest of space, but we report their R-squared and F-statistic.
Clustered standard errors in parentheses at the city level. *** p<0.01, ** p<0.05, * p<0.1.