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Do Publicly Traded Firms Price Differently From Private Firms

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WORKING PAPER N° 53

"Do Publicly Traded Firms Price Differently From Private Firms?"

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Abstract :
This paper analyzes whether publicly traded firms price differently from privately held firms in the product markets. The main contribution is to present empirical evidence on the effect of ownership structure on pricing. The model shows that public firm shareholders optimally demand short-run returns to reduce agency costs. This stock-market pressure forces public firms to charge higher prices than private firms do. The evidence shows that in the US newspaper industry public firms charge higher advertising rates than private firms. The effects are statistically and economically significant. In addition, public firm prices are decreasing in insiders' ownership participation. To our knowledge, there are no previous studies comparing pricing by private and public companies.

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1. Introduction

This paper studies whether public firms price differently from private firms, analyzing empirical evidence from the US newspaper industry. On the one hand, public firms may suffer pressure from the stock market to boost current cash-flows. On the other hand, public firms have better access to capital markets than private firms. Describing competition in the Denver newspaper market between the publicly held E. W. Scripps Co. and the privately held Media News, the *New York Times* noted:

> *"The Scripps company has the deepest pockets in such a matchup, ... But Scripps is a publicly traded company, subject to pressure from Wall Street to cut losses."* (*New York Times*, December 16, 1996)

If the stock-market pressure deters public firms from investing in expanding their market shares, or from engaging in price wars improving their ability to sustain tacit collusive agreements, public firms will tend to charge higher prices than private firms. On the other hand, if their deeper pockets allow them to implement cost reducing technologies or to prey on rivals, or if public firm managers pursue empire-building ambitions, public firms will tend to have lower prices than private firms.

The theoretical predictions on the effect of ownership structure on product market prices are ambiguous. The main contribution of this paper is to present an empirical analysis of this issue. To our knowledge, there are no previous studies comparing pricing by public and private companies. We first introduce a model developing the view that stock-market pressure leads public firms to charge higher prices than private firms do. Then, we present empirical evidence showing that public firms charge higher advertising rates than private firms in the US newspaper industry.

Our model emphasizes agency problems as the main difference between public and private firms, and analyzes how ownership structure affects product market pricing when firms make investments in market shares. We assume that firm profits and investments are only observable to the person in charge of the firms. In public firms, unobservability allows the

manager to divert company funds into private benefits. The portion of profits that the manager can divert is restricted by the "normal" dividends that the manager has to pay out to avoid being fired or taken over. However, when the firm has investment opportunities available, the manager can claim that dividends are low because investments are being undertaken, while actually diverting the funds. In order to effectively induce the manager to invest, the shareholders have to "bribe" her with a portion of the returns from the investment. These agency costs reduce the level of investment that the shareholders wish to induce, relative to the level that a private owner would choose.

The prediction that the separation of ownership and control may generate underinvestment is more general than our specific theoretical model. Managers may have a shorter time horizon, a higher risk aversion or a higher personal cost of capital than the shareholders. Managers acting in the interest of uninformed shareholders may boost short-term results to signal good prospects and prevent takeovers at unfavorable prices (Stein, 1988). Managers may try to inflate current earnings and stock-market expectations if their compensation is linked to stock prices (Stein, 1989). Our model contributes to this literature by obtaining underinvestment as an optimal result (from the shareholders' point of view) when the agency costs of implementing investment projects are explicitly considered. Corporate managers usually complain that capital market pressure precludes them from pursuing long-term objectives (Stein, 1989; Porter, 1992; Poterba and Summers, 1995). Our finding rationalizes investors' impatience. Investors have to demand some short-run profits to reduce what managers can divert from them.

When prices are the investment variables, underinvestment translates into higher prices. In our model prices are investment variables because we assume that future profits depend on current market shares. Again, the prediction that stock-market pressure may force public firms to set higher prices is more general than the case of investments in market share. For example, this pressure may deter public firms from engaging in price wars. Ownership structure may act as a commitment not to undertake aggressive actions, and help public firms to sustain tacit collusive arrangements. In fact, the stock-market pressure to generate short-run profits can relax competition and actually allow public firms to obtain higher profits.

The US newspaper industry provides an appropriate setting for comparing pricing by public and private companies. It is an industry populated by an even distribution of public and private firms. Circulation demand inertia, which translates also into advertising demand inertia, makes current market shares affect positively future demand and profitability. When setting prices, newspaper firms face a trade-off between increasing long-run profits by charging a low price to capture market share, and increasing short-run profits by charging a high price to current consumers.

The empirical evidence shows that, in the US newspaper industry, public firms charge higher local and national advertising rates than private firms, both in absolute terms as well as per reader. The effect of ownership structure on prices is not only statistically but also economically significant: public firm rates are around 22% higher in absolute terms and 13% higher in per reader terms than private firm rates. We also explore the effect of insiders' ownership participation on prices. Public firm rates are decreasing in insiders' ownership, although the effect is only significant for the national rates.

The empirical results do not show that a better access to capital markets translates into lower prices for public firms. Instead, the evidence is consistent with the view that their ownership structures lead public firms to charge higher prices. We also explore alternative explanations. The evidence is not consistent with the hypotheses that public newspaper chains charge higher prices because they are larger, nor that public newspapers charge higher advertising rates because better quality or some other factor allows them to have greater readership, nor that private owners satisfy non profit-maximizing preferences.

This paper is also related to the theoretical and empirical literature on the interaction between product market competition and capital structure. In our model, the stock-market pressure forces public firms to focus on short-run profits. In those models, leveraged firms focus on short-run profits, either because they have a positive probability of bankruptcy and their equityholders will not get the long-run benefits of investing in market share if the firm bankrupts (Chevalier and Scharfstein, 1996); or because, given that investments require cash flows, leveraged firms are committed not to undertake aggressive investments (Phillips, 1991; Schargrodsky, 1997a).

Empirical papers in that literature compare pricing by leveraged and non-leveraged firms (Chevalier, 1995; Phillips, 1995; Chevalier and Scharfstein, 1996; Schargrodsky, 1997b). These papers deal with the issue that, just as firms' debt levels may affect their prices, demand or supply shocks may affect their financial positions. To address this endogeneity problem, the authors exploit some exogenous event or instrument. We consider that our study is significantly safer from endogeneity problems than this previous research. It is more forced to argue that current demand or supply shocks affect firms' ownership structure, than to consider that these shocks affect financial variables. This is also an important motivation for this paper. However, this raises the concern that, if public firms are more leveraged than private firms, ownership structure could be just acting as a proxy or instrument for debt. According to the available information, public newspaper firms do not seem to have higher debt ratios than private newspaper firms.

Section 2 presents the theoretical model. Section 3 analyzes the empirical evidence. It first describes the sample, then presents the empirical results, and finally discusses alternative explanations and interpretations. Section 4 presents our conclusions. Appendix 2 provides data definitions, sources, and summary statistics.

2. The Model

We consider a firm in a two-period model. When the firm is private, it is managed by its owner. When the firm is public, it is managed by a manager appointed by the shareholders. The manager has no wealth and a zero-outside opportunity. Period-1 profits are only observable to the person who manages the firm. Although shareholders cannot observe profits, there is no uncertainty and shareholders know that in the first period the level of profits is $\overline{\pi}_1$. However, the manager has discretion on how to distribute these profits between dividends and perquisites. The manager cannot steal the company profits and transfer them to her pockets, but she can spend the money in perquisites. Perquisites are unobservable. The perquisites remain in the firm and are enjoyed by whoever is in charge.

For the public firm to be viable, there has to be some mechanism forcing the manager to pay dividends to the shareholders. After the manager pays period-1 dividends D_1, shareholders decide whether to keep the manager in charge or appoint one of the shareholders in her place. We assume away any shareholders' coordination problem. Whenever they believe that the manager has diverted profits, the shareholders fire the manager and one of them is appointed in her place, attracted by the consumption of perquisites.[1,2] As shareholders know that period-1 profits are $\bar{\pi}_1$, they believe that the manager is cheating when $D_1 < \bar{\pi}_1$. When the manager is fired, she not only loses the potential perquisites, but also suffers a dismissal disutility. For simplicity, period-2 profits $\bar{\pi}_2$ are observable and verifiable, and accrue directly to the shareholders as dividends D_2. Dividends payments D_1 and D_2 are verifiable. For the public firm, the time structure is:

Period 1: The manager collects profits $\bar{\pi}_1$.
The manager distributes $\bar{\pi}_1$ between dividends D_1 and perquisites.
Shareholders receive D_1, and decide whether to replace the manager or not.
Perquisites (if they exist) are consumed by whoever is in charge.

Period 2: Shareholders receive $D_2 = \bar{\pi}_2$.

By construction, the threat of dismissal disciplines the manager not to steal:

Lemma 1: In perfect Bayesian equilibrium, the manager pays out dividends $D_1 = \bar{\pi}_1$, and is not fired.

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[1] Firing the manager is not an empty threat. When shareholders believe that there are perquisites to consume, shareholders strictly prefer to fire the manager attracted by the perquisites. At least the shareholder to be appointed prefers to fire the manager, and the others are indifferent. We can also consider that the elected shareholder (or an outside raider) pays the rest for the opportunity to consume the perquisites. This can be interpreted as a takeover. When the shareholders believe that there are no perquisites to be consumed, they are indifferent about firing the manager or not. In that case, we assume that the shareholders do not fire the manager. An $\varepsilon>0$ severance payment for firing a manager who has paid $D_1 = \bar{\pi}_1$ (a severance payment contract based on the verifiable dividends can be written) would break this indifference.

[2] Why is not one of the shareholders appointed manager from the very beginning? As long as ownership is disperse (i.e., as long as the firm is public), there would be the same agency conflicts.

Proof: If the manager pays $D_1 < \bar{\pi}_1$, shareholders believe that the manager is cheating and fire her. The manager enjoys no perquisites and suffers the dismissal disutility. If she pays $D_1 = \bar{\pi}_1$, shareholders believe that the manager is not cheating and keep her. The manager enjoys no perquisites and suffers no disutility. Then, the manager pays out $D_1 = \bar{\pi}_1$, and is not fired.

Let us now suppose that the firm has available an investment opportunity. The investment implies a reduction in short-run cash-flows which will be more than compensated by an increase in long-run profits. Under the investment, period-1 profits are $\hat{\pi}_1 < \bar{\pi}_1$, and period-2 profits are $\hat{\pi}_2 > \bar{\pi}_2$, s.t. $\hat{\pi}_1 + \hat{\pi}_2 > \bar{\pi}_1 + \bar{\pi}_2$. At the beginning of period 1, the person in charge of the firm decides whether to undertake the investment or not. We assume that undertaking the investment is unobservable. As there is no conflict of interests, the private firm owner always undertakes any profitable investment opportunity. This is not true for the public firm.

Lemma 2: Undertaking the investment is not an equilibrium for the public firm. In perfect Bayesian equilibrium, the public firm manager does not undertake the investment, pays out dividends $D_1 = \bar{\pi}_1$, and is not fired.

Proof: If the shareholders believe that the manager is not cheating when $D_1 < \bar{\pi}_1$ and keep her, then she would not undertake the investment, obtain $\bar{\pi}_1$, and divert the difference. Shareholders' beliefs would be incorrect, and this would not be an equilibrium. In perfect Bayesian equilibrium, shareholders believe that the manager is cheating whenever $D_1 < \bar{\pi}_1$, and that she is not cheating when $D_1 = \bar{\pi}_1$. Then, the manager pays out $D_1 = \bar{\pi}_1$, and is not fired.

Shareholders can solve this inefficiency through a compensation scheme based on dividends, but they have to share some investment returns with the manager. To induce the manager to undertake the investment opportunity, first shareholders have to commit not to fire her if period-1 dividends are $\hat{\pi}_1$. However, then the manager can obtain $\bar{\pi}_1$, pay out $D_1 = \hat{\pi}_1$, and steal the difference. Eventually, the shareholders will know the truth but the perquisites will already have been consumed. The manager has to be "bribed." The shareholders have to

promise to pay the manager in the second period, at least what the manager could have diverted in the first period.[3] Shareholders offer a compensation scheme to the manager at the very beginning of period 1, before the manager decides on the investment. The appropriate contract stipulates that the manager cannot be fired if she pays dividends $D_1 = \hat{\pi}_1$ in period 1, and that she gets paid at least $B = \bar{\pi}_1 - \hat{\pi}_1$, when she pays dividends $D_2 = \hat{\pi}_2$ in period 2. The bribe B declines in $\hat{\pi}_1$:[4]

Lemma 3: The agency cost of implementing a certain investment is declining in the level of short-run profits $\hat{\pi}_1$ under that investment.

Proof: In order to implement an investment policy with period-1 returns $\hat{\pi}_1$, the manager has to be offered a bribe $B = \bar{\pi}_1 - \hat{\pi}_1$, which is declining in $\hat{\pi}_1$, where $\bar{\pi}_1$ are the maximum attainable period-1 profits.

We can apply this result to the case of price investments in market shares. Let us assume that period-2 profits are positively related to period-1 market share. Firm profits are $\pi_1(p_1) + \pi_2(\sigma_1(p_1))$, where σ_1 is period-1 market share.[5] The market interest rate is zero. We assume that $\pi_1(p_1)$ and $[\pi_1(p_1) + \pi_2(\sigma_1(p_1))]$ are concave in p_1, $\frac{\partial \pi_2(\sigma_1(p_1))}{\partial \sigma_1} > 0$, and $\frac{\partial \sigma_1(p_1)}{\partial p_1} < 0$, $\forall\ p_1$. There is now a continuum of investment levels. As before, we assume that the investment variables (i.e., prices) are unobservable. When the firm is private, the owner solves:

$$\underset{\{p_1^{s-Priv}\}}{Max}\ \pi_1^s(p_1^{s-Priv}) + \pi_2^s(\sigma_1(p_1^{s-Priv}))$$

[3] If you give somebody $1 today, for an investment that will tomorrow have a verifiable return of $3, and this person can claim that she lost the money today without being punished; you had better commit to giving her at least $1 tomorrow when the investment matures!

[4] This agency cost may turn some socially efficient investment opportunity unprofitable from the shareholders' point of view. Monitoring could help to implement profitable long-term projects when asymmetric information impedes it (Von Thadden, 1995).

[5] The result can be extended to a multi-period model in which in each period t the firm maximizes $\pi_t(p_t) + V_{t+1}(\sigma_t(p_t))$, where $V_{t+1}(\sigma_t(p_t))$ is period-t+1 firm value.

The FOC is:

$$\frac{\partial \pi_1^s\left(p_1^{s-Priv^*}\right)}{\partial p_1^{Priv}} + \frac{\partial \pi_2^s\left(\sigma_1\left(p_1^{s-Priv^*}\right)\right)}{\partial \sigma_1}\frac{\partial \sigma_1\left(p_1^{s-Priv^*}\right)}{\partial p_1^{Priv}} = 0$$

The first term represents the effect of period-1 price on current profits. The second term represents the effect of period-1 price on future profits, through its effect on market share. As in switching cost models (Klemperer, 1995), the period-1 price is below the short-run profit-maximizing level: $\frac{\partial \pi_2^s\left(\sigma_1\left(p_1^{s-Priv^*}\right)\right)}{\partial \sigma_1} > 0$, $\frac{\partial \sigma_1\left(p_1^{s-Priv^*}\right)}{\partial p_1^{Priv}} < 0$, and thus in the optimum $\frac{\partial \pi_1^s\left(p_1^{s-Priv^*}\right)}{\partial p_1^{Priv}} > 0$.

When the firm is public, the shareholders can implement a certain level of investment in market share through an appropriate incentive scheme. For any investment level with period-1 profits $\pi_1\left(p_1^{Pub}\right)$ that the shareholders wish to implement, the manager can always steal the difference between that profit level and the maximum period-1 profits level $\underset{\{p_1^{s-Mger}\}}{Max}\ \pi_1^s\left(p_1^{s-Mger}\right)$ that she can attain. To implement that investment level, the manager has to be offered a bribe B satisfying:

$$B \geq \underset{\{p_1^{s-Mger}\}}{Max}\ \pi_1^s\left(p_1^{s-Mger}\right) - \pi_1^L\left(p_1^{L-Priv^*}\right)$$

The shareholders choose the incentive scheme that induces a certain investment level in order to maximize dividends. We can directly consider that shareholders choose the price, subject to the manager's incentive compatibility constraint. Thus, the shareholders' problem is:

$$\underset{\{p_1^{s-Pub}\}}{Max}\ \pi_1^s\left(p_1^{s-Pub}\right) + \pi_2^s\left(\sigma_1\left(p_1^{s-Pub}\right)\right) - B \text{ s.t. } B \geq \underset{\{p_1^{s-Mger}\}}{Max}\ \pi_1^s\left(p_1^{s-Mger}\right) - \pi_1^L\left(p_1^{L-Pub}\right)$$

In the optimum, the constraint is satisfied with equality. The problem becomes:

$$\underset{\{p_1^{L-Pub}\}}{Max}\left[2\pi_1\left(p_1^{L-Pub}\right)+\pi_2\left(\sigma_1\left(p_1^{L-Pub}\right)\right)-\underset{\{p_1^{L-Mger}\}}{Max}\,\pi_1\left(p_1^{L-Mger}\right)\right],$$

i.e., the shareholders solve:

$$\underset{\{p_1^{L-Pub}\}}{Max}\,2\pi_1\left(p_1^{L-Pub}\right)+\pi_2\left(\sigma_1\left(p_1^{L-Pub}\right)\right)$$

The public firm puts more weight on current profits than the private firm, as this reduces the bribe that has to be paid to the manager. The FOC is now:

$$\frac{\partial \pi_1^{\,L}\left(p_1^{L-Pub*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_1^{\,L}\left(p_1^{L-Pub*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_2^{\,L}\left(\sigma_1\left(p_1^{L-Pub*}\right)\right)}{\partial \sigma_1}\frac{\partial \sigma_1\left(p_1^{L-Pub*}\right)}{\partial p_1^{Pub}}=0$$

The first term represents the effect of period-1 price on current profits, the second is the effect of period-1 price on agency costs, and the third represents the effect of period-1 price on future profits.

Proposition 1: Public firms choose higher prices than private firms.

Proof: Evaluating the public firm FOC at $p_1^{L-Priv*}$,

$$\frac{\partial \pi_1^{\,L}\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_1^{\,L}\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_2^{\,L}\left(\sigma_1\left(p_1^{L-Priv*}\right)\right)}{\partial \sigma_1}\frac{\partial \sigma_1\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}>0,\ \text{because}$$

$$\frac{\partial \pi_1^{\,L}\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}>0.$$

By concavity, $p_1^{L-Pub*}>p_1^{L-Priv*}$.

It is not optimal for the shareholders to induce the manager to charge the long-run profit-maximizing price p_1^{Priv*}. At that level, shareholders always have an incentive to increase the price, as this has a second-order effect on total profits but a first-order effect on agency costs. The public firm's manager is forced to put more focus on short-run profits than the private owner does. Reducing agency costs generates underinvestment in market shares.

The model predicts that public firms underinvest in unobservable investments.[6] We have assumed that prices are unobservable. In reality, prices are generally observable by outsiders. However, information asymmetries between managers and shareholders regarding market conditions make investments in market share still invisible to outsiders (Stein, 1989). Appendix 1 extends the results and intuition to the case of observable prices but unobservable market share investments.

Corporate managers usually complain that capital market pressure precludes them from pursuing long-term objectives (Stein, 1989; Porter, 1992; Poterba and Summers, 1995).[7] Our finding rationalizes investors' impatience. Investors have to demand some short-run profits to reduce what managers can divert from them. We should not conclude from this underinvestment result that public firms obtain lower profits than private firms. Firms compete with rivals in situations of imperfect or monopolistic competition. The stock-market pressure to generate short-run profits may relax competition and allow public firms to sustain more collusive equilibria in product market competition and, thus, obtain higher profits.[8]

3. Empirical Evidence

In this section we analyze whether public firms price differently from private firms in the US newspaper industry. The newspaper industry provides an appropriate setting for this study. The industry is evenly populated by public and private firms acting in monopolistic and oligopolistic local markets, without statistical relationship between the firms' ownership structure and either the size of the cities in which the newspapers are published or the market structure that the firms face. The local-market feature allows us to consider firms in the same industry in different markets, avoiding the problem of cross-industry cost and demand comparisons.

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[6] Porter (1992) blames capital markets for favoring tangible over intangible investments.

[7] Poterba and Summers (1995) reports that CEO's responding to their survey answered that they would increase investment by 20% if stock-market correctly valued long-term investment.

[8] An earlier version of this paper shows this result formally for an explicit switching-cost model of price competition.

As in our theoretical model, in this industry future demand and profitability are positively related to current market shares. Newspaper firms produce one tangible product, the newspaper, but in reality face two demands: circulation demand from readers, and advertising demand from advertisers. There is a positive link between current and future circulation demand: habit makes readers loyal to one newspaper relative to other newspapers or media. Band-wagon effects can strengthen inertia in newspaper readership (Bucklin, Caves, and Lo, 1989).

There is also a positive interaction between circulation and advertising demands. Readership attracts advertisers. A long literature also shows that advertising attracts readers. The informational content on product prices and availability provided by advertising is valuable to consumers (Rosse, 1970; Compaine, 1980; Ferguson, 1983; Picard, 1988; Bucklin, Caves and Lo, 1989; Blair and Romano, 1993). The interaction between circulation and advertising demand makes circulation demand inertia translate into advertising demand inertia. An increase in advertising rates reduces current advertising and, therefore, readership. In turn, this decreases future readership and, thus, future advertising demand. When setting both circulation and advertising prices, newspaper firms face a trade-off between increasing long-run profits by charging a low price to capture market share, and increasing short-run profits by charging a high price to current consumers.

3.1 Sample

The initial sample considered all the newspapers included in the top 50 (according to circulation levels as of September 30 of each year) in any year between 1984 and 1995. The analysis starts in 1984 because, since July 1, 1984, advertising prices for all the newspapers are expressed in the same space units, the Standard Advertising Unit (SAU). This resulted in a total of 60 newspapers. From the initial sample, newspapers published for more than one market are excluded.[9] Also newspapers published under Joint Operating Agreements,[10] and

[9] It is not possible to define market variables for these newspapers. This criterion excludes the national newspapers, *USA Today* and *Wall Street Journal*, and *New York Newsday*, which was published for both the Long Island and New York City markets.

newspapers published by foreign parent companies are excluded.[11] The available observations for newspapers that ceased publication during the period of analysis are included in the sample.[12] Two editions of the same newspaper or two newspapers published by the same firm in the same city are considered one newspaper (and the combination advertising rate is used). Local and national advertising rates for each newspaper are available biannually from 1985 to 1993 (5 observations per newspaper). The final sample has 51 newspapers and 230 newspaper-year observations with the following distribution:

Table 1

Final Sample

	Monopoly	Oligopoly	Total
Private	74	32	106
Public	85	39	124
Total	159	71	230

We do not reject the hypothesis of independence of the market structure and the ownership structure variables with a Pearson's χ^2 test at any relevant significance level. Table 2 shows that cities with newspapers published by public and private companies have approximately similar size. Both for monopolistic and oligopolistic markets, we do not reject the hypotheses of equal mean population for cities with private and public firms at any relevant significance

[10] Joint operating agreements (JOA's) are agreements between publishing firms which allow two newspapers in the same city to pool their advertising, circulation, production and business operations while maintaining separate editorial departments. JOA's are exempt from antitrust law by the Newspaper Preservation Act of 1970. Newspapers published under JOA's cannot be classified as public or private. This criterion excludes all the newspaper-year observations for *Chronicle*, San Francisco; *Times*, Seattle; *Free-Press* and *News*, Detroit; and *Press*, Pittsburgh; and some newspaper-year observations for *Herald*, Miami; *Dispatch*, Columbus; and *Post-Gazette*, Pittsburgh.

[11] These newspapers cannot be classified as public or private, as this difference does not have the same implications in other countries as in the United States. This criterion excludes all the newspaper-year observations for *Herald*, Boston (R. Murdoch); and some newspaper-year observations for *Sun-Times*, Chicago; *Express-News*, San Antonio; and *Post*, New York (R. Murdoch); *Daily News*, New York (R. Maxwell); and *Post*, Houston (Toronto Sun Publishing Group).

[12] *Herald Examiner*, Los Angeles; *Globe-Democrat*, St. Louis; and *Times Herald*, Dallas, ceased publication during the period of analysis. Results are robust to excluding these newspapers.

level. Cities with competing newspapers are significantly larger than cities with monopolistic newspapers.[13]

Table 2

Average Metropolitan Statistical Area (MSA) Population

	Monopoly	Oligopoly
Private	1,705,585	4,061,322
Public	1,780,293	4,756,163
t-stat.†	-0.38	-1.10

† Null hypothesis of equal means

3.2 Prices

Newspaper firms collect revenues from circulation and advertising. Advertising revenues are obtained from three categories: local (or retail) display, national (or general) display, and classified.[14,15] Newspaper firms set four prices: circulation price, local display price, national display price, and classified price. There is not enough variation in cover circulation prices,[16] and there are not homogeneous subscription and classified prices to compare circulation and classified prices for public and private firms. This study, therefore, concentrates on local and national display advertising prices. Table 3 shows the sample mean local and national advertising rates for each group.

Table 3

Observed Sample Mean Dollar Rates

	Local Advertising Rates	National Advertising Rates

[13] New York and Chicago are the only oligopolistic markets with more than two competing newspapers. In Chicago there are actually only two big players, *Tribune* and *Sun-Times*.

[14] Display advertising appears throughout the paper and often involves illustrations. Local rates are charged to local advertisers, and national rates are charged to national advertisers. Classified advertising appears on special pages ordered by item.

[15] Rosse (1978) calculates that in a typical newspaper in 1977, 75.4% of revenues came from advertising (50.1% from local display, 6.9% from national display, and 18.4% from classified), and the other 24.6% from circulation. See also Blair and Romano (1993).

[16] In 1985, for example, 36 out of 44 newspapers in the sample cost $0.25. There seem to be significant "menu costs" in cover prices. Prices are only expressed in exact coin amounts, preferably quarters. For many newspapers, prices stayed at $0.25 for several years and then jumped to $0.50.

	Local Advertising Rates			National Advertising Rates		
	Monopoly	Oligopoly	All	Monopoly	Oligopoly	All
Private	$52.43	$63.93	$55.89	$101.81	$119.74	$107.22
Public	$61.87	$97.00	$72.92	$127.19	$199.58	$149.95
t-stat.†	-2.23**	-3.91***	-4.02***	-3.08***	-4.29***	-4.90***

† Null hypothesis of equal means
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

For monopolies, for oligopolies, and for the whole sample, the hypotheses of equal mean rates for private and public firms are rejected at significance levels below 3%, both for local and national rates. Public firms charge higher advertising prices than private firms do. Although cities with competing newspapers are around 155% larger than cities with monopolistic newspapers, oligopolistic newspapers' advertising rates are only around 42% higher than monopolistic newspapers' advertising rates. There is strong price discrimination by newspaper firms between local and national advertisers (see American Association of Advertising Agencies). Prices for national advertisers are about double those for local advertisers.

3.3 Regressions

Table 3 showed that, on average, public newspapers charge higher advertising rates than private newspapers. However, this could reflect the fact that public newspapers are published under market conditions that generate higher prices. To analyze the effect of ownership structure on prices controlling for demand and supply conditions, we run the following reduced-form regression for both local and national advertising prices:[17]

$$Rate_{it} = \lambda_0 + \lambda_1 MSApop_{it} + \lambda_2 \left(MSApop_{it}\right)^2 + \lambda_3 Density_{it} + \lambda_4 Wage_{it} + \lambda_5 Paper_t + \lambda_6 Ink_t$$
$$+ \lambda_7 Allday_{it} + \lambda_8 M\&E_{it} + \lambda_9 Tabloid_{it} + \lambda_{10} Chain_{it} + \lambda_{11} Oligopoly_{it} + \lambda_{12} Public_{it} + \varepsilon_{it}$$

The equation states that advertising prices for newspaper i at time t are a function of variables affecting advertising space demand (both directly and through their effect on

[17] Data definition, sources and summary statistics are presented in Appendix 2.

circulation demand): demographic variables (MSA population, MSA population squared, density)[18] and newspaper characteristics (all day, morning & evening, tabloid);[19] and variables affecting newspapers' advertising space supply: cost variables (labor, paper, and ink), chain membership, market structure (oligopoly or monopoly), and ownership structure (public or private). Most of these variables may actually affect advertising rates both through advertising demand and supply. Alternatively, we also include year-effects instead of the cost variables paper and ink.[20] It is not necessary to control for the degree of multimarket contact between the newspaper chains in the sample because it is negligible (there are only 2 cases in which firms met in more than one market).[21] Our interest is focused on the last coefficient, λ_{12}, which measures the effect of ownership structure on advertising prices.

The results, presented in Table 4 and 5, show that public firms charge higher prices than private firms after taking into account the effect of the control variables.[22] The results are very similar for both local and national advertising rates. They also hold when year-effects are included instead of the paper and ink cost variables, and in pure cross-section studies for each year (the regression for 1989 is shown).[23] The effects are not only statistically, but also economically significant. Evaluated at the mean sample rates, the ownership structure coefficients imply that public firm rates are around 22% higher than private firm rates.

Regarding the control variables, market size measures have a positive, significant, and declining (non-linear) effect on prices. Density -the ratio of city population to MSA population- has a positive but non-significant effect. Wages and printing ink price have a positive effect on prices. Paper price has no effect, once the ink price is included. All-day

[18] Results are robust to including other demographic variables (number of households, income, employment, and retail sales), both at the MSA and city levels, besides population. All these variables show a very high degree of collinearity among them.
[19] There are no firms in the sample publishing only an evening newspaper.
[20] These cost variables correspond to commodities priced at the national level. There would be perfect collinearity if year-effects and paper and ink cost variables were included simultaneously.
[21] Chicago Tribune Co. and News America Pub. Co. (R. Murdoch) met in Chicago and New York in 1985, and New York Times Co. and News America Pub. Co. (R. Murdoch) met in Boston and New York in 1993.
[22] Significance levels are obtained using robust standard errors.
[23] Results are robust to a FGLS correction for the presence of autocorrelation.

newspapers have lower advertising rates. Morning & evening and tabloid dummies are non-significant. Newspaper chains seem to have lower prices, although the effect is only significant for the local rates. Monopolies charge higher rates than oligopolies.

If public firm managers suffer pressure from the stock market to boost short-term results, this pressure should be greater when their ownership participation is lower, i.e., when takeover threats are stronger. Insiders' ownership in the public firms in our sample is high and heterogeneous. The voting power of all directors and officers as a group for the election of the Board of Directors ranges from 1.94% to 93.67%, with a mean of 42.19%.[24]

We classify public firms as "disperse" when the voting power of insiders is below 30%.[25] Results in the first column of Tables 6 and 7 show that disperse public firms charge higher prices than concentrated public firms. The difference is not significant for the local rates, but it is significant for the national rates. In the second column of these Tables we use the voting power of insiders as a continuous variable (valued at 100% for the private firms) instead of the ownership dummies. As expected, the voting power of insiders has a negative and significant coefficient both for local and national rates. In the third column, we interact the continuous voting power variable with the ownership dummy. Controlling for being public, insiders' ownership has a negative effect on prices. Again, the effect is significant for the national rates, but insignificant for the local rates. We interpret this as additional evidence that the stock market pressure leads public firms to charge higher prices. We speculate that the statistical significance of the insiders' ownership variable is higher for the national rates than for the local rates because newspapers have more market power relative to national advertisers.[26] The results also suggest that even when insiders' ownership is high, public firms behave differently from private firms.[27]

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[24] Ownership is concentrated in media industries (Demsetz and Lehn, 1985), but this concentration has been declining in the newspaper industry over the last three decades (Squires, 1993).

[25] Weston (1979) reports that no hostile takeovers occur when insiders' ownership is more than 30%. Results are similar for a 25% cutoff (Morck, Shleifer and Vishny, 1988).

[26] Without market power, stock-market pressure could not generate any difference between public and private firms.

[27] It is interesting to note that the public company with the highest insiders' ownership in our sample, E. W. Scripps, is the one referred to in our initial quotation as suffering "*pressure*

3.4 Alternative Explanations

It can be argued that larger newspaper chains have market power that allows them to charge higher advertising prices. Although public and private newspaper chains are not of very different size, public chains tend to be more extended.[28] If larger newspaper chains enjoy more market power, this could explain why public firms have higher prices. It may be true that newspaper chains have more market power than isolated newspapers relative to nationwide advertisers, but it is more difficult to make the argument that publishing a newspaper in one city gives a firm more market power relative to local advertisers in another city. On the other hand, newspaper chains may have economies of scale that lower, rather than increase, prices. The regressions in Tables 4 and 5 already controlled for chain membership. The Chain dummy showed a negative effect on prices (non-significant for the national rates). If chain membership has some effect on prices, economies of scale seem to prevail.[29] Here, we additionally control for chain size using a continuous variable (the natural log of the number of newspaper in each chain), and also considering small and big newspaper chains separately. Besides, we run the regression reducing the sample to only newspapers belonging to chains, and then to only newspapers belonging to big chains. Tables 8 and 9 show that the effect of ownership structure on prices is robust to these alternative specifications.

We may also consider that some uncontrolled factor can make some newspapers more attractive to readers and advertisers, and at the same time this factor can be related to the ownership structure. For example, better financial resources may allow public newspapers to enhance their quality and attract more readers, or readers may consider that public corporations have more objective editorial voices than private firms. We control for editorial

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from Wall Street." At the time of that quotation, insiders' ownership in E. W. Scripps Co. was 80%. Even when ownership is concentrated in the hands of directors and officers, public firms are perceived as suffering pressure from the stock market.

[28] See *Market Share Reporter*, 1993.

[29] Several studies show that newspaper chains enjoy neither factor, capital or advertising market advantages, nor economies of scale. Instead, the growth of newspaper chains is

quality using as a proxy the number of personnel in titled editorial positions (Bucklin, Caves and Lo, 1989). The results, presented in Table 10, are robust to this specification.

In addition, we control for unobservable factors that could make public newspapers more appealing to readers, and thus to advertisers, by analyzing the milinch rates, the rates per inch per thousand circulation.[30] Table 11 shows the regressions considering the milinch rates as the dependent variables. Public newspapers charge higher advertising rates per reader than private newspapers. Evaluated at the mean sample rates, the ownership structure coefficients imply that public firm milinch rates are around 13% higher than private firms'. The control variables have similar signs as in previous literature.[31] This specification controls for unobservable factors increasing readership and shows that greater readership for public newspapers is not driving our results.

Another concern is raised by the literature on the interaction between product market competition and capital structure. Empirical papers in this literature show that leveraged firms choose higher prices than non-leveraged firms (Chevalier, 1995; Phillips, 1995; Chevalier and Scharfstein, 1996; Schargrodsky, 1997b). These papers deal with the endogeneity problem that, just as firms' debt levels may affect their price choices, demand or supply shocks may affect their financial positions. To address this issue, these authors exploit some exogenous event or instrument. We consider that our study is significantly safer from endogeneity problems than this previous research. Ownership structures are much more permanent than financial positions. It would be forced to argue that current demand or supply shocks affect firms' ownership structures.

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attributed to tax advantages (Dertouzos, 1982; Dertouzos and Thorpe, 1982; Dertouzos and Trautman, 1990).

[30] Given that what advertisers buy is the opportunity to reach readers, research on advertising rates often focus on the milinch rates (Ferguson, 1983; Simon, Primeaux, and Rice, 1986; Picard, 1988). This rests on the idea that advertisers compare advertising costs per reader.

[31] The non-significant or negative effect of population in the milinch regressions reflects the strong economies of scale in this industry (Ferguson, 1983). The non-significant effect of market structure on the rates per reader probably reflects the counterbalance of market power and economies of scale. Ferguson (1983) finds higher milinch rates for competing newspapers, and Picard (1988) finds lower milinch rates for competing newspapers.

However, if their access to stock markets also allows public firms to take on higher debt levels than private firms, the concern is whether both ownership structure and leverage have an effect on prices, or whether ownership structure is just acting here as a proxy or instrument for debt, and capturing the effect of debt on prices rather than having a direct effect. Unfortunately, there is no financial information available by firm for the private companies to control for debt levels. We have only found average data on debt ratios for all the firms (public and private) in the industry from IRS tax returns. Table 12 compares the average industry debt ratio (from IRS tax returns) with the average public firm debt ratio (from Compustat data) for firms of similar size. Public firms do not seem to have higher debt ratios than private firms.[32]

Table 12

Debt Ratios (Total Liabilities/Total Assets)

Year	IRS†		Compustat‡	
	Number of Corp.	Average Debt Ratio	Number of Corp.	Average Debt Ratio
1985	24	53.6	10	55.7
1986	26	56.5	10	55.6
1987	31	57.4	11	54.8
1988	33	61.3	13	54.5
1989	36	62.9	15	52.9
1990	37	52.6	15	54.1
1991	35	53.6	14	54.4
1992	33	52.0	15	54.5
1993	33	55.6	14	50.4

† Average debt ratio for newspaper firms with assets above $250M. Source: *Almanac of Business and Industrial Financial Ratios*, with data from IRS tax returns.
‡ Average debt ratio for public newspaper firms with assets above $250M. Source: Compustat.

Other hypotheses have also been explored. Three private newspapers filed for bankruptcy during the period of analysis. If demand falls for newspapers under bankruptcy, this could explain the finding of lower prices for private firms. Results are robust to excluding these newspapers.[33] It may also be argued that older newspapers have larger demand, as readers may value tradition. At the same time, they could more likely be public, as more time might have elapsed since the founder's death. Most of the newspapers in the sample are very old

[32] This comparison must be taken with caution. We are ignorant of how comparable Compustat and IRS data are.
[33] For the adventures of *Globe-Democrat*, St. Louis; *Post*, New York; and *Daily News*, New York, see *Editor & Publisher*, January 3, 1987, and January 1, 1994.

(founded in the XVIII and XIX centuries), and there is no statistical difference in age between public and private newspapers. Results are robust to controlling for newspaper age in several ways.

3.5 Public Firms Price High or Private Firms Price Low?

We can interpret the pricing difference between public and private newspapers as evidence that public newspapers price too high or, instead, as showing that private newspapers price too low. Private owners might satisfy non-profit maximizing preferences when choosing prices. In the same way that Hicks' monopolists enjoy a "quiet life" without the product-market pressure, the "quiet life" of private owners without the stock-market pressure may allow them to pursue other (political, social, dynastic, etc.) purposes. If private newspaper owners have a taste for reaching a larger audience, they may choose lower prices.

Given their development, it would be difficult to argue that private newspaper chains, like Samuel Newhouse's Advance Publications,[34] Cox Enterprises, or Hearst Corporation, do not have profit-maximizing preferences, like any other corporation. Privately held chain growth has kept pace with the development of publicly held chains.[35] Unless their owners are infinitely rich, private chains have had to generate profits to finance their acquisitions of newspapers in successful bids against other chains. However, some non-chain newspapers in private hands belong to individuals, families or institutions that might pursue non-profit maximizing objectives.[36] These newspapers are excluded when we only consider those belonging to chains or big chains. Tables 8 and 9 have already shown that our results hold when only chain newspapers are considered. Even if both chain and non-chain private firms could pursue non-profit maximizing purposes, we would expect less departure from profit

[34] For a list of antitrust suits and tax fraud accusations faced by Newhouse, see *Business Week*, July 1, 1985.

[35] For example, see "Privately Held Groups Did Most of the Buying," *Editor & Publisher*, January 5, 1985.

[36] The best potential example of non-profit maximizing behavior could be the *Times*, St. Petersburg. Its publisher, Nelson Poynter, left his newspaper to the Poynter Institute for Media Studies, implementing an elaborate scheme to ensure that the *Times* would remain free from chain control (Coulson, 1988).

maximization by the chains. However, the effect of ownership structure on prices is not smaller when we only consider big chains than for the whole sample.

In addition, when we compare private oligopolies and private monopolies, we can presume that oligopolistic private owners have less freedom to deviate from profit maximization than monopolistic private owners, as product market competition disciplines them towards economic efficiency. Oligopolistic private owners need to generate profits in order to compete and survive in product market competition. Therefore, the price difference between private and public firms should be smaller under duopoly than under monopoly. On the contrary, Table 13 shows that this price difference is in fact larger for oligopolies than for monopolies.

4. Conclusions

This paper analyzes whether publicly traded firms charge different prices than privately held firms in the product markets. Our theoretical model shows that public firm shareholders optimally demand short-run returns to reduce agency costs, forcing public firms to charge higher prices than private firms. Other theoretical arguments predict that public firms have lower prices than private firms. The empirical evidence shows that, in the US newspaper industry, public firms charge higher advertising rates than private firms. The effects are statistically and economically significant. In addition, public firm prices are decreasing in insiders' ownership participation. The evidence is consistent with the view that their ownership structures lead public firms to charge higher prices. The evidence is not consistent with the alternative explanations that public newspaper chains charge higher prices because they are larger; or because better quality, or other factors allow them to have greater readership; or because they are more leveraged; or because private owners pursue non profit-maximizing purposes.

Appendix 1

Let us assume now that shareholders can observe prices, but information asymmetries between managers and shareholders regarding cost and demand conditions make investments in market share still invisible to shareholders. We assume that there are S possible states of nature. In each state s, profits are $\pi_1^s(p_1^s)+\pi_2^s(\sigma_1(p_1^s))$, where σ_1 is period-1 market share; $\pi_1^s(p_1^s)$ and $\left[\pi_1^s(p_1^s)+\pi_2^s(\sigma_1(p_1^s))\right]$ are concave in p_1^s; and $\frac{\partial\pi_2^s(\sigma_1(p_1^s))}{\partial\sigma_1}>0$, and $\frac{\partial\sigma_1(p_1^s)}{\partial p_1}<0$, $\forall\ p_1^s$. In period 1, the manager observes the state of nature and chooses price. Shareholders observe prices, but prices are completely uninformative about the state of nature. Shareholders cannot infer from the prices which state of nature has occurred. In period 2, shareholders observe the state of nature. For the public firm, the time structure is:

Period 1: The manager observes s, chooses p_1, and collects profits $\pi_1^s(p_1^s)$.
The manager distributes $\pi_1^s(p_1^s)$ between dividends D_1 and perquisites.
Shareholders receive D_1, and decide whether to replace the manager or not.
Perquisites (if they exist) are consumed by whoever is in charge.

Period 2: Shareholders receive $D_2=\pi_2^s(\sigma_1(p_1^s))$.

When the firm is private, in each state s the owner solves:

$$\underset{\{p_1^{s-Priv}\}}{Max}\ \pi_1^s(p_1^{s-Priv})+\pi_2^s(\sigma_1(p_1^{s-Priv}))$$

The FOC is:

$$\frac{\partial\pi_1^s(p_1^{s-Priv^*})}{\partial p_1^{Priv}}+\frac{\partial\pi_2^s(\sigma_1(p_1^{s-Priv^*}))}{\partial\sigma_1}\frac{\partial\sigma_1(p_1^{s-Priv^*})}{\partial p_1^{Priv}}=0$$

As in switching cost models, the period-1 price is below the short-run profit-maximizing level: $\frac{\partial\pi_2^s(\sigma_1(p_1^{s-Priv^*}))}{\partial\sigma_1}>0$, $\frac{\partial\sigma_1(p_1^{s-Priv^*})}{\partial p_1^{Priv}}<0$, and thus in the optimum $\frac{\partial\pi_1^s(p_1^{s-Priv^*})}{\partial p_1^{Priv}}>0$.

In each state s in period 1 the private firm makes $\pi_1^s\left(p_1^{s-Priv^*}\right)$. One of these states, which we call state L, gives the lowest period-1 profit at the long-run profit-maximizing price: $\pi_1^L\left(p_1^{L-Priv^*}\right) < \pi_1^s\left(p_1^{s-Priv^*}\right), \forall s \neq L.$

When the firm is public, the shareholders can implement a certain level of investment in market share through an appropriate incentive scheme. Let us suppose first that the shareholders wish to induce the same investment level that a private firm would undertake. To do that, shareholders have to commit not to fire the manager when she pays $D_1 = \pi_1^L\left(p_1^{L-Priv^*}\right)$, the lowest possible profit level. But then, in any state s, the manager can steal the difference between that profit level and the maximum period-1 profits level $\underset{\left\{p_1^{s-Mger}\right\}}{Max}\, \pi_1^s\left(p_1^{s-Mger}\right)$ that she can attain. To implement the long-run profit-maximizing investment level, the manager has to be offered a bribe B (the bribe B is paid in period 2 when the information asymmetry has been resolved) satisfying:

$$B \geq \underset{\left\{p_1^{s-Mger}\right\}}{Max}\, \pi_1^s\left(p_1^{s-Mger}\right) - \pi_1^L\left(p_1^{L-Priv^*}\right)$$

The shareholders choose the incentive scheme that induces a certain investment level in each state s in order to maximize dividends. We can directly consider that shareholders choose the price, subject to the manager's incentive compatibility constraint. Thus, the shareholders' problem in each state s is to choose p_1^{s-Pub} to solve:

$$\underset{\left\{p_1^{s-Pub}\right\}}{Max}\, \pi_1^s\left(p_1^{s-Pub}\right) + \pi_2^s\left(\sigma_1\left(p_1^{s-Pub}\right)\right) - B \text{ s.t. } B \geq \underset{\left\{p_1^{s-Mger}\right\}}{Max}\, \pi_1^s\left(p_1^{s-Mger}\right) - \pi_1^L\left(p_1^{L-Pub}\right)$$

In state L (and with the constraint satisfied with equality), the problem becomes:

$$\underset{\left\{p_1^{L-Pub}\right\}}{Max}\left[2\pi_1\left(p_1^{L-Pub}\right) + \pi_2\left(\sigma_1\left(p_1^{L-Pub}\right)\right) - \underset{\left\{p_1^{L-Mger}\right\}}{Max}\, \pi_1\left(p_1^{L-Mger}\right)\right],$$

i.e., the shareholders solve:

$$\underset{\left\{p_1^{L-Pub}\right\}}{Max}\, 2\pi_1\left(p_1^{L-Pub}\right) + \pi_2\left(\sigma_1\left(p_1^{L-Pub}\right)\right)$$

In state L, the public firm puts more weight on current profits than the private firm, as this reduces the bribe that has to be paid to the manager. In state L, the FOC is now:

$$\frac{\partial \pi_1^L\left(p_1^{L-Pub*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_1^L\left(p_1^{L-Pub*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_2^L\left(\sigma_1\left(p_1^{L-Pub*}\right)\right)}{\partial \sigma_1}\frac{\partial \sigma_1\left(p_1^{L-Pub*}\right)}{\partial p_1^{Pub}}=0$$

The first term represents the effect of period-1 price on current profits, the second is the effect of period-1 price on agency costs, and the third represents the effect of period-1 price on future profits.

Proposition: Public firms choose (weakly) higher prices than private firms.

Proof: In state L, evaluating the public firm FOC at $p_1^{L-Priv*}$,

$$\frac{\partial \pi_1^L\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_1^L\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}+\frac{\partial \pi_2^L\left(\sigma_1\left(p_1^{L-Priv*}\right)\right)}{\partial \sigma_1}\frac{\partial \sigma_1\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}>0,$$

because $\frac{\partial \pi_1^L\left(p_1^{L-Priv*}\right)}{\partial p_1^{Pub}}>0$. By concavity, $p_1^{L-Pub*}>p_1^{L-Priv*}$.

Note that the public firm price may be higher than the private firm's not only in state L but also in other states. It may occur that once the public firm optimally increases the price in state L above the long-run optimal level, there is now another state K such that $\pi_1^K\left(p_1^{K-Priv*}\right)<\pi_1^L\left(p_1^{L-Pub*}\right)$. If this is the case, the public firm price in state K also has to be distorted.

Appendix 2

Data Definition and Sources

Variable	Definition	Source
Rate (local and national)	Rate per inch for a 1,000 inch-annual bulk contract (most representative contract according to A.A.A.A.) for local or national advertisers (combination rate for two editions of the same newspaper or two newspapers published by same firm).	*Newspaper Rate Differentials: A.A.A.A. Study of General and Retail Advertising Rates*, American Association of Advertising Agencies

Milinch Rate (local and national)	=(*Rate**1,000)/Circulation	See *Rate*, and *Editor & Publisher International Yearbook*
MSAPop	Metropolitan Statistical Area (MSA) population	*Editor & Publisher Market Guide*
Density	City population/MSA population	See *MSAPop*
Wage	Publication industry (SIC 2711) wage at the state level	*Employment and Wages -Annual Averages-*, and *Employment and Earnings*, Bureau of Labor Statistics
Paper	Newsprint price index	*Producer Price Indexes*, Bureau of Labor Statistics
Ink	Printing ink price index	See *Paper*
Allday	Dummy=1 if newspaper is published all-day, =0 otherwise	*Editor & Publisher International Yearbook*
M&E	Dummy=1 if morning & evening editions published by the same firm (under the same or different names), =0 otherwise.	See *Allday*
Tabloid	Dummy=1 if newspaper is tabloid, =0 otherwise	See *Allday*
Chain Size	Number of newspapers published by the chain	See *Allday*
Chain	Dummy=1 if *Chain Size*>1, =0 otherwise	See *Allday*
Small Chain	Dummy=1 if 5≥*Chain Size*≥2, =0 otherwise	See *Allday*
Big Chain	Dummy=1 if *Chain Size*>5, =0 otherwise	See *Allday*
Oligopoly	Dummy=1 if newspaper is a central-city oligopolist, =0 if newspaper is a central-city monopolist	See *Allday*
Public	Dummy=1 if parent company is public, =0 if parent company is private	*Editor & Publisher International Yearbook*, *Editor & Publisher*, *Directory of Corporate Affiliations*, 10 K's, COMPUSTAT
Editors	Total number of titled editorial positions (news executives, editors and managers)	See *Allday*
Voting Power	=Ownership by all directors and officers as a group if public parent company with one common stock class, =Ownership by all directors and officers weighted by voting rights if public parent company with dual common stock classes and pooled voting arrangements, =Ownership by all directors and officers weighted by Board members per class if public parent company with dual common stock classes and class voting arrangements, =100 if private parent company	Proxy statements
Disperse Public	Dummy=1 if *Voting Power*≤30, =0 otherwise	See *Voting Power*

Summary Statistics

Variable	Mean	Std. Deviation	Min	Max
Local Rate	65.07687	33.0797	20.2	197.85
National Rate	130.2613	69.14777	50.36	412
Local Milinch Rate	0.17148	0.04742	0.08409	0.34368
National Milinch Rate	0.34394	0.10939	0.17825	0.76287
MSAPop	2578221	2178020	377709	9656033
Density	0.35072	0.18276	0.09968	0.85926
Wage	435.7522	98.83847	260	858
Paper	120.1452	6.48271	110.3	129.3
Ink	105.8078	6.50118	97.3	113.4
Allday	0.20434	0.40410	0	1
M&E	0.23478	0.42478	0	1

Tabloid	0.07179	0.24967	0	1
Chain Size	13.93478	16.49507	1	83
Chain	0.81739	0.38718	0	1
Small Chain	0.17826	0.38356	0	1
Big Chain	0.63913	0.48130	0	1
Oligopoly	0.30869	0.46296	0	1
Public	0.53913	0.49955	0	1
Editors	52.25652	20.947	19	147
Voting Power†	42.19136	25.81592	1.94	93.67
Voting Power	68.83361	34.52444	1.94	100
Disperse Public	0.23478	0.42478	0	1

† Considering public firms only.

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Table 4

Dependent variable: Local Advertising Rate

Variables	Cost variables	Year Effects	1989
MSA Population	0.0000263***	0.0000262***	0.0000306***
	(8.106)	(8.093)	(4.995)
(MSA Population)^2	-1.61e-12***	-1.60e-12***	-2.22e-12**
	(-3.549)	(-3.519)	(-2.495)
Density	16.35459	15.87761	32.26611
	(1.591)	(1.531)	(1.426)
Wage	0.03222**	0.02824*	0.02254
	(2.123)	(1.801)	(0.720)
Paper	-0.04698		
	(-0.266)		
Ink	1.08335***		
	(5.991)		
All day	-7.86853***	-7.61849**	-1.67499
	(-3.463)	(-3.318)	(-0.270)
Morning & Evening	1.40634	1.76862	5.27257
	(0.638)	(0.786)	(1.070)
Tabloid	-2.06906	-2.085	0.60086
	(-0.352)	(-0.358)	(0.056)
Chain	-4.92604**	-5.09199**	-7.51567
	(-2.199)	(-2.299)	(-1.592)
Oligopoly	-13.56327***	-13.23508***	-12.04749*
	(-4.062)	(-3.901)	(-1.998)
Public	13.97078***	14.13945***	20.78006***
	(5.196)	(5.273)	(3.357)
Year-effects	NO	YES	NO
Observations	230	230	48
R^2	0.7764	0.7784	0.7445

Robust t-statistics are in parentheses

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Table 5

Dependent variable: National Advertising Rate

Variables	Cost variables	Year Effects	1989
MSA Population	0.0000334***	0.0000333***	0.0000412***
	(5.887)	(5.915)	(3.371)
(MSA Population)^2	-1.06e-12	-1.04e-12**	-2.04e-12
	(-1.463)	(-1.423)	(-1.291)
Density	15.04097	13.62582	47.8384
	(0.829)	(0.748)	(1.212)
Wage	0.11434***	0.10221***	0.08720
	(3.166)	(2.761)	(1.046)
Paper	-0.20252		
	(-0.564)		
Ink	2.47589***		
	(6.507)		
All day	-20.56851***	-19.82296***	-10.7713
	(-4.236)	(-4.075)	(-0.857)
Morning &	3.28157	4.34888	9.78583
Evening	(0.620)	(0.838)	(0.874)
Tabloid	-13.79673	-13.8236	-9.56629
	(-1.447)	(-1.452)	(-0.550)
Chain	-3.44709	-3.93470	-8.08068
	(-0.692)	(-0.805)	(-0.713)
Oligopoly	-22.76429***	-21.80746***	-20.70101
	(-3.440)	(-3.288)	(-1.452)
Public	28.98334***	29.49687***	41.46865***
	(5.996)	(6.157)	(3.615)
Year-effects	NO	YES	NO
Observations	230	230	48
R^2	0.7914	0.7958	0.7773

Robust t-statistics are in parentheses
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 6

Dependent variable: Local Advertising Rate

Variables	Disperse Public Dummy	Voting Power	Public*Voting Power
MSA Population	0.0000262***	0.0000257***	0.0000263***
	(8.121)	(7.785)	(8.096)
(MSA Population)^2	-1.60e-12***	-1.56e-12***	-1.61e-12***
	(-3.526)	(-3.255)	(-3.531)
Density	16.11971	14.61371	16.34263
	(1.561)	(1.331)	(1.595)
Wage	0.03490**	0.04802***	0.03246**
	(2.171)	(2.978)	(2.005)
Paper	-0.05247	-0.02734	-0.04652
	(-0.297)	(-0.151)	(-0.262)
Ink	1.07197***	1.08187***	1.08365***
	(5.833)	(5.825)	(6.014)
All day	-8.13996***	-9.86543***	-7.90075***
	(-3.596)	(-4.223)	(-3.406)
Morning & Evening	1.46420	1.53569	1.41190
	(0.662)	(0.711)	(0.638)
Tabloid	-2.56718*	-2.88812	-2.08056
	(-0.438)	(-0.462)	(0.356)
Chain	-5.18851**	-3.74487	-4.92963**
	(-2.284)	(-1.562)	(-2.196)
Oligopoly	-13.23034***	-12.31113***	-13.53687***
	(-3.832)	(-3.839)	(-3.947)
Public	13.00581***		14.12709***
	(4.115)		(4.203)
Disperse Public	2.01049		
	(0.692)		
Voting Power		-0.16475***	
		(-4.684)	
Public*Voting Power			-0.00398
			(-0.069)
Observations	230	230	230
R^2	0.7768	0.7662	0.7764

Robust t-statistics are in parentheses
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 7

Dependent variable: National Advertising Rate

Variables	Disperse Public Dummy	Voting Power	Public*Voting Power
MSA Population	0.0000325***	0.0000328***	0.0000335***
	(6.049)	(5.969)	(6.090)
(MSA Population)^2	-1.01e-12	-1.05e-12	-1.10e-12
	(-1.389)	(-1.395)	(-1.501)
Density	12.83897	12.47272	14.34313
	(0.677)	(0.636)	(0.763)
Wage	0.13941***	0.14492***	0.12808***
	(3.749)	(3.916)	(3.397)
Paper	-0.25401	-0.15492	-0.17567
	(-0.718)	(-0.430)	(-0.493)
Ink	2.36922***	2.49130***	2.49322***
	(6.342)	(6.499)	(6.584)
All day	-23.1131***	-24.57288***	-22.44742***
	(-4.915)	(-5.024)	(-4.663)
Morning & Evening	3.824	3.74006	3.60614
	(0.748)	(0.730)	(0.694)
Tabloid	-18.46637*	-15.34058	-14.46693
	(-1.830)	(-1.473)	(-1.462)
Chain	-5.90769	-2.37478	-3.65650
	(-1.159)	(-0.456)	(-0.720)
Oligopoly	-19.64323***	-19.89893***	-21.22498***
	(-3.047)	(-3.208)	(-3.273)
Public	19.93711***		38.09665***
	(3.555)		(5.891)
Disperse Public	18.84765***		
	(3.349)		
Voting Power		-0.40637***	
		(-6.309)	
Public*Voting Power			-0.23244*
			(-1.936)
Observations	230	230	230
R^2	0.7997	0.7921	0.7948

Robust t-statistics are in parentheses

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Table 8

Dependent variable: Local Advertising Rate

Variables	Whole Sample	Whole Sample	Only Chains	Only Big Chains
MSA Population	0.0000263***	0.0000263***	0.0000252***	0.0000294***
	(8.076)	(8.180)	(7.335)	(7.822)
(MSA Population)^2	-1.61e-12***	-1.62e-12***	-1.46e-12***	-1.81e-12***
	(-3.554)	(-3.585)	(-3.119)	(-3.639)
Density	17.14801*	16.42617	23.66268**	16.59578
	(1.660)	(1.593)	(2.230)	(1.482)
Wage	0.03272**	0.03358**	0.05322***	0.02998
	(2.130)	(2.165)	(3.053)	(1.102)
Paper	-0.04693	-0.04775	-0.02529	-0.04178
	(-0.264)	(-0.270)	(-0.129)	(-0.184)
Ink	1.09218***	1.07325***	1.06418***	1.26625***
	(6.006)	(5.887)	(5.265)	(5.577)
All day	-8.01978***	-8.24294***	-9.67673***	-10.0296***
	(-3.549)	(-3.629)	(-3.691)	(-3.582)
Morning & Evening	0.78482	1.60980	0.23167	-7.38665**
	(0.340)	(0.706)	(-0.092)	(-2.504)
Tabloid	-1.13781	-2.24985	5.66554	7.42118
	(-0.191)	(-0.381)	(1.212)	(1.532)
Small Chain		-6.30501**	-0.76586	
		(-2.120)	(-0.295)	
Big Chain		-4.51559*		
		(-1.915)		
Ln(Chain Size)	-0.71262			
	(-0.895)			
Oligopoly	-13.88005***	-13.61131***	-16.53963***	-22.82648***
	(-4.060)	(-4.107)	(-4.552)	(-5.786)
Public	13.23492***	13.87612***	11.22875***	17.15575***
	(4.907)	(5.135)	(3.548)	(4.480)
Observations	230	230	188	147
R^2	0.7741	0.7768	0.7973	0.8215

Robust t-statistics are in parentheses

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Table 9

Dependent variable: National Advertising Rate

Variables	Whole Sample	Whole Sample	Only Chains	Only Big Chains
MSA Population	0.0000333***	0.0000336***	0.0000335***	0.0000421***
	(5.890)	(6.056)	(5.373)	(6.322)
(MSA Population)^2	-1.07e-12	-1.12e-12	-1.17e-12	-1.73e-12**
	(-1.474)	(-1.559)	(-1.523)	(-2.180)
Density	14.94629	15.35296	27.2595	11.46535
	(0.820)	(0.843)	(1.408)	(0.536)
Wage	0.11781***	0.12024***	0.16827***	0.06480
	(3.250)	(3.215)	(3.651)	(1.033)
Paper	-0.21375	-0.20589	-0.15979	-0.14516
	(-0.593)	(-0.572)	(-0.400)	(-0.336)
Ink	2.47012***	2.43186***	2.18879***	2.976***
	(6.442)	(6.444)	(4.949)	(7.002)
All day	-21.15376***	-22.20046***	-24.10665***	-24.24768***
	(-4.443)	(-4.546)	(-4.421)	(-4.501)
Morning & Evening	3.46261	4.16842	-4.59365	-16.89746**
	(0.636)	(0.775)	(-0.803)	(-2.574)
Tabloid	-12.73145	-14.58473	2.04880	9.00111
	(-1.360)	(-1.537)	(0.254)	(1.007)
Small Chain		-9.45759	-5.58929	
		(-1.362)	(-0.918)	
Big Chain		-1.65806		
		(-0.323)		
Ln(Chain Size)	0.71456			
	(0.444)			
Oligopoly	-22.44481***	-22.97366***	-29.30779***	-45.4801***
	(-3.295)	(-3.489)	(-4.058)	(-6.509)
Public	27.89336***	28.57075***	26.79209***	37.64795***
	(5.649)	(5.831)	(4.598)	(5.452)
Observations	230	230	188	147
R^2	0.8059	0.7930	0.8052	0.8392

Robust t-statistics are in parentheses

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Table 10

Variables	Dependent Variable: Local Advertising Rate	Dependent Variable: National Advertising Rate
MSA Population	0.0000163***	0.0000218***
	(5.883)	(4.108)
(MSA Population)^2	-7.26e-13*	-4.88e-14
	(-1.932)	(-0.075)
Density	12.66862	10.78866
	(1.354)	(0.610)
Wage	0.03286**	0.11508***
	(2.320)	(3.219)
Paper	0.13382	0.00606
	(0.848)	(0.017)
Ink	1.06040***	2.44941***
	(6.618)	(6.644)
All day	-9.17765***	-22.07877***
	(-4.885)	(-4.787)
Morning &	-7.81578***	-7.35747
Evening	(-3.263)	(-1.442)
Tabloid	-2.31682	-14.08255
	(-0.447)	(-1.520)
Chain	-4.50425**	-2.96050
	(-2.122)	(-0.621)
Editors	0.47275***	0.54538***
	(7.463)	(4.331)
Oligopoly	-5.59338**	-13.56988**
	(-2.083)	(-2.129)
Public	9.80891***	24.18203***
	(4.141)	(5.111)
Observations	230	230
R^2	0.8250	0.8062

Robust t-statistics are in parentheses
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 11

Dependent Variables: Milinch Rates

Variables	Local Milinch Rate	National Milinch Rate
MSA Population	4.66e-9	-3.85e-8***
	(0.916)	(-3.206)
(MSA Population)^2	-8.22e-16	4.17e-15***
	(-1.474)	(2.623)
Density	0.01808	-0.04630
	(0.893)	(-0.895)
Wage	-0.00007**	-0.00019***
	(-2.426)	(-2.911)
Paper	0.00020	0.00021
	(0.527)	(0.246)
Ink	0.00445***	0.01084***
	(9.337)	(9.930)
All day	-0.00559	-0.01929
	(-0.841)	(-1.361)
Morning &	-0.14878**	-0.02645*
Evening	(-2.096)	(-1.682)
Tabloid	-0.00574	-0.01675
	(-0.520)	(-0.656)
Chain	-0.01875***	-0.01341
	(-2.766)	(-1.086)
Oligopoly	0.00388	0.00820
	(0.506)	(0.486)
Public	0.01917***	0.04923***
	(3.541)	(4.251)
Observations	230	230
R^2	0.4278	0.4611

Robust t-statistics are in parentheses

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Table 13

Variables	Dependent Variable: Local Advertising Rate	Dependent Variable: National Advertising Rate
MSA Population	0.0000254***	0.0000311***
	(8.125)	(5.646)
(MSA Population)^2	-1.51e-12***	-8.34e-13
	(-3.559)	(-1.230)
Density	13.9461	9.09469
	(1.479)	(0.552)
Wage	0.02501*	0.09654***
	(1.774)	(3.000)
Paper	-0.04004	-0.18540
	(-0.236)	(-0.539)
Ink	1.18815***	2.73463***
	(6.558)	(7.318)
All day	-6.23879**	-16.54489***
	(-2.603)	(-3.424)
Morning &	2.19822	5.23663
Evening	(1.038)	(1.004)
Tabloid	0.90986	-6.4421
	(0.151)	(-0.679)
Chain	-4.94357**	-3.49037
	(-2.177)	(-0.718)
Oligopoly	-20.98906***	-41.09766***
	(-4.306)	(-4.872)
(Public*	9.50850***	17.96652***
(1-Oligopoly))	(4.241)	(3.918)
(Public*	24.89684***	55.95848***
Oligopoly)	(4.300)	(5.791)
Observations	230	230
R^2	0.7869	0.8060

Robust t-statistics are in parentheses
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level