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Corporate Governance and Public Corruption

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Abstract

Corporate governance in the private sector and corruption are important for economic development and private sector development. This paper investigates how corporate governance in private-sector media companies can affect public corruption. The analytical framework, based on models of corporate governance, identifies two channels through which media ownership concentration affects corruption: an owner effect, which discourages corruption and a competition-for-control effect that enhances it. When the ownership structure of a newspaper has a majority shareholder, the first effect dominates and corruption decreases as ownership becomes more concentrated in the hands of majority shareholders. Without majority shareholders, the competition-for-control effect dominates and corruption increases with the concentration of ownership of the media company. Thus, the paper shows that cases of intermediate media-ownership concentration are the worst at promoting public accountability, while extreme situations, where the ownership is completely concentrated or widely held, can result in similar and lower levels of corruption.

This paper—a product of the Trade and Integration Team, Development Research Group—is part of a larger effort in the department to understand the links between private-sector development and public corruption. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at acusolito@worldbank.org.

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1 Introduction

Economists have long recognized the cozy relationship between economic progress and the development of good institutions. In Douglass North[26]'s words, institutions are the rules of the game in a society that shape human interactions through incentives. Therefore, institutions matter for economic growth because they shape the incentives of key economic actors in a society.

A relevant institution of the civil and political society are the media, because they control the flows and the content of information provided to voters. This paper presents a game theoretical model to discuss how and when media is captured. In doing so, it brings into the analysis corporate governance theory. The results provide new insights to regulate the industry.

The theoretical analysis rests on a two-period moral hazard voting model, which adds to the standard framework a media sector, which provides endogenously information about the incumbent to the electorate. As an innovation, the model opens media firms and introduces a contest for corporate control, which figures out the channel through which ownership concentration affects corruption.

Control of each media firm is determined in a shareholders' meeting, where large media shareholders submit competing proposals to capture the votes of minority ones. The proposals are binding commitments on a monetary payment that each large shareholder promises to distribute, as a dividend of the firm, in case he wins the control of the outlet and there is no written story exposing the corrupt politician. This payment serves to compensate minority owners for the profits they lose when the controlling shareholder accepts a bribe in exchange for the suppression of the news.

A key determinant of corruption in equilibrium is how much money the corrupt politician has to pay to silence the media. Higher bribes decrease the return to corruption and thereby the amount of stolen public funds. The bribe has to compensate the money that the controlling shareholder loses when he accepts to make the firm uninformative. This amount depends on two components. The benefits the shareholder loses as an owner of the firm, and the compensation he has to pay to minority owners.

The effect of ownership concentration on corruption can be decomposed

into two different effects: a negative *owner effect*, which discourages corruption, and a non-negative *contest-for-control effect*, which enhances it. Specifically, when the ownership structure of a media outlet is concentrated, there is a majority owner, shareholders do not compete for corporate control. Instead, the main shareholder runs the company and he pays nothing to minority owners in case he suppresses the bad news. The *contest-for-control effect* is null, and because the bribe that the incumbent has to pay to capture a media firm increases with the size of the main shareholder's stake of shares, corruption decreases as ownership concentrates.

By contrast, when the ownership structure is widely held, large shareholders compete for corporate control. In equilibrium, the largest owner wins the contest, promising to the smaller ones a compensation for misreporting that decreases with the size of his holding. This introduces a new type of tunneling problem, called the *second-order* tunnel, where the benefits expropriated, or more precisely, not payed to minority owners, are implicitly transferred to the corrupt politician; fact that reduces the burden he has to pay to win the re-election. In this case, the *owner* and the *contest-for-control effects* co-exist. However, since the latter effect dominates, corruption increases as ownership concentrates.

Therefore, the relationship between ownership concentration and corruption is non-monotonic. In this respect, cases of intermediate concentration are the worst to promote accountability, while extreme situations, where the ownership is completely concentrated or widely held, are likely to deliver the same levels of corruption. The results stands in sharp contrast with the conventional wisdom and constitutes overall the main contributions of this work.

The case of Bosnian media provides an illustrative example of the owner effect. The story has been documented by the book *Media Ownership and its Impact on Media Independence and Pluralism*, and it refers to the *Dnevni Avaz*, the main newspaper in Bosnia and Herzegovina. For a long time, the paper has been the only one in the market, and there has been a lot of discussion about its finance and political affiliation. However, it has been widely claimed that *Avaz*, initially, was supported by the ruling Bosnian nationalist party *SDA*. Nevertheless, in 2000, its only owner, Fahrudin Radonic,

distanced himself from the party in an attempt to establish an independent daily. This move was severely punished by *SDA* officials, who used, without success, various forms of pressure to put an end to his rebelion. The fact that all the property of the newspaper was concentrated in one shareholder prohibited the government from silencing the outlet and helped to curb corruption.

The case of the Estonian media, at the beginning of the privatization processes, illustrates the contest-for-control effect. According to the same source that documents the case of Bosnia, the Estonian media have played an outstanding role in the transformation and liberalization of the civil and political society. Privatization brings ownership diversification, mainly in the editorial teams, who became the owners of the newspapers. Press freedom brought about joint ventures and agreements, which divide the market among competing companies and shareholders. The process delivers independence, pluralism and accountability.

The interest for the media industry has increased considerable in the last years. In particular, during the last decade, the media industry of many countries around the world has experienced remarkable changes, and even though these changes have been affected by each country's idiosyncratic factors, most of the transformations in the industry have been characterized by two worldwide trends: ownership and market concentration. In the U.S the dominant trend has been the conglomeration of media ownership. To some extent, this trend has been fueled by a desire to create lucrative vertical and horizontal integrations. As a result, the press industry has experienced a spectacular consolidation, which has left half a dozen major chains and a handful of shareholders to rule the market.[1]

Similar trends have also been observed in Europe, where there has been a constant push towards the consolidation of the sector. Concentration has taken place not only in the market, but also in the ownership of publishing firms. This process leaves few outlets and shareholders controlling the in-

[1]..."At the end of the World War II, 80 percent of the daily newspapers in U.S were independently owned by chains. In 1981, twenty corporations controlled most of the business of the country's 11.000 magazines, but only seven years later, that number had shrunk to three corporations." Bagdikian, *The Media Monopoly*, p.4.

dustry. Some Western European media firms have been acquired by large American media groups, while other Western European media groups have bought old Eastern European media companies.[2]

The same process has also been evidenced in Latin America, even though at a smaller scale. During the 1990s, the media industry of many countries has become rather less dispersed. Concentration takes place at the hands of domestic pre-existing media groups, which expand their holdings in the industry.

Thus, what has been clear during these years, is that what every the country around the world, the option of being a small- or middle-sized media firm is hardly viable at present. Furthermore, despite the fact that there are-literally speaking-thousands of titles across the world, in each country these titles are controlled by a small number of shareholders.

1.1 Literature Review

This paper relates to different strands of research. First, it is part of the literature on media and political accountability. In this literature, we find the works by Besley and Prat[9], Corneo[12], Djankov[14], and Strömberg and Prat[28], which are closely related to this paper.

Besley and Prat[9] develop a model of democratic politics to analyze how and when media is captured. They find that pluralism provides an effective protection against media capture. Since the existence of a large number of independent media firms make less likely that the government controls news provision. They also find that ownership concentration is related to more corruption. Corneo[12] highlights the role played by firm ownership in determining media independence. He shows that if voters vote over the level of a productivity-enhancing public bad, then an increase in the concentration of firm ownership makes the occurrence of media bias more likely; while Djankov et al.[14] examine the patterns of media ownership around the world. The authors show that government ownership is associated with less press

[2]..." There is a clear issue of concern about the high levels of local, regional and national ownership concentration of newspapers in CEE countries. For example, the German media giant *WAZ* has an European empire, with more than 130 newspapers." European Federation of Journalists, *Eastern Empires, p.8.*

freedom, fewer political and economic rights, inferior governance, and inferior social outcomes.

Strömberg and Prat[28] analyze the effect of liberalizing a country's broadcasting system on the level of information of its citizens. They show that people who start watching commercial TV news increase their level of political knowledge more than those who do not; and that the positive informational effects are particularly valuable since commercial TV news attracts ex ante uniformed voters.

Another group of papers study the role of media to shape government responsiveness to citizens' needs. In this strand of research we find the works by Besley and Burgess[8], who show that having a more informed and politically active electorate strengthens incentives for governments to be responsive; and that of Strömberg[31], who finds that if better informed voters receive favorable policies, then the existence of mass media and/or the invention of a new mass medium affect public policy because mass media provide most of the information people use in voting.

Second, the paper relates to the literature on the balance of power in corporations with multiple (single) large shareholders. A common theme of some of the papers in this strand of research (e.g., Berle and Means[6], Jensen and Meckling[19], Grossman and Hart[16], Shleifer and Vishny[29], Agrawal and Mandelke[2], Chen[11], and Gutierrez and Tribo[17] and Bloch and Ulrich[10]) is that ownership concentration enhances firms' performance. However, it delivers higher levels of expropriation of minority shareholders' profits. This paper merges both strands of research and examines how corporate governance affects governmental corruption.

The paper is structured as follows. Section 2 presents evidence of the importance of the forces that our formal framework identifies. Section 3 presents the model. Section 4 displays the equilibrium results. Section 5 analyzes extensions. Section 6 concludes.

2 Stylized facts

The aim of this section is to offer some evidence that we think is suggestive of the importance of the forces that our formal framework identifies. We

are interested in the existence of a negative owner effect and a non-negative contest for control effect.

Data on media ownership is scarce. However, we extend the data of the paper by Djankov et al.[14] to the year 2003. We perform this task according to the availability of free and reliable information at the time to conduct the extension. The new sample covers 28 middle- and high-income countries. For each country, we have information on the ownership structure and market shares of the top two newspapers, which in most of the cases compete for the same market.[3]

The empirical illustration focuses on the case of the press industry, instead on that of the T.V or radio ones, because it is in the first industry where the ownership structure of media firms experienced more changes. The estimating equation is as follows:

$$Corr_{it} = \beta_0 + \beta_1 \underbrace{\sum_{j=1}^{2} \alpha_{1jit}}_{OE} + \beta_2 \underbrace{\sum_{j=1}^{2} \frac{(\alpha_{1jit} - \alpha_{2jit})}{(1 - \alpha_{1jit} - \alpha_{2jit})} I_{ijt}}_{CCE} + \Theta X_i + \delta Z_{it} \gamma_t + \varepsilon_{it}, \tag{1}$$

where $Corr_{it}$ denotes corruption in country i at time t; α_{1jit} is the fraction of shares owned by shareholder 1 from outlet j of country i at time t; α_{2jit} is the fraction of shares owned by shareholder 2 from outlet j of country i at time t; I_{jit} denotes a dummy variable that equals 1 if outlet j of country i in period t has no majority shareholder and 0 otherwise; X_i is a set of time invariant variables, which capture fixed effects; Z_{it} is a vector of time variant countries' characteristics; and α_t are time effects.

The first term captures the sum of the owner effects in the top two newspapers of country i. The second term stands for the sum of the contest for control effects in the same newspapers. Each effect measures the contestability of shareholders 1' voting power. X_i and Z_{it} control for previous findings in the corruption literature, such as the ones provided by Ades and Di Tella[1], La Porta et al.[22], Triesman[33], and Besley and Prat[9]. Thus, X_i controls for legal origin, protestant traditions, federal states, ethnic and

[3]Newspapers are ranked according to readership figures.

linguistic fractionalization,[4] and democracy; while Z_{it} includes the logarithm of real GDP, an openness index, the sum of the market shares of the top two newspapers, an index of voice and accountability, and daily newspapers circulation.[5] Table I presents the estimation results.

[Insert Table 1 about here]

The sign and the statistical significance of the coefficients of interest are as expected according to the theory. A one standard deviation increases in α_{1jit} generates, through the owner effect, a -0.181 standard deviations reduction in the perceived level of corruption. The same increment delivers, through the contest for control effect, a 0.191 standard deviations increase in the dependent variable. Thus, the empirical illustration shows that if the contest effect is null, the owner effect dominates and corruption decreases as ownership concentrates. Otherwise, both effects coexist but since the contest effect dominates, corruption increases as ownership concentrates.

A potential source of concern regarding the results of Table I is the reverse causality problem. That is, rather than identifying the impact of ownership concentration on corruption, we may be identifying the reverse effect; as corrupt politicians may have a greater incentive to promote the development of highly concentrated ownership structures for media firms. To address this problem, we instrument the owner effect using an index of political stability, which turns to be a valid instrument.[6] We find that we cannot reject the exogeneity hypothesis. To conclude, the results provide evidence in line with the theory.

[4]Because of data constrains, we assume the index is constant over the period 1999-2003.

[5]The Appendix contains a description of each variable and its source.

[6]Recall that to be a valid instrument, a variable has to satisfy three conditions. The first one requires that the variable be not correlated to the error term. The second condition is that in the linear projection of the endogenous variable onto all exogenous regressors the coefficient of the instrumental variable be statistically different from zero at least at the 5% level. The third condition is the exclusion restriction, which demands that the instrument does not affect corruption through channels other than the owner effect. We provide in the appendix the results of each test.

3 The model

The model considers some ingredients of the retrospective voting model of Besley and Prat[9], but it departures from that model in two directions. First, because the focus of this paper is on the relationship between corruption and ownership concentration, the model considers the opposite case to Besley and Prat[9], the one in which there is only one firm in the market. As we explain later, this is not a crucial assumption to prove the main results of the paper. Second, the model opens media firms and incorporates corporate governance theory in the analysis.

3.1 Set-up

The set-up consists of two periods. In the first period, an incumbent is exogenously in power. There are two possible types $\theta \in \{b, g\}$, with $\Pr(\theta = g) = \gamma$, where g stands for good and b for bad. A good incumbent delivers a benefit of 1 to voters. A bad incumbent extracts $y \in [0, 1]$ from the public funds, obtains benefits $v(y)$, with $v'(y) > 0$ and $v''(y) < 0$, and delivers the remainder, $1 - y$, to voters.

Voters choose whether to re-elect the incumbent or a randomly selected challenger, one that is good with probability γ. Voters do not known the incumbent's type, and they can not observe y before the election. However, they can get information through the media in order to update their believes. Voters buy news when media is informative. Before buying news, voters know whether the media report something about the incumbent. However, they ignore the content of the news.[7]

There is one media outlet. If the incumbent is bad, with probability $\varphi(y)$, the controlling shareholder receives a signal, where $\varphi(y)' > 0$, $\varphi(y)'' \geq 0$, $\varphi(0) = 0$, and $\varphi(1) = 1$. If the signal is reported, the outlet makes profits Π, which are distributed proportionally among shareholders.

The incumbent can manipulate the news. This is modeled as a bargaining game between the manager and the politician. Specifically, the incumbent

[7] We assume, for the sake of simplicity, that media do not report about the challenger. This assumption does not alter the main result of the paper. A proof is available upon author request.

can make a non-negative offer of money t to the controlling shareholder in exchange for the suppression of the news. If the shareholder accepts this offer, he makes no report, and the incumbent gets benefits $v(y_2^*) - t$ if he is re-elected, and $-t$ if he is not.[8]

The media firm has two large shareholders, $i = 1, 2$, and a continuum of small ones. We denote by α_1 and α_2 the fractions of shares owned by each shareholder. We assume $\alpha_1 > \alpha_2$. The remainder of the shares are distributed uniformly among small owners.[9]

A shareholders' meeting is annually convened in order to allocate control power. At the meeting, each large shareholder proposes a plan to run the company. The plan of shareholder-i describes what fraction, $x_i \in [0, 1]$, of benefits Π, shareholder-i will distribute as dividends of the firm, in case he wins the control of the company and there is no written story exposing the corrupt politician. This payment is intended to limit the payoffs that the controlling shareholder can obtain by exploiting the informational advantage he has as he is the only one that receives the signal, and thereby the only shareholder who can bargain with the incumbent in exchange for the suppression of the news. The plans are binding commitments that will be enshrined in the company's charter and cannot be revoked by the controlling shareholder.

Each share carries one vote and the controlling shareholder is elected by simple majority of the votes effectively cast.[10] While the attendance of large shareholders to the meeting is guarantee, this is not the case for small shareholders, who face a cost, $\kappa\Pi$, with $\kappa \sim$ U on [0,1], for participating in the meeting. The winner shareholder obtains extra rents, V, for being in office.[11]

The timing of the game is as follows:

[8] y_2^* stands for the equilibrium level of corruption in period 2.

[9] We assume this particular ownership structure because it is related to what the data describe.

[10] To break ties, we assume that when two plans receive the same number of votes, the largest shareholder wins the contest. Frequently, the largest stake-holder of a media firm is the founder. Thus, this rule might reflect the power of the entrepreneur as the founder of the organization. The same assumption can be found in Bennedsen and Wolfenzon[5].

[11] These rents guarantee that large shareholders always want to participate in the contest.

1. Large shareholders compete to become the manager of the media. Each shareholder proposes $x_i \in [0,1]$, for $i = 1, 2$, and all shareholders vote. The manager is elected.

2. The incumbent's type θ is realized. If $\theta = g$ the manager observes no signal. If $\theta = b$, with probability $\varphi(y)$, the manager receives a signal. The incumbent observes the signal and selects a transfer $t \geq 0$.

3. The manager observes the transfer t and decides whether to accept t or to reject it. If he accepts t, he suppresses the bad news. If he rejects t, he reports about the incumbent.

4. Voters decide whether to buy news and they vote for the incumbent or the challenger.

4 Equilibrium

We solve the pure strategy perfect Bayesian equilibrium, and we restrict the solution of the corporate game to strong equilibrium, i.e equilibria such that no group of agents with positive measure has an incentive to deviate. The following proposition characterizes the equilibrium.[12]

Proposition 1 *In the pareto-efficient equilibrium of the game, the following occurs:*

1. *Voters vote for the challenger if they observe a report about the incumbent and re-elect the incumbent otherwise.*

2. *Shareholder 1 becomes the controlling shareholder of the outlet. He proposes* $x_1^* = 0$ *if* $\alpha_1 \geq 0.5$*, and* $x_1^* = 1 - \frac{(\alpha_1 - \alpha_2)}{(1-\alpha_1-\alpha_2)}$ *if* $\alpha_1 < 0.5$.

3. *The controlling shareholder accepts* t *if and only if* $t \geq [\alpha_1\Pi + (1 - \alpha_1)x_1^*\Pi]$.

4. *A bad incumbent offers* $t = [\alpha_1\Pi + (1-\alpha_1)x_1^*\Pi]$ *if shareholder 1 observes the bad signal and* $v(1) \geq t$.

[12]The Appendix presents the proofs.

5. *In the second period,* $y = 1$. *In the first one,* y *satisfies the following condition:*

$$v'(y) - \varphi'(y)v(1) + \varphi'(y)\max\left(0, v(1) - [\alpha_1\Pi + (1-\alpha_1)x_1^*\Pi]\right) = 0.$$

Proposition 1 shows that media capture is a function of the ownership structure of the firm. When the ownership structure has a majority owner, the bribe equals the benefits the shareholder loses for making the newspaper uninformative, $\alpha_1\Pi$. When no shareholder has the majority of the company's votes, the bribe equals $\alpha_1\Pi + (1-\alpha_1)x_1^*\Pi$. The first term captures the benefits the shareholder loses as owner of the firm. The second term reflects the compensation he has to pay to minority owners. This payment is a decreasing function of α_1 as well as of the contestability of shareholder 1's voting power, $\frac{(\alpha_1-\alpha_2)}{(1-\alpha_1-\alpha_2)}$.

The proposition also shows that ownership concentration, which is measured by the size of shareholder 1's stock, affects corruption through two different channels. The first one is called the *owner effect*,

$$\frac{-\varphi'(y)\Pi}{[-v''(y) + \varphi''(y)v(1) - \varphi''(y)max(0, v(1)-t)]},$$

the second channel is called the *contest for corporate control effect*,

$$\frac{\varphi'(y)[1 + \frac{(1-\alpha_1)}{(1-\alpha_1-\alpha_2)} + \frac{(\alpha_1-\alpha_2)\alpha_2}{(1-\alpha_1-\alpha_2)^2}]\Pi}{[-v''(y) + \varphi''(y)v(1) - \varphi''(y)max(0, v(1)-t)]}.$$

The first effect is negative and underlines the fact that when there is a majority owner, corruption decreases as ownership concentrates. The impact of this effect reflects how the alignment of interests in the private sector improves accountability in the public area. To our knowledge, this is the first paper that identifies this effect. Other papers by Berle and Means[6], Jensen and Meckling[19], Grossman and Hart[16], Shleifer and Vishny[29], Agrawal and Mandelke[2], Chen[11], and Gutierrez and Tribo[17] document a positive impact of ownership concentration on private sector's performance.

The second effect is either zero or positive depending on the ownership structure of the firm. If shareholder 1 owns more than 50% of the company, the effect is null. If shareholder 1 owns less than 50% of the firm, the effect is positive. This effect relates three remarkable ingredients of the problem we study, which in turn characterize the links between the private and the public sector. The elements are the following: contestability of shareholder 1's voting power, expropriation of minority owners' benefits, and cost for the corrupt politician to silence the media.

When the ownership structure is widely held, large shareholders compete for corporate control. In equilibrium, the largest owner wins the contest, promising to the smaller shareholders a compensation that decreases with the size of his stock. This introduces a new type of tunneling problem, called a *second-order tunnel*, where the benefits expropriated, or more specifically not payed to minority owners, are implicitly transferred to the corrupt politician; fact that reduces the burden he has to pay to win his re-election.

If $\alpha_1 \geq 0.5$, the *owner effect* dominates and corruption decreases as ownership concentrates. Otherwise, the *contest-for-control effect* prevails and corruption increases as ownership concentrates. The following proposition characterizes the corruption function in equilibrium. For such purpose, let $\hat{\alpha}_{10} \equiv 1+\frac{\alpha_2}{2}-\frac{v(1)}{2\Pi}-\{2+[\frac{1}{2}(\frac{v(1)}{\Pi})^{0.5}-\frac{1}{2}\alpha_2(\frac{\Pi}{v(1)})^{0.5}-\alpha_2(\frac{\Pi}{v(1)}+1)]\}$ and $\hat{\alpha}_{11} \equiv \frac{v(1)}{\Pi}$.

Proposition 2 *Corruption is a non-monotonic function of ownership concentration. Increasing and concave in the interval* $[\hat{\alpha}_{10}, 0.5)$. *Decreasing and concave in the interval* $[0.5, \hat{\alpha}_{11})$. *Constant in the interval* $[0, \hat{\alpha}_{10})\ U\ (\hat{\alpha}_{11}, 1]$.

Corollary 1 *Assume* $0 < \hat{\alpha}_{10} \leq 0.5$ *and* $0.5 \leq \hat{\alpha}_{11} < 1$. *The maximum level of corruption is achieved at* $\alpha_1 = 0.5$. *This level,* y^*, *satisfies the following condition:*

$$v'(y^*) - \varphi'(y^*)\Pi = 0$$

Corollary 2 *Assume* $0 < \hat{\alpha}_{10} \leq 0.5$ *and* $0.5 \leq \hat{\alpha}_{11} < 1$. *Extreme cases where the ownership is completely concentrated or widely held deliver the same levels of corruption,* y^*, *where* y^* *satisfies the following condition:*

$$v'(y^*) - \varphi'(y^*)v(1) = 0$$

Three results make proposition 2 relevant for the debate on media regulation. The first one shows that contrary to the conventional wisdom, corruption is a non-monotonic function of ownership concentration. The second result points out that under certain conditions, intermediate situations, where the main shareholder has 50% of the shares of the company, are the worst to promote accountability. The third finding shows that extreme cases can deliver the same level of corruption.

Thus, the findings remark that conventional prescriptions on ownership concentration may not be appropriate when it comes to an industry such as the media. This is because policies designed to promote competition must take into account not only economic welfare considerations, but also accountability effects.

5 Extensions

This section analyzes the robustness of the results to changes in the assumptions of the model. First, we explore the case where there are N outlets in the market. Second, we study a situation where large shareholders have more available actions than in the baseline model to decide who controls the firm. Finally, we investigate the case of ideological media.

5.1 N outlets in the market

Assume there are N outlets in the market, each one with an ownership structure similar to the one previously described. The outlets receive the same signal. The readers are distributed equally among informative outlets.

In equilibrium, it is a dominated strategy for the incumbent to silence partially the market. Because he will not be re-elected, but he will have to pay some bribes. Therefore, if the incumbent wants to win the re-election he has to pay to the controlling shareholder of each firm a bribe equivalent to the one the shareholder would require if his outlet were the only one in the market. Then, corruption satisfies the following condition:

$$v'(y) - \varphi'(y)v(1) + \varphi'(y)\max(0, v(1) - \sum_{i=1}^{N} t_i) = 0$$

.

The results of Proposition 2 hold. However, $\hat{\alpha}_{10,j} = \frac{v(1)}{\Pi} - \sum_{i=1,i\neq j}^{N} t_i$ and $\hat{\alpha}_{11,j} = 1 + \frac{\alpha_{2j}}{2} - \frac{\gamma}{2} - \gamma^{0.5}\{2 + [\frac{\gamma-\alpha_2}{2\gamma^{0.5}} - \alpha_2(\frac{1}{\gamma}+1)]\}^{0.5}$, with $\gamma = \frac{v(1)}{\Pi} - \sum_{i=1,i\neq j}^{N} t_i$.

5.2 Actions to decide who controls the firm

Assume now, that large shareholders can buy shares rather than make a proposal to minority owners at the time to compete for corporate control. If this possibility were available, we would obtain in equilibrium that one of the two large shareholders wins the contest paying an equilibrium price, p^*, per vote he buys.

When this shareholder receives a bad signal, he has to decide whether to make or not a report about the incumbent. In doing so, he compares the benefits he would obtain in each case. If he rejects the bribe t, he gets a payment $0.5\Pi - (0.5 - \alpha_i)p^*$. If he accepts the transfer t, he obtains a payment $t - (0.5 - \alpha_i)p^*$. In both situations, the shareholder pays the cost of winning the contest, and the equilibrium bribe, 0.5Π, is independent of the ownership structure. This result contradicts the empirical finding by Djankov et al.[14], who show that corruption is a dependent function of ownership concentration. It is therefore because of this reason that we exclude the possibility of buying shares from our main set-up.

Consider next, the case where shareholders collude or compete. In any case, shareholder 1 receives the signal about the incumbent, and he decides whether to make a take it or leave offer to shareholder 2. If both shareholders collude, they pay nothing to the rest of the owners, and shareholder 1 bargains with the incumbent for a payment in exchange of the suppression of the news.

The equilibrium compensation that shareholder 1 proposes to shareholder 2, in order to collude, is $\alpha_2(1 - \frac{(\alpha_1-\alpha_2)}{(1-\alpha_1-\alpha_2)})$. This is the minimum payment that shareholder 1 has to make to have shareholder 2 accepting the collusion. Shareholder 1 asks for a bribe equal to that of the baseline model, and he

always prefers to collude because he can get extra positive rents equal to $(1-\alpha_1-\alpha_2)(1-\frac{(\alpha_1-\alpha_2)}{(1-\alpha_1-\alpha_2)})$.

5.3 Ideological media

Assume, as in Besley and Prat[9], that the electorate is divided in left and right voters. Left voters are a fraction $1-p>0.5$ of the population. The remainder proportion, $p>0.5$, are right wingers. Voters are also divided according to their incentives to buy news. A proportion ρ of the them values ideology over information. They buy the newspaper if media share the same ideological preference. The other proportion, $1-\rho$, prioritizes information; and the voters that belong to this group buy news if media is informative.

The outlet obtains a benefit (loss) B from having (not having) a politician of its preferred (non-preferred) ideology in office. Large shareholders compete for corporate control. At the meeting, each large shareholder proposes a plan to run the company. The plan of shareholder-i describes what fraction, $x_i \in [0,1]$, of benefits $[\Pi(1-\rho)-Bd+B(1-d)]$, shareholder-i will distribute as dividends of the firm, in case he wins the control of the company, and there is no written story exposing the corrupt politician; where d stands for a dummy that equals 1 if the politician in office shares the same ideology as that of the newspaper and 0 otherwise.

In the equilibrium of the game, shareholder 1 becomes the controlling shareholder of the outlet. He proposes $x_1^*=0$ if $\alpha_1 \geq 0.5$, and $x_1^*=1-\frac{(\alpha_1-\alpha_2)}{(1-\alpha_1-\alpha_2)}$ if $\alpha_1<0.5$. The shareholder accepts to suppress the bad news if and only if he receives a transfer t that at least compensates him for the loses he faces when he decides to make the newspaper uninformative, $[\alpha_1+(1-\alpha_1)x_1^*][\Pi(1-\rho)-dB+B(1-d)]$. The corrupt politician silences the outlet if and only if $v(1) \geq [\alpha_1+(1-\alpha_1)x_1^*][\Pi(1-\rho)-dB+B(1-d)]$.

The results of Proposition 2 hold. However, $\hat{\alpha}_{10}=\frac{v(1)}{[\Pi(1-\rho)-dB+B(1-d)]}$ and $\hat{\alpha}_{11}=1+\frac{\alpha_{2j}}{2}-\frac{\gamma}{2}-\gamma^{0.5}\{2+[\frac{\gamma-\alpha_2}{2\gamma^{0.5}}-\alpha_2(\frac{1}{\gamma}+1)]\}^{0.5}$, with $\gamma=\frac{v(1)}{[\Pi(1-\rho)-dB+B(1-d)]}$.

6 Conclusions

This paper presents a model to examine the relationship between corruption in the public sector and concentration of the ownership structure of media firms. The main result of the paper shows that the relationship between corruption and ownership concentration is non-monotonic, with extreme cases, where the ownership is completely concentrated or widely held, likely to deliver the same levels of corruption. Thus, the paper shows that conventional regulatory prescriptions on ownership concentration may not be appropriate when it comes to industries such as the media. This is because the prescriptions must take into account not only economic welfare considerations, but also accountability effects. In this respect, ownership concentration may harm neither media freedom nor public accountability; this fact contradicts the conventional wisdom, and therefore constitutes overall the main contribution of this work.

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7 Appendix

Proof of Proposition 1

The structure of the proof follows Besley and Prat[9]. We borrow the proof for the equilibrium of the corporate game from Bloch and Hege[10].

To prove that voters do not play weakly dominated strategies, let's analyze their behavior. The only information voters receive about the incumbent is through the media. Kicking out the incumbent if media make a report is a strictly dominant strategy. Therefore, what remains to be proved is that voters do not kicked out the incumbent if media make no report. For such purpose, notice that if this situation happens, voters do not buy news. However, they up-date their believes. The posterior on the incumbent's type is as follows:

$$P(\theta = b \mid a = nr) = \frac{P(\theta = b)P(a = nr \mid \theta = b)}{P(\theta = g)P(a = nr \mid \theta = g) + P(\theta = b)P(a = nr \mid \theta = b)},$$

where a is an element of the set of available actions for the controlling shareholder,$\{r, nr\}$, and r stands for reporting while nr stands for the contrary action. This probability can be re-written in the following manner:

$$P(\theta = b \mid a = nr) = \frac{\gamma P}{(1-\gamma) + \gamma P}.$$

Because the posterior about the incumbent, $\frac{\gamma P}{(1-\gamma)+\gamma P}$, is lower than the prior about the challenger, γ, voters do not kicked out the incumbent if there is no report.

Now let's consider the interaction between the incumbent and the controlling shareholder. If controlling shareholder i accepts to suppress the bad news, he receives a payoff $t - (1-\alpha_i)x_i^*\Pi$. Otherwise, he yields $\alpha_i\Pi$. Therefore, shareholder i accepts t if and only if $t \geq [\alpha_i\Pi + (1-\alpha_i)x_i^*\Pi]$. And, the corrupt politician silences the outlet if and only if $v(1) \geq \alpha_i\Pi + (1-\alpha_i)x_i^*\Pi$.

As any elected politician will not be removed from office in the second period, y of period 2 is equal to 1. In the first period, the incumbent chooses y to maximize his expected utility:

$$v(y) + (1 - \varphi(y))v(1) + \varphi(y) \left(\max\left(0, v(1) - t\right)\right),$$

subject to

$$t = [\alpha_i \Pi + (1 - \alpha_i) x_i^* \Pi].$$

The first order condition to this problem is as follows:

$$v'(y) - \varphi'(y)v(1) + \varphi'(y) \max(0, v(1) - t) = 0$$

The second order condition is as follows:

$$v''(y) - \varphi''(y)v(1) + \varphi''(y) \max(0, v(1) - t) < 0$$

Given the solution to the incumbent's problem, let's analyze the equilibrium of the corporate control game. Because voting is costly, it is a dominant strategy for small shareholders not to participate in the meeting when their preferences agree with those of the largest shareholder. Therefore, the only situation where the votes of small shareholders matter is when they favor the proposal of the second largest owner. Specifically, shareholder 2 wins the contest if and only if he attracts the votes of a fraction $\frac{\alpha_1 - \alpha_2}{1 - \alpha_1 - \alpha_2}$ of small shareholders. This requires that a proportion $\frac{\alpha_1 - \alpha_2}{1 - \alpha_1 - \alpha_2}$ of those shareholders find $x_2 \Pi - \kappa \Pi \geq x_1 \Pi$. Because κ is uniformly distributed on [0,1], this condition can be written as follows:

$$x_1 \leq x_2 - \frac{\alpha_1 - \alpha_2}{(1 - \alpha_1 - \alpha_2)}. \tag{2}$$

To understand why the equilibrium involves a pair of proposals $(x_1^*, x_2^*) = (1 - \frac{(\alpha_1 - \alpha_2)}{(1 - \alpha_1 - \alpha_2)}, 1)$ when $\alpha_1 < 0.5$ consider Figure I.

[Insert Figure I about here]

By employing the last condition we can divide the plane into two regions. Region A where shareholder 1 wins the contest and region B where shareholder 2 does.

We first claim that there cannot be an equilibrium that belongs to region B. To understand this statement notice that whenever $x_1 = 1$, shareholder 1 wins the contest. Hence, for any point in region B, shareholder 1 has a profitable deviation. And thereby it can not be an equilibrium in region B.

Now consider a point in region A, with $x_1 \leq x_1^*$. As $x_1 \leq x_1^*$, x_2 satisfies the following condition $x_2 > 0$. By choosing $x_2 = 1$, shareholder 2 wins the contest. Hence, for any point in region A, shareholder 2 has a profitable deviation.

Finally, consider a point in region A where $x_2 > 0$ and $x_1 > x_1^*$. Because shareholder 1's utility decreases in x_1, his proposal has to be the minimum that guarantees to win the contest. Therefore, the only possible equilibrium is: $(x_1^*, x_2^*) = (1 - \frac{(\alpha_1 - \alpha_2)}{((1-\alpha_1-\alpha_2))}, 1)$. The case $\alpha_1 \geq 0.5$ is trivial, and for this reason we omit the proof.

Proof of Proposition 2

Consider first the case where $\alpha_1 \geq 0.5$. At $\alpha_1 = \frac{v(1)}{\Pi}$, the incumbent is indifferent between silencing or not the newspaper. For $\alpha_1 \geq \frac{v(1)}{\Pi}$, the owner effect dominates, and the incumbent does not silence the newspaper. Corruption satisfies the following condition:

$$v'(y) - \varphi'(y)v(1) = 0.$$

For $0.5 \leq \alpha_1 \leq \frac{v(1)}{\Pi}$, the incumbent captures the media, and the first order condition is as follows:

$$v'(y) - \varphi'(y)\alpha_1\Pi = 0.$$

Consider the case where $\alpha_1 < 0.5$. At $\alpha_1 = 1 + \frac{\alpha_2}{2} - \frac{v(1)}{2\Pi} - \{2 + [\frac{1}{2}(\frac{v(1)}{\Pi})^{0.5} - \frac{1}{2}\alpha_2(\frac{\Pi}{v(1)})^{0.5} - \alpha_2(\frac{\Pi}{v(1)} + 1)]\}$, the incumbent is indifferent between silencing or not the newspaper. For $1 + \frac{\alpha_2}{2} - \frac{v(1)}{2\Pi} - \{2 + [\frac{1}{2}(\frac{v(1)}{\Pi})^{0.5} - \frac{1}{2}\alpha_2(\frac{\Pi}{v(1)})^{0.5} - \alpha_2(\frac{\Pi}{v(1)} + 1)]\} < \alpha_1 < 0.5$, the contest for control effect dominates, and the incumbent captures the media. Corruption satisfies:

$$v'(y) - \varphi'(y)[\alpha_1 + (1 - \alpha_1)(1 - \frac{(\alpha_1 - \alpha_2)}{(1 - \alpha_1 - \alpha_2)})]\Pi = 0.$$

For $0 < \alpha_1 \leq 1 + \frac{\alpha_2}{2} - \frac{v(1)}{2\Pi} - \{2 + [\frac{1}{2}(\frac{v(1)}{\Pi})^{0.5} - \frac{1}{2}\alpha_2(\frac{\Pi}{v(1)})^{0.5} - \alpha_2(\frac{\Pi}{v(1)} + 1)]\}$, the incumbent does not silence the media. Corruption satisfies the following condition:

$$v'(y) - \varphi'(y)v(1) = 0.$$

Table 1. Estimation Results

Explanatory variables	Corruption
Owner effect	-0.475
	[0.228]**
Contest for corporate control effect	0.444
	[0.147]***
Market share of the top two newspapers	-0.577
	[0.9183]
Logarithm of real GDP	0.233
	[0.442]
Openess	-0.010
	[0.006]
Democracy index	1.170
	[0.228]***
Federal state	0.111
	[0.217]
Voice & Accountability index	-1.174
	[0.295]***
Daily newspapers circulation	2.60E-08
	[5.99E-09]***
Ethnic fractionalization	0.066
	[0.707]
Linguistic fractionalization	0.509
	[1.039]
Protestant traditions	-0.007
	[0.0128]
English legal origin	-3.712
	[0.745]***
French legal origin	-0.774
	[0.372]
German legal origin	-1.908
	[0.673]
Nordic legal origin	-3.250
	[1.117]**
Time effects	YES
Regional effects	YES
R-squared	0.8928
Num. of observations	56

Note: The dependent variable is the perceived level of corruption from ICRG. The omited category for the legal origen variable is Socialism. The omited category is non-federal state. Robust standard errors in brackets. ***: significant at the 1% level; **: significant at the 5% level; significant at the 10% level.

Table 2. Testing the Goodness of Political Stability as an IV

Explanatory variables	Owner effect
Political stability	-0.475
	[0.148]***
Contest for corporate control effect	0.003
	[0.120]
Market share of the top two newspapers	-0.044
	[0.264]
Logarithm of real GDP	-0.543
	[0.335]
Openess	0.007
	[0.007]
Democracy index	0.744
	[0.271]***
Federal state	0.329
	[0.185]*
Voice & Accountability index	0.178
	[0.200]
Daily newspapers circulation	5.90E-09
	[4.08E-09]
Ethnic fractionalization	0.519
	[0.610]
Linguistic fractionalization	-0.769
	[0.419]*
Protestant traditions	0.004
	[0.008]
English legal origin	0.131
	[0.665]
French legal origin	1.069
	[0.598]*
German legal origin	0.566
	[0.500]
Socialist legal origin	1.039
	[0.393]**
Time effects	YES
Regional effects	YES
R-squared	0.8014
Num. of observations	56

Note: The dependent variable is the "owner effect". The omited category for the legal origen variable is Nordic. The omited category is non-federal state. Robust standard errors in brackets. ***: significant at the 1% level; **: significant at the 5% level; *: significant at the 10% level.

Table 3. Testing Exogeneity of the Owner Effect

Explanatory variables	Corruption
Predicted residuals	-0.706
	[0.691]
Owner effect	0.100
	[0.619]
Contest for corporate control effect	0.368
	[0.128]***
Market share of the top two newspapers	-0.555
	[0.932]
Logarithm of real GDP	0.851
	[0.659]
Openess	-0.007
	[0.006]
Democracy index	0.714
	[0.501]***
Federal state	-0.193
	[0.337]
Voice & Accountability index	-1.144
	[0.263]***
Daily newspapers circulation	2.14E-08
	[7.16E-09]***
Ethnic fractionalization	-0.352
	[0.894]
Linguistic fractionalization	0.856
	[1.102]
Protestant traditions	-0.007
	[0.012]
English legal origin	-3.166
	[0.899]***
French legal origin	-0.765
	[0.357]**
German legal origin	-1.688
	[0.670]**
Nordic legal origin	-2.730
	[1.133]**
Time effects	YES
Regional effects	YES
R-squared	0.8956
Num. of observations	56

Country	Sources of media variables
ARGENTINA	http://www.ivc.com.ar
	http://www.comunica.org/chasqui
	www.grupoclarin.com
	The World Bank
AUSTRALIA	http://oldwww.roymorgan.com/pressreleases
	www.fxj.com.au
	www.newscorp.com
	The World Bank
AUSTRIA	Amadeus data base
	The European Institute for the Media. Report 2003
	www.styria.com
	http://www.oeak.at
	The World Bank
BELGIUM	The European Institute for the Media. Report 2003
	Amadeus data base
	www.vum.be
	www.persgroep.be
	www.concentra.be
	http://www.ejc.nl/jr/emland/belgium
	www.cim.be
	The World Bank
CANADA	http://www.cna-acj.ca/client
	www.bellglobemedia.ca
	www.torstar.com
	The World Bank
CHILE	Colección Ideas Año 5 Nª53, Univerisdad de Chile
	Mega Time SA
	The World Bank
CROACIA	http://www.project-syndicate.org
	Media Ownership and Its Impact on Media Independence and Pluralism
	The World Bank
FINLAND	Amadeus data base
	http://www.sanomawsoy.fi/investors/
	http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf
	The World Bank
FRANCE	Amadeus data base
	http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf
	The World Bank
GREECE	Amadeus data base
	http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf
	The World Bank

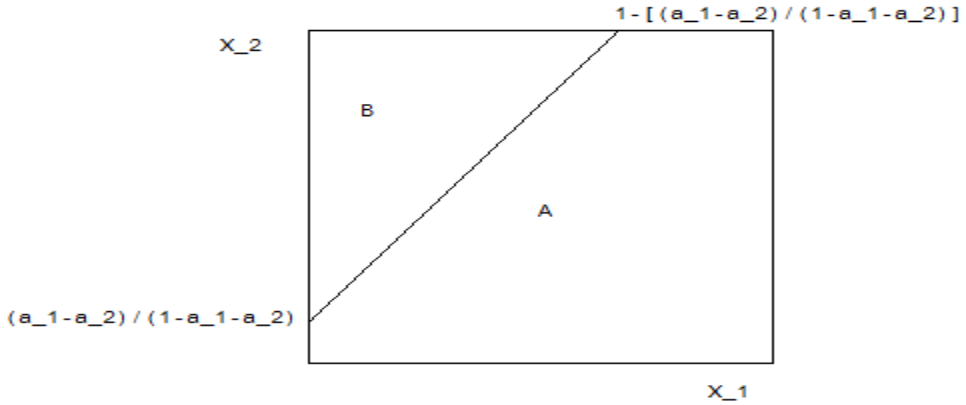
Country	Sources of media variables
HUNGARY	http//:www.matesz.hu http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf The World Bank
INDIA	The World Bank
LATVIA	Media Ownership and Its Impact on Media Independence and Pluralism http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf Amadeus data base http://www.baltkurs.com/english/archive/01/port.htm The World Bank
LITHUANIA	Media Ownership and Its Impact on Media Independence and Pluralism http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf The World Bank
MALAWI	The World Bank
MEXICO	The World Bank
NEW ZEALAND	http://npa.co.nz/statistics.php hilary@npa.co.nz The World Bank
PERU	The World Bank
PORTUGAL	Amadeus data base The World Bank
ROMANIA	Media Ownership and Its Impact on Media Independence and Pluralism The World Bank
SLOVAK	Media Ownership and Its Impact on Media Independence and Pluralism The World Bank
SLOVENIA	Media Ownership and Its Impact on Media Independence and Pluralism The World Bank
SPAIN	Amadeus data base http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf The World Bank
SWEEDEN	http://www.novinar.com The World Bank
SWITZERLAND	http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf The World Bank
UNITED KINGDOM	http://www.novinar.com/upload/EIM-EP-REPORT-2004.pdf The World Bank
UNITED STATES	Audit Bureau of circulation The World Bank
VENEZUELA	The World Bank

Variable	Description
Corruption	Is an index of perceived corruption based on the extent high government officials are expected to demand special payments. Illegal payments are generally expected in the form of bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans. The index ranges from 1 to 6, with lower values indicating less
alpha_1	This variable corresponds to the "ultimate controlling shareholder" in Djankov et al. [14]. When the ownership structure of a firm is direct, there is no chain of firms controlling the newspaper, the variable reflects the fraction of shares owned by the main shareholder of the firm. Otherwise, the variable captures the fraction of shares owned by the shareholder that at the end of the chain of control commands thenewspaper. Source: see details for media variables.
alpha_2	This variable captures the size of the second largest owner. Source: see details for media variables.
Market share	This variable measures the accumulated market shares of the top two newspapers of each country. Source: see details for media variables.
Logarithm of real GDP	Logarithm of real GDP. Source: Penn World Tables. http://pwt.econ.upenn.edu.
Openess	Total trade as a percentage of GDP. Source: Penn World Tables.
Democracy index	values indicating lower levels of democracy. Annually available. Source: Polity IV Data Sets. CIDCIM. http://www.cidcm.umd.edu/polity.
Federal state	Dummy variable that takes value 1 if a country has a federal state and 0 otherwise.
Voice & Accountability index	Index that identifies the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and
Daily newspapers circulation	Daily circulation per thounsands of inhabitants. Source: UNDP.
Ethnic and linguistic fractionalization	Indexes of ethnic and linguistic fractionalization. Source: Alesina et al. 2002. Fractionalization. Harvard Institute of Economic Research. Discussion Paper 1959.
Protestant traditions	Identifies the percentage of the population of each country that belonged to the
Legal origin	Source: La Porta et al. (1999).
Political stability	Index of political stability. The index ranges from -2.5 to 2.5. Source: The World Bank.

		Outlet 1		Outlet 2		
Country	Year	Size of Shareholder 1	Size of Shareholder 2	Size of Shareholder 1	Size of Shareholder 2	Market Share Outlet 1 and 2
ARGENTINA	1999	1	0	0.44	0.1	0.4
ARGENTINA	2003	0.82	0.18	0.66	0.1	0.38
AUSTRALIA	1999	0.31	0.05	0.31	0.05	0.32
AUSTRALIA	2003	0.31	0.05	0.31	0.05	0.41
AUSTRIA	1999	0.51	0.49	1	0	0.48
AUSTRIA	2003	0.5	0.28	0.98	0.02	0.78
BELGIUM	1999	1	0	0.47	0.4	0.37
BELGIUM	2003	1	0	0.6	0.28	0.37
CANADA	1999	0.5	0.5	0.73	0.27	0.15
CANADA	2003	0.5	0.5	0.69	0.32	0.15
CHILE	1999	0.5	0.25	0.5	0.25	0.26
CHILE	2003	0.75	0.1	0.75	0.1	0.31
CROACIA	2003	1	0	0.5	0.5	0.66
CROACIA	1999	0.6	0.05	0.5	0.5	0.66
FINLAND	2003	0.27	0.13	0.27	0.13	0.29
FINLAND	1999	0.43	0.06	0.43	0.06	0.71
FRANCE	2003	0.96	0.05	0.82	0.13	0.38
FRANCE	1999	1	0	0.75	0.25	0.1
GREECE	2003	0.5	0.09	0.35	0.19	0.28
GREECE	1999	0.59	0.06	0.7	0.05	0.45
HUNGARY	2003	1	0	0.49	0.27	0.25
HUNGARY	1999	0.67	0.27	0.44	0.05	0.41
INDIA	2003	1	0	1	0	0.1
INDIA	1999	1	0	1	0	0.1
LATVIA	1999	0.51	0.04	1	0	0.41
LATVIA	2003	0.7	0.14	0.39	0.1	0.35
LITHUANIA	2003	0.4	0.14	0.12	0.09	0.41
LITHUANIA	1999	0.41	0.05	0.12	0.09	0.34
MALAWI	2003	1	0	1	0	1
MALAWI	1999	1	0	1	0	1
MEXICO	2003	1	0	1	0	0.2
MEXICO	1999	1	0	1	0	0.2
NEW ZEALAND	2003	1	0	0.14	0.05	0.39
NEW ZEALAND	1999	0.27	0.05	0.31	0.05	0.39

		Outlet 1		Outlet 2		
Country	Year	Size of Shareholder 1	Size of Shareholder 2	Size of Shareholder 1	Size of Shareholder 2	Market Share Outlet 1 and 2
PERU	2003	1	0	1	0	0.3
PERU	1999	1	0	1	0	0.3
PORTUGAL	2003	0.5	0.55	0.09	0.06	0.28
PORTUGAL	1999	0.51	0.05	0.33	0.33	0.21
ROMANIA	1999	1	0	0.5	0.05	0.4
ROMANIA	2003	1	0	0.81	0.05	0.43
SLOVAK	2003	1	0	0.5	0.5	0.33
SLOVAK	1999	1	0	0.3	0.05	0.44
SLOVENIA	1999	0.6	0.05	0.6	0.05	0.59
SLOVENIA	2003	0.25	0.11	0.25	0.11	0.51
SPAIN	2003	1	0	0.79	0.05	0.17
SPAIN	1999	0.52	0.05	1	0	0.21
SWEEDEN	2003	0.26	0.1	0.26	0.1	0.2
SWEEDEN	1999	0.26	0.1	0.65	0.05	0.2
SWITZERLAND	2003	0.51	0.14	1	0	0.23
SWITZERLAND	1999	1	0	0.01	0	0.23
UNITED KINGDOM	1999	0.32	0.05	0.6	0.23	0.31
UNITED KINGDOM	2003	0.32	0.05	0.63	0.23	0.44
UNITED STATES	2003	0.85	0.05	0.63	0.05	0.06
UNITED STATES	1999	0.85	0.05	0.63	0.05	0.06
VENEZUELA	2003	1	0	1	0	0.15
VENEZUELA	1999	1	0	1	0	0.15

Figure I



Note: X_1×X_2=[0,1]×[0,1]