

‘Make or Buy’ as Competitive Strategy: Evidence from the Spanish Local TV Industry

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Abstract

In this paper we empirically investigate whether changes in product market competition affect firm boundaries – the perennial make-or-buy problem. Exploiting regulation-induced shocks to entry barriers and differences in regulation enforcement across cities to obtain a source of exogenous variation in product-market 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. We also find 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 and stations belonging to a network tend to outsource more.

JEL Codes: D22, L22, L24, L82

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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). Much less is known, however, about the causes of this phenomenon. An explanation to the increasing adoption of new organizational structures and redefinition of firm boundaries that is gathering increasing consensus (see Bloom and van Reenen, 2007; Bloom et al., 2009; and Bresnahan and Levin, 2012) relates these changes to changes in the firms' operating environments – prominently, changes in competition in product markets brought about by, e.g., local deregulation and international trade liberalization.

In this paper we empirically investigate whether changes in product market competition affect firm boundaries – Coase's (1937) perennial make-or-buy problem. Exploiting regulation-induced shocks to entry barriers and differences in regulation enforcement across cities to obtain a source of exogenous variation in product-market competition, we establish a negative causal effect of competition on vertical integration in the setting of the Spanish local television industry between 1995 and 2002.

The question is important because both organizational structure and product-market competition have been recently identified as important drivers of widely-documented, large and persistent differences in firm-level productivity (see Syverson, 2011). Several papers have looked at the relationship between competition and productivity (see, for instance, MacDonald, 1994; Nickell, 1996; Nickell et al., 1997; Schmitz, 2005; and Syverson, 2004), while others have related organization and productivity (e.g., Bloom and Van Reenen, 2007; Maksimovic and Phillips, 2002; and Schoar, 2002). In particular, Forbes and Lederman (2010) and Hortaçsu and Syverson (2007) document how vertical integration positively affects firm-level productivity in airlines and the cement industry.

Hortaçsu and Syverson (2009) extend this result to most private non-agricultural establishments in the US, but Lu and Tao (2011) find a negative effect of integration on productivity in Chinese manufacturing firms. Regardless of sign, all these studies provide evidence that vertical integration and productivity are related.

Product-market competition can affect productivity directly or by inducing productivity-enhancing changes in organizational structures (Syverson, 2011). Studies documenting a relationship between competition and firm organization include Bloom et al. (2010), Bloom and Van Reenen (2007, 2010), and Nickell et al. (2001), but we are not aware of many previous empirical studies explicitly linking product-market competition and firm boundaries.¹ Exceptions are early studies by Levy (1985) and Tucker and Wilder (1977) reporting a positive correlation between vertical integration and industry concentration in US manufacturing. More recently, Bayo-Moriones et al. (2012) have found a positive correlation between service outsourcing and competition in survey data from Spanish manufacturing.

While several correlations are solidly documented, much research in this question is still needed to establish causality. This paper contributes to this agenda by proposing a credible identification strategy to show that increased competition causes a reduction in the degree of vertical integration. 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 strategy, they find that increased competition leads firms to flatten, i.e., reduce depth (the number of management levels) and increase breadth (the CEO's span of control).

To guide our empirical analysis, we first provide a simple model that uses a circular model *à*

¹Incidentally, we note that the extensive survey of Lafontaine and Slade (2007) on vertical integration does not even include a section directly addressing this relationship between competition and integration.

la Salop where firms (TV stations) enter a market and then decide whether to make or buy their content and the quality of that content. Given that the Salop model takes station location as given, the degree of competition is then determined by the endogenous number of stations, which in turn depends on market size and the fixed cost of entry. Our model shows that firms facing a larger number of competitors (due to lower entry costs) and firms in larger markets outsource more.

To test these predictions, we use a data set composed by three annual censuses of Spanish local television stations published in the years 1996, 1999 and 2002. The data report, for each station, 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 of 1995, when the first industry regulation was passed. Second, 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. We use a difference-in-differences strategy to exploit the first source of variation, as stations passed from being in an unregulated to a regulated industry, to examine the relation between vertical integration and competition. On the other hand, we run traditional 2SLS regression models to exploit the latter source of variation, using the political color of a city (for whether the existing law was enforced) to instrument competition.

We begin our empirical section by presenting OLS regressions that show no statistically significant relation between the percentage of content produced internally by a station and the level of competition. Once we exploit our two sources of exogenous variation, our empirical results are consistent with the simple predictions from our model. We also find that private (as opposed to government-owned) stations are more likely to outsource content production, and that (if anything)

whether a station is a member of local TV station network has a marginally negative significant effect on their make-or-buy decisions.

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. In Section 3, we introduce a model of monopolistic competition with endogenous quality differentiation that we use to draw hypotheses and testable implications. Section 4 presents the data. In section 5 we describe our empirical methodology, show and discuss our findings. Section 6 concludes.

2 Institutional details

This section builds on information obtained in personal interviews with industry managers and previous work (Gil and Riera-Crichton, 2012; and Gil and Nishida, 2012).

2.1 European versus American model of local television

To understand how competition in the Spanish local television industry works, we first want to highlight the main differences between television markets in Europe and in the United States. The US market has been mainly characterized by little government intervention and verticality, whereas the European markets have shown strong government intervention and lack of verticality. In the US, stations in big markets were the first to broadcast content and after a while dominated the industry. As (smaller) stations were created in smaller markets, these grew dependent on the dominant stations because the latter were the main providers of content. Eventually, these relationships of content exchange were so frequent that dominant and local stations formed networks. Nowadays, local stations are affiliated to the networks, and even though the network directly provides some of their content, they still produce a reasonable share of their programming that adjusts to local preferences.

The US case differs much from the European experience. In Europe, each country regulated and monitored its own TV industry. Entry was highly regulated and the presence of local TV stations was limited. In fact, most countries entered the 1980s with only government-owned and run TV stations and, at best, a few regional stations broadcasting content for a small part of the national territory. Given the dominant role played by national and regional stations, there was almost no room left for local stations, to the point that regulation did not even recognize them as legal entities. In other words, local stations were neither legal nor illegal because no regulation prohibited or acknowledged their existence.

2.2 Local television in Spain

Badillo (2005) defines 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) invisible deregulation (1996-2002). Until the mid-1980s Spain had just two TV stations, TVE and TVE2. The former was the main station and the latter served as window to minority content and local news broadcast from small satellite stations that had little independence in their programming decisions. The new democratic regime in Spain consolidated during the mid-1980s and, as a consequence, the central government granted the right to its regional counterparts to develop regional stations. Still at that point, 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. Since regulation at the time neither recognized nor prohibited these local TV stations, police and the judicial often did not know how to apply the law or what penalties to impose as a number of interventions and cases made it to court (Badillo, 2003).

Many local stations were created after those years and, as their economic and cultural sig-

nificance grew, the need for a legal framework became clear to politicians and regulators.² 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, 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 of 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, this law limited the market of local stations to their city.³ 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. Given the nature of the 1995 law and the discussions surrounding its passing, it seems fair to assume that the new regulation was unrelated to vertical integration decisions – indeed, neither the law nor any of the proposals that circulated contained any disposition concerning the production of content.

In March of 1996, the PSOE unexpectedly lost the national election to the right-winged Partido Popular (PP), which had a 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 which lifted the restrictions on number of stations and private ownership and management introduced by the 1995 law. Rather than insisting on a new law, the PP government took the alternative route of not implementing the PSOE law – what Badillo (2005)

² 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 may seem low, regional stations at the time captured 4.2%, 3.7%, and 4.2% in those three years.

³ 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.

has termed a “silent deregulation”. Badillo (2003) documents the lack of enforcement of the 1995 law with anecdotal evidence. He describes instances in which enforcement was selective depending on whether local TV stations were located in a city ruled by a PSOE or PP mayor (the enforcement of the law was definitely laxer in the last case). Other regions, such as Catalonia, chose to start developing the law themselves with little support from the central government. Figure 1 compiles information from Badillo (2005) showing entry of new stations between 1997 and 2002, which should not have occurred according to the 1995 law. Although a moderate amount of sanctioning activity (files opened by the administration as well as closed cases) occurred between 1997 and 1999, such activities winded down a lot after the PP won the election in the year 2000 by an unexpected margin.

[FIGURE 1 ABOUT HERE]

The 2000 election changed the landscape of the regulation of local TV stations quite a bit. After the election, the PP gained full control of Congress and decided to push forward the 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 were silently implemented (and affected stations’ behavior) since the 2000 election. We observe further evidence of this silent deregulation in the emergence of vertical networks already in 2001 and 2002 (with Localia and Vocento), even though the 1995 law clearly prevented stations from being part of any network (horizontal or vertical). Moreover, as Table 1 shows, violations to the limit on number of stations was far more common in cities ruled by the PP – especially after 2000. We note once again that this liberalization process undertaken by the PP was not related to vertical integration.

[TABLE 1 ABOUT HERE]

In this paper, we will exploit these changes in regulation from 1995 to 2002 to analyze how changes in market structure across cities and years affected the degree of vertical integration in the Spanish local TV industry. But before turning to that matter, we present in the following section a model of monopolistic competition with endogenous quality that we will use to derive testable hypotheses that we will later take to the data.

3 Make-or-buy choices in market equilibrium

We view this as an empirical paper and therefore we do not attempt a rigorous theoretical modeling. However, to guide the empirical analysis, we develop in this section a simple model of the integration decision in market equilibrium.⁴

A TV station is not different from any other firm in any other industry in that it maximizes profits. To do so, a station has more than one revenue source. On the one hand, television stations produce content that they sell to television consumers or viewers. On the other hand, stations sell television space to advertisers. Since viewers value television content free of advertising and advertisers value the number of television viewers, stations balance and manage revenue flows obtained from each source to maximize total profits. Some stations do not charge consumers to view their content to maximize the number of viewers, while selling advertisement space to advertisers at high prices. Other stations choose to charge a subscription fee to consumers and limit the amount of advertising.

In order to attract both viewers and advertisers, stations carefully choose the content of their programming. Programs may be outsourced or produced in-house. In the former case, these could

⁴Previous models of integration in market equilibrium include Aghion et al (2006), Conconi et al (2012), De Bettignies (2006), Gal-Or (1999), Grossman and Helpman (2002), and McLaren (2000).

be old programs produced in the past and now recycled, or content outsourced to an independent producer and specifically produced for the station’s audience. In the latter case, the content may be produced internally by the programming division.

To model the interaction and competition among local TV stations in Spain during the period under study (1995 to 2002), we assume that local TV stations broadcast their content and maximize profits through maximization of audience.⁵ They sell audience to advertisers at a competitive price p that we take as given. On the other hand, local TV stations compete for audience with other stations through the provision of content (and its quality) that they give away. This content can be either produced in-house or outsourced to an independent content producer. We model next the interaction between the outsourcing decision and competitive pressures among local TV stations.

3.1 The economic setup

A local TV station (the principal) needs some content to broadcast. For content production, it must contract with a content producer (the agent). Either the principal or the agent controls the facilities used to develop and produce content (or, equivalently, the right to use that content). In the first case, the agent is an employee of the principal, and therefore we will speak of in-house production or vertical integration. Under in-house production, the TV station “makes” its own content. Alternatively, the agent can be an independent content producer, with whom the TV station contracts at arm’s length and from which the TV station “buys” content. In this case, we will speak of non-integration, outsourcing, or contracting out production.

The details of the relationship between the TV station and the content producer are borrowed from Hart et al. (1997). The principal and the agent can write a contract specifying some basic

⁵For the sake of simplicity, we initially leave out of the model and analysis stations that do not entirely finance content through advertising such as pay-per-view and government-owned local TV stations. These only represent about 20% of firms in our sample.

content to be provided at price P_0 . This basic content is characterized by a certain quality q_0 and cost c_0 . The content provider can invest resources to improve the quality or reduce the cost of the content, without breaching the formal contract, but neither of these innovations is ex-ante contractible. Only the owner of the right to use the content can approve any innovation to the basic content specified in the contract. The modified content is characterized by quality $q_i = q_0 - b(e_i) + \beta(i_i)$ and costs $c_i = c_0 - c(e_i) + e_i + i_i$ to produce (costs are borne by the agent in any case), where e_i, i_i denote the agent's effort in reducing costs and improving quality, $c(e_i) \geq 0$ is the resulting cost reduction, $b(e_i) \geq 0$ is the damage to quality from cost-reducing activities, and $\beta(i_i) \geq 0$ is the increase in quality (net of costs) brought about by the quality innovation.⁶ Total effort costs for the agent are $e_i + i_i$. We assume e, i, c, b , and β are observable by the principal and agent, but not verifiable by a third party. Similarly, local TV stations are not able to observe the realization of these variables from other stations but they can observe realized final qualities. Both principal and agent are risk neutral and face no wealth constraints. After content is produced, TV stations broadcast their content (i.e., charge a zero price to viewers) and compete for viewers, while the market for advertising is perfectly competitive.

3.2 Timing

Summing up, the timing of the game is as follows:

1. All firms make their entry decisions simultaneously.
2. All firms simultaneously sign contracts with their content providers, and make their integration choices.
3. Content producers make their effort choices.

⁶Following Hart et al. (1997), we make standard assumptions on b, c , and β : $b(0) = 0, b' \geq 0, b'' \geq 0; c(0) = 0, c'(0) = \infty, c' > 0, c'' < 0, c'(\infty) = 0; \beta(0) = 0, \beta'(0) = \infty, \beta' > 0, \beta'' < 0, \beta'(\infty) = 0; c' - b' \geq 0$.

4. Each TV-producer pair bargain over modifications to the basic content.
5. Firms compete in the product market to attract viewers and advertisers.
6. Consumers choose which TV station they view and payoffs accrue.

3.3 The industry and the market

We consider a monopolistically competitive industry with differentiated brands, composed of a large number of identical potential firms (i.e., local TV stations). The product space is a circle with a perimeter equal to one (Salop, 1979). In this market, n firms (indexed by $i = 1, \dots, n$) enter and choose symmetric locations – the distance between firms is then $\frac{1}{n}$. The cost of entry is f , and there is free entry and exit.

Consumers are located uniformly around the circle with mass m . They have unit demands and incur a transport cost td^2 when viewing content from a TV station located at distance d from their location.⁷ To focus on changes in n and f , we set the unit transport cost $t = 1$. Each consumer derives gross surplus $v + q_i$ when consuming the content broadcasted by firm i . We assume v is sufficiently large that all consumers turn on their TV sets – i.e., the market is always covered.

Formally:

ASSUMPTION 1: $v > \frac{1}{4}$.⁸

At date 5, all firms have set their qualities. Suppose firm i has quality q_i . A consumer located at a distance $z \in (0, \frac{1}{n})$ from firm i is indifferent between “purchasing” from firms i and $i + 1$ if

$$v + q_i - z^2 = v + q_{i+1} - \left(\frac{1}{n} - z\right)^2.$$

⁷As usual, the unit transport cost t could be interpreted as the utility loss consumers suffer from not consuming their preferred variety.

⁸Notice that this assumption implies that all consumers would watch TV even if quality were equal to zero and there were only one firm serving the market, and is stronger than necessary. It would suffice that $v + q_0 > \frac{1}{4n^2}$ holds for our results to go through.

Solving for z ,

$$z = \frac{1}{2n} + \frac{q_i - q_{i+1}}{2}n.$$

Analogously, for a consumer located at $z' \in (0, \frac{1}{n})$ from firm i between firms i and $i - 1$, we can compute

$$z' = \frac{1}{2n} + \frac{q_i - q_{i-1}}{2}.$$

The total demand faced by firm i is just m times $z + z'$, or

$$y_i = D_i(q_i, q_{-i}) = m\left(\frac{1}{n} + \frac{n}{2} [(q_i - q_{i+1}) + (q_i - q_{i-1})]\right).$$

If firm i expects its rivals to choose quality $E(q)$, its expected (gross) profits π_i are given by

$$\pi_i = pm \left[\frac{1}{n} + n(q_i - E(q)) \right], \tag{1}$$

where p is the price charged to advertisers per individual in the audience. The resulting expression for profits implicitly assumes that a station's revenues from advertising are proportional to its market share, and that (consistent with our knowledge of this industry) local TV stations are price takers in the advertising market.

3.4 Outsourcing versus in-house content production

When examining the make-or-buy decision in our model, we must place upper bounds on realized quality to obtain a symmetric interior equilibrium that ensures that each firm has only two effective (closest) competitors. Formally:

ASSUMPTION 2: $\max \{q_i\} - q_0 \leq \frac{1}{\bar{n}^2}$.

Note that $\bar{n} = \frac{pm}{f}$ is the maximum equilibrium number of firms, and is obtained from the zero

profit condition $\frac{pm}{n} - f = 0$, where the first term on the left-hand side is each firm's maximum expected profit in a symmetric equilibrium. The assumption ensures that it is not profitable for firm i to sell to customers located further from it than its immediate neighbors, and that the quality of the modified good cannot be much better than contractible quality.

At date 4 the parties bargain over the modifications to the basic content. We assume they divide the gains from renegotiation according to the Nash bargaining solution: each party gets her disagreement payoff plus half of the surplus created. We begin by identifying the parties' disagreement payoffs under each governance structure.

Under vertical integration, since the principal owns the content, she can implement both innovations. Disagreement payoffs are

$$\begin{aligned} \text{Principal:} \quad & pm \left[\frac{1}{n} + n(q_0 - b(e) + \beta(i) - E(q)) \right] - P_0 + c(e) \\ \text{Agent:} \quad & P_0 - c_0 - e - i \end{aligned}$$

Under contracting out, the content producer does not need the approval of the TV station to implement changes to the basic content. In the absence of renegotiation, no quality innovation will take place (since the agent will not be paid for it), but it is in the content producer's interest to implement a cost reduction. Hence, disagreement payoffs in this case are

$$\begin{aligned} \text{Principal:} \quad & pm \left[\frac{1}{n} + n(q_0 - b(e) - E(q)) \right] - P_0 \\ \text{Agent:} \quad & P_0 - c_0 + c(e) - e - i \end{aligned}$$

3.4.1 Equilibrium under in-house provision

There are clearly no gains from renegotiation in this case, which hence does not take place. Anticipating this, the agent chooses to exert no effort; i.e., $e^{VI} = i^{VI} = 0$. The total surplus under integration is

$$S^{VI} = pm \left[\frac{1}{n} + n(q_0 - E(q)) \right] - c_0.$$

3.4.2 Equilibrium under outsourcing

The gains from renegotiation concern the quality innovation, and are given by $pmn\beta(i)$, which is split 50:50 through Nash bargaining. The parties' payoffs are

$$\begin{aligned} U_P^{NI} &= pm \left[\frac{1}{n} + n(q_0 - b(e) - E(q)) \right] - P_0 + \frac{pmn}{2}\beta(i) \\ &= pm \left[\frac{1}{n} + n \left(q_0 - b(e) + \frac{\beta(i)}{2} - E(q) \right) \right] - P_0 \\ U_A^{NI} &= P_0 - c_0 + c(e) - e - i + \frac{pmn}{2}\beta(i) \end{aligned}$$

The agent's problem is to maximize U_A^{NI} through his effort choices. The first-order conditions from that problem are

$$\begin{aligned} c'(e^{NI}) &= 1 \\ \frac{pmn}{2}\beta'(i^{NI}) &= 1 \end{aligned}$$

Note then that $e^{NI} > e^{VI}$ and $i^{NI} > i^{VI}$. This basically states that outsourcing content production is cheaper, but not necessarily of higher quality (because of quality-damaging cost reductions), than in-house production. When comparing efforts to the first-best solution, it is easy to show that $e^{NI} > e^{FB}$ and $i^{NI} < i^{FB}$. Under non-integration, the content producer engages in

too much cost reduction (because he neglects the negative impact on quality) and still invests too little in quality improvements (because the benefits must be shared with the TV station through bargaining).

The total surplus from the relationship under non-integration is

$$S^{NI} = pm \left[\frac{1}{n} + n(q_0 - b(e^{NI}) + \beta(i^{NI}) - E(q)) \right] - c_0 + c(e^{NI}) - e^{NI} - i^{NI}.$$

3.4.3 Integration decision

Let $\Delta \equiv S^{NI} - S^{VI}$.⁹ Then,

$$\Delta = pmn(-b(e^{NI}) + \beta(i^{NI})) + c(e^{NI}) - e^{NI} - i^{NI}.$$

where the value of Δ is independent of rivals' choices because all firms are symmetric in this model and therefore the equilibrium in organizational choices will also be symmetric, with all firms choosing either outsourcing or in-house production. Given this expression, a local TV station contracts out the provision of content if and only if $\Delta > 0$.

Doing standard comparative statics with parameters t , m and n , we have

$$\begin{aligned} \frac{\partial \Delta}{\partial m} &= pn(-b(e^{NI}) + \beta(i^{NI})) + (pmn\beta'(i^{NI}) - 1) \frac{\partial i^{NI}}{\partial m}; \\ \frac{\partial \Delta}{\partial n} &= pm(-b(e^{NI}) + \beta(i^{NI})) + (pmn\beta'(i^{NI}) - 1) \frac{\partial i^{NI}}{\partial n}; \end{aligned}$$

which could, in principle, be of either sign.

A sufficient condition to have unambiguous predictions for both effects is $-b(e^{NI}) + \beta(i^{NI}) \geq 0$,

⁹Notice that we focus on the total surplus of the relationship to determine the optimal organizational form. The price P_0 can always be used to allocate this surplus among the parties at date 2 without affecting incentives.

i.e., that the net effect of both effort types on quality is nonnegative. Under this condition, it is easy to show that

$$\begin{aligned}\frac{\partial \Delta}{\partial m} &> 0; \\ \frac{\partial \Delta}{\partial n} &> 0.\end{aligned}$$

In words, with a given (exogenous) market structure, stronger competition (through a larger number of rivals) leads to increased outsourcing of content production, and TV stations in larger markets tend to be less integrated. Since the number of firms is likely to depend on market size m and entry costs f , we analyze entry decisions next.

3.5 Entry decision

If we allow for free entry, firms enter the market until profits are driven down to the fixed cost of entry, f . The equilibrium number of firms in the market is thus given by a zero-profit condition:

$$\max \{S^{NI}, S^{VI}\} - f = 0,$$

which reflects the fact that each firm can optimally choose its organizational form after entering the market (hence the “max”; see Marin and Verdier, 2008).¹⁰

In a symmetric equilibrium in which local TV stations opt for in-house production of content (a VI -equilibrium), the equilibrium number of firms, n^{VI} , is the solution to

$$S^{VI} - f = 0,$$

¹⁰For simplicity, we treat n as a continuous variable.

or

$$pm \left[\frac{1}{n^{VI}} + n^{VI} (q_0 - E(q)) \right] - c_0 - f = 0.$$

Since $E(q) = q_0$ under vertical integration, we have

$$n^{VI} = \frac{pm}{c_0 + f}.$$

Clearly,

$$\begin{aligned} \frac{\partial n^{VI}}{\partial m} &> 0; \\ \frac{\partial n^{VI}}{\partial f} &< 0. \end{aligned}$$

This means that in a market with a symmetric integration equilibrium an increase in market size would increase the number of firms in equilibrium, and an increase in the fixed cost of entry would decrease the number of firms in equilibrium.

Similarly, in a symmetric equilibrium with firms choosing to contract out the production of content (a NI -equilibrium), the zero-profit condition is $S^{VI} - f = 0$, all firms have the same quality, and the equilibrium number of firms, n^{NI} , is given by

$$\frac{pm}{n} - c_0 + c(e^{NI}) - e^{NI} - i^{NI} - f = 0. \quad (2)$$

Applying the implicit function theorem to (2), it is straightforward to show that

$$\begin{aligned} \operatorname{sgn} \left(\frac{\partial n^{NI}}{\partial m} \right) &= \operatorname{sgn} \left(p + \frac{\beta'}{\beta''} \right); \\ \frac{\partial n^{NI}}{\partial f} &< 0. \end{aligned}$$

Note that $\frac{\partial n^{NI}}{\partial m} > 0$ if and only if $p > -\frac{\beta'}{\beta\sigma}$, i.e., if p is large enough, which we assume in what follows. This would particularly be true in large markets as advertisers will be willing to pay higher prices in more highly populated and more dense geographical areas.¹¹

With an endogenous market structure, stronger competition (through reduced entry barriers) leads to increased outsourcing of content production, and TV stations in larger markets tend to be less integrated:

$$\begin{aligned}\left.\frac{d\Delta}{dm}\right|_{VI} &= \frac{\partial\Delta}{\partial m} + \frac{\partial\Delta}{\partial n} \frac{\partial n^{VI}}{\partial m} > 0; \\ \left.\frac{d\Delta}{df}\right|_{VI} &= \frac{\partial\Delta}{\partial n} \frac{\partial n^{VI}}{\partial f} < 0.\end{aligned}$$

$$\begin{aligned}\left.\frac{d\Delta}{dm}\right|_{NI} &= \frac{\partial\Delta}{\partial m} + \frac{\partial\Delta}{\partial n} \frac{\partial n^{NI}}{\partial m} > 0; \\ \left.\frac{d\Delta}{df}\right|_{NI} &= \frac{\partial\Delta}{\partial n} \frac{\partial n^{NI}}{\partial f} < 0.\end{aligned}$$

In this particular setting, we are mostly interested in the effect of f on vertical integration, since entry costs were clearly affected by the regulatory changes we are focusing on. In that case, a reduction in entry costs unambiguously increases the number of firms in the market, which in turn increases the benefits of outsourcing. Finally, we also find no ambiguity on the effect of market size on vertical integration: larger markets attract more firms increasing the degree of competition and increasing the benefits from outsourced content.

We summarize the main predictions of the model in two hypotheses that we can take to the data later in the paper:

- Hypothesis 1: A reduction in entry barriers f increases the number of firms in the market

¹¹This will also be true when $-\frac{\beta'}{\beta\sigma} > 0$ is small enough and β displays high levels of concavity.

and makes outsourcing more likely.

- Hypothesis 2: Firms in larger markets (m large) are more likely to choose to outsource content production.

In the next section we present our data, which we will use to test our hypotheses.

4 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 hereafter) 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 2001.¹² According to the data, 881 stations were operating in 1995, 740 stations in 1998, and 898 in 2001. Figure 2 provides a timeline for census data collection, changes in regulation, and elections.

[FIGURE 2 ABOUT HERE]

To create each of these censuses, the AIMC sent questionnaires to each of the existing stations in each year and published the responses. 183 stations responded in 1996 while 457 and 645 responded in 1999 and 2002 respectively. 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 extent of vertical integration and make-or-buy decisions in content production for each station that

¹²AIMC did not include sporadic and random emission of television content but rather established entities that emit on a regular basis. AIMC also sent questionnaires to all stations in the census, asking questions regarding the stations' schedules, content, coverage areas, and other business-related issues. We do not use this information in this paper. Bayo-Moriones et al. (2012) describe the nature of that data further.

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 information at the city, province, and region level on population, unemployment rate, number of cars, and other similar variables.¹³ The census covers 3,209 cities, all of which at some point had 1,000 inhabitants or more. 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.

Table 2 provides summary statistics across years and cities. Information in this table shows that on average stations produce in-house 69% of their content and are located in cities receiving broadcast content from 4.4 stations. The average station locates in a city with 148,000 inhabitants. Also, 57% of the stations in the sample are located in cities where the PP scored 30% or more votes in the most recent municipal elections. Finally, 78% of the stations responding to the questionnaire are privately owned and 60% of them belong to a network.

[TABLE 2 ABOUT HERE]

Table 3 repeats the exercise in Table 2, breaking the sample by year. This table shows the average number of stations broadcasting into a city increased from census to census, beginning with 3.2 in 1996, up to 3.8 in 1999, and reaching 5.2 in 2002.¹⁴ This overall growth in the number of stations is mainly driven by two extremes: the number of cities with a monopoly station and those cities with five or more stations. The number of cities with two, three, or four stations remained rather stable during this period of time. At the same time, the percentage of in-house content grew from 69% to 72% between 1996 and 1999, and then fell back to just 67% in 2002.

[TABLE 3 ABOUT HERE]

¹³The data did not contain information on population for 1996, which we proxied with population levels of 1998.

¹⁴These qualitative changes remain unaltered when we consider the number of stations located in the same city, and the number of stations in the area covered by a station. The pairwise correlations between these variables are between 0.87 and 0.99.

Because the goal of this paper is to study the impact of changes in regulation between 1995 and 2002 on in-house content production due to changes in competition, an understanding of how market structure changed in that period on a city-by-city basis is useful. For this purpose, Tables 4 and 5 cross-tabulate the number of local stations per city and changes in this number for different years. Table 4 tabulates the number of local stations per city in 1995 and 2001. During the whole period, 2,464 cities started and finished with no stations. Of 3,209 total cities, 159 cities lost all stations and 183 cities went from no stations to a positive number of stations. Of the rest, 240 cities started and finished with the same positive number of stations, whereas 72 cities saw their number of stations increase and 88 saw it decrease.

[TABLE 4 ABOUT HERE]

Table 5 cross-tabulates changes in the number of stations between census years 1995-1998 and 1998-2001. This table shows the number of local stations remained constant between 1995 and 2001 for 2,629 cities. Only 21 cities saw their number of stations increase in both periods of time, whereas only 6 cities saw their number of stations decrease in both periods. Changes in the number of stations appear to have been relatively more frequent between 1995 and 1998 (14% of cities) than between 1998 and 2001 (8%).

[TABLE 5 ABOUT HERE]

The last source of data that we include in this paper is the electoral outcomes from the 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.¹⁵ These data are important because, as argued in Section 2.2, law enforcement varied with the political color of local government officials. As further evidence, consider Figures 3-6, where we have plotted the percentage of in-house produc-

¹⁵<http://www.infoelectoral.mir.es/min/>.

tion (Figure 3), number of stations (Figure 4), in-house production by year of entry (Figure 5), and entry (Figure 6) for stations grouped according to the political party ruling the city in which each is located. All figures point to a clear difference in the behavior of the variables between PP and non-PP markets, and suggest changes in behavior across time. Stations located in cities ruled by the PP face more entry of competing stations and outsource more content production than stations located elsewhere.

[FIGURES 3-6 ABOUT HERE]

In the next section, we exploit the variation illustrated in Figures 3-6 to analyze the effect of changes in product-market competition on vertical integration. We begin by describing in detail our empirical specifications, and then turn to the results of our estimations, which largely corroborate the story suggested by the above figures.

5 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.

5.1 OLS regressions with fixed effects

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:

$$VI_{ijt} = \alpha_0 + \alpha_1 Comp_{ijt} + \alpha_2 X_{ijt} + \gamma_j + \delta_t + u_{ijt}, \quad (3)$$

where VI_{ijt} is the percentage of content produced in-house by station i located in city j in year t ; $Comp_{ijt}$ is the number of stations that broadcast their content into city j in year t ; X_{ijt} are a number of controls and characteristics at the station and city level; and γ_j and δ_t are different market and year fixed effects.

Since this research is mostly interested in recovering α_1 , we focus on two main possible problems that could cause that $corr(u_{ijt}, Comp_{ijt}) \neq 0$ and therefore that the parameter of interest is estimated with a bias. The first possible problem is omitted-variable bias. There may be factors that are year or station specific that are unobservable to the econometrician, and correlated with $Comp_{ijt}$. This means that potentially the error term u_{ijt} could have a structure such that

$$u_{ijt} = r_{ij} + z_t + e_{ijt},$$

where r_{ij} are unobservable factors specific to station i and city j , z_t are unobservable factors specific to year t , and e_{ijt} is a normally independently and identically distributed error term. The problem appears when r_{ij} and z_t are correlated with $Comp_{ijt}$. In that case, the estimates of α_1 will be inefficient and inconsistent. To address this issue, we use market and year fixed effects to control for the presence of unobserved-but-fixed omitted variables that may bias the estimates of the parameter α_1 .

Table 6 shows OLS estimates of (3). Column 1 contains a simple regression of vertical integration on our competition measure, whereas column 2 adds controls for market size (city population), whether the station belongs to a network and for private ownership. Column 3 adds a dummy for whether the PP scored more than 30% votes in the previous municipal election. Our measure of competition is number of stations broadcasting into a city, and therefore it does not vary across stations within a city but across cities and years. Columns 4, 5 and 6 then include year and market

(province or city) fixed effects. We observe that the coefficient on competition has no robust sign and that it is not statistically significant in any of the specifications. If anything, we can show that private stations are less likely to produce their content internally, up to column 6 in which no coefficient is statistically significant.

[TABLE 6 ABOUT HERE]

The OLS results, even if uninspiring, are not surprising due to endogeneity. Stations may enter markets for unobservable reasons (to the econometrician) that change idiosyncratically by city and year. Similarly, stations could match themselves with markets that will adjust behavior to environmental changes in ways that benefit them the most. If larger markets are also those with stronger preferences for differentiated content, stations with lower costs of internal content production may self-select into these and produce non-statistically significant estimates. Another potential source of statistical insignificance is measurement error of our competition variable as more stations may not necessarily mean fiercer competition among them. In other words, an increasing number of stations could be a sign of market segmentation and therefore it may not need be capturing an increase in the degree of competition among stations. For these reasons, in the next section we exploit two sources of plausible exogenous variation to estimate in this setting the causal impact of competition on vertical integration (percentage of internally produced content) at the station level.

5.2 Addressing endogeneity: DiD and 2SLS

The second possible problem with the estimation of a relationship like (3) is the endogeneity of in-house content production and firm entry. More profitable markets that accommodate a larger number of stations may also have a higher taste for specialized content. On the other hand, it could be that larger markets have a lower demand for specialized content since they need to appeal

to a large variety of taste and stations in larger markets are less likely to produce their content regardless of competition.

To address this problem, we use the institutional details described in Section 2 in two ways. First, we exploit the December 1995 law to implement a difference-in-differences (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 the PSOE law was passed. Next, we claim that the political color of the party ruling a given city is a valid instrument for competition, and use two-stage least squares (2SLS) as our estimation procedure.

5.2.1 DiD analysis

Table 7 displays the average percentage of in-house content production in stations located in PP and non-PP cities (PSOE and others), before (1995) and after (1998) the introduction of the PSOE law. We also compute changes in in-house production over time in each type of city, market differences in each period, and the difference-in-differences (using cities run by either the PSOE or other parties). The degree of vertical integration is higher in PSOE markets (and also in other non-PP markets in 1998), and it increases from 1995 to 1998 in all non-PP cities, but it decreases in stations located in cities governed by the PP. The table shows negative difference-in-differences, consistent with our expectation that the reduction in competition (i.e., the enforcement of the law) was more important in non-PP cities.

[TABLE 7 ABOUT HERE]

Now we use regression to check whether our DiD still appears after the inclusion of controls and fixed effects. To implement our DiD regression, we separate markets that are ruled by PP officials from markets ruled by other parties by means of a dummy variable, $Over30\%PPVotes_{ijt}$, that takes value 1 if the PP received at least 30% of votes in city j in the 1995 municipal election. 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 dummy $PostLaw_t$ that takes value 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, and 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, and 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 value 1 if the station belongs to a network, and if it is privately-owned.

To sum up, we estimate the following relationship:

$$\begin{aligned}
 VI_{ijt} = & \beta_0 + \beta_1 PostLaw_{ijt}^* Over30\%PPVotes_{ijt} + \beta_2 PostLaw_{ijt} + \beta_3 Over30\%PPVotes_{ijt} \\
 & + \alpha_2 X_{ijt} + \gamma_j + \delta_t + u_{ijt}.
 \end{aligned} \tag{4}$$

The causal effect of interest is β_1 , the coefficient on the interaction of the PP and post-law dummies. Table 8 shows the results of our estimation of (4). We find a negative coefficient on the interaction $PostLaw_{ijt}^* Over30\%PPVotes_{ijt}$, which we ascribe to a negative effect of competition on vertical integration (Hypothesis 1) – in this case, a restriction of competition leads firms to integrate more. The result is robust to the inclusion of controls and various fixed effects. 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 – this led to increased vertical integration in stations located in these markets relative to stations located in PP markets. Other results in this table show again that privately owned stations are less likely to produce content

in-house. Stations belonging to a network seem to outsource more content production, though the estimates are not very precise. We do not find evidence of a relationship between market size (proxied by population) and the degree of vertical integration (our Hypothesis 2).

[TABLE 8 ABOUT HERE]

5.2.2 2SLS results

As discussed in Section 2.2, enforcement of the PSOE 1995 law depended strongly on the political color 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 silent liberalization, which implied, among other things, lower barriers to entry of new local TV stations. As we have argued, it seems safe to 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. This is our identifying assumption. Table 9, in columns (A), (B), (C), and (D), shows results of different regressions of our competition variable (number of stations broadcasting into a city) on our instruments, i.e., electoral dummies that take value 1 if the PP, the PSOE or the CiU 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 (which is consistent with a story in which the local TV industry went from no regulation to... essentially no regulation whenever the PP was in power).

We exploit our instruments to analyze first 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 2). Columns 1 and 2 in Table 9 show the second stage.

Column 1 contains a simple regression in which the number of stations is the only explanatory variable, whereas in Column 2 we include the full set of controls. Consistent with Hypothesis 1, 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 5.32 percentage points (a 7.7% 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 17.7 percentage points in in-house production (outsourcing) – more than 25% of average vertical integration in our sample. Contrary to Hypothesis 2, stations in larger markets appear to outsource less, although the coefficient is small. As before, private stations and stations belonging to a network tend to do more outsourcing than their public and non-network counterparts.

Given the proximity of the passing of the 1995 law (December) and the 1996 election (March) won by the PP, it might not be clear whether the PSOE law represented such a strong landmark in practice in this industry. As a robustness check of our results, we run 2SLS regressions with the full sample; i.e., we include data from the 1996 census, using the 1995 election to instrument the competition variable.¹⁶ Columns 5 and 6 of Table 9 show that results are reassuringly similar. We show here again (these appear in Table 6 already) results of running traditional OLS regressions to provide a comparison benchmark for the full sample results (see columns 3 and 4).

6 Conclusions

Ever 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 concentrated the attention of many

¹⁶Data from the previous local election (1991) were not available.

scholars and businessmen alike – see Holmstrom 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 paper we focus on a determinant of make-or-buy decisions that has, until recently, been largely overlooked both in theoretical and empirical work: product-market competition.

To study the relationship between product-market competition and vertical integration, we develop a simple model of make-or-buy choices in market equilibrium that predicts a negative effect of competition on integration, and then exploit plausibly exogenous variation in competition across markets and years to identify this negative causal effect in station-level data from the Spanish local TV industry between 1995 and 2002. This period is particularly attractive to test our predictions because regulation was introduced at the end of 1995 that arguably raised entry costs. Additionally, election results in 1996 and 2000 generated variation in regulation enforcement according to the political color of 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 is the first paper 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, as predicted by our model. Contrary to another prediction from the model, we find that stations located in larger markets are on average more likely to produce their content in-house than stations in smaller markets – a result that also runs counter to a basic extent-of-the-market argument for (dis)integration (Stigler, 1951). We also find evidence that private stations and stations belonging to a network (composed by other local stations located in other cities) tend to do more outsourcing than their public and non-network counterparts.

We have linked changes in regulation to changes in market competition, and studied how the latter impacted organizational structure. Although not addressed in this paper, competition-induced

organizational change has been recently associated with firm-level productivity. Therefore, understanding product-market competition as a driver of integration decisions becomes important when thinking about the productivity consequences of government interventions in markets (Syverson, 2011). How our results extend to other industries, however, must await future research.

References

- [1] Abraham, Katharine G. and Susan K. Taylor (1996). “Firms’ Use of Outside Contractors: Theory and Evidence,” *Journal of Labor Economics*, Vol. 14, No. 3 (Jul., 1996), pp. 394-424.
- [2] Aghion, Philippe, Rachel Griffith, and Peter Howitt (2006). “Vertical Integration and Competition,” *The American Economic Review*, Vol. 96, No. 2 (May, 2006), pp. 97-102.
- [3] Badillo, Angel (2003) “Spanish Local Television Deregulation: The Case of Castilla and Leon,” PhD Thesis, Universitat Autònoma de Barcelona.
- [4] Badillo, Angel (2005). “La Desregulación Invisible: El Caso de la Televisión Local por Ondas en España,” *Revista de Economía Política de las Tecnologías de la Información y Comunicación*, vol. III, n. 1, Ene. – Abr. 2005.
- [5] Bayo-Moriones, Alberto, Jose E. Galdon-Sanchez, and Ricard Gil (2012). “‘Make-or-Buy’ of Peripheral Services in Manufacturing: Evidence from Spanish Plant-Level Data,” Working Paper, December.
- [6] Bloom, Nicholas and John Van Reenen (2007). “Measuring and Explaining Management Practices Across Firms and Countries,” *The Quarterly Journal of Economics*, Vol. 122, No. 4, pp. 1351-1408.
- [7] Bloom, Nicholas and John Van Reenen (2010). “Why Do Management Practices Differ across Firms and Countries?,” *Journal of Economic Perspectives*, Vol. 24, No. 1, pp. 203-224.
- [8] Bloom, Nicholas, Raffaella Sadun, and John Van Reenen (2009). “The Organization of Firms Across Countries,” NBER Working Paper 15129.

- [9] Bloom, Nicholas, Raffaella Sadun, and John Van Reenen (2010). “Does Product Market Competition Lead Firms to Decentralize?,” *The American Economic Review*, Vol. 100, No. 2 (May, 2010), pp. 434–438.
- [10] Bresnahan, Timothy F. and Jonathan D. Levin (2012). “Vertical Integration and Market Structure,” NBER Working Paper 17889.
- [11] Campa, Jose and Linda S. Goldberg (1997). “The Evolving External Orientation of Manufacturing Industries: Evidence from Four Countries,” *Economic Policy Review*, Vol. 3, No. 2 (Jul., 1997), pp. 53-81.
- [12] Coase, Ronald (1937). “The Nature of the Firm,” *Economica*, Vol. 4, No. 16, pp. 386-405.
- [13] Conconi, Paola, Patrick Legros, and Andrew F. Newman (2012). “Trade Liberalization and Organizational Change,” *The Journal of Industrial Economics*, Vol. 86, No. 2, pp. 197-208.
- [14] De Bettignies, Jean-Etienne (2006). “Product Market Competition and Boundaries of the Firm,” *Canadian Journal of Economics*, Vol. 39, No. 3, pp. 948-970.
- [15] Forbes, Silke and Mara Lederman (2010). “Does Vertical Integration Affect Firm Performance? Evidence from the Airline Industry,” *RAND Journal of Economics*, Vol. 41, No. 4 (Winter 2010), pp. 765–790.
- [16] Gal-Or, Esther (1999). “Vertical Integration or Separation of the Sales Function as Implied by Competitive Forces,” *International Journal of Industrial Organization*, Vol. 17, No. 5 (Jul., 1999), pp. 641–662.
- [17] Gibbons, Robert (2005). “Four Formal(izable) Theories of the Firm?,” *Journal of Economic Behavior & Organization*, Vol. 58, No. 2 (Oct. 2005), pp. 200–245.

- [18] Gil, Ricard and Mitsukuni Nishida (2012). “Does Regulation Drive Competition? Evidence from the Spanish Local TV Industry,” Working Paper, July.
- [19] Gil, Ricard and Daniel Riera-Crichton (2012). “Price Discrimination and Competition in Two-Sided Markets: Evidence from the Spanish Local TV Industry,” Working Paper, July.
- [20] Grossman, Gene and Elhanan Helpman (2002). “Integration versus Outsourcing in Industry Equilibrium,” *The Quarterly Journal of Economics*, Vol. 117, No. 1 (Feb., 2002), pp. 85-120.
- [21] Guadalupe, Maria and Julie Wulf (2010). “The Flattening Firm and Product Market Competition: The Effect of Trade Liberalization on Corporate Hierarchies,” *American Economic Journal: Applied Economics*, Vol. 2, No. 4 (Oct., 2010), pp. 105–127.
- [22] Hart, Oliver, Andrei Shleifer, and Robert W. Vishny (1997). “The Proper Scope of Government: Theory and an Application to Prisons,” *The Quarterly Journal of Economics*, Vol. 112, No. 4 (Nov., 1997), pp. 1127-1161.
- [23] Holmstrom, Bengt and Jean Tirole (1989). “The Theory of the Firm,” in R. Schmalensee and R. Willig (eds.), *Handbook of Industrial Organization*, North-Holland, Amsterdam, pp. 61–131.
- [24] Hortacsu, Ali and Chad Syverson (2007). “Cementing Relationships: Vertical Integration, Foreclosure, Productivity, and Prices,” *The Journal of Political Economy*, Vol. 115, No. 2, pp. 250-301.
- [25] Hortaçsu, Ali and Chad Syverson (2009). “Why Do Firms Own Production Chains?,” Working Paper, April.
- [26] Kakabadse, Andrew and Nada Kakabadse (2002). “Trends in Outsourcing: Contrasting USA and Europe,” *European Management Journal*, Vol. 20, No. 2, pp. 189–198.

- [27] Lafontaine, Francine and Margaret Slade (2007). "Vertical Integration and Firm Boundaries: The Evidence," *Journal of Economic Literature*, Vol. 45, No. 3, pp. 631-687.
- [28] Levy, David T. (1985). "The Transactions Cost Approach to Vertical Integration: An Empirical Examination," *The Review of Economics and Statistics*, Vol. 67, No. 3 (Aug., 1985), pp. 438-445.
- [29] Lu, Yi and Zhigang Tao (2011). "Vertical Integration and Firm Performance," Working Paper, December.
- [30] MacDonald, James M. (1994). "Does Import Competition Force Efficient Production?," *The Review of Economics and Statistics*, Vol. 76, No. 4 (Nov., 1994), pp. 721-727.
- [31] Maksimovic, Vojislav and Gordon Phillips (2002). "Do Conglomerate Firms Allocate Resources Inefficiently across Industries? Theory and Evidence," *The Journal of Finance*, Vol. 57, No. 2, pp. 721-767.
- [32] Marin, Dalia, and Thierry Verdier (2008). "Power inside the Firm and the Market: A General Equilibrium Approach," *Journal of the European Economic Association*, Vol. 6, No. 4 (Jun., 2008), pp. 752-788.
- [33] McLaren, John (2000). "'Globalization' and Vertical Structure," *The American Economic Review*, Vol. 90, No. 5 (Dec., 2000), pp. 1239-1254.
- [34] Nickell, Stephen J. (1996). "Competition and Corporate Performance," *The Journal of Political Economy*, Vol. 104, No. 4 (Aug., 1996), pp. 724-746.
- [35] Nickell, Stephen J., Daphne Nicolitsas and Neil Dryden (1997). "What Makes Firms Perform Well?," *European Economic Review*, Vol. 41, No. 3-5 (Apr., 1997), pp. 783-796.

- [36] Nickell, Stephen J., Daphne Nicolitsas and Malcom Patterson (2001). "Does Doing Badly Encourage Management Innovation?," *Oxford Bulletin of Economics and Statistics*, Vol. 63, No. 1 (Feb., 2001), pp. 5-28.
- [37] Salop, Steven (1979). "Monopolistic Competition with Outside Goods," *The Bell Journal of Economics*, Vol. 10, No. 1. (Spring, 1979), pp. 141-156.
- [38] Schmitz, James A., Jr. (2005). "What Determines Productivity? Lessons from the Dramatic Recovery of the U.S. and Canadian Iron Ore Industries following Their Early 1980s Crisis," *The Journal of Political Economy*, Vol. 113, No. 3 (Jun., 2005, pp.582-625.
- [39] Schoar, Antoinette (2002). "Effects of Corporate Diversification on Productivity," *The Journal of Finance*, Vol. 57, No. 6 (Dec. 2002), pp. 2379-2403.
- [40] Stigler, George (1951). "The Division of Labor is Limited by the Extent of the Market," *The Journal of Political Economy*, Vol. 59, No. 3 (Jun., 1951), pp. 185-193.
- [41] Syverson, Chad (2004). "Market Structure and Productivity: A Concrete Example," *The Journal of Political Economy*, Vol. 112, No. 6, pp. 1181-1222.
- [42] Syverson, Chad (2011). "What Determines Productivity?," *Journal of Economic Literature*, Vol. 49, No. 2 (Jun., 2011), pp. 326-365.
- [43] Tucker, Irvin B. and Ronald P. Wilder (1977). "Trends in Vertical Integration in the U.S. Manufacturing Sector," *The Journal of Industrial Economics*, Vol. 26, No. 1 (Sep., 1977), pp. 81-94.
- [44] Whittington, Richard, Andrew Pettigrew, Simon Peck, Evelyn Fenton, and Martin Conyon (1999). "Change and Complementarities in the New Competitive Landscape: A European Panel Study, 1992–1996", *Organization Science*, Vol. 10, No. 5 (Sep.-Oct., 1999), pp. 583-600.

Figure 1. Station Entry vs. Regulatory Activity 1997 to 2002

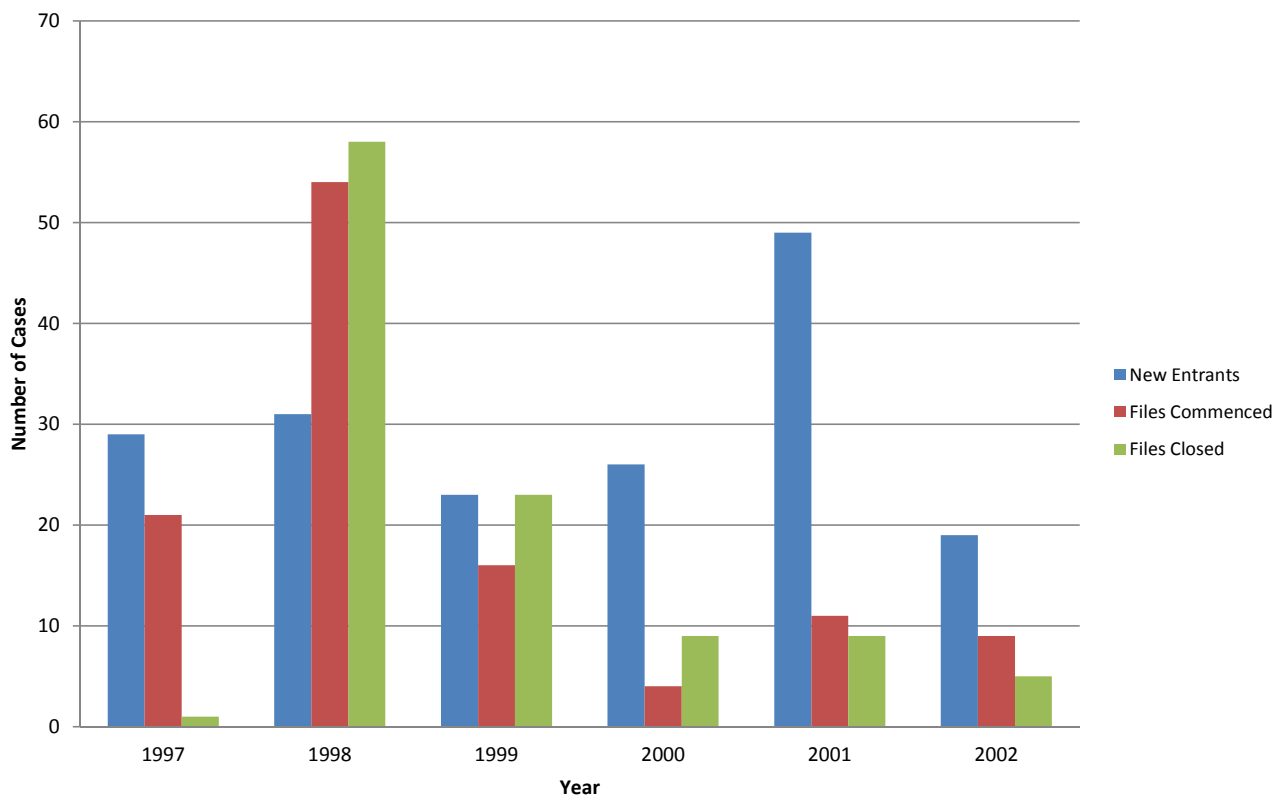


Table 1. Violations by Year and PP Markets

% Violations per Year	Cities Ruled by PP	Cities Ruled by Others Not PP
1995	18%	8%
1998	15%	3%
2001	27%	5%

Note: A violation here is more than two TV stations per city. We need to take into consideration that in 1995 there was no law in place so technically no violation took place.

Figure 2. Timing of Elections, Regulation Changes and Data Collection

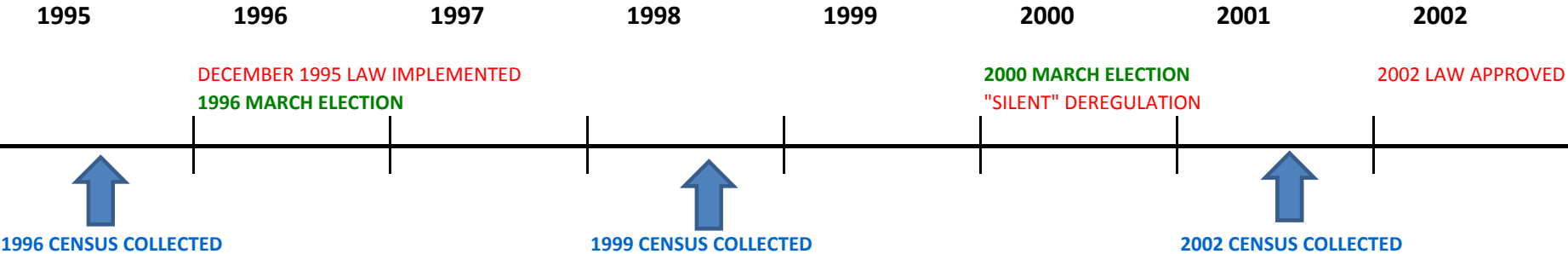


Table 2. Summary Statistics

Variable	Obs	Mean	Std Dev	Min	Max
% Content In-house	1193	0.6935	0.2971	0	1
No Stations Comp	1193	4.41744	3.31664	1	17
Population (000s)	1193	148.022	427.998	0.22	3016.79
Belongs to Network?	1193	0.59933	0.49024	0	1
Private?	1193	0.78458	0.41129	0	1
More than 30% PP Votes	1193	0.57083	0.49517	0	1

This table shows summary statistics of all variables used in this paper and across years.

Table 3. Summary Statistics per Year

	1996	1999	2002
% Content In-house	0.6925 (0.2698)	0.7208 (0.2882)	0.6745 (0.3089)
No Stations Comp	3.2270 (3.2873)	3.7694 (2.8064)	5.1934 (3.4642)
Population (000s)	179.4264 (474.9940)	133.6975 (431.0141)	149.6232 (412.5217)
Belongs to Network?	0.7301 (0.4453)	0.5271 (0.4999)	0.6149 (0.4870)
Private?	0.7975 (0.4031)	0.7788 (0.4155)	0.7851 (0.4111)
More than 30% PP Votes	0.6135 (0.4884)	0.5388 (0.4991)	0.5818 (0.4937)
No Obs	163	425	605

This table provides year means (top) and standard deviations (bottom, in brackets).

Table 4. Cross-Tabulation of No Stations per City for Years 1995 and 2001

No Stations per City Year 1995	No Stations per City Year 2001													Total
	0	1	2	3	4	5	6	7	8	10	11	13	16	
0	2,464	167	14	1	1	0	0	0	0	0	0	0	0	2,647
1	147	213	33	8	3	3	0	0	0	0	0	0	0	407
2	8	56	17	9	5	3	0	0	0	0	0	0	0	98
3	4	6	14	7	0	2	0	0	0	0	0	0	0	33
4	0	1	3	2	1	0	0	0	1	0	1	0	0	9
5	0	0	2	1	0	0	0	0	0	0	0	0	0	3
6	0	0	0	1	0	0	2	1	0	0	0	0	0	4
7	0	0	0	0	0	0	1	0	0	1	0	0	0	2
8	0	0	0	0	0	1	0	0	0	0	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	2,623	443	83	29	11	10	4	1	1	1	1	1	1	3,209

Note: This table shows results of cross-tabulating the number of stations per city in 1995 with the number of stations per city in 2001.

Table 5. Cross-Tabulation of Changes in No Stations per City between 1995-1998 and 1998-2001

Change in No Stations 1995-1998	Change in No Stations 1998-2001									Total
	-3	-2	-1	0	1	2	3	4	8	
-13	0	0	0	1	0	0	0	0	0	1
-7	0	0	0	1	0	0	0	0	0	1
-6	0	0	0	0	0	1	0	0	0	1
-5	0	0	0	0	0	0	0	0	1	1
-4	0	0	0	0	3	0	0	0	0	3
-3	0	0	0	3	2	1	0	0	0	6
-2	0	0	2	12	7	5	2	1	0	29
-1	0	1	3	175	35	8	1	0	1	224
0	0	1	36	2,629	82	7	2	1	0	2,758
1	0	0	33	115	13	1	2	0	0	164
2	1	2	4	7	2	1	0	0	0	17
3	0	0	0	2	2	0	0	0	0	4
Total	1	4	78	2,945	146	24	7	2	2	3,209

Note: This table shows results of cross-tabulating the changes in number of stations per city between censuses 1995-1998 and censuses 1998-2001.

Figure 3: Vertical Integration

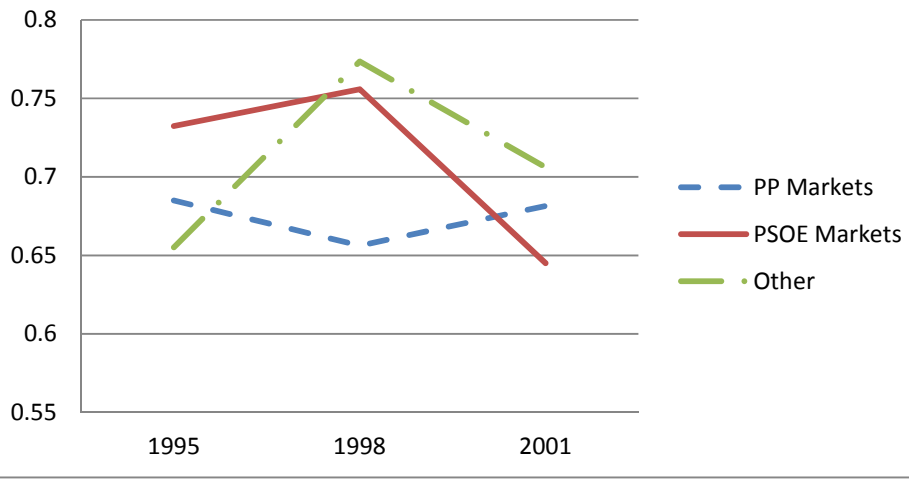


Figure 4: Number of Stations

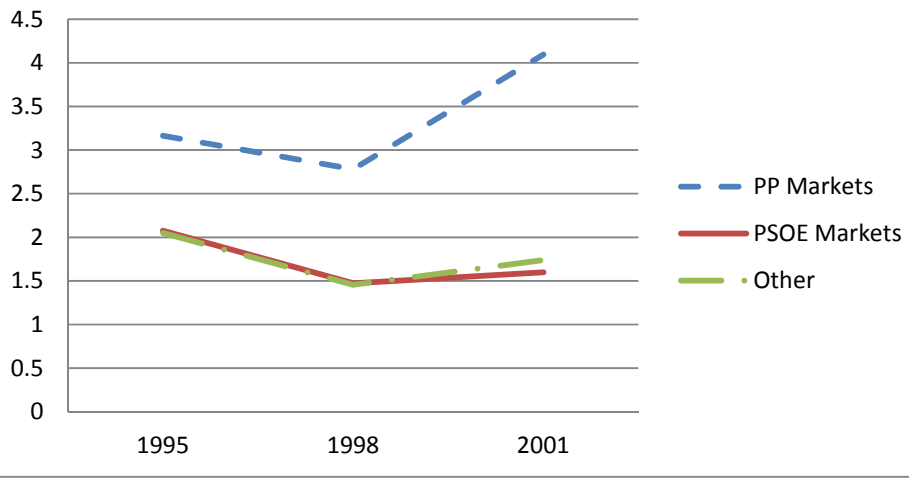


Figure 5: Vertical Integration by Year of Entry

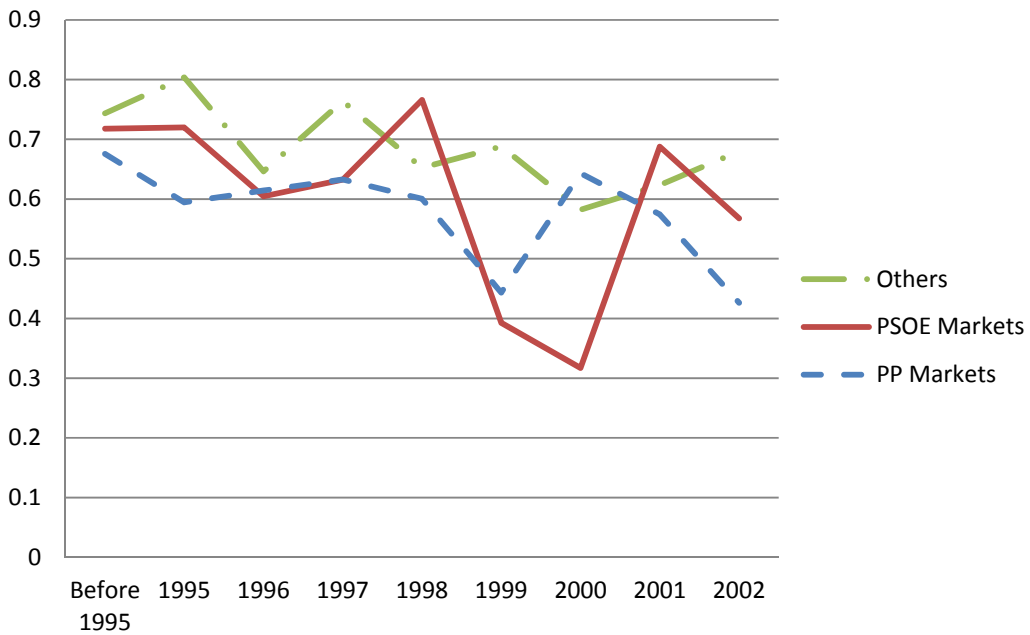


Figure 6. Entry by Year

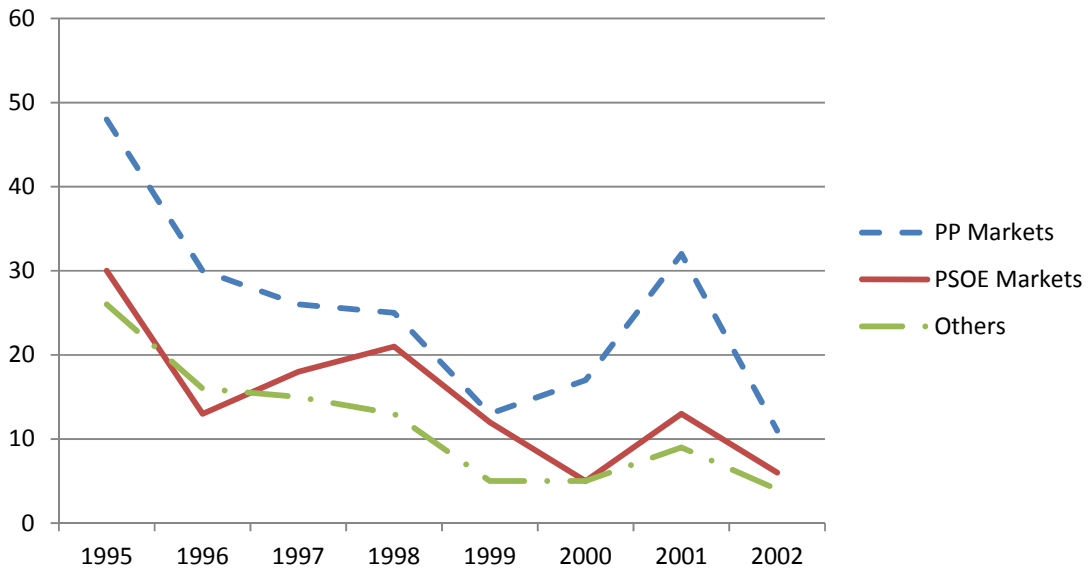


Table 6. OLS Regressions of % Content In-house on the Number of Stations Broadcasting into a City

	(1)	(2)	(3)	(4)	(5)	(6)
Dep Var:	% Content In-house					
No Stations Comp	-0.001932 (0.003042)	-0.000274 (0.003805)	-0.000252 (0.003804)	0.001802 (0.004172)	0.007504 (0.004793)	0.008147 (0.006082)
Population (000s)		0.000016 (0.000022)	0.000017 (0.000022)	0.000008 (0.000025)	-0.000028 (0.000029)	0.000454 (0.000667)
Belongs to Network?		-0.015046 (0.017895)	-0.0153 (0.017909)	-0.011055 (0.018154)	0.002206 (0.019082)	0.015822 (0.030410)
Private?		-0.161606*** (0.018675)	-0.159294*** (0.019390)	-0.161766*** (0.019389)	-0.123496*** (0.018554)	-0.060129 (0.038515)
More than 30% PP Votes			-0.009788 (0.018014)	-0.008302 (0.018006)	0.062138** (0.026686)	-0.039605 (0.111758)
Constant	0.701992*** (0.015413)	0.828170*** (0.021098)	0.831763*** (0.022233)	0.822530*** (0.023302)	0.729844*** (0.031868)	0.669416*** (0.127960)
Year FE	No	No	No	Yes	Yes	Yes
Province FE	No	No	No	No	Yes	Yes
City FE	No	No	No	No	No	Yes
Observations	1,193	1,193	1,193	1,193	1,193	1,193
R-squared	0.05%	5.23%	5.26%	5.74%	18.23%	60.68%

Robust standard errors in parentheses clustered at the city/year level.

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Average Percentage of In-House Production Before and After the 1995 Law

Variable	PP	PSOE	Other	Difference PP-PSOE	Difference PP-Other
% In-House before (1995 data, all observations)	0.684938	0.732396	0.655143	-0.047458	0.029795
% In-House after (1998 data, all observations)	0.656205	0.755817	0.773510	-0.099612	-0.117305
Change in mean % In- House	-0.028733	0.023421	0.118367	-0.052154	-0.147100

Table 8. Diff-in-Diff for 1996 to 1999 with Various Fixed Effects

	(1)	(2)	(3)	(4)
Var:	% Content In-house			
Post Law?*Over 30% PP?	-0.1065** (0.0531)	-0.1107** (0.0508)	-0.1234** (0.0479)	-0.1453** (0.0668)
Over 30% PP Votes?	0.0099 (0.0445)	0.0368 (0.0427)	0.1308*** (0.0497)	-0.0438 (0.0706)
Post Law?	0.0864** (0.0407)	0.0797** (0.0391)	0.0931*** (0.0356)	0.0851* (0.0482)
Population (000s)		0.0000003 (0.00002)	-0.00001 (0.00003)	-0.0019 (0.0046)
Belongs to Network?		-0.0411* (0.0244)	-0.0229 (0.0259)	-0.0704 (0.0600)
Private?		-0.1381*** (0.0262)	-0.0964*** (0.0243)	-0.0437 (0.0538)
Constant	0.6864*** (0.0355)	0.8100*** (0.0392)	0.7114*** (0.0414)	1.0913 (0.6623)
Province FE	No	No	Yes	No
City FE	No	No	No	Yes
Observations	588	588	588	588
R-squared	0.02	0.07	0.26	0.73

OLS regressions with observations from 1996 and 1999.

Robust standard errors in parentheses clustered by town and year.

*** p<0.01, ** p<0.05, * p<0.1

Table 9. OLS and 2SLS results for 1999-2002 and the Whole Data Set Period

	(A)	(1)	(B)	(2)	(3)	(4)	(C)	(5)	(D)	(6)
Sample	1999-2002				1996-1999-2002					
	1st Stage	2SLS	1st Stage	2SLS	OLS	OLS	1st Stage	2SLS	1st Stage	2SLS
Dep Var:	No Stations	% In-House	No Stations	% In-House	% In-House	% In-House	No Stations	% In-House	No Stations	% In-House
No Stations Comp		-0.0438*** (0.0165)		-0.0532* (0.0274)	-0.0019 (0.0030)	-0.0003 (0.0038)		-0.0475*** (0.0169)		-0.0675** (0.0293)
Population (000s)			0.0043*** (0.0004)	0.0002* (0.0001)		0.00002 (0.00002)			0.0044*** (0.0004)	0.0003** (0.0001)
Belongs to Network?			-0.3939* (0.2313)	-0.0324 (0.0253)		-0.0150 (0.0179)			-0.4537** (0.2132)	-0.0472* (0.0265)
Private?			0.7124*** (0.2267)	-0.1101*** (0.0342)		-0.1616*** (0.0187)			0.6078*** (0.2045)	-0.1090*** (0.0322)
PP Max Votes?	0.8045 (0.5344)		-0.1420 (0.3911)				0.7030 (0.4826)		-0.2692 (0.3552)	
PSOE Max Votes?	-0.6408* (0.3632)		-0.6690* (0.3456)				-0.6362* (0.3376)		-0.6792** (0.3159)	
CiU Max Votes?	-1.7464*** (0.3683)		-1.3516*** (0.3440)				-1.65*** (0.3343)		-1.2976*** (0.3137)	
Constant	4.5568*** (0.3278)	0.8952*** (0.0712)	4.0207*** (0.3294)	1.0098*** (0.0975)	0.7019*** (0.0154)	0.8282*** (0.0211)	4.4000*** (0.2979)	0.9035*** (0.0699)	3.9683*** (0.3069)	1.0586*** (0.1014)
Observations	1,030	1,030	1,030	1,030	1,193	1,193	1,193	1,193	1,193	1,193
R-squared	5.45%		35.07%		0.05%	5.23%	4.60%		36.66%	

Clustered standard errors in parentheses at the city and year level. *** p<0.01, ** p<0.05, * p<0.1.

Columns (3) and (4) are OLS regressions. Columns (A), (B), (C) and (D) are first-stage regressions of (1), (2), (5) and (6) respectively. Instrumental variables are dummies for whether PP, PSOE or CiU were the political forces with the maximum amount of votes in 1995 election (for years 1996 and 1999) and the 1999 election (for year 2002).