The Logic of Private and Collective Action

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Since Mancur Olson's Logic of Collective Action *(1965), it is impossible for political scientists to conceive of political participation without reference to his powerful argument linking numbers of participants, public goods, and participatory outcomes. What is puzzling is the poor empirical support for this argument in the domain where it should work best, namely explaining business political activity. Olson thought his arguments principally applicable to economic groups, and for the empirical development of his arguments Olson drew heavily on business interests, the most active segment of the interest group community. We explore these arguments with business political activities data by examining the statistical performance of various measures of market structure in determining business political activity, and find little empirical support. We do offer an alternative basis for business behavior lodged in both private and collective goods that preserves business rationality and also helps explain not only the amount of business political participation but the modes of business participation.*

When we think about the paradox of participation, one of the formative puzzles of modern political science, we tend to think first of voting and citizen participation. We think of the large numbers involved, the small probability that an individual vote will be decisive, and we conclude that no one will vote. The puzzle then becomes why so many people do vote. To find a solution we tend to plead some sort of "diminished rationality," such as the costs of voting are too low even to consider carefully or that they are outweighed by the norm of civic duty.

In this article, we examine the paradox of participation in the principal context that Olson (1965) considered it. For the empirical development of his arguments Olson drew heavily on business interests. He observed that business was the most active segment of the interest group community and noted that for large numbers of participants seeking pubic goods, the dominant choice is to do nothing. He argued that business activity derived from multiple markets and related industries segmenting the larger business community into small groups. In an oligopolistic market it is rational for the individual firm to participate in association with others or on its own: "A

group agreement might be set up to spread the costs more widely or to step up the level of provision of the collective good. But since there is an incentive for unilateral and individual action to obtain the collective good, neither a formal organization nor even an informal group agreement is indispensable to obtain a collective good" (Olson 1965, 46). We explore these arguments, as others have done before us, with business political activities data (see Andres 1985; Boies 1989; Esty and Caves 1983; Grier, Munger, and Roberts 1994; Hart 2001; Humphries 1991; Masters and Keim 1985; Munger 1988; Schuler, Rehbein, and Kramer 2002). Specifically, we examine the influence of market structure on the various forms of business political activity. What is puzzling is the poor empirical support for this argument in the domain where it should work best: there is too much business political activity, just as there is too much voting.

In an early examination of this issue, Munger (1988) found that market structure, measured by concentration ratios, did not influence participation. At the same time he argued that this result does not mean that firms are irrational (1988, 297). He identified two possibilities. First, there is Zardkoohi's (1988) claim that firms

in concentrated industries manage market pressures independent of government and so are less likely to participate in politics. Second, he notes that researchers have focused on Political Action Committee (PAC) contributions, but that corporate political participation is multidimensional and includes other types of contributions and lobbying: "a broader view, recognizing that other kinds of political activity are substitutes for campaign contributions, may be necessary to resolve the paradox" (Munger 1988, 297).

Building on this earlier research, we examine these possibilities as well as other potential solutions to the paradox. Fortunately, the data on other types of political activity are now available to explore this explanation directly. Since the mid-1990s the Federal Election Commission has recorded soft money and individual contributions and the government, since 1995, has significantly improved the reporting requirements for lobbying activity.

In addition to a more comprehensive and multidimensional measurement of the dependent variable, it is also worth conceiving of the measurement of market structure more broadly. It is possible that the particular measure of concentration may not be capturing the market in a meaningful sense, and so we test a more exhaustive battery of different measures of market structure and their impact on political participation. In this way we can for the first time eliminate a simple measurement solution to the paradox. Despite more comprehensive measurements of political participation and concentration, the results remain disappointing for the theoretical argument. These new results raise old questions about the rationality of business political participation (see Munger 1988). An alternative solution lies in the largely unquestioned assumption that business political activity is a good demonstration of the logic of collective action. If, however, firms are motivated as much by private goods as by public goods, their actions are rational even in less oligopolistic situations. We find support for this alternative solution in the empirical analysis.

After briefly reviewing the theoretical argument that frames the paradox, we collect and organize the results of previous research on the impact of market structure on political behavior. In the second part of the article we describe our data and measures and present the results of our statistical analysis.

The Paradox of Political Participation and Concentration

Olson argues that a firm would not contribute or lobby to secure a *collective good* because the individual contribu-

tion is unlikely to make a difference to the outcome and because the individual cannot be punished for not contributing. At the same time, Olson observes, business is very active politically. When firms are divided into smaller, more concentrated markets the free-rider obstacle is mitigated, it is easier to coordinate political activity, and there is less diffusion of responsibility. When size varies among the firms, it may be that for the larger firm the gain from the collective good outweighs the cost of securing the good. Political activity "depends to a striking degree on the number of individuals in the group," but it is not completely dependent as the group may have members with "highly unequal degrees of interest in a collective good" (1965, 45). Olson argues that the large amount of business political activity derives from the fact that multiple markets and related industries segment the larger business community. Political participation becomes rational in these smaller groups, with a small number of firms or a small number of oligopolistic firms for whom it is worthwhile to assume the cost of political activity. The standard measure for the degree of oligopoly in an industry is the concentration ratio.

How has market structure performed in empirical tests? In Table 1, we show its mixed fortunes in 15 empirical studies that use concentration to explain firm political activity.[1] The weight of empirical research reports no relationship between concentration and political activity. No study finds consistently significant results (5% level) when modeling the political activities of individual firms. Schuler, Rehbein, and Kramer (2002) find concentration positive and "marginally significant" at the 10% level, and Andres (1985) finds concentration related positively to PAC formation at the 10% level. Using a nonlinear form (incorporating both concentration and the square of concentration), Grier, Munger, and Roberts (1991, 1994) find a positive relationship at lower levels of concentration and then a negative relationship between concentration and political activity in the more concentrated industries. Concentration is significant for the probit model of the presence or absence of individual corporate PAC contributions aggregated to the industry level as the dependent variable in their larger 124-industry sample (1978–1986), but not for their model of the amount of contributions

[1] Olson frames his theory in terms of "action," and specifically business political activities, not policy outcomes, but many scholars extend the theory to policy outcomes. Results are similarly poor. For example, Blonigen and Bown (2003) examine anti-dumping decisions and do not find significant results for concentration. Rehbein and Lenway (1994) look at International Trade Commission decisions and find no significant results for concentration across six models, and Magat, Krupnick, and Harrington (1986, 156) "reject the industry concentration hypothesis" in their examination of Environmental Protection Agency rules.

TABLE 1 **Studies of Market Structure and Political Participation**

Study	Dependent Variable	Procedure	Result (5% level)
Andres (1985)	PAC Formation	Logit	Not significant
Boies (1989)	PAC Amount	Tobit	Not significant
Esty and Caves (1983)	PAC and Lobbying Amount	OLS	Mixed
Grier, Munger, and Roberts (1991)	PAC Formation (% of firms in industry with PACs)	Tobit	Mixed
Grier, Munger, and Roberts (1994)	PAC Amount (industry level)	Heckman	Mixed
Hansen and Mitchell (2000)	PAC, Lobbying, Charity Amount	Heckman	Mixed
Mitchell, Hansen, and Jepsen (1997)	PAC Formation and Amount	Heckman	Not significant
Mizruchi and Koenig (1988)	PAC Similarity of contributions	IRR	Not Significant
Mizruchi and Koenig (1991)	PAC Similarity of contributions	OLS	Not Significant
Munger (1988)	PAC Amount (industry level)	OLS	Not Significant
Pittman (1977)	Campaign Contributions	OLS	Not directly tested
Schuler, Rehbein, and Cramer (2001)	PAC and Lobbying Formation and Presence	ALR	Not significant
Zardkoohi (1985)	PAC Amount	OLS	Not significant

(1994). Concentration is significant for all models in their smaller 110-industry sample, and they describe a negative effect of concentration ranging from levels of concentration of 70% or above (1994), or 43.85% and above (1993). The idea is that highly concentrated industries have sufficient control to obviate the need for government intervention to relieve market pressures (Grier, Munger, and Roberts 1991, 737). As they recognize, this polynomial relationship between concentration and political contributions is contrary to Olson's theory.

Of the other studies, the analysis by Esty and Caves (1983) finds a significant result for legislative outcomes, but not for PAC and lobbying activity aggregated at the industry level.[2] Pittman (1977) finds an interactive effect on his other independent variables for more highly concentrated industries (above the median concentration value). In Mizruchi and Koenig's (1988, 1991) model of the similarity of PAC contributions, concentration is significant only at the 10% level. Overall, evidence for the importance of concentration as an influence on business political activity is sparse. But given the power of the theo-

[2]This result may be difficult to replicate given the way the sample of industries is constructed: "we secured a list of the largest and the smallest 150 enterprises included in the 1980 Fortune Double 500 Directory. We then picked for consideration industries with which some of these firms could clearly be identified. We narrowed the resulting list of industries further by excluding those lacking clear boundaries or fitting badly into the Standard Industrial Classification. We also omitted some industries closely similar to others on our list and sought roughly representative coverage across the manufacturing section of the Standard Industrial Classification" (1983, 33).

retical argument, it is worth exploring the effects of some different research design decisions and assumptions. Earlier research has suggested that the dependent variable requires more comprehensive measurement. But the independent variable also requires attention. The poor performance of the market structure argument may reflect poor measurement; we need to ensure that we have explored alternative measures of concentration that may better capture the relevant markets.

The theoretical argument for concentration is that individual firms see government as a source of industry costs or benefits. Yet government deploys both coercion and incentives that capture the attention of firms as individuals not just as members of a group. Government selectively enforces a regime of regulations, exercises powers that may prevent a firm's competitor from entering the market, and creates demand for a firm's products. The private goods that a firm seeks from government involve both regulation and procurement, and we must represent both in models of firm political activity.

We assume this private goods seeking generates expectations about the modes of political participation used by the firm. In research on citizen political participation, researchers separate out different activities, from voting to citizen contacting, as they reflect more or less instrumental behaviors (Leighley 1995). A citizen's vote is improbably linked to any definitive outcome and is a relatively uncommunicative act in comparison to contacting a representative directly about an issue of concern. Similarly, firms motivated by private goods likely prefer the more instrumental to the less instrumental political

activities. Lobbying is the firm equivalent to contacting and is most easily tied to specific benefits for the individual firm, whether relief from regulation or securing a government contract. Of those analyzed, the least instrumental of activities available to firms is a soft-money contribution to political parties rather than to an individual candidate running for election. While we know that the different forms of political participation are complementary (see Hansen and Mitchell 2000; Schuler, Rehbein, and Kramer 2002), if firms are private goods seekers the balance of their allocations for political activities should favor lobbying, as in fact it does (see Table A3 in the appendix). Firms that lobby spend on average over one million dollars, while average soft money and PAC contributions are about 230 and 150 thousand dollars, respectively.

Data and Analysis

We analyze the *Fortune 1000* corporations (2000), along with the largest foreign investors in the United States from *Forbes*, for the 1999–2000 election cycle. Conventionally, analyses have focused on the *Fortune* firms (Andres 1985; Boies 1989; Humphries 1991; Masters and Keim 1985), although Hart (2001) focuses on a specific sector, and Grier, Munger, and Roberts focus on 124 three-digit Standard Industrial Classification (SIC) industries (1994). In our sample of firms, 191 out of 311 different industries are represented based on the four-digit North American Industrial Classification System (NAICS), including both manufacturing and service sectors, and all 122 of the Standard & Poor's industry classifications are represented.[3]

We use PAC activity, soft money, and lobbying to measure political participation. Among the firms in our data set, 49% engage in PAC giving, 44% report lobbying expenditures, and 46% give soft money contributions. Overall, 773 firms, or 66%, are politically active, most in multiple activities (see the appendix for descriptive statistics and sources of our measures).

In order to disentangle the impact of concentration, we include several variables drawn from the standard model of business political activity (see Grier, Munger, and Roberts 1994). Firm size is represented by revenues. We argue that foreign firms, fearful of the perception of interfering in the domestic politics of the host country,

voluntarily constrain political activity (see Hansen and Mitchell 2000; Rehbein 1995). We use a dummy variable for foreign-owned firms. While we argue that firms may seek private goods, this is likely in addition to public goods. To capture the public good dimension of regulation, we include an industry-level measure that has been utilized effectively in earlier research (see Grier, Munger, and Roberts 1994). To incorporate the ideas of pluralists (see Jordan 1990, 2000) and countervailing power theorists like Galbraith (1954; see also Austen-Smith and Wright 1994) we measure opposition activity by the frequency with which corporations are identified as targets in citizens' and environmentalists' campaigns, and we combine these into one measure of countervailing power. While anecdotal evidence suggests that business interests may countervail other business interests, Schlozman and Tierney find that almost 90% of their respondents named other corporations as an ally and only 23% also named antagonists among the business community (1986, 256–58). Environmental and citizen group activity provides a less ambiguous representation of the pluralist argument, although still not without methodological challenges. Specifically, the theoretical argument suggests the possibility of a simultaneous relationship between political activity and countervailing power; we will address this possibility in the model.

To test the argument that firms may seek private, as well as collective, goods, we include firm-specific measures of government regulation and government contracts. Firms seek to minimize costly regulation. To measure regulation at the firm level, we use the number of firm interactions with federal regulatory agencies and federal courts.[4] We expect firms not just to fight regulation on behalf of an industry, but also to fight specific regulatory interventions as individuals, so we measure regulation at the firm level as well as at the industry level. We also use government contracts for individual firms as a direct measure of private goods that firms secure from government. With these measures we can control for the influence of other economic, institutional, and political factors in examining the impact of market structure on the firm's decision of whether or not to engage in political activity and at what levels. We note that firm political activity and

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[3]The three nations that comprise the North America Free Trade Agreement (NAFTA)—the U.S., Mexico, and Canada—developed and implemented the NAICS in order to harmonize transactions and data collection after the adoption of the NAFTA in 1994. The NAICS has replaced the Standardized Industrial Classification (SIC) system previously used in government data collection.

[4]The agencies include the Federal Trade Commission, the Federal Communications Commission, the Federal Energy Regulatory Commission, the Environmental Protection Agency, the National Labor Relations Board, the Food and Drug Administration, the Federal Deposit Insurance Corporation, the Securities Exchange Commission, and the Safety Transportation Board. By "interactions" we mean court actions and a number of different types of regulatory agency actions, including adjudicative decisions, consent orders, interlocutory orders, and opinion letters regarding requests, such as legal exemptions.

government contracts may also have a simultaneous relationship, and we test for the possibility of endogeneity in the analysis.

Concentration as an Independent Variable

Our task in this article is to test market structure logic applied to political activity. The theoretical argument suggests that firms in competitive industries with larger numbers of smaller firms are less likely to organize for political activity. The first analytical challenge is fitting the firm to the appropriate industry. It is plausible that the poor results for concentration in the earlier research are attributable to the problem of finding the relevant market. Large, politically active firms may operate in multiple markets. This question of the relevant market is not a trivial one, and it occupies the courts as well as scholars. Numerous antitrust cases have been decided on the basis of the choice of market definition.[5]

In contrast to the earlier work that relies on a single measure of concentration, we systematically shift the analyses through multiple definitions of market for each of the firms in the sample. We rely on others' classifications of the firm's industry rather than making the judgment ourselves. First, we use the concentration ratio most used by scholars based on the U.S. Census Bureau's industrial concentration measures by the North American Industrial Classification System (NAICS), which replaced the Standard Industrial Classification (SIC) system. Most four-digit SIC codes have a rough concordance with a six-digit NAICS code. We use both the detail-rich six-digit NAICS designations, and following Grier, Munger, and Roberts (1994) we also test for the significance of the concentration measures at the four-digit NAICS level, which is broadly equivalent to the three-digit SIC (for example, "sugar and confectionery products" was classified as SIC 206 under the old system and is now 3113 under the new NAICS system).

Using concentration ratios from the NAICS (or the old SIC) system is complicated. There are over 400 different six-digit NAICS categories, an "industry" may comprise multiple six- or four-digit NAICS codes, and many firms participate in activities that correspond to multiple codes. The most common way around this problem

is the assignment of a firm or industry to a code that best describes a "plurality" of its activity. Furthermore, the firms in some industries—particularly banking—are involved not only in the products that they manufacture or the services that they provide, but also in investment in other companies that participate in activities that are completely different from the parent company. The Census Bureau has circumvented the difficulty of describing this phenomenon by assigning several "catch-all" codes that designate "holding companies" with economic data that correspond to a very amorphous "industry." Not surprisingly, there are no concentration values for these codes.

In addition to using the potentially problematic NAICS-based concentration measures, we develop an alternative concentration measure using Standard and Poor's (S&P) 122 industry categories. We rely on their industry classification of the firms in our sample, and we use revenue values from the S&P database in order to calculate four-firm concentration ratios for each industry category (this database includes over 20,000 publicly traded U.S. companies in addition to thousands of foreign firms). Standard & Poor developed and maintains this classification system in order to provide data to investment and banking groups that monitor the performance of firms and industries. This measure avoids many of the problems created by multiple related NAICS codes by categorizing firms more generally.[6]

We also test the concentration hypothesis using the Census Bureau's Herfindahl Index, another commonly used measure of concentration. The Herfindahl index facilitates a more effective analysis of how industries with particularly dominant firms compare to other industries, yet it is available only for manufacturing industries.[7]

The other measures are not concentration ratios, but they capture a different dimension of market structure. Some of these measures have been included in earlier research. We use the number of establishments per six-digit NAICS code, which is an updated version of the

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[5]A classic example of this is the 1945 case of the United States v. Aluminum Company of America. A more recent example of the importance of market definition is the proposed merger between Coca-cola and Dr. Pepper in 1986 where the two sides debated whether the appropriate market was soft drinks or all beverages.

[6]Representing a firm that participates in multiple industries in the dataset more than once would bias the sample by giving too much statistical weight to those firms, and would also cause difficulties with the independence of the single-firm/multiple-industry cases. In an effort to test for the possibility that changes in firms' total industry ventures are affecting its political behavior, we include a measure of the change in firm revenue in the year prior to our spending variables. We anticipate that shifts in revenue should catch changes in performance (good or bad) that might motivate a firm to seek preferential treatment from the government. In all specifications of our models, this measure is never statistically significant.

[7]The Herfindahl measure is based on the sum of the squared values of the percentage share of revenue of the largest 50 firms in a NAICS industry category. Accordingly, the largest possible value is 10,000 where one firm has 100% market share. This measure is particularly helpful in differentiating between monopolies and oligopolies.

number of establishments per SIC code used by Masters and Keim (1985) and Humphries (1991) to explain corporate political activity. Masters and Keim found the expected negative relationship, the more firms the less political activity, but it was only significant at the 10% level (1985, 1169). When they included a larger sample of firms in their analysis, the number of firms was not significant at the undemanding 10% level. Humphries (1991, 362) also used number of firms, but found no significant relationship with corporate PAC formation. We also use a measure of the number of firms in each S&P industry category. Finally, using the S&P industry classifications, we examine two other concentration-related measures: the individual firm's share of the industry's total revenue and the number of firms with 1% or greater share of industry revenue. We expect a positive relationship between firm share and political activity and a negative relationship between number of firms and political activity.

Empirical Analysis

Table 2 presents a correlation matrix of our measures of market structure. What is striking is the general weakness of the relationships—indicating that the different measures define quite different markets. For example the four-digit NAICS concentration ratio correlates with our S&P concentration value at only 0.24, and the correlation is only 0.17 when we use the narrower six-digit NAICS measure. Even the four- and six-digit NAICS concentration ratios correlate at only 0.63 suggesting that analysts are using quite different measures when they select one or the other. When we move to the measures of number of establishments, again we see the effect of quite different definitions of markets with a relatively weak 0.35 correlation between the six-digit NAICS number of establishments and the S&P number of firms.

For the multivariate analysis, we follow the literature and we first use logit analysis to predict whether or not a firm has a politically active PAC. In Table 3, we present the results of the PAC logit models, shifting through the eight different measures of concentration. For concentration, none of the eight measures are significant in the expected direction. The results that are significant, two of the S&P measures and the NAICS number of establishments, are in the wrong direction. The nonfinding for "concentration," however measured, is consistent with much of the earlier research.[8] Industry-wide regulation, the public goods

[8]Even when we drop our measure of size, firm revenue, from our models, concentration is still insignificant.

TABLE 2 Correlation Matrix for Different Measures of Market Structure

	NAICS 4-Digit Concentration	NAICS 6-Digit Concentration	S&P Concentration	S&P Firm's Share of Industry Revenue	NAICS 6-Digit Number of Establishments	S&P Number of Firms with 1% or More of Market	S&P Total Number of Firms in the Industry	Herfindahl Index
NAICS 4-Digit Concentration	1.00							
NAICS 6-Digit Concentration	0.63	1.00						
S&P Concentration	0.24	0.17	1.00					
S&P Firm's Share of Industry Revenue	0.18	0.18	0.45	1.00				
NAICS Number of Establishments	−0.27	−0.43	−0.14	−0.11	1.00			
S&P Number of Firms with 1% or more of Market	−0.27	−0.15	−0.84	−0.37	0.05	1.00		
S&P Total Number of Firms in the Industry	−0.19	−0.22	−0.52	−0.23	0.35	0.41	1.00	
Herfindahl Index	0.49	0.94	0.20	0.17	−0.30	−0.20	−0.21	1.00

TABLE 3   Logit Models of PAC Activity Using Different Measures of Market Structure

Independent Variables	NAICS Concentration (Four-Digit) Coefficient (S.E.)	NAICS Concentration (Six-Digit) Coefficient (S.E.)	S&P Concentration Coefficient (S.E.)	S&P Firm's Share of Industry Revenue Coefficient (S.E.)	NAICS Number of Establishments (10,000s) Coefficient (S.E.)	S&P Number of Firms with 1% or More of Market Coefficient (S.E.)	S&P Total Number of Firms in the Industry Coefficient (S.E.)	Herfindahl Index Coefficient (S.E.)
Constant	−6.62* (0.80)	−6.85* (0.81)	−6.47* (0.84)	−6.64* (0.85)	−6.72* (0.79)	−6.95* (0.89)	−6.90* (0.84)	−6.50* (1.50)
Revenue (logged)	0.71* (0.10)	0.72* (0.10)	0.75* (0.11)	0.71* (0.11)	0.69* (0.10)	0.73* (0.11)	0.69* (0.11)	0.60* (0.20)
Foreign Firm Dummy	−0.64* (0.22)	−0.66* (0.22)	−0.71* (0.26)	−0.75* (0.26)	−0.66* (0.22)	−0.72* (0.26)	−0.83* (0.26)	−0.70* (0.36)
Number of regulatory interactions (logged)	0.05 (0.06)	0.04 (0.06)	0.01 (0.06)	−0.01 (0.06)	0.06 (0.06)	0.0001 (0.06)	0.04 (0.06)	0.07 (0.11)
Number of Federal Court regulatory actions (logged)	0.20* (0.07)	0.20* (0.07)	0.17* (0.07)	0.17* (0.07)	0.20* (0.07)	0.17* (0.07)	0.17* (0.07)	0.13 (0.14)
Industry regulation	0.99* (0.28)	1.04* (0.28)	1.03* (0.30)	1.18* (0.30)	1.09* (0.28)	1.14* (0.30)	1.11* (0.30)	—
Government Contracts (logged)	0.04* (0.02)	0.04* (0.02)	0.03 (0.02)	0.03 (0.02)	0.04* (0.02)	0.03 (0.02)	0.03 (0.02)	0.05* (0.02)
Countervailing Power (logged)	0.72* (0.11)	0.71* (0.11)	0.75* (0.12)	0.74* (0.11)	0.73* (0.11)	0.74* (0.11)	0.80* (0.12)	0.97* (0.18)
Concentration	−0.006 (0.005)	0.001 (0.004)	−0.01* (0.004)	0.01 (0.01)	0.00001* (0.000003)	0.01 (0.01)	0.002* (0.0004)	0.0002 (0.0002)
Number of Cases	1,046[1]	1045	974[2]	974	1,046	974	974	385[3]
Number of Active Firms	518	517	507	507	518	507	507	175
% Active	50%	49%	52%	52%	50%	52%	52%	45%
LR χ^2	351	351	326	320	356	320	351	164
% Correctly Predicted	75%	75%	76%	74%	76%	75%	76%	78%

*p < .05
[1] Number of observations is reduced from the sample of 1167 due to missing data. Specifically data on revenues are missing for 3 firms, NAICS codes were not available for 24 firms, and NAICS concentration ratios do not exist for 121 firms in the sample (mainly mining, construction, and information industries as classified by NAICS).
[2] Using data from Standard & Poors, we are missing 193 of our firms.
[3] Herfindahl Indices are only available for manufacturing firms and are not complete. Industry regulation drops out due to collinearity.

measure of regulation, is consistently significant for the PAC model, but there is evidence for a substantial private goods motivation for firm political activity as well. While firm-level regulation is not significant, the other private goods measures, court actions and government contracts, are positive in all specifications and sometimes significant. Further, the firm-level measure of countervailing power is positive and significant across all specifications, and this measure, where the firm itself is the target, also may capture the private goods incentive. The measure for revenue is positive and statistically significant for all eight specifications, and the dummy variable for foreign ownership is negative and significant in all specifications.

Next, as suggested by earlier researchers, in order to move beyond the simple PAC measures we test the same set of models using other forms of political activity, namely lobbying and soft money contributions. Table 4 presents the models for whether or not a firm spends money on lobbying activities. With lobbying as the dependent variable, concentration still performs poorly across all specifications. The industry-level measure of regulation is significant in two of the models, and all of our measures of private goods are significant in the expected direction across all measures of concentration, except the Herfindahl index with the much more limited number of observations (N = 385).

Table 5 reports the models using soft money as the dependent variable. Revenues, the foreign firm dummy, and our measure of countervailing power are significant and perform as expected. Our measures of private goods are insignificant for this less-targeted mode of political activity. While we find a significant result for the industry-wide measure of regulation in some of the models, concentration is insignificant across all specifications. So even when we expand our research beyond PAC contributions to include other types of activities, concentration remains a poor predictor of business participation in politics.[9] These analyses do not provide evidence for the proposition of earlier researchers that concentration will per-

[9]A fourth measure of political activity that we are able to test is contributions by individuals who are associated with our firms. Again the models perform similarly with concentration insignificant or the wrong sign across the board at the 5% level. Only the S&P measure of a firm's share of the total industry revenue performs as expected at the weaker 10% level of significance. So the larger a firm's share of the total industry revenue, the more likely one is to observe giving by individuals associated with that firm. Further, firms are members of politically active associations. We did find evidence that firm and association political activity is complementary (over seventy % of politically active firms are also members of politically active associations). In contrast, only a small minority of the firms that are not politically active, 13%, are members of politically active associations.

form better using forms of participation other than PAC contributions.

In Table 6 we examine whether market structure has the expected influence when we aggregate the different forms of political participation. The dependent variable is assigned a value of 1 if a firm engages in any one or more of our three measures of political activity, PAC giving, lobbying, or giving soft money contributions, and is 0 otherwise. As in the PAC models, S&P concentration and total number of firms in the S&P industry category are significant in the opposite direction as expected, as is the number of establishments.[10] Court actions and government contracts are in the right direction and significant across all models, and firm regulation is sometimes significant. Countervailing power, industry regulation, and the foreign firm dummy are in the expected direction and significant across all models.

To test Grier, Munger, and Roberts (1991, 1994) alternative theory of a nonlinear relationship between political activity and concentration, we include concentration and concentration squared in all of our logit models. Among the 32 models run to test the nonlinear specification (one for each of the specifications in Tables 3–6), only two attain significance in the expected direction, both for soft money contributions. For soft money giving, the S&P concentration and its square are significant in the expected direction, and the Herfindahl index and its square are both significant in the direction predicted.

In contrast to the poor performance of market structure, whatever the measure, note the significant results obtained for the firm-specific measures of private goods, particularly with lobbying as the dependent variable. The earlier research has measured regulation generally only at the industry level with a dummy variable. Our measures of agency and court interactions with specific firms are generally good predictors of particularly the more targeted forms of firm political activity. Additionally, the most interesting and consistent finding in the literature suggesting the importance of private goods-seeking activity is for the very limited group of firms holding defense contracts (Boies 1989; Burris 1987; Hansen and Mitchell 2000; Lichtenberg 1989). This group represents only a subset of those firms that have government as a customer. Our measure of government contracts incorporates all government contracts, not just the defense department, and is consistently significant in the more targeted form of political activity, namely lobbying.

[10]We also considered the degree of political activity using an ordered probit model where the dependent variable ranges from 0 to 3. Here the results are virtually identical, with concentration insignificant or the wrong sign across the models.

TABLE 4   Logit Models of Lobbying Activity Using Different Measures of Market Structure

Independent Variables	NAICS Concentration (Four-Digit) Coefficient (S.E.)	NAICS Concentration (Six-Digit) Coefficient (S.E.)	S&P Concentration Coefficient (S.E.)	S&P Firm's Share of Industry Revenue Coefficient (S.E.)	NAICS Number of Establishments (10,000s) Coefficient (S.E.)	S&P Number of Firms with 1% or More of Market Coefficient (S.E.)	S&P Total Number of Firms in the Industry Coefficient (S.E.)	Herfindahl Index Coefficient (S.E.)
Constant	−6.55* (0.80)	−6.61* (0.81)	−6.13* (0.83)	−6.68* (0.85)	−6.68* (0.79)	−6.41* (0.88)	−6.30* (0.82)	−6.44* (1.46)
Revenue (logged)	0.59* (0.10)	0.59* (0.10)	0.60* (0.11)	0.63* (0.11)	0.62* (0.10)	0.58* (0.11)	0.57* (0.11)	0.55 (0.19)
Foreign Firm Dummy	−0.59* (0.23)	−0.60* (0.23)	−0.67* (0.26)	−0.66* (0.26)	−0.60* (0.23)	−0.68* (0.26)	−0.71* (0.26)	−0.57 (0.34)
Number of regulatory interactions (logged)	0.17* (0.06)	0.17* (0.06)	0.20* (0.06)	0.21* (0.06)	0.16* (0.06)	0.19* (0.07)	0.20* (0.06)	0.21 (0.11)
Number of Federal Court actions (logged)	0.40* (0.07)	0.40* (0.07)	0.32* (0.07)	0.32* (0.07)	0.40* (0.07)	0.32* (0.07)	0.31* (0.07)	0.38* (0.14)
Industry Regulation	0.57* (0.28)	0.57* (0.27)	0.46 (0.29)	0.48 (0.29)	0.55 (0.27)	0.54 (0.28)	0.53 (0.28)	—
Government Contracts (logged)	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.04 (0.02)
Countervailing Power (logged)	0.50* (0.11)	0.50* (0.11)	0.49* (0.11)	0.50* (0.11)	0.49* (0.11)	0.49* (0.11)	0.50* (0.11)	0.49* (0.16)
Concentration	−0.001 (0.005)	0.001 (0.004)	−0.006 (0.004)	−0.02 (0.01)	−0.05 (0.03)	0.004 (0.01)	0.001 (0.0004)	0.0002 (0.0002)
Number of Cases	1,046	1,045	974	974	1,046	974	974	385
Number of Active Firms	469	469	462	462	469	462	462	182
% Active	45%	45%	47%	47%	45%	47%	47%	47%
LR χ^2	385	385	351	352	388	349	351	152
% Correctly Predicted	76%	76%	76%	76%	77%	76%	76%	78%

*p < .05

TABLE 5   Logit Models of Soft Money Activity Using Different Measures of Market Structure

Independent Variables	NAICS Concentration (Four-Digit) Coefficient (S.E.)		NAICS Concentration (Six-Digit) Coefficient (S.E.)		S&P Concentration Coefficient (S.E.)		S&P Firm's Share of Industry Revenue Coefficient (S.E.)		NAICS Number of Establishments (10,000s) Coefficient (S.E.)		S&P Number of Firms with 1% or More of Market of Coefficient (S.E.)		S&P Total Number of Firms in the Industry Coefficient (S.E.)		Herfindahl Index Coefficient (S.E.)	
Constant	−6.87*	(0.77)	−6.90*	(0.78)	−6.52*	(0.80)	−6.54*	(0.81)	−6.71*	(0.76)	−6.47*	(0.84)	−6.60*	(0.79)	−8.20*	(1.46)
Revenue (logged)	0.75*	(0.10)	0.76*	(0.10)	0.76*	(0.10)	0.74*	(0.11)	0.73*	(0.10)	0.75*	(0.10)	0.75*	(0.10)	0.93*	(0.19)
Foreign Firm Dummy	−0.86*	(0.22)	−0.83*	(0.22)	−0.83*	(0.25)	−0.85*	(0.25)	−0.84*	(0.22)	−0.86*	(0.25)	−0.85*	(0.25)	−0.29	(0.33)
Number of regulatory interactions (logged)	−0.01	(0.07)	0.01	(0.05)	0.009	(0.05)	0.005	(0.05)	0.004	(0.05)	0.005	(0.05)	0.01	(0.05)	−0.08	(0.10)
Number of Federal Court actions (logged)	0.10	(0.07)	0.10	(0.07)	0.04	(0.07)	0.05	(0.07)	0.10	(0.07)	0.05	(0.07)	0.05	(0.07)	0.07	(0.13)
Industry Regulation	0.69*	(0.26)	0.64*	(0.26)	0.33	(0.27)	0.38	(0.27)	0.68*	(0.26)	0.38	(0.27)	0.36	(0.27)	—	
Government Contracts (logged)	0.02	(0.01)	0.02	(0.01)	0.008	(0.02)	0.008	(0.02)	0.02	(0.01)	0.008	(0.02)	0.009	(0.02)	−0.01	(0.02)
Countervailing Power (logged)	0.39*	(0.10)	0.40*	(0.10)	0.49*	(0.10)	0.49*	(0.10)	0.41*	(0.10)	0.49*	(0.10)	0.49*	(0.10)	0.51*	(0.15)
Concentration	0.004	(0.005)	0.002	(0.004)	−0.003	(0.004)	−0.004	(0.009)	0.03	(0.03)	−0.006	(0.01)	0.0002	(0.0004)	0.00002	(0.0002)
Number of Cases	1,046		1,045		974		974		1,046		974		974		385	
Number of Active Firms	481		480		478		478		481		478		478		163	
% Active	46%		46%		49%		49%		46%		49%		49%		42%	
LR χ²	256		257		231		231		257		231		231		109	
% Correctly Predicted	70%		70%		70%		71%		70%		70%		70%		73%	

*p < .05

TABLE 6　Logit Models of Firm Political Activity (PAC, Lobbying, and Soft Money) Using Different Measures of Market Structure

Independent Variables	NAICS Concentration (Four-Digit) Coefficient (S.E.)	NAICS Concentration (Six-Digit) Coefficient (S.E.)	S&P Concentration Coefficient (S.E.)	S&P Firm's Share of Industry Revenue Coefficient (S.E.)	NAICS Number of Establishments (10,000s) Coefficient (S.E.)	S&P Number of Firms with 1% or More of Market Coefficient (S.E.)	S&P Total Number of Firms in the Industry Coefficient (S.E.)	Herfindahl Index Coefficient (S.E.)
Constant	−6.48*	−6.60*	−6.07*	−6.32*	−6.47*	−6.87*	−6.52*	−9.13*
	(0.91)	(0.91)	(0.99)	(1.00)	(0.90)	(1.04)	(1.00)	(1.76)
Revenue (logged)	0.76*	0.77*	0.81*	0.77*	0.75*	0.79*	0.76*	1.03*
	(0.12)	(0.12)	(0.13)	(0.13)	(0.12)	(0.13)	(0.13)	(0.23)
Foreign Firm Dummy	−0.79*	−0.79*	−0.70*	−0.75*	−0.79*	−0.71*	−0.80*	−0.80*
	(0.23)	(0.23)	(0.27)	(0.27)	(0.23)	(0.27)	(0.27)	(0.37)
Number of regulatory interactions (logged)	0.10	0.09	0.11	0.10	0.12*	0.10*	0.13*	0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)
Number of Federal Court actions (logged)	0.25*	0.25*	0.19*	0.19*	0.26*	0.19*	0.19*	0.32*
	(0.07)	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)	(0.14)
Industry Regulation	1.04*	1.03*	0.70*	0.85*	1.10*	0.81*	0.80*	—
	(0.34)	(0.34)	(0.35)	(0.35)	(0.34)	(0.35)	(0.35)	
Government Contracts (logged)	0.06*	0.06*	0.05*	0.05*	0.06*	0.05*	0.06*	0.06*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Countervailing Power (logged)	0.94*	0.93*	1.01*	0.98*	0.96*	1.00*	1.04*	0.81*
	(0.16)	(0.16)	(0.17)	(0.16)	(0.16)	(0.16)	(0.17)	(0.22)
Concentration	−0.0002	0.003	−0.01*	0.006	0.06*	0.02	0.002*	0.0003
	(0.005)	(0.004)	(0.004)	(0.01)	(0.03)	(0.01)	(0.001)	(0.0002)
Number of Cases	1,046	1,045	974	974	1,046	974	974	385
Number of Active Firms	695	694	679	679	695	679	679	245
% Active	66%	66%	70%	70%	66%	70%	70%	64%
LR χ^2	345	346	302	294	350	295	312	168
% Correctly Predicted	75%	74%	75%	74%	75%	75%	76%	78%

*p < .05

TABLE 7   Tobit Models of Political Spending

Independent Variable	PAC (logged) Coefficient (S.E.)	Lobbying (logged) Coefficient (S.E.)	Soft (logged) Coefficient (S.E.)	All Three (logged) Coefficient (S.E.)
Constant	−24.43*	−27.98*	−29.9*	−14.96*
	(2.86)	(3.48)	(3.32)	(2.21)
Revenue (logged)	2.83*	2.68*	3.43*	2.20*
	(0.36)	(0.44)	(0.42)	(0.29)
Foreign Firm Dummy	−2.03*	−2.25*	−3.95*	−2.22*
	(0.87)	(1.08)	(1.04)	(0.68)
Number of regulatory interactions (logged)	0.13	0.82*	−0.02	0.29
	(0.21)	(0.25)	(0.24)	(0.17)
Number of Federal Court actions (logged)	0.83*	1.89*	0.51	0.91*
	(0.26)	(0.33)	(0.30)	(0.21)
Industry Regulation	4.17*	3.37*	3.64*	3.40*
	(1.02)	(1.25)	(1.16)	(0.82)
Government Contracts (logged)	0.10	0.11	0.07	0.08
	(0.05)	(0.06)	(0.06)	(0.04)
Countervailing Power (logged)	1.95*	1.69*	1.48*	1.40*
	(0.40)	(0.43)	(0.41)	(0.29)
Concentration (4-digit NAICS)	−0.03	−0.02	0.02	−0.005
	(0.02)	(0.02)	(0.02)	(0.02)
Number of Cases	1,046	1,046	1,046	1,044
Number of Active Firms	515	469	481	693
% Active	49.4	44.8	46.0	66.4
LR χ^2	364	400	277	406

*$p < .05$

In Table 7, we examine the *degree* of firm political activity using tobit models to account for censoring on the dependent variable. Here we report models for the different types of political spending and a combined measure summing across the types of spending, using just the most common measure of concentration, the NAICS four-digit. Industry regulation is consistently significant. The results of the private goods measures are consistently in the expected direction, although mixed in their degree of significance. Agency regulation is only significant in the lobbying model at the 5% level, and our measure of government contracts is consistently significant at the 10% level across all but the soft money models. The countervailing power measure is positive and significant. Again concentration, across all types of spending, is never significant in the expected direction no matter the measure of market structure used.

While our central concern is the influence of market structure, an additional concern is that the relationships for both government contracts and countervailing power have only been modeled as if contracts and countervailing power determine political activity and have not accounted for the potential simultaneous influence of political ac-

tivity on contracts and countervailing activity. Though simultaneously including both endogenous variables is prohibitive for these models, we do control for these endogenous relationships one at a time using a two-stage tobit model.[11] In Table A4 of the appendix we provide models for the first stage where we predict countervailing power and government contracts.[12]

Table 8 presents the second-stage tobit models for each type of political activity and a combined measure

[11]The standard errors that are produced using a two-stage limited dependent variable model are said to be incorrect because the variance-covariance matrix of the second-stage estimator is biased. Any hypothesis tests based on this matrix would also be biased. The bias is a result of the incorporation of predicted values generated in the first stage and imputed in the second stage that are measured with sampling error (Greene 2003; Maddala 1983; Murphy and Topel 1985; Nelson and Olson 1978). In order to facilitate correct hypothesis testing, we use a robust Murphy-Topel technique (Hardin 2002; Murphy and Topel 1985), which corrects the matrix problem and calculates asymptotically correct standard errors.

[12]Endogeneity is less likely to be a problem for our other measures of private goods. Firm political activity is not likely to cause court and regulatory interactions, as with government contracts.

TABLE 8　Simultaneous Tobit Models Controlling for Endogeneity, Using NAICS Concentration (Four-Digit)

Independent Variable	Countervailing Power–Endogenous				Government Contracts–Endogenous			
	PAC Coefficient (S.E.)	Lobby Coefficient (S.E.)	Soft Coefficient (S.E.)	Combined Coefficient (S.E.)	PAC Coefficient (S.E.)	Lobby Coefficient (S.E.)	Soft Coefficient (S.E.)	Combined Coefficient (S.E.)
Constant	−27.52* (4.67)	−18.53* (5.39)	−27.52* (4.67)	−13.81* (3.40)	−24.08* (3.88)	−18.82* (5.24)	−22.95* (4.66)	−10.34* (3.27)
Revenue (logged)	3.20* (0.43)	2.11* (0.57)	3.37* (0.48)	2.22* (0.34)	2.84* (0.38)	2.23* (0.52)	3.09* (0.46)	1.99* (0.31)
Foreign Firm Dummy	−1.75† (0.98)	−2.14† (1.24)	−3.54* (1.08)	−1.97* (0.71)	−2.11* (0.98)	−1.56 (1.26)	−3.40* (1.11)	−1.88* (0.76)
Number of regulatory interactions (logged)	−0.36 (0.25)	0.40 (0.31)	−0.11 (0.28)	0.28 (0.19)	0.17 (0.23)	0.54† (0.30)	−0.24 (0.27)	0.16 (0.18)
Number of Federal Court regulatory actions (logged)	1.21* (0.39)	1.03* (0.47)	0.31 (0.43)	0.83* (0.30)	0.85* (0.29)	1.51* (0.39)	0.22 (0.34)	0.72* (0.24)
Industry Regulation	4.27* (0.99)	2.39† (1.14)	3.27* (1.14)	3.19* (0.76)	3.99* (1.04)	4.91* (1.54)	4.80* (1.31)	4.15* (0.91)
Government Contracts (logged)	0.10* (0.05)	0.10† (0.06)	0.06 (0.05)	0.08* (0.03)				
Countervailing Power (Predicted)	0.22 (0.66)	2.71* (0.81)	1.20 (0.74)	0.85 (0.52)				
Government Contracts (Predicted)					0.01 (0.04)	0.16* (0.06)	0.12* (0.05)	0.08* (0.04)
Countervailing Power (logged)					1.99* (0.33)	1.78* (0.45)	1.54* (0.41)	1.45* (0.26)
Concentration (four-digit NAICS)	−0.02 (0.02)	−0.02 (0.03)	0.02 (0.02)	−.002 (0.02)	−0.03 (0.02)	−0.03 (0.02)	0.009 (0.02)	−0.01 (0.02)
Number of Cases[1]	1,025	1,025	1,025	1,023	1,046	1,046	1,046	1,044

*p < .05, †p < 0.10
[1] We lose observations in predicting countervailing power because of missing values in our instruments.

summing across political activities. Again for simplicity, we report the results using only one measure of concentration, the NAICS four-digit.[13] As in previous models, concentration is never significant in the expected direction. Our measure of industry regulation remains strong, and our measures of court actions and government contracts are significant in most models. And, these results are virtually identical across the eight measures of concentration.

Conclusion

We have examined a number of plausible solutions to the paradox of corporate political participation. Our analyses of the variety of forms of participation, using a battery of measures of market structure, are broadly consistent with the PAC results of earlier research. It makes sense to use a battery of measures of concentration, representing different definitions of the relevant market. Even the decision about whether to use a four- or six-digit NAICS (or SIC) measure is an important one given the moderate correlation (0.63) between the two. Only by exploring these measures can we have confidence in the findings of the influence of market structure on business political participation; substituting one concentration measure for another in our models had little impact on the magnitude, direction, or significance of the coefficients of the other independent variables.[14]

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[13]In Table 8 we specify the two-stage Countervailing Power model including government contracts as an independent variable in both stages. Similarly, we specify the Government Contracts model with countervailing power as an independent variable in both stages. When we remove government contracts from the Countervailing Power model, or countervailing power from the Government Contracts model, our results and conclusions do not change.

[14]In fact, removing the concentration measures entirely has very little impact on the models.

Despite the substance of these findings, we, like Munger, are reluctant to conclude that business political activity is irrational. Instead, we suggest that our results direct attention to the motivating assumption of this research field; much business participation is aimed not only at public goods but also at private goods. We present a range of supporting evidence for this solution to the paradox. The results for our firm-level measures of contracts, court interactions, and regulation, even when controlling for industry-level regulation, offers support for this solution. Further, earlier research has found strong support for the inclusion of other measures of private goods, such as defense contracts (Boies 1989; Burris 1987; Lichtenberg 1989), in predicting business political participation.

While Olson (1965) framed the research problem in terms of explaining participation aimed at obtaining collective goods, a solution to the paradox lies in systematically testing for private goods as well as public goods in our models of firm political activity. Such a strategy promises to improve our understanding of how firms make participation choices.

Such a solution, however, poses a new paradox: if firms are after private goods, why do so many join politically active associations? It is possible that associational activity is different and more exclusively focused on public goods. Or, following the logic developed in this article, a plausible solution lies in the extent to which firms can also manipulate the association in their efforts to secure private goods. This direction for research is anticipated in De Figueiredo and Tiller's finding that Fortune 1000 firms that lobby the Federal Communications Commission fear the hazard of releasing proprietary information when they lobby collectively with members of a trade association (2001, 109). The implication is that firms may also realize selective benefits through collective action perhaps in the form of information concerning government or rivals' strategies, or more directly in the form of soliciting the aid of the association in influencing government on the firm's behalf.

Appendix

TABLE A1   Descriptive Statistics for Variables

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Dependent Variables					
PAC	1,167	0.49	0.50	0	1
Lobby	1,167	0.44	0.50	0	1
Soft Money	1,167	0.46	0.50	0	1
Politically Active Firms	1,167	0.66	0.47	0	1
Independent Variables					
Revenue (logged)	1,164	8.19	1.07	0.10	12.15
Foreign Firm Dummy	1,167	0.15	0.35	0	1
Countervailing Power (logged)	1,167	0.66	0.97	0	4.84
Industry Regulation	1,167	0.09	0.28	0	1
Number of regulatory agency interactions (logged)	1,167	1.93	1.76	0	8.35
Number of Federal Court regulatory actions (logged)	1,167	2.12	1.46	0	6.46
Government Contracts (logged dollars)	1,167	2.02	5.26	0	24.22
Market Structure Measures					
NAICS Six-digit Concentration Ratio	1,045	36.71	20.62	1.5	100
NAICS Four-digit Concentration Ratio	1,046	24.73	15.37	1.5	84.4
S&P Concentration Ratio	974	48.16	19.08	19.88	99.42
NAICS Number of Establishments	1,046	14,027.39	27,616.44	4	191,245
S&P Number of Firms	974	126.84	176.52	3	782
S&P Number of Firms with 1% Market Share	974	16.68	5.79	2	30
S&P Market Share	974	6.29	9.36	0.1	89.44
Herfindahl	385	826.63	624.17	14.90	2,983.50

TABLE A2   Data Measures and Sources

Variable	Measure	Source
Dependent Variables		
PAC	Whether or not a firm belongs to a politically active PAC.	Sample of firms is drawn from *Fortune* and *Forbes*; Center for Responsive Politics provided political activity data for all measures of activity.
Lobby	Whether or not a firm reports spending money on lobbying.	
Soft Money	Whether or not a firm makes soft money contributions.	
Politically Active Firms	Whether or not a firm engages in any one or more of our political activities: PAC, lobby, or soft money.	

TABLE A2 Data Measures and Sources *(Continued)*

Variable	Measure	Source
Independent Variables		
Revenue ($billions)	Each firm's revenue.	*Fortune* and *Forbes*
Foreign Firm Dummy	Whether the firm is foreign-owned or not.	*Fortune* and *Forbes*
Countervailing Power	# of citations by environmental and citizens groups.	Environmental Working Group and Public Citizen
Industry Regulation	Dummy variable for highly regulated industries.	Grier, Munger, and Roberts 1994; Pittman 1977
# of Regulatory Agency Interactions	Number of formal interactions that each firm has with nine of the largest federal agencies.	Westlaw
# of Federal Court Interactions	Number of times that each firm is named formally in a federal court action.	Westlaw
Government Contracts (dollars)	Dollar value of each firm's government contracts.	Federal Business Opportunities
Market Structure Measures		
NAICS Four-digit Concentration Ratio	Percentage of four-digit industry category's revenue generated by the four largest firms.	U.S. Census Bureau
NAICS Six-digit Concentration Ratio	Percentage of six-digit industry category's revenue generated by the four largest firms.	Same as above
S&P Concentration Ratio	Percentage of S&P industry category's revenue generated by the four largest firms.	S&P Research Insight
NAICS Number of Establishments	Number of establishments that participate in the activities described by the specific six-digit code.	U.S. Census Bureau
S&P Number of Firms	Number of firms in the S&P industry category.	S&P Research Insight
S&P Number of Firms with 1% Market Share	Number of firms that generate 1% or more of the revenue in the industry category.	Same as above
S&P Market Share	The percentage of the industry category's revenue generated by the firm.	Same as above
Herfindahl	The sum of the squared values of the percentage of revenue of the largest 50 firms in the NAICS category.	U.S. Census Bureau *Survey of Manufacturers*

TABLE A3 Descriptive Statistics of Politically Activity[*]

Variable	N (active)	Mean	Std. Dev.	Minimum	Maximum
PAC dollars	564	148,582	232,725	500	2,017,117
Lobby dollars	517	1,000,881	1,716,659	10000	14,800,000
Soft money dollars	531	229,382	390,571	250	3,843,620

[*]The statistics in this table includes only active firms.

TABLE A4   **Two-Stage Least-Squares Models for Predicting Government Contracts and Countervailing Power**

We apply a two-stage least-squares method for each endogenous variable in a variety of specifications to confirm the robustness of our findings. In the two-stage models, we treat government contracts and countervailing power as endogenous variables and include a number of instrumental variables along with the independent variables reported in Tables 3–6. While finding good instruments that are truly exogenous is a ubiquitous problem, and the results that we report in Table 8 should be viewed with some caution, as seen in the tables below, we have identified instrumental variables that have some predictive power. In predicting the size of government contracts, we use four instrumental variables:

- Advertising (number of paid advertisements each firm has in the *National Journal*, logged).
- Media Coverage (number of times a firm appeared in the headlines of the *Wall Street Journal*, logged).
- Industry Representation (number of different 6-digit NAICS industries in which the firm operates).
- Super Coverage (the interaction of Media Coverage and Industry Representation).

In predicting countervailing power we use three instrumental variables:

- Manufacturing (a dummy variable if the firm is predominantly in the manufacturing sector, by NAICS codes).
- Media Coverage (number of times a firm appeared in the headlines of the *Wall Street Journal*, logged).
- Super Coverage (the interaction of Media Coverage and Industry Representation).

We use tobit models to estimate the logged dollar value of government contracts and the logged number of countervailing citations by environmental and citizens groups. The models are reported below. We then use the predicted values of government contracts and countervailing power as independent variables in the second-stage models of political activity that appear in Table 8 of the text.

Independent Variables	Coefficient (S.E.)
Tobit Model of Government Contracts (logged dollars)	
Constant	−56.3*
	(11.1)
Revenue (logged)	1.76
	(1.38)
Foreign Firm Dummy	−4.39
	(3.28)
Number of regulatory interactions (logged)	1.64
	(0.76)
Number of Federal Court actions (logged)	1.64
	(1.01)
Countervailing Power (logged)	−1.88*
	(1.32)
Concentration (NAICS four-digit)	0.07
	(0.07)
Advertising	3.71*
	(1.64)
Media Coverage	3.29*
	(1.24)
Industry Representation	1.53*
	(0.56)
Super Coverage	−0.14
	(0.17)
Number of Cases	1046
LR χ^2	130
Tobit Model of Countervailing Power (logged)	
Constant	−5.12*
	(0.48)
Revenue (logged)	0.35*
	(0.06)
Foreign Firm Dummy	−0.02
	(0.15)
Number of regulatory Interactions (logged)	0.15*
	(0.03)
Number of Federal Court Actions (logged)	0.38*
	(0.05)
Government Contracts (logged dollars)	−0.01
	(0.01)
Concentration (NAICS four-digit)	0.004
	(0.003)
Manufacturing Dummy	0.68*
	(0.12)
Media Coverage	0.16*
	(0.05)
Super Coverage	0.009*
	(0.004)
Number of Cases	1,025
LR χ^2	534

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