Industry characteristics and interest group formation: An empirical study*

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Abstract. The role of interest groups in the political process has been the subject of much analysis in both political science and economics. However, few studies have examined directly the factors which influence the variation in interest group formation across industrial sectors and between countries. Using data on 75 industrial sectors in 10 countries, we examine the way in which variations in interest group formation are explained by variations in industrial and political characteristics. In cross-sectional empirical relationships we test for the significance of a variety of industry and political variables. Our results indicate that industry characteristics such as the proportion of total demand purchased by households and the concentration ratio are related to variations in interest group formation. We discuss the implications that our results have for recent theoretical work on the effect of interest groups on economic policy.

1. Introduction

There is a long tradition in political science of studies examining the role of interest groups in the political process. This tradition still plays a central part in the analysis of the political system.[1] With the development of the field of public choice, economists have shown increasing interest in the impact of interest groups on political and economic outcomes.[2] Such studies immediately suggest questions that must be addressed in understanding the ultimate determinants of government policies. One must ask which factors affect the distribution of political power across different sectors of society and what circumstances confer advantages on particular groups engaged in the competition for political benefits.[3]

These are large questions and no single study can provide any more than a

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small part of the answer. Here, we focus on the manufacturing sectors of industrialized democracies. Studies examining policy formation often invoke strong assumptions about the sectoral distribution of political power. But these assumptions are usually made on the basis of *ad hoc* observations or *a priori* reasoning. No study has been able to base its theorizing on a multivariate empirical examination of the factors influencing the variation in collective action across industrial sectors and between countries.[4] Hence, the need for empirical studies on the extent of interest group formation has been frequently recognized (Schlozman and Tierney, 1986: xi).

Using data on 75 industrial sectors in 10 countries, we examine how variations in interest group formation can be explained by variations in industrial and political characteristics. Among the questions that we address are whether increases in industrial concentration spur the formation of interest groups, whether foreign-trade interactions influence group formation, and whether higher government spending leads to more groups.

In Section 2 we develop a systematic categorization of the variables that explain the sources of collective action. That section also examines the properties of our dependent variable, the number of interest groups, particularly its use in measuring interest group activity. Theoretical arguments underlying the explanatory variables follow in Section 3. Section 4 describes the data and the estimation procedures. The results follow in Section 5. Their implications are discussed in Section 6.

2. Categorizing the variables affecting interest group formation

The interest groups examined here represent economic agents within specific sectors of manufacturing industry: they are trade associations. These groups are predominantly the type that Salisbury (1975: 182) calls "sectional" – formed primarily to promote the narrow economic interests of members engaging in similar activities. The absence of labor unions and other groups from our study is dictated by the data source and the aspiration to collect sufficient information to conduct a meaningful cross-sectoral, cross-national study.

Our focus is on the material benefits[5] that can be obtained through interest group formation.[6] In this framework, constituent firms support a group only if the group's actions are within their narrow economic interest. For the groups included here, collective action is the continuation of profit-maximization by other means.

The level of interest group activity will be a function of the benefits that can be obtained through the political process and the obstacles that any group must overcome to obtain these benefits. In the political context, these obstacles include the level of political organization of those groups that are harmed by any

particular policy. Two distinct sets of explanatory variables can therefore be identified. The first includes variables measuring how the *demand* for the benefits from given policies varies with the characteristics of the industry and the market in which a firm operates. The second set of variables focusses on the *nature of the opposition*.[7]

Pareto (1971) originally developed the idea that economic equilibrium results from a balance between demand and obstacles (or in modern parlance costs). Black (1950: 512–513) used the same terms to characterize political equilibrium. We think the division between demand and obstacles, where the obstacles are now political opposition, is particularly appropriate for a description of the aspects of the political process that are modelled here.

In forming policies, the government and legislature must act within the constraints of a given political system. Prospective members of interest groups will be aware of such constraints, which may affect the costs and benefits of collective action. Thus, we include variables describing *components of the political system*.

Potential groups do not always organize when benefits exceed costs. Since groups usually seek collective goods, underprovision will result in the absence of mechanisms to overcome the incentive to free-ride (Olson, 1965). Since these incentives vary across industries, we use variables measuring *differences in free-riding* across industries.

The above has assumed that we have a perfect measure of interest group activity. Unsurprisingly, this is not the case. Such a measure would be a function of many components of activity – membership, monetary contributions, the number of groups. No single measure would be entirely satisfactory. Because our aim has been to construct a consistent data set for many industries in a variety of countries, we have information only on the numbers of groups in each industry. We are the first to admit that such a measure is imperfect – the number of interest groups and quantity of collective action are not perfectly correlated. But, below we argue that the correlation will be positive.

Every industry comprises many sub-sectors, each having divergent interests. The distinction between sub-sectors could reflect, for example, the fact that firms typically produce different products or that some firms export while others do not. Each sub-sector could potentially be represented by its own interest group. At any time, only some groups are active: for some sub-sectors the incentives for organization have not overcome the barriers to group formation. If industry characteristics changed, making collective action more profitable, existing groups would expend more and new groups would form. Then, the total amount of activity and the number of groups are positively correlated – one is a proxy for the other. Hence, if each industry had the same number of sub-sectors, cross-industry variations in the number of organized subsectors would solely reflect demand, the strength of the opposition, and free-

rider effects.[8] Therefore, the empirical work includes an extra set of independent variables, accounting for variations in the number of groups that are due to differences in *the number of sub-sectors in an industry*.

Our use of less than perfect data is necessitated by the absence of alternatives in an area with a dearth of empirical research. Here a comparison to an analogous literature might be helpful to justify our approach. Just as we use the group numbers to proxy group activity, economists (e.g., Scherer, 1965) have long used patent numbers to proxy research and development activity. The use of this proxy has approximately the same problem as ours. Horstmann et al. (1985: 838) have provided an argument that the number of patents is correlated with research and development expenditures. Nevertheless, precise theoretical justification lagged behind the use of the patent data, because researchers were willing to accept intuitive arguments when the data showed promise of illuminating a neglected area of research. Similarly, the dearth of empirical work on the formation of interest groups has encouraged us to proceed while acknowledging the need for more theoretical analysis of the circumstances under which numbers of groups are an adequate proxy for collective action.

3. Theories of interest group formation

3.1. Opposition

3.1.1. Household consumption
The following discussion develops a framework for analyzing the effect of a potential group's opponents on the incentives to organize. We apply the framework to the variable HCONS – the proportion of an industry's sales purchased by households. For many types of government assistance, an industry's opponents comprise mainly the buyers of that industry's output, whose level of political organization depends on whether those buyers are households or other industries.

There are two main actors, the representative firm in an industry, I, and the industry's opposition, O. Initially, the industry interest group is not organized, but a firm is considering the potential benefits from organization. Both I and O can attain two different states: I^G signifies the industry's state when it is organized into a group and I^N when it is not organized. Similarly, O^G and O^N show the opposition's status. Both industry and opposition influence policy, the degree of influence depending on whether the groups are organized. One can write a function, $B(I^i, O^j)$, $(i, j = G, N)$, expressing the return to the firm as a function of the statuses of industry and opposition.

The firm must take into account the opposition's future behavior. The firm formulates probabilities over the opposition's status, which in turn depends on

the industry's status. Let $Pr(O^j|I^i)$ be the firm's perceived probability that the opposition will have status O^j if the industry has status I^i. The net benefit to the firm of the industry organizing is then:

$$B(I^G, O^G). \ Pr(O^G|I^G) + B(I^G, O^N). \ Pr(O^N|I^G)$$
$$- B(I^N, O^G). \ Pr(O^G|I^N) - B(I^N, O^N). \ Pr(O^N|I^N)$$

Rearrangement of this expression facilitates analysis of the opposition characteristics that affect group formation:

$$B(I^G, O^N) - B(I^N, O^N) \tag{1}$$

$$+ Pr(O^G|I^N). \ \{[B(I^G, O^G) - B(I^N, O^G)] - [B(I^G, O^N) - B(I^N, O^N)]\} \tag{2}$$

$$+ \{Pr(O^G|I^G) - Pr(O^G|I^N)\}. \ \{B(I^G, O^G) - B(I^G, O^N)\} \tag{3}$$

To examine the effect of the variable HCONS, we focus on the second and third expressions in the above formula.

Expression (2) comprises two elements. The element within { }'s is itself composed of two sub-parts. $B(I^G, O^G) - B(I^N, O^G)$ measures the benefits of reacting to an organized opposition – the net benefit of defensive organization. Similarly, $B(I^G, O^N) - B(I^N, O^N)$ is the net benefit of offensive organization. It seems likely that defensive organization is more fruitful than offensive (Wilson, 1973: 309). Posner (1974: 343) argues that the costs of finding out about opportunities for increased profits through governmental regulation might be greater than the costs of perceiving losses that regulation might reduce. For these reasons, the element of (2) within { }'s will be positive. Expression (2) varies directly with $Pr(O^G|I^N)$.

$Pr(O^G|I^N)$ summarizes the opposition's ability to organize, which varies across industries due to such factors as the strength of free-rider effects. Since voluntary contributions to the provision of a collective good decrease with the number benefitting from provision (Olson, 1965) and since households are far more numerous than firms, free-rider effects are likely to be more serious the higher is HCONS. Thus, $Pr(O^G|I^N)$ varies inversely with HCONS.

There is a countervailing influence on expression (2). The evidence in Schlozman and Tierney (1986: 284) indicates that trade associations usually regard citizen groups, rather than business groups, as their antagonists in the political process. Since citizen groups are far more likely to pursue household interests than business interests, that level of antagonism varies directly with HCONS. Thus, $B(I^G, O^G) - B(I^N, O^G)$, the benefit of defensive organization, might increase with HCONS. One cannot be sure whether (2), as a whole, varies directly or inversely with HCONS.

Because the second half of (3) is negative, the industry is more likely to organize the smaller is $Pr(O^G|I^G) - Pr(O^G|I^N)$. This difference is probabilities expresses the likelihood that the opposition reacts to changes in the industry's group status. The swifter is the opposition's reaction, the less likely is action by the industry itself. If the opposition mainly comprises households, the costs of any policy obtained by the industry will be widely distributed. No single agent is likely to react to any change in these costs. Furthermore, groups of households are less able than industry groups to generate selective incentives to overcome the free-rider problem. Hence, expression (3) varies directly with HCONS.

Examination of these three expressions shows that the effect of HCONS cannot be determined *a priori*. Empirical investigation is needed to determine which effects dominate.

3.1.2. Foreign trade
The following discussion predicts that an import-competing industry seeking tariffs will face less opposition than an export-oriented industry seeking a subsidy. This difference will result in more interest groups in import-competing industries.

Consider a *ceteris paribus* comparison between two industries, identical in every respect except that one is an importer and the other is an exporter. Using a standard consumer-surplus, producer-surplus analysis, it is easily shown that the net welfare loss from a tariff is the same as that from an identical per-unit export subsidy. Similarly, the gain in producer surplus is the same for both policies. Hence, the net welfare loss of consumers and taxpayers, considered as an entity, is the same in both cases. The two policies, however, affect consumers-taxpayers in different ways: the tariff results in a higher loss in consumer surplus, which is offset by the contribution to the government budget of the tariff revenues.

To predict that import-competitors are more likely to form an interest group than exporters, one must assume that consumers are less likely to be politically active than taxpayers or that exporting industries are less favored than those threatened by imports. Both assumptions seem plausible. First, since the rise in price comes about as an *indirect* consequence of a tariff, the consumer-taxpayer group is less likely to attribute responsibility to politicians for that price increase than for changes in taxes from a subsidy. Given the differing lengths of the links between policy and effect, consumers, rationally, have less information about the causes of changes in consumer surplus than about changes in taxes. Hence, there will be less opposition to the tariff measure than the export-subsidy measure. Second, producers threatened by imports have the advantage of the emotional appeal of lost domestic markets, relying especially on xenophobia.

To test whether import-competing industries have more interest groups than export producers, we must include exports and imports separately in our empirical work. In any case, one could argue that both variables should be included. When an industry produces a good that is internationally traded, the scope for government assistance is expanded. Such assistance will be contested by a different mix of opponents than measures aiding industries engaged solely in domestic commerce. Since only one policy is needed to help any group, it is more likely that a politically acceptable measure can be found the larger is the set of possible policies. Therefore, when an industry exports or imports there is a higher probability that its lobbying will be successful and consequently a greater likelihood of group formation. Increments to international trade will be more important when trade is small than when it is large: a non-linear relation between interest group formation and trade levels is expected. Thus, we use the square-root of exports (EXP) and imports (IMP) in the empirical work.

3.2. Demand

3.2.1. Labor's share
Anderson (1980) has analyzed the expected benefits from government assistance in the context of a specific factors model.[9] When output price rises, there is an increase in the demand for the factors of production employed by an industry. The returns will rise most for the least mobile factors. The increase in revenues from the industry's price rise must be completely divided among factors. Hence, when a mobile factor – the one receiving the lowest increase in its rate of return – accounts for a large share of costs, the returns to all factors must rise more than when the mobile factor accounts for only a small share. Therefore, if labor is more mobile than capital, the expected benefits to capitalists from successful political action will be greater the higher is labor's share of output in the industry (Anderson, 1980: 142–143). This would imply a positive effect of labor's share (LSH) on interest group formation.

An industry's chances of obtaining government assistance will be greater the more allies it has in the political process. The result in the previous paragraph implies that labor is more likely to lobby for government assistance the higher is its share of output (Grilli, 1983: 22). This increases the industry's expected profits from organizing and also implies that the coefficient on LSH will be positive.[10]

An important prediction from Becker's (1983; 1985) model of political competition stands in contrast to those of Anderson. In Becker's model, deadweight cost is important in determining which groups receive assistance (Becker, 1983: 373). There are two reasons why higher deadweight costs reduce the chances that a particular group will be subsidized. First, "... optimal ex-

penditures on pressure even by selfish recipients are smaller when the social cost of subsidies is greater because the effect of subsidies on the utility of selfish recipients depends negatively on the dead weight cost of subsidies" (Becker, 1985: 334). Secondly, higher subsidies encourage increased taxpayer opposition since higher subsidies imply that the marginal social cost of the taxes needed to finance them increases (Becker, 1985: 334). Given the assumption that labor is more mobile than capital, the deadweight costs of a unit of government assistance will be greater the larger is the share of total costs earned by labor. Thus Becker's model would predict a negative coefficient for LSH.

3.2.2. Elasticity

To consider the effect of demand elasticity on the incentive for group formation examine the benefits derived from a simple form of government assistance. Suppose that successful interest groups are aided by government assistance in cartel formation. As a result, consumers lose, producers gain, and no other agents are affected. The difference between the fall in consumer surplus and the rise in profits is the deadweight cost of the market intervention. The size of the deadweight cost is positively related to the elasticity of demand. Thus, for a given loss suffered by consumers, the gain in profits is negatively related to the value of the elasticity of demand: the benefits to the industry of a policy of given political cost are greater the more inelastic is demand. Therefore, producer interest groups are more likely to form in industries facing inelastic demands.[11] The variable ELAS, which measures households' elasticity of demand, is used to test this proposition.

3.2.3. Concentration

The effects of concentration span a number of the categories in our classification of theories of interest group formation. We begin with free-rider effects.

As the number in the group providing a collective good increases, there is a decrease in the probability that a particular subset of the group finds it worthwhile to contribute. In addition, the transactions costs of organizing increase with the number in a group. Hence, Olson (1965) concludes that collective action is more likely to occur in small groups and that, the larger the number of potential members of a group, the farther the group will fall short of providing a group-optimal amount of the collective good.[12] The four-firm concentration ratio (CONC) is used to proxy the number of firms in the industry.

Collective action can occur without the formation of interest groups. Large firms may undertake political action on an individual basis or choose tacit collusion instead of organizing a trade association. These possibilities weaken the likelihood of a positive coefficient on CONC. However, while small firms may try to free ride on the individual action of large firms, they may also discover that the political action is not adequately promoting their interests and decide

to form a separate interest group instead (Stigler, 1974).

Concentration might also have an impact on the political opposition facing an industry. Coolidge and Tullock (1980: 45) argue that the climate of opinion in the United States is opposed to the concentration of political power and that this might undermine the political strength of concentrated industries. This argument implies an inverse relationship between interest group formation and concentration.

Through influences on demand, the number of firms in an industry might also have a positive effect on the amount of group formation. First, Murrell (1984: 155–157) showed that the number of interest groups in a country increased with population, even if the number of industries remains constant. Similarly, at the industry level, as the number of firms in existing sub-sectors increases, economies of scale in organizing will permit the creation of specialized groups to cater for the distinctive demands of different types of firms. Second, Posner (1974: 345) argues that the demand for government regulation is greater among industries (such as those with low concentration) that find it difficult to form private cartels.[13]

3.3. Country characteristics

This section discusses the country variables employed in our empirical analysis. The discussion here is briefer than the previous for two reasons. First, most of the hypotheses concerning these variables have been extensively discussed in the political science literature. Second, since the industry variables are only available for a small number of countries, restricting the diversity of countries available for use in the statistical analysis, multicollinearity problems prevent extensive testing of country variables.

3.3.1. Accumulation

Olson (1965) argued that collective action occurs in groups with large numbers of potential members only if selective incentives are available. The establishment of such incentives often depends upon fortuitous coincidence, which occurs infrequently. Once the selective incentives are in place, groups tend to survive in the absence of major social upheavals (Olson, 1982: 38–41). Thus, the number of groups will be positively related to the length of time during which formation was possible. This time period is measured by DATE, the number of years since a country began political and economic modernization.

3.3.2. Size of government

Loomis and Cigler (1986: 10–15) argue that extra government activity spurs interest group activity. Berry (1984: 36) claims that the recent upsurge in busi-

ness political activity was related to the rise in regulatory legislation that began in the 1960s. We examine these arguments with the variable GOVT, total tax collections as a proportion of GDP. Not all types of government spending have the same impact on group formation. An increase in the proportion of GDP that is spent on subsidies is likely to have a relatively large effect on the formation of trade associations. This proportion is measured by SUB.

3.3.3. Federalism

Wilson (1973: 79) argued that the existence of a federal system provides interest groups with multiple access points to pursue their objectives. Alternatively, it has been argued that federalism leads to decentralized organizations, which have less cohesion (Truman, 1951: 116). To examine which of the hypothesized effects of federalism dominates, we constructed the variable FERG, which is zero for unitary countries and equal to the number of political sub-divisions in federal systems.

3.3.4. Business cycles

Austen-Smith (1981: 150) showed that relatively more resources are devoted to political activity when the rate of return to economic activity is more uncertain. However, Salisbury (1975: 197) argues that business downturns lead to less interest group activity because political entrepreneurs then find it more difficult to offer incentives profitably to potential members. FLUC, a measure of fluctuations in GDP between 1950 and 1979, was used to test the impact of business cycles.

3.3.5. Economic development

Loomis and Cigler (1986: 18) argue that people with higher incomes are more willing to contribute to groups. The per capita income of each country – GDP – was used to capture this effect.

3.3.6. Population

Murrell's (1984) model showed that higher population was likely to increase the number of interest groups, even without any change in industrial structure. The variable POP is the population of a country.

3.4. Numbers of groups as a proxy for the amount of collective action

As noted in Section 2, our dependent variable, the number of interest groups, is not a perfect proxy for the phenomenon we want to explain. We must therefore use variables that explain the deviation of our dependent variable from a perfect measure. Their use serves to strengthen the validity of the results on the other variables.

3.4.1. Product differentiation

When two industries contain different numbers of sub-sectors, the number of groups can differ without any difference in the benefits and costs of collective action to a representative firm. The larger number of groups in one industry might be solely due to the fact that this industry has more sub-sectors. Variations in the number of industry sub-sectors are measured by PRODS, the number of products that could be potentially produced by an industry in any country.

3.4.2. Size

Given the difficulties of measuring the number of distinct sub-sectors within an industry, it is possible that PRODS is not entirely satisfactory. Therefore, it is important to try alternatives. An alternative measure of industry size is value-added in an industry, which we denote by VA.

3.4.3. Germany

Because the interest group data were collected by a German company, we had reason to suspect that the information is more comprehensive for that country than for others.[14] To reduce the effect of this possible data problem, we included an extra independent variable – an intercept dummy (GERM) for the German observations. Given the degree of difficulty in obtaining data, we judged that this was a better procedure than simply discarding the German information.

4. Data and econometrics

From the World Guide to Trade Associations (1982), we compiled data on the numbers of interest groups in 75 sectors of manufacturing industry in the 24 OECD countries. The sectors were defined at the 4-digit level of the U.N. International Standard Industrial Classification. Data on the independent variables were not available in such a comprehensive fashion. For most variables, data were missing for some sectors and some countries. In estimations, therefore, we used between 181 and 422 observations, depending on which variables were included. These observations covered a wide variety of sectors in Belgium, Canada, France, F.R. Germany, Ireland, Italy, Japan, the Netherlands, the United Kingdom, and the United States.

The independent variables are summarized in Table 1. The exact details of the construction of these variables, the description of data sources, and comments on data reliability are reserved for an Appendix.[15] The ensuing paragraphs discuss the estimation techniques.

The dependent variable is truncated: some industries in our sample have no

Table 1. A summary of the variables used in the empirical analysis

Variable name	Theoretical basis for inclusion	Expected sign	Variable definition
HCONS	Type of opposition (households or other industries)	+/−	Proportion of demand by households
IMPP	Type of opposition (consumers or taxpayers)	+	Square root of predicted level of imports
EXPP	Type of opposition (consumers or taxpayers)	+	Square root of predicted level of exports
LSH	Benefits from assistance related to significance of mobile factor	+/−	Share of output earned by labor
ELAS	Benefits from assistance related to efficiency losses	−	Consumers' elasticity of demand
CONC	Free-rider effects; number of firms	+/−	Four-firm concentration ratios
PRODS	Number of sub-sectors in each industry	+	Number of potential products
VA	Size of industry	+	Value added
DATE	Length of time in which group formation possible	+	Date of beginning of modernization process
GOVTP	Size of government	+	Predicted tax revenue as a percentage of GDP
SUBP	Size of government	+	Predicted subsidies as a per-cent of GDP
FERG	Multiple jurisdictions under federalism	+/−	Number of sub-divisions in federal systems (0 for unitary countries)
FLUC	Uncertainty/fluctuations	+/−	Fluctuations in GDP 1950–1979
GDP	Level of economic development	+	Per-capita GDP
POP	Country size	+	Population
GERM	Possible bias in data	+	Dummy for Fed. Rep. Germany

interest groups. We therefore used Tobit analysis, the standard technique for such circumstances. (For a description of Tobit see, for example, Maddala, 1983).

A major problem lay in the simultaneity of some of our explanatory variables. We argued above that interest groups lobby for measures that affect foreign trade: EXP and IMP are simultaneously determined. Mueller and Murrell (1986) have shown that interest groups affect the level of government spending: GOVT is endogenous, as, presumably, is SUB.

To handle simultaneity simply, we purged the relevant variables of their endogenous components by using predicted values from regressions on exo-

genous variables. (If we had complete data and if the interest group equation had been linear instead of truncated-linear, then our procedure would have been identical to two-stage least squares.[16] Thus, for example, the exports in each sector were related to factor endowments in regressions whose unit of observation was a country.[17] This procedure was repeated for each sector and the predictions of each sector's exports (EXPP) were used instead of actual exports in the equation explaining numbers of interest groups. Predicted import (IMPP) data were similarly obtained.

For country variables subject to simultaneity, the same technique was used. For these variables, which do not vary across sectors, only one predicting equation was needed — a single regression in which the observations were the 24 OECD countries. Mueller and Murrell (1986) provided us with the relevant exogenous variables for predicting government size (GOVTP) — voters as a percentage of population, ethnic fractionalization, and population. For subsidies, Blais (1986) found that agricultural employment as a percent of total employment and the political composition of national government were important explanatory variables. We used these variables to obtain predicted values for subsidies (SUBP).

For one variable, the elasticity of demand, we were able to obtain only partial information. Simple algebra shows that total elasticity is the sum of two components — elasticity of household consumption demand times the share of output sold to households and the elasticity of industrial purchasers times the share of output sold to industry. Since industrial customers and households are different types of political opponents, variables measuring each of these components should be used separately in the analysis. However, while we were able to obtain the relevant data for households, we were unable to obtain elasticity information for industries. The elasticity variable (ELAS), therefore, measures only the final demand component; the intermediate demand elasticity is missing.

5. Results

Our statistical results are presented in Tables 2 and 3. Table 2 summarizes the most important lessons derived from the empirical analysis. Because the use of some variables causes a large decline in the number of usable observations, there is a trade-off when running regressions between number of observations and number of variables. Under such circumstances there is no general theory showing which regression contains the most reliable results. Therefore, we present a spectrum of results: equation 1 has 422 observations when ELAS and VA are excluded, and equation 4 has 181 when all variables measuring industry characteristics are included.

Table 2. Interest group formation related to industry characteristics

Variable	Mean value	Equation (1)	Equation (2)	Equation (3)	Equation (4)
HCONS	0.26	54.99**	66.27**	76.56**	95.18**
		(3.90)	(3.03)	(3.64)	(2.82)
IMPP	26.4	0.26**	0.28**	0.26*	0.31*
		(2.19)	(2.17)	(1.69)	(1.71)
EXPP	26.7	0.07	0.09	− 0.002	0.05
		(0.48)	(0.50)	(− 0.01)	(0.19)
LSH	0.23	75.26**	91.77*	104.72**	127.74*
		(2.06)	(1.94)	(2.00)	(1.78)
ELAS	0.33	−	− 9.98	−	− 16.5
			(− 0.59)		(− 0.58)
CONC	39.8	− 0.26**	− 0.18	− 0.31*	− 0.27
		(− 2.19)	(− 1.21)	(− 1.66)	(− 1.13)
DATE	157.4	0.13**	0.17**	0.08	0.11
		(1.96)	(− 2.06)	(0.74)	(0.81)
GOVTP	38.5	0.36	0.07	− 0.32	0.03
		(0.45)	(0.06)	(− 0.22)	(0.01)
PRODS	74.5	0.17**	0.25**	0.23**	0.27**
		(3.56)	(3.36)	(3.18)	(2.71)
VA	1245	−	−	0.0003	0.0003
				(0.40)	(0.36)
GERM	0.11	88.8**	91.96**	79.99**	91.24**
		(7.32)	(5.97)	(4.48)	(3.89)
CONSTANT	−	− 43.39	− 78.71	− 47.96	− 81.65
		(− 1.17)	(− 1.62)	(− 0.72)	(− 0.90)
R^2	−	0.34	0.39	0.36	0.41
Number of observations	−	422	288	246	181
Number of limit observations	−	44	26	13	9

t-statistics in parentheses.
*significant at the 90% level; **significant at the 95% level.

The reader will recall that many industry variables could not be unambiguously signed using theory alone. Table 2 offers clear answers to some of the questions raised by theory. For example, the coefficient on HCONS is always positive and significant, while that on concentration (CONC) is always negative and sometimes significant. The former result indicates that the possibility of opposition reaction is an important stimulant to interest group formation. The latter result indicates that the effect of a larger number of firms plus the need for firms in unconcentrated industries to obtain government regulation appear to outweigh the free-rider problem.

The signs and relative size of the coefficients on IMPP and EXPP are consis-

Table 3. Regressions relating interest group formation to political variables and industrial characteristics

Name, coefficient,	Equation (5)	Equation (6)	Equation (7)	Equation (8)	Equation (9)	Equation (10)
and t-statistic of	FERG	FLUC	GDP	POP	SUBP	FLUC
added variable	0.23	8.08	0.17	0.05	− 3.08	− 423*
	(1.32)	(0.02)	(0.96)	(1.14)	(− 1.23)	(− 1.66)
HCONS	53.48**	55.60**	54.68**	54.36**	54.83**	56.03**
	(3.79)	(3.95)	(3.89)	(3.87)	(3.91)	(3.98)
IMPP	0.24**	0.27**	0.25*	0.24**	0.25**	0.28**
	(2.00)	(2.28)	(2.15)	(2.03)	(2.10)	(2.41)
EXPP	0.05	0.08	0.07	0.04	0.06	0.09
	(0.37)	(0.58)	(0.50)	(0.29)	(0.45)	(0.69)
LSH	69.06*	77.75**	74.19**	72.13**	71.69**	84.57**
	(1.88)	(2.15)	(2.05)	(1.98)	(1.97)	(2.37)
CONC	− 0.25**	− 0.26**	− 0.26**	− 0.25**	− 0.27*	− 0.25**
	(− 2.13)	(− 2.17)	(− 2.22)	(− 2.13)	(− 2.27)	(− 2.11)
DATE	0.14**	0.13	0.14**	0.15**	0.12*	−
	(2.17)	(1.20)	(2.11)	(2.22)	(1.75)	
PRODS	0.17**	0.17**	0.17**	0.17**	0.17**	0.16**
	(3.66)	(3.53)	(3.59)	(3.64)	(3.61)	(3.47)
GERM	86.05**	85.52**	83.51**	87.13**	88.6**	79.53**
	(9.09)	(8.06)	(8.66)	(9.09)	(9.02)	(8.53)
CONSTANT	− 58.46**	− 59.14*	− 71.98**	− 61.60**	− 46.74**	− 26.24
	(− 3.86)	(− 1.85)	(− 3.49)	(− 4.00)	(− 2.61)	(− 1.61)
R^2	0.34	0.34	0.34	0.34	0.34	0.34

All regressions contain 422 observations, of which 44 are limit observations.

t-statistics in parentheses.

*significant at the 90 percent level; **significant at the 95 percent level.

tent with the theory of Section 3: industries threatened by imports produce more interest groups. The positive coefficient on LSH reflects the argument that both capital and labor benefit more from an increase in government assistance the higher the share of labor in total costs. Arguments based on efficiency considerations call for negative signs on LSH and ELAS. The significant, positive sign on LSH and the insignificant coefficient on ELAS suggest that deadweight costs are not among the most important determinants of interest group formation.

Because of the small number of countries for which we were able to obtain data, extreme multicollinearity would have resulted from testing all the country variables simultaneously. The choice of the two country variables appearing in Table 2 reflects our judgement on the most important results obtained while undertaking this research. DATE was included because its coefficient was more consistently significant than those of the other country variables. The

positive coefficient on DATE supports Olson's hypothesis on the gradual accumulation of interest groups. GOVTP was also entered into the regressions, since it reflects one of the more important hypotheses – the possible link between size of government and interest group formation. The consistent insignificance of the coefficient on GOVTP indicates that one should not think of interest groups as reacting to opportunities created by government.

Table 3 summarizes the testing of the country variables. To ensure inclusion of many countries as possible, we dropped the two insignificant variables (ELAS and VA) whose inclusion causes us to lose many observations. Each country variable is then tested individually. Thus, equations 5 to 9 in Table 3 are identical to equation 1 in Table 2, except that GOVTP has been replaced by a different country variable in each equation. None of the variables introduced had a significant coefficient.[18] The coefficient on DATE became insignificant when the business cycle variable, FLUC, was introduced, indicating possible multicollinearity. Therefore, we included FLUC and excluded DATE in equation 10. The coefficient is now significantly negative, indicating that interest group formation is more difficult in recession-prone economies.[19]

6. Implications

The question whether certain groups command disproportionate amounts of political power is central to analysis of the effects of interest groups. Olson (1982: 37) has argued that there are wide variations in the ability of different sectors to organize and that these variations imply that one cannot expect Pareto-optimal policies to result from inter-group bargaining. On the other hand, Becker claims that democracies are characterized by competition among groups with relatively equal political strength and this competition leads to the selection of policies having relatively low deadweight costs (Becker, 1985: 345). Our empirical analysis sheds considerable light on whether interest group formation varies across industries. We find that industry characteristics do help to explain variations in interest group activity. If political strength and amount of interest group activity are positively correlated, then our results provide little support for the proposition that democracies are characterized by groups with relatively equal political strength.

Becker also argues that the pressure exerted by an interest group is negatively related to the deadweight costs of policies affecting the group. We have not been able to find such a relationship between interest group activity and deadweight costs in our results on LSH and ELAS. Because neither of these variables is completely satisfactory, it is clear that further work is needed on the relationship between collective action and economic efficiency. If future work confirms our conclusion that industry characteristics are more important than

deadweight costs in determining collective action, this would raise serious doubts about Becker's hypothesis that competition among interest groups results in relatively efficient policies being chosen. Our tentative conclusion, awaiting further work, is that our results support the more negative conclusions on the effect of interest groups of Olson (1982) and Mueller and Murrell (1986).

Our results help to explain disparities between the use of tariffs and export subsidies. In the political economy of trade literature, many studies attempt to explain the size of tariffs, while export subsidies are largely ignored. The literature reflects reality, where tariffs are pervasive and export subsidies less common, but does not explain the disparity. We argued that there would be relatively more interest groups in import competing industries. The results support our argument and they also provide a rationale for the disparity between tariffs and export subsidies.

Our results also have implications for the interpretation of several previous studies examining the relationship between political outcomes and industry characteristics. Consider a puzzling result in the political economy of protection literature, namely that concentration sometimes has a negative effect on tariffs (Caves, 1976; Anderson, 1980). As Baldwin (1984: 581) notes, the surprising failure of concentration to produce higher levels of protection could emanate from the incorrectness of one of two assumptions. Either it is not true that concentration produces higher levels of interest group formation or it is incorrect to assume that higher levels of political action lead to larger tariffs. Our results indicate that the problem lies in the usual assumption about interest group formation. In fact, unconcentrated industries seem to produce more groups and this could help explain why they secure more protection.

Finally, our results can aid in applying methodologies developed in two recent studies. These studies develop methods of embodying the effect of interest groups in systematic models. Becker (1983) postulates an influence function whose arguments are variables measuring the determinants of interest group activity. Coughlin, Mueller, and Murrell (1989) show that probabilistic voting in a two-party system results in a choice of policies that maximizes a weighted function of voter utilities. The sizes of the weights are determined by the locus of interest group power. Therefore, our empirical results suggest which variables should be used as arguments of Becker's influence functions and which explain the size of the Coughlin-Mueller-Murrell weights. Given our identification of the relevant variables, it is then a simple step to undertake comparative statics exercises linking changes in the determinants of interest group power to changes in policy outcomes.[20]

Notes

1. For the classic works see Schattschneider (1935), and Truman (1951). Examples of recent studies are Berry (1984), various chapters in Cigler and Loomis (1986), and Schlozman and Tierney (1986).
2. Examples are Caves (1976), Olson (1982), and Becker (1983, 1985).
3. We do not imply that only organized groups obtain political benefits. Denzau and Munger (1986) show how periodic elections enable unorganized groups to be represented in the political process.
4. Murrell's 1984 study was a cross-country analysis. Esty and Caves (1983) have investigated the relationship between industry structure and political influence in the United States.
5. Salisbury (1975: 193) has categorized the motives for joining interest groups as material, solidary, and expressive.
6. Moe (1980: 198) argues that firms join trade associations in response to selective economic incentives. There is little evidence on variations in the supply of selective incentives across industries. The argument that selective incentives are the only factors affecting group formation is contradicted by the lack of private firms competing with trade associations (Wilson 1973: 152).
7. The distinction between the demand for policies and the opposition only helps if one adopts a consistent definition of what is being demanded and opposed. We define a unit of policy as a measure reducing the welfare of the opposition by a fixed amount.
8. The degree to which the number of interest groups adequately proxies the amount of collective action will naturally vary with the policy arena on which that activity centers. (In Lowi's, 1972: 299, terms policies determine politics). If a decision on policy affects a broad industrial category, the existence of many groups in an industry might indicate a lack of cohesion which results in less total activity.
9. Anderson conducts his discussion in terms of labor's share of value-added. His argument applies also to labor's share of gross output, since in his model the amount spent on intermediate goods does not change when the industry receives assistance. We have phrased the argument in terms of gross output to make it correspond to our data.
10. The implication of Anderson's model that both capital and labor gain from an increase in government assistance is supported by evidence reported in Magee (1982: 289). Of twenty one industries lobbying on the President's trade bill in 1973, labor and capital adopted the same position in nineteen of them.
11. This analysis has not examined the effect of elasticity when other forms of government intervention are used, Gardner (1983: 233) has examined a variety of such interventions and concludes that "In general, redistributive efficiency increases as either the supply or demand function becomes less elastic."
12. Olson's conclusions do not hold if the good provided by the group is perfectly non-rivalrous (McGuire, 1974; see also Hardin's, 1982, clarifying discussion). It is reasonable to assume that goods typically provided by trade associations exhibit some degree of rivalry.
13. Zardkoohi (1988: 188) argues that one should distinguish industries that are concentrated because of underlying economic reasons from those that are concentrated because they have obtained government regulation. Data limitations prevent us from making this distinction, but Zardkoohi's point implies that great care should be taken in interpreting the results on the concentration variable.
14. For example, many more regional branches of national interest groups seemed to be included for Germany than for other countries.
15. This Appendix is available from the authors, on request.
16. We were unable to use full maximum likelihood techniques in response to simultaneity since

this would have been possible only if data were available for all 24 OECD countries for all 75 sectors.
17. For these regressions, we used data on all OECD countries.
18. Our data include only trade associations. Since many of the theories concerning the political variables refer to all types of groups, the results cannot be taken as evidence against these theories.
19. We also ran country-specific regressions that are not reported here. Although the lack of data points implies that many of the coefficients are no longer significant, the signs on the variables provide support for the results in Tables 2 and 3. Several other political variables were tested, none of which were significant. The results of these exercises are available from the authors on request.
20. Conceptually simple, that is, not necessarily algebraically so.

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40

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