Does Regulation Drive Competition?
Evidence from the Spanish Local TV Industry

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Literature

- Regulation and competition:
  Joskow (1973), Samprone (1979), Armstrong and Vickers (1993),
  Vickers (1995), Danzon and Chao (2000)

- Static entry game:
  Bresnahan and Reiss (1990,1991,1994), Mazzeo (2002), Seim (2006),
  Jia (2008), Bajari et al. (2010a 2010b), Grieco (2012)

- E¤ect of regulation on entry:
  Gri¢ th and Harmgart (2008), Schaumans and Verboven (2008),
  Cohen et al. (2010), Suzuki (2012), Nishida (2012), Datta and
  Sudhir (2012)

- Telecommunication industries:
  Berry and Waldfogel (1999), Goolsbee and Petrin (2004), Xiao and
  Orazem (2011), Crawford and Yurukoglu (2012), Gil and Ruzzier
  (2012)

Spanish TV Industry

- Prior to 1980s, National Government-Owned: TVE and TVE2
- Early 1980s, Regional: At most two per region
- Mid 1980s, Municipals (= cities): local stations
- Late 1980s, National Privately-Run: Antena3, Tele5, Canal+

Advertising in 2001

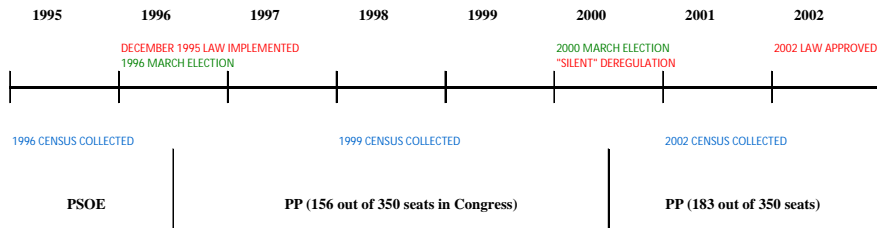|	**Market for TV Advertising**			
Market for TV Content	**No Info**	**No Adv**	**Adv**	**Total**
No Info	0	3	8	11
Broadcast	11	66	442	519
Pay-per-View	1	47	67	115
Total	12	116	517	645

Local TV Regulation in Spain

- Mid 1980s-1995: regulation for regional stations but no regulation for local stations
- 1st regulation: December 1995 law
  - ▸ Limited to the geographical boundaries to city
  - ▸ No more than two stations allowed per city
  - ▸ No network formation
  - ▸ Need to have local government personnel on advisory and executive boards (if private)
- "Silent" deregulation accelerates in 2000 after general election results (Badillo, 2003)
- 2nd regulation: December 2002 law
  - ▸ Number of stations proportional to population
  - ▸ No restriction on station ownership or network formation
  - ▸ No need for local government personnel on advisory and executive boards

Two Major Political Parties

- PSOE (Partido Socialista Obrero Español): left-wing party, the industry needs to be regulated
- PP (Partido Popular): right-wing party, the industry needs to be deregulated
- Timeline
  - ▸ Before 1996: PSOE
  - ▸ 1996 election: PP with little support in congress (156 out of the 350 seats)
    - = Chose not fully enforce the law. The enforcement of the law is

Timeline

1995	1996	1997	1998	1999	2000	2001	2002

DECEMBER 1995 LAW IMPLEMENTED
1996 MARCH ELECTION

2000 MARCH ELECTION
"SILENT" DEREGULATION

2002 LAW APPROVED

1996 CENSUS COLLECTED   1999 CENSUS COLLECTED   2002 CENSUS COLLECTED

PSOE   PP (156 out of 350 seats in Congress)   PP (183 out of 350 seats)

Number of Stations in 1995 and 1998

No Stations per City Year 1995	No Stations per City Year 1998									Total
	0	**1**	**2**	**3**	**4**	**5**	**6**	**12**	**13**	**Total**
0	2,506	131	9	1	0	0	0	0	0	2,647
1	153	218	30	5	1	0	0	0	0	407
2	8	60	24	2	3	1	0	0	0	97
3	1	14	9	9	0	0	0	0	0	33
4	0	2	4	2	0	1	0	0	0	9
5	0	2	1	0	0	0	0	0	0	3
6	0	0	0	1	2	0	1	0	0	4
7	0	0	1	0	1	0	0	0	0	2
8	0	0	0	0	1	0	0	0	0	1
9	0	0	0	1	0	0	0	1	0	2
13	0	0	0	0	0	0	1	0	0	1
15	0	0	0	0	0	0	0	0	1	1
17	0	0	0	0	1	0	0	0	0	1
Total	2,668	427	78	21	9	2	2	1	1	3,209

Number of Stations in 1998 and 2001

No Stations per City Year 1998	No Stations per City Year 2001													Total
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**	**13**	**16**	
0	2,571	93	4	0	0	0	0	0	0	0	0	0	0	2,668
1	48	328	36	11	2	2	0	0	0	0	0	0	0	427
2	3	22	35	11	4	2	0	0	0	1	0	0	0	78
3	1	0	7	6	3	3	0	0	0	0	1	0	0	21
4	0	0	1	1	2	2	2	1	0	0	0	0	0	9
5	0	0	0	0	0	1	0	0	1	0	0	0	0	2
6	0	0	0	0	0	0	2	0	0	0	0	0	0	2
12	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	2,623	443	83	29	11	10	4	1	1	1	1	1	1	3,209

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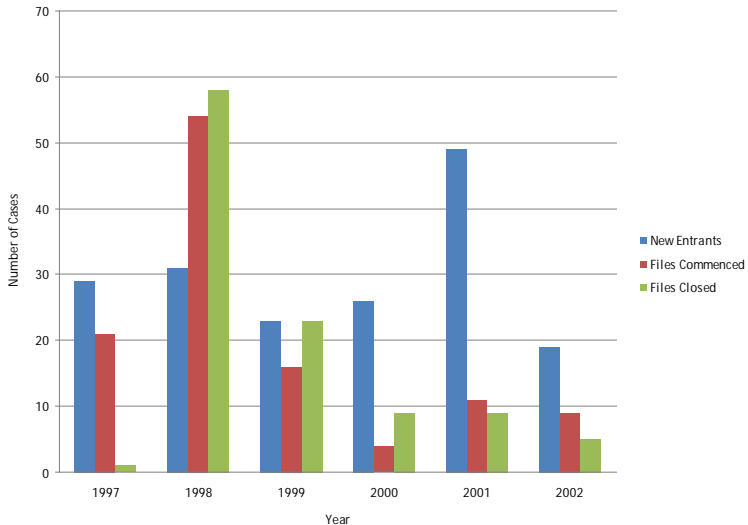
Data Source

- Local TV station census from AIMC (Asociación para la Investigación de Medios de Comunicación)

Variable	Obs	Mean	Std. Dev.	Min	Max
Stations HQ per City	9627	0.26	0.77	0	17
Monopoly?	9627	0.133	0.339	0	1
Duopoly?	9627	0.027	0.162	0	1
Triopoly?	9627	0.009	0.092	0	1
Quadropoly?	9627	0.003	0.055	0	1
Five Stations or More?	9627	0.004	0.065	0	1
Stations not HQ per City	9627	1.407	1.885	0	13
City Population (000)	9627	12.17	67.73	0.32	3016.79
City Growth	9627	0.04	0.11	-0.78	5.73
Province Population (000)	9627	1223.66	1363.04	56.93	5527.15
Province Growth	9627	0.03	0.03	-0.05	0.22
Unemployment Rate per City	9627	3.89	1.90	0	25
Cars per capita and City	9627	0.37	0.15	0.04	7.08
Bank Office per capita and City	9627	0.41	0.43	0	4.01
Province on the Coast?	9627	0.56	0.50	0	1

Empirical Model

- Pro…t function

$$\pi_N = V_N \cdot S(Y, \cdot) - F_N(W, \cdot) + u,$$

where S: city population, province population, population growth

- Per-capita variable pro…ts

$$V_N = \beta_1 + X\beta + \sum_{n=2}^{N} \delta_n,$$

where X: unemployment rate, # of cars per person, # of bank o¢ ces per person

- Fixed costs

$$F_N = \gamma_1 + W_L \gamma_L + \sum_{n=2}^{N} \mu_n,$$

where W: coastal province, geographical area, violation in 1995 law, violation and PP interaction, violation and PSOE interaction

Estimation

- Probability of observing markets with no ...rms

$$\Pr(\pi_1 \geq 0) = 1 - \Phi(\overline{\pi}_1),$$

where $\Phi(.)$ is cdf of u and $\pi_1 = \overline{\pi}_1 + u$.

- Assuming $(\overline{\pi}_1 \geq \overline{\pi}_2 \geq \overline{\pi}_3 \geq ...)$, probability of observing N in equilibrium

$$\Pr(\pi_N \geq 0 \text{ and } \pi_{N+1} \leq 0) = \Phi(\overline{\pi}_N) - \Phi(\overline{\pi}_{N+1}).$$

Variables	1995	1998	2001
1	2.643***	2.636***	2.792***
	(0.146)	(0.147)	(0.149)
2	0.722***	0.896***	1.061***
	(0.0680)	(0.0723)	(0.0764)
3	0.462***	0.705***	0.510***
	(0.0936)	(0.137)	(0.124)
4	0.569***	0.509**	0.491***
	(0.182)	(0.240)	(0.190)
5	0.384*	0.0617	0.287
	(0.232)	(0.185)	(0.265)
6	0.201	0.183	0.893***
	(0.139)	(0.452)	(0.334)
violate_ppmax		-0.205	0.529
		(0.419)	(0.411)
violate_psoemax		0.274	0.920**
		(0.436)	(0.427)
violate		-1.194***	-1.450***
		(0.350)	(0.341)
coast	-0.468***	-0.458***	-0.487***
	(0.0675)	(0.0648)	(0.0627)
1km2	-0.196***	-0.225***	-0.266***
	(0.0275)	(0.0280)	(0.0277)
Log likelihood	3,142	3,146	3,146
Observations	-1507	-1396	-1509
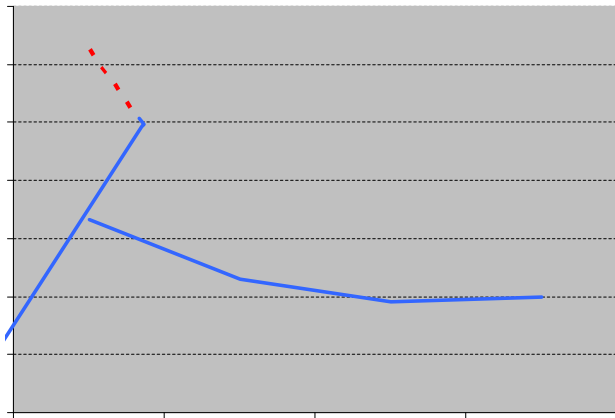
$S\_N = F\_N/V\_N$

Conclusion

- How does policy enforcement affect firm behavior?
- We estimate entry thresholds across years and decompose them
- Data: Spanish local TV industry 1995, 1998, and 2001
- Findings
  - (1) Fixed costs are affected in 1998 and 2001
  - (2) Variable profits are affected in 2000
- Even a simple model can be informative about (1) how strongly the government enforces the policy and (2) the nature of the regulation enforcement
- The approach is useful for public policies of which enforcement and effect on the competition of firms are not obvious

Appendix

Station Ownership by PP or PSOE City Ruling Government

Variable	Obs	Mean	Std. Dev.	Max Votes PP? = 1	Max Votes PP? = 0	Max Votes PSOE? = 1	Max Votes PSOE? = 0
Year 2001							
Private Property?	632	0.80	0.40	0.90 (0.02)	0.72 (0.02)	0.76 (0.03)	0.83 (0.02)
Max Votes PP?	632	0.46	0.50				
Max Votes PSOE?	632	0.33	0.47				

Variables	1995	1998	2001
province population ($_1$)			

Variables	1995	1998	113 48)
1	2.568 207	2.617***	2.831***
	(0.133)	(0.137)	(0.141)
2	0.737***	0.898***	1.049***
	(0.0652)	(0.0702)	(0.0765)
3	0.456***	0.681***	0.466***
	(0.0903)	(0.0192)	(0.117)
4	0.687***	0.678***	0.673***
	(0.117)	(0.150)	(0.123)
5 5 **5** 4	0.373	0.0323	0.247
5	(0.229)	(0.170)	(0.256)
6	0.207		

4

5

New Entry of Local TV Stations