Interest groups and the size of government*

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1. Introduction

The size of government, both absolutely and as a percentage of gross national product, has in the last decade reached unprecedently high levels in all Western countries (Nutter, 1978). Although in most cases growth in government began long before World War II, it is only in recent years that the level of government activity has reached such proportions as to cause widespread concern and discussion in the political arena and in academia. In the economics literature, this concern has led to an increasing interest in positive analysis of the size of government (Borcherding, 1977; Brunner, 1978; Frey, 1982; Meltzer and Richard, 1978, 1981; Peltzman, 1980; Fratianni and Spinelli, 1982). The present paper is a contribution to that analysis.

Among the many factors explaining the size of government, mention is often made of the potential role of interest groups. Yet, surprisingly little has been done to develop and test hypotheses concerning the impact of interest groups on government size (but see McCormick and Tollison, 1981). This paper begins to remedy this deficiency. In Section 2, we discuss the impact of interest groups on government size. The hypotheses to be tested are formulated in Section 3. Section 4 presents single equation estimates aimed at testing these hypotheses. In Section 5, we embody interest group activity and voting behavior in a rudimentary simultaneous equations model determining the size of government and we estimate that model. Conclusions are drawn in Section 6.

2. Interest groups in the political process

We envisage a political process in which the government, the executive that is, is, is formed by the winning majority coalition in parliament. When a single party wins a majority of the seats in parliament in an election, it forms the government itself. When no party secures a majority, a coalition of parties with a majority of seats must come together to form a government. This type of system characterizes most democracies in the world today, the most important exception being the U.S.A.

Interest groups attempt to win favors for their membership by offering to supply a party with votes. An interest group may endorse a party, supply campaign volunteers, or contribute funds to the party's campaign. Each of these translates into votes which the interest group attempts to 'trade' with a given party in exchange for a promised favor should the party succeed in becoming the government, or a part thereof.

Some of the favors interest groups seek, such as a quota to protect a given industry, do not have large, direct impacts on government size. Others, like a depletion tax allowance for a particular industry, may actually reduce tax revenues. However, many programs like urban mass transit subsidies, job retraining and the construction of dams and other public works involve expanded government activity which directly benefits given economic or geographic interest groups. Such activities will be introduced into the government budget when the benefits to interest groups can be targeted more efficiently through these programs than by means of 'costless' regulations or tax subsidies.[1] We hypothesize that on average the favors sought by interest groups from government require an expansion of tax revenues and expenditures.

The supply of legislation to specific interest groups comes about as parties attempt to maximize their expected votes and win elections (Downs, 1957). A competition for interest group support among parties is assumed in which, at least in the early phases, each party is induced to increase the number of interest groups supporting it in response to an increase in the number of interest groups supporting its opponents. Whether this competition leads to the absorption of all interest groups into the list of supporters of one or the other parties cannot be deduced without a more formal modeling of political competition. What seems quite intuitive, however, is that the number of interest groups absorbed into the political process is an increasing function of the number of interest groups existing in the polity. Thus, the effective demand for government programs favoring interest groups is greater, the greater the number of interest groups in society.

Competition for interest groups takes place prior to an election. After the election one or more of the parties controlling a majority of the seats of parliament form a government. This party or coalition of parties governs

until the next election. During this period the party(ies) in the majority control both the executive and the parliament, and effectuate the bargains struck with its (their) interest group supporters during the election.

The next election brings a new competition for interest groups, most likely some reshuffling of interest group support among the parties, perhaps a new government. Almost certainly the set of interest groups represented in the new government will not be identical to those in the previous one. Some of these may have felt the previous level of government expenditures excessive. Thus, one cannot predict that this new set of interest groups represented in parliament favors an increase in expenditures over the previous level. One can predict a *level* of government outlays that is greater, the greater the number of interest groups in the society. Our theory of interest group politics predicts excessive levels of government expenditures, not necessarily excessive *growth* in the size of government.

In the foregoing discussion, the number, size and other characteristics of interest groups are treated as exogenous. The hypothesis proposed here can be used to predict growing government size in an era in which the number of organized interest groups grows, since new interest groups bring with them demands for publicly funded goods. But a full, dynamic modeling of the growth of interest groups and government is beyond the scope of this paper. We do allow for the possible endogeneity of interest groups in our empirical work, however (see Section 5).

3. The size of government equation

The basic hypothesis emerging from the preceding discussion is that the relative size of government is positively related to the number of organized interest groups. In testing this hypothesis, we shall include in our equations several additional variables gleaned from the public choice literature. We do so not in the pretense that we are testing these alternative models of government against our own, but under the assumption that the impact of these other factors is additive. We thus make the strong prediction that the effect of interest groups on size of government remains as predicted in the presence of additional institutional complexity, and begin to test this assumption by adding several of the variables which other studies have posited to be determinants of the size of government.

3.1 *The basic equation*

We seek to explain the relative size of government across countries. No one measure may fully capture the concept of governmental size. We shall, therefore, employ several alternative dependent variables that measure

Table 1. The variables

Variable name	Concept measured	Predicted sign of coefficient in equation explaining size of government	Variable definition
1. EXP	Size of government		Total outlays of government as a percentage of GDP
2. TAX	Size of government		Total tax revenue as a percentage of GDP.
3. CONS	Size of government		Government final consumption as a percentage of GDP
4. POP	Population	−	Population in millions
5. INC	Mean income	+	Per capita GDP as a percentage of U.S. per capita GDP × 10
6. EFRC	Ethnic fractionalization	−	The probability that two randomly selected members of the population will not be from the same ethnolinguistic group
7. NIG	Number of interest groups	+	A count of the number of interest groups listed for each country in a standard reference work
8. PFRC	Political fractionalization	+	The probability that two randomly selected members of parliament will not be from the same party
9. SKEW	Skewness of income distribution	+/−	Total income of the middle quintile of households in the income distribution as a proportion of average household income divided by 5
10. VOTE	Degree of enfranchisement	+	Percentage of adult population voting in a general election
11. MINC	Median income	+	Variable 5 multiplied by Variable 9
12. DATE	Start of modernization		Average of the years in which a country began the political and economic modernization processes
13. CENT	Governmental centralization		Percentage of tax revenues collected at the central government level
14. LIT	Educational level		Percentage of adult population able to read
15. SWI	Dummy variable		Switzerland = 1; other countries = 0.

Notes to Table 1, by variable number

1. For estimates in Table 3, OECD 1982a p. 59; for estimates in Tables 4 and 5 International Monetary Fund 1973.

2. For estimates in Table 3, OECD 1980a p. 43; for estimates in Tables 4 and 5 International Monetary Fund 1973.

3. For estimates in Table 3, OECD 1982a p. 58; for estimates in Tables 4 and 5 United Nations, 1973.

4. United Nations 1972 pp. 140–144.

5. Kravis, Summers, and Heston 1978 pp. 232–237, column (5).

6. Taylor and Hudson 1972 pp. 271–274.

7. *Internationales Verzeichnis der Wirtschaftsverbände* (1973). All groups listed in this work were included in the data. The groups are industry and trade associations, labor unions, and chambers of commerce.

8. Taylor and Hudson 1972 p. 48. The data refer to some point in 1963 to 1968.

9. Sawyer 1976 pp. 14, 23–25. The reader should be warned that definitions of income, households, etc., vary a great deal between countries. For most countries the data are based on pretax post-transfer income.

10. Taylor and Hudson 1972 pp. 54–56. The data refer to some point in the 1960s.

12. Black (1966) has identified periods during which the 'consolidation of modernizing leadership' and 'economic and social transformation' took place. DATE is the average of the beginning years of these two periods minus 2,000.

13. International Monetary Fund (1982). The data are for some point in the late 1970s. This source was chosen, rather than a source giving data for an earlier time period, because this source had data for more countries than others. The temporal mismatch between this variable and others is no problem because centralization is a variable which exhibits temporal stability.

14. Taylor and Hudson 1972 pp. 229–235.

government size as a percentage of total economic activity.[2] These variables are listed and defined in Table 1 together with all other variables used in this study. The data are for 1970, unless otherwise noted.

The traditional discussion of the role of government views it as a provider of public goods. By definition public goods have significant scale economy attributes. The price per capita of an army, of a judicial system, or of a central government should fall as the population of a country increases. Thus, as population increases the relative cost of public goods should decline. As the demand for public goods is likely to be price inelastic, probably infinitely so for goods such as legislative activity, the fraction of total income devoted to government should decline as population increases. For some goods, however, demand may shift outward as population increases: for example, the threat of aggression (demand for defense), the level of crime, etc., may increase with country size. The population variable thus captures the net effect of shifting public good demand and falling public good price.

McCormick and Tollison (1981) assume all government activity consists of wealth transfers. They hypothesize that interest groups have more success using government to make these transfers, the less diligent are citizens in policing government, i.e., the more citizen free-riding there is. Since free-riding increases with population they predict a positive correlation between population and government size. The coefficient on population can be used to test whether total government activity appears more as a public good or a wealth transfer.

In addition to relative cost (as proxied by population), theory leads us to expect a positive relationship between income and public good demand. Since we seek to explain the relative size of national government expenditures, a positive relationship between income and government implies that the income elasticity of a nation's demand for public goods exceeds the income elasticity of its demand for private goods, which is the assumption usually referred to as Wagner's Law (see Pryor, 1968: 50). Both mean and median income have been used in previous studies and each is tried in the present work.

We employed a second demographic variable besides population to capture the degree of ethnic fractionalization in a country. Ethnic fractionalization might be viewed as a form of tastes variable, but we view it as more related to the transaction costs of reaching collective decisions. The greater the ethnic fractionalization, the greater the difficulty of reaching collective decisions, and the smaller is the expected size of government.

We turn now to those variables that emerge explicitly from the public choice literature.

3.2 *Public choice variables*

The discussion in Section 2 argues that the government supplies services to special interests in exchange for political support. The greater the number of interest groups in a country, the greater will be the number of programs arising as a result of bargains between government and special interests. We test for the influence of interest groups on government size by including a count of the number of interest groups in each country listed in a standard reference work (see notes to Table 1).

Intuition suggests some sort of weighting of interest groups by their potential influence. But the most obvious choices of weights are unsatisfactory. For example, interest group influence is not a function of the number of members in any simple way. An industry trade association may have relatively few members, but exert a large impact through substantial financial contributions to a party. Citizens groups of similar size may vary greatly in their impacts depending on the intensity of the members concerns. For this reason, and due to the non-availability of suitable alternative data, we have chosen to use the absolute number of interest groups formally operating in a country as the measure of interest group strength. In doing so, we make the implicit assumption that the expected impact of a single interest group is the same across countries.

While we emphasize the importance of organized interest groups in adding additional expenditure items to the public budget, one might argue that political parties are also a means by which different voter interests are weighted in the political process, and by analogy that government size is greater the greater the number of political parties. This analogy seems most plausible when parties are closely associated with given interests (a farm party, a labor party), but may hold more generally. We test for this potential role of number of parties by including a measure of party fractionalization, i.e., the probability that two randomly selected members of parliament belong to different parties.

It is often argued, however, that multiparty systems are less stable, and thus less effective than two party systems. To the extent that this is true there may be an offsetting effect of the number of political parties on the size of government. States with multiparty parliaments may make more promises to more interest groups, but be less effective at delivering on their promises. We hypothesize, nevertheless, that government size is greater, the greater the degree of party fractionalization.

The most frequently used public choice model in studies of local government expenditures is the median voter model.[3] The median voter theorem predicts the outcome from a simple majority rule vote over a set of single dimensional issues when voters have single-peaked preferences (Mueller, 1979: 40–42). As its assumptions are stretched considerably even when the

median voter model is used to predict expenditures by city governments, it is not likely to be applicable to a cross-section study of national government size.[4] Thus, we do not explicitly attempt to use the median voter theorem in our empirical work. We do test to see whether median income performs better than mean income as a measure of average income, and we also tested an admittedly crude proxy for the tax price of the median voter. The latter had no impact on any of the measures of government size and no results for this variable are reported here.[5]

Two studies have recently appeared that rely on the median voter theorem and explicitly seek to explain the size, or growth in size, of government. Both assume that all government activity involves only redistribution and that the amount of redistribution is related to the skewness of the distribution of income. Meltzer and Richard (1981) use the median voter theorem to argue that more redistribution takes place (and thus more governmental activity) the lower the income of the median voter relative to average income. Peltzman predicts the reverse sign and claims empirical support for his hypothesis. Thus, we include a measure of the relative income of the median voter. Our intention, however, is not to conduct a test of these rival theories but rather to ensure that our results on interest group influence are not biased by omitting relevant variables.

An important element of Meltzer and Richard's account of the growth in government is the extension of the voting franchise to increasing numbers of voters, whose income falls below the mean. We test for this enfranchisement effect directly by including as a separate explanatory variable the percentage of the adult population which votes. Our supposition here, based on considerable empirical support,[6] is that lower income groups tend to be disproportionately excluded from voting *de facto* if not *de jure*. Thus, higher percentages of voters in a population mean higher percentages of low income voters relative to high income voters, and should lead to greater redistribution and government size.

Following Niskanen (1971) many economists have argued that the strength of the bureaucracy is important in determining the size of the government. We were able to construct a rather crude measure of bureaucratic strength and test for its influence on a small subsample of countries. Given the small size of the sample for this test, and the lack of significance of the bureaucracy variable, the results for this variable are not reported here.

4. Ordinary least squares results

4.1 *OECD countries*

The hypotheses put forward pertain to developed countries in which interest groups have the potential for influencing government decisions. A natural choice of sample meeting this criterion is the OECD countries.

While data for OECD countries are more plentiful than for others, even for these, observations on all variables are not available. We thus confront a trade-off between number of observations and number of variables in any equation. Rather than arbitrarily select a given subset of variables and sub-sample of countries, we have chosen to present a spectrum of results running from maximum number of observations and fewest explanatory variables to fewest observations and maximum number of variables. The reader is thus free to make his own trade-off. Table 2 lists the 24 OECD countries and indicates which were deleted from the various subsamples.

The first 3 equations in Table 3 provide the benchmark for measuring the influence of interest groups and the other public choice variables on the relative size of government. Population has a negative coefficient in each equation consistent with the hypothesis that total government output has on average good characteristics.[7] Both income and ethnic fractionalization

Table 2. Countries in Sample

OECD countries

Australia 1, 2	Greece 1, 2	Norway 1, 2, 3, 4, 5, 6, 7
Austria 1, 2, 3, 4, 5, 6, 7	Iceland 1, 4, 5, 6, 7	Portugal 1
Belgium 1, 2, 3, 4, 5, 6, 7	Ireland 1, 2, 3, 4, 5, 6, 7	Spain 1, 2
Canada 1, 2, 3, 4, 5, 6, 7	Italy 1, 2, 3, 4, 5, 6, 7	Sweden 1, 2, 3, 4, 5, 6, 7
Denmark 1, 2, 3, 4, 5, 6, 7	Japan 1, 2, 3, 4, 5, 6, 7	Switzerland 1, 2, 3, 4, 5, 6, 7
Finland 1, 2, 3, 4, 5, 6, 7	Luxembourg 1	Turkey 1, 2, 3, 4, 5, 6, 7
France 1, 2, 3, 4, 5, 6, 7	Netherlands 1, 2, 3, 4, 5, 6, 7	United Kingdom 1, 2, 3, 4, 5, 6, 7
F.R. Germany 1, 2, 3, 4, 5, 6, 7	New Zealand 1, 2, 3, 4, 5, 6, 7	United States 1, 2, 3, 4, 5, 6, 7

Non-OECD countries

Chile 4, 5, 6, 7	Jamaica 4, 5, 6	Singapore 4, 5, 6
Costa Rica 4, 5, 6, 7	Mexico 4, 5, 6	Trinidad 4, 5, 6
Israel 4, 5, 7	Panama 4, 5, 6, 7	Uruguay 5, 6
Venezuela 4, 5, 6		

Key

1 − included in equations 1–6 Table 3.	5 − included in equation 3 Table 4.
2 − included in equations 7–9 Table 3.	6 − included in equation 4 Table 4.
3 − included in equations 10–12 Table 3.	7 − included in equations in Table 5.
4 − included in equations 1–2 Table 4.	

Table 3. Regression results using ordinary least squares, OECD sample (t-statistics in parentheses)

Dependent variable	Number of observations	R̄² S.E.E.	INTERCEPT	POP	EFRC	INC	MINC	NIG	PFRC	SKEW	VOTE
1. EXP	24	.24 7.02	18.4 (3.30)	-.045 (-1.35)	-.117 (-1.55)	0.29 (3.04)					
2. TAX	24	.42 5.33	15.5 (3.66)	-.055 (-2.17)	-.106 (-1.85)	0.30 (4.22)					
3. CONS	24	.11 3.41	8.03 (2.96)	-.003 (-0.21)	-.019 (-0.52)	0.11 (2.35)					
4. EXP	24	.51 5.61	24.2 (5.03)	-.137 (-3.29)	-.161 (-2.50)	0.06 (0.59)		0.006 (2.44)	0.109 (1.70)		
5. TAX	24	.67 4.04	20.6 (5.92)	-.136 (-4.55)	-.149 (3.21)	0.14 (1.83)		0.005 (4.03)	0.065 (1.40)		
6. CONS	24	.32 2.99	10.8 (4.19)	-.051 (-2.30)	-.050 (-1.47)	0.07 (1.18)		0.003 (2.76)	0.008 (-0.25)		
7. EXP	21	.52 5.67	19.3 (1.62)	-.14 (-3.24)	-.100 (2.84)		0.06 (0.41)	0.006 (3.17)	0.079 (1.09)	0.12 (0.66)	
8. TAX	21	.67 4.16	25.0 (2.87)	-.14 (-4.38)	-.170 (-3.38)		0.02 (1.83)	0.005 (3.56)	0.058 (1.15)	-0.47 (-0.36)	
9. CONS	21	.50 2.57	18.5 (3.43)	-.05 (-2.76)	-.062 (-1.98)		0.02 (2.55)	0.002 (2.54)	0.002 (-0.05)	-.14 (-1.73)	
10. EXP	18	.70 4.19	-0.80 (-0.07)	-.12 (-3.60)	-.10 (-1.56)		0.01 (1.37)	0.005 (3.48)	0.129 (1.10)		0.28 (3.48)
11. TAX	18	.84 2.70	-3.27 (-0.43)	-.11 (-5.03)	-.07 (-1.79)		0.02 (3.36)	0.004 (4.17)	0.136 (1.81)		0.23 (4.36)
12. CONS	18	.41 2.71	1.16 (0.15)	-.04 (-1.66)	-.014 (-0.35)		0.01 (2.03)	0.002 (1.63)	0.01 (0.13)		0.09 (1.71)

have the predicted signs in all three equations, although only income is statistically significant in each.

The fit is improved considerably by the inclusion of the two public choice variables, number of interest groups and political fractionalization. The former is significant at the 99 percent level in all 3 equations, political fractionalization is significant at the 5 percent level (one tail test) in one equation. The performance of both population and ethnic fractionalization is noticeably improved by the addition of the number of interest groups and political fractionalization. The performance of mean income is worsened.

For 21 countries we were able to measure median income and skewness of the income distribution. When median income is introduced its coefficient is positive in all 3 equations and significant in 2. In those 3 equations, and the following 5, we tried mean income and median income as alternatives and median income performed better, in terms of t-values, all 8 times. We report the results for only median income throughout the rest of the table.

Both the Meltzer-Richard and Peltzman theories posit a relationship between the pre-transfer skewness of the income distribution and government size. Our skewness measure is post-transfers, and thus our results are biased away from the negative coefficient that the Meltzer-Richard theory predicts and toward the positive coefficient Peltzman expects. The negative coefficient on this variable in two equations in spite of this bias might be regarded as weak support for the Meltzer-Richard hypothesis. The statistical performance of this variable remained weak in the remaining equations also, and it is omitted to save a degree of freedom.

The performance of the other variables in eqs. 7—9 is similar to that in eqs. 4—6, but with lower t-values as can be expected given the addition of a variable which performs poorly. The number of interest groups remains significant in all 3 equations, however.

To add VOTE, the percentage of the population which votes, another 3 countries must be dropped from the sample. Eqs. 10—12 present the results with the VOTE variable included. Its coefficient is positive as predicted, and significant in all 3 equations. Its inclusion increases all R^2's visibly, and generally increases the t-statistics on the other variables. For the first time, the intercept is not significantly different from zero, as one's intuition suggests should be the case. Eqs. 10—12 are clearly the best specifications of the government size equation in the table.

Since the scale of the interest group variable will not be known to most readers, it will be useful to give more information to facilitate interpretation of coefficient estimates. This information is best conveyed through elasticity estimates. Thus, in equation 10, for example, the elasticity at the sample mean of the interest group variable is 0.18. (The equivalent statistic for equation 11 is 0.15 and for equation 12, 0.13.) This indicates that, *ceteris*

paribus, in a country which is at the sample mean (government expenditure 35% of GDP), a 10% increase in numbers of interest groups will lead to an extra 0.7% of GDP flowing through the government sector.[8]

4.2 *An expanded democratic country sample*

There are two fairly obvious criticisms of the results presented so far, (1) the sample is small and (2) some of the right-hand side variables in the estimated equations may be related to the dependent variable in other relationships and therefore will not be exogenous. We take up the first objection here, the second in the following section.

In extending the sample we faced the problem that most non-OECD countries have significantly lower levels of economic development than the OECD countries and only a small fraction have political institutions sufficiently democratic that one might reasonably expect to find the kind of trading of interest group support for government programs the theory predicts. We used Bollen's (1980) democracy index to decide which countries had sufficiently democratic institutions,[9] and we omitted any country with a per capita income less than Turkey's, which has the lowest figure for any OECD country. Using these criteria, we were able to find 10 countries, in addition to the OECD ones, for which at least one of the three dependent variables and the most important independent variables could be obtained (see Table 2).

Table 4 presents the ordinary least squares regression results for the expanded sample. The equations include the variables shown by the OECD sample to be important: population, number of interest groups, voter participation, and income. Mean income replaces median income and political fractionalization has been dropped due to the lack of data. These results can be compared with those for equations 10–12 in Table 3. The results for the government final consumption variable (equation 3) are disappointing. Inspection of the data revealed the newly added observation on Israel to be an outlier. The size of that country's defense expenditures causes Israel's government final consumption observation to be 75% higher than the next largest observation. When Israel is excluded (equation 4), the results for this dependent variable fall in line with those for the other two and resemble those of Table 3.

The coefficient for the number of interest groups is positive and significant in all 3 equations; that of population is negative and significant in all 3. Once again, the model explains government consumption less well than total expenditure or tax revenue. Both income and voter participation are highly significant in the expenditure and revenue equations and of the right sign in the consumption equation. Ethnic fractionalization is of the right sign in all three but is not significant. It performed even more weakly in

Table 4. Regression results using ordinary least squares, expanded sample (*t*-statistics in parentheses)

Dependent variable	Number of observations	$\overline{R}^2$ S.E.E.	INTERCEPT	POP	EFRC	INC	NIG	VOTE
1. EXP	28	.64 0.43	1.92 (0.26)	−0.12 (−2.67)	−0.11 (−1.49)	0.02 (2.66)	0.005 (2.25)	0.27 (2.76)
2. TAX	28	.80 3.94	2.14 (0.47)	−0.11 (−3.98)	−0.06 (−1.38)	0.02 (4.66)	0.004 (2.98)	0.21 (3.52)
3. CONS	29	.08 4.93	5.69 (1.00)	−0.04 (−1.22)	−0.002 (−0.03)	0.004 (0.72)	0.002 (1.06)	0.09 (1.28)
4. CONS	28	.38 2.69	8.93 (2.86)	−0.05 (−2.44)	−0.02 (−0.66)	0.003 (0.91)	0.002 (2.71)	0.05 (1.22)

initial estimates of the simultaneous equations model of the next section and is (therefore) dropped from those results.

5. Toward a simultaneous equations model of government size

While feedbacks from the level and composition of government expenditures to the level of national income and population size can be envisioned, such feedbacks are likely to unfold sufficiently slowly that we are justified in ignoring them. More serious, perhaps, are possible feedbacks from government size to the two political variables with the greatest explanatory power, interest groups and voter participation. We allow for these feedbacks in this section by estimating a three equation model, with government size, number of interest groups and voter participation as the dependent variables.

The first equation of our model is, of course, the one developed in previous sections. The second equation focuses on the determinants of interest group formation. Peter Murrell (1984) has examined eleven hypotheses regarding the formation of interest groups. Of the many variables used to test these theories only three, population, decentralization of government, and length of time of modernization (see Table 1), had significant explanatory power. These three variables are used to explain variations in the number of interest groups across countries here.

Countries with larger populations can be expected to have more heterogeneous populations. Thus, larger countries require more interest groups to represent the diverse interests of the polity. If we assume there are some fixed costs, or scale economies to interest group formation, then holding heterogeneity constant, the larger the population the more interest groups of optimal size a society can accommodate (Pauly, 1967). Thus, population size should have a positive impact on the number of interest groups.

Mancur Olson (1982) hypothesizes that the formation of interest groups is fostered by periods of democratic stability. We incorporate this hypothesis by including the date when modern political and economic development in a country began. Its sign should be negative.

Salisbury (1975: 200) argues that the more decentralized political power is, the more potential for interest group influence there is and the greater the number of interest groups there will be. A negative coefficient is predicted for political centralization.

Finally, we test whether large government size spurs the formation of interest groups by including a measure of government size in the equation explaining the number of such groups.[10]

To find the determinants of voter participation to be included in our third equation, we turn first to cross-section studies of voter behavior in the

United States. These studies find education and income to be important explanatory variables (see Note 6). We tried both of these variables in our equation, proxying educational level by the literacy rate.

To the extent that greater voter participation is a result of larger turnouts by the enfranchised poor, rather than differences in enfranchisement across countries, one might expect the poor to participate in greater numbers the greater the competition for their support among existing parties. In turn, more party competition can be expected the greater the number of viable political parties. The political fractionalization variable measures the degree of multiparty competition in a country, and we include it to capture this possible effect.

In 1970, women did not have the right to vote in Switzerland. One would expect that, if this fact were not taken into account, there would be an over-prediction of Switzerland's voter participation given its literacy and income levels. Indeed, we have already observed Switzerland's outlier status in some equations (see Note 8). An intercept dummy for Switzerland is included in the VOTE equation.

Both of the other dependent variables are included in the VOTE equation. As hypothesized for NIG, larger government size might induce greater interest in politics and greater political participation. The number of interest groups is expected to have a negative impact on voter participation, if it has any impact at all. Interest groups are in part a substitute for direct political participation. The stronger the interest group structure in a country, the smaller the direct participation of voters in the political process. The negative sign on this variable may also reflect some voter disillusionment in polities where interest groups are very strong.

These hypotheses lead to a fully identified, three equation system. Table 5 presents two-stage least squares results for this system using the 23 countries for which data were available for all variables. The first 3 equations specify a linear relationship among all of the variables. We report only the results for the tax revenue measure of the size of government, since the other measures of government size give similar results, once Israel is excluded for the reason discussed above.

In equation 1 of Table 5 we see that the number of interest groups continues to have a strong positive impact on government size when allowance is made for the endogeneity of this variable. The other variables perform as before. In equation 2, we see that the POP, DATE, and CENT variables perform as predicted from Murrell's (1984) study, although the t-value for CENT is lower than Murrell found for the OECD countries alone.[11] Of particular interest is the low t value on tax revenue in this equation. Government size does not appear to affect the formation of interest groups in this linear formation of the model. Thus, the estimates presented in Tables 3 and 4 are not contaminated by simultaneous equations' bias, at least with respect to the NIG variable.

Both income and political fractionalization performed weakly in the VOTE equation and are omitted from the reported results. Thus, on a cross-national basis, higher incomes do not lead to greater voter participation, nor does an increase in the number of political parties induce greater participation as a result say of greater competition for votes. Switzerland has significantly lower voter turnout as a percentage of the population as expected. Literacy is positively related to voter participation. The number of interest groups shows a strong negative relationship to voter participation indicating that indirect participation through interest groups does substitute for direct participation to some extent. There is some indication that greater government size elicits greater voter participation. The hypotheses are not formulated in such a way as to determine which is the most appropriate functional form. Thus, all equations presented in linear form throughout the paper were also estimated in log-linear form and results were generally similar for both specifications. With respect to the equation predicting the number of interest groups, however, an important difference emerged. The estimates of the log-linear version of the model are thus given in Table 5. The tax revenue variable obtained a t-value greater than 2 when all variables were included in log form (see eq. 5). Thus, whether one can treat the number of interest groups as exogenous or not when explaining government size depends upon whether a linear or logarithmic specification is imposed. While eq. 5 suggests a better fit under the logarithmic specification, equations 4 and 6 indicate weaker fits. Nevertheless, essentially the same pattern of results emerges when all variables are measured in logs.

6. Conclusions

The results of the previous section, estimates of a three equation model from 23 observations, must obviously be regarded as tentative. The consistent positive relationship between number of interest groups and size of government observed with changing sets of included independent variables, changing samples of nations, and treating the number of interest groups as either exogenous or codetermined, does imply rather unequivocally that interest groups are able to influence public policies in such a manner as to lead to increased government size. Beyond helping to reinforce this conclusion, the results of the previous section should be regarded as first steps in the development of a model of the polity that can explain participation in the political process by interest groups and citizens as well as the size of government.

The two most important variables explaining government size other than the number of interest groups proved to be population and the percentage of the population voting. The consistently negative relationship between

Table 5. Two-stage least squares estimates of three-equation model in both linear and log-linear forms (*t*-statistics in parentheses)

Dependent variable	Functional form	Number of observations	$\bar{R}^2$	S.E.E.	INTERCEPT	NIG	VOTE	TAX	POP	INC	CENT	DATE	LIT	SWI
1. TAX	Linear	23	0.72	4.20	1.06 (0.19)	0.005 (2.34)	0.25 (3.44)		-.13 (-3.12)	0.02 (2.48)				
2. NIG	Linear	23	0.78	617.	10679 (2.47)			3.73 (0.13)	17.5 (5.42)					
3. VOTE	Linear	23	0.73	7.91	29.2 (2.17)	-0.004 (-2.45)		0.47 (1.25)			-11.9 (-1.29)	-5.44 (-2.61)	0.37 (1.79)	-50.1 (-5.65)
4. TAX	[a] Log-linear	23	0.76	0.14	0.28 (0.48)	0.13 (1.75)	0.40 (3.06)		-0.069 (-1.59)	0.20 (1.11)				
5. NIGI	[a] Log-linear	23	0.89	0.55	83.3 (2.98)			1.55 (2.24)	0.42 (4.72)		-2.24 (-3.72)	-9.90 (-2.82)		
6. VOTE	[a] Log-linear	23	0.81	0.12	2.10 (2.72)	-0.04 (-1.66)		0.29 (1.49)					0.32 (1.39)	-1.54 (-7.28)

[a] Variables in the log-linear equations are the natural logarithms of the variables listed in Table 1, except SWI which in the log-linear form is the natural log of one plus the variable in the linear form.

relative government size and population is noteworthy since several recent papers have assumed that the *only* government output is redistribution. The negative relationship, implying that an increase in population leads to a less than proportionate increase in the size of government, shows that government expenditure exhibits a most basic public good characteristic.

The percentage of the population voting, which probably is closely related to the proportion of voters with incomes below the median, consistently has a positive and significant impact on the size of government. The Meltzer-Richard hypothesis that greater participation by low income voters leads to more redistribution and greater government size is strongly supported.

The inclusion of both the interest group and voter participation variables in the government size equation relies on theories related to redistributive activities. The voter participation variable posits a direct responsiveness of government outcomes to voter preferences through the operation of the median voter theorem, and implies rich-to-poor redistribution. The interest group theory posits increasing government size through the addition to the public weal of expenditures on goods with disproportionate benefits for certain interest groups. Such expenditures have distributional implications since in the absence of government provision the interest groups would either go without the goods or have to provide them themselves. While the theory makes no explicit prediction about the direction of this redistributional flow, since the largest single category of interest groups in most countries by far is industry trade associations,[12] one might expect poor-to-rich redistribution as the most likely consequence of interest group influence. Thus, the possibility exists that the influence of the two variables on the distribution of income might be largely offsetting, while their influence on the size of government is cumulative. Disaggregating the effects of these and other public choice variables is a promising avenue for future research.

NOTES

1. This proposition is rigorously derived along with others concerning interest groups and government size in Mueller and Murrell (1983). Becker (1983) stresses the point that the most efficient means for supplying benefits to interest groups will be employed.
2. These variables all measure aggregate government size. A direct consequence of our theory, however, is that interest groups will have more effect on some components of government than on others. Unfortunately, we were not able to carry out our tests on disaggregate data because of the unavailability of sufficient numbers of observations on components of government spending.
3. See Bergstrom and Goodman (1973), Borcherding and Deacon (1972), Deacon (1978), Pommerehne (1978).
4. For a lengthy critique of the median voter literature as applied to explaining levels of local government expenditures see Romer and Rosenthal (1979), and Mueller (1979: 106–111).

5. For the results using this tax-price variable and for the results, discussed at the end of this section, on the bureaucratic strength hypothesis, see Mueller and Murrell (1983).

6. See Frey (1971), Tollison and Willett (1973), and Verba and Nie (1972), and references therein.

7. McCormick and Tollison (1981: Ch. 3) find that population size is positively related to regulation activities at the state level consistent with their hypothesis that large population size leads to less vigilant citizen policing of government and thus more wealth transfer activities by government. The two results need not be contradictory. Some government activities of a particularly redistributive nature may grow larger as population increases, while those with public good characteristics become relatively smaller. Our results indicate that the latter tendency dominates for total government output at the national level.

8. We tested for the presence of heteroscedasticity using a modified version of the Glejser procedure in which the log of the squared errors from eqs. 10–12 was regressed on the log of each independent variable (see Pindyck and Rubinfeld, 1981: 123–126). The hypothesis that the residuals were drawn from a homogeneous distribution could not be rejected for eqs. 10 and 11, but the test did indicate heteroscedasticity, with the residuals inversely correlated to the number of interest groups, for eq. 12. Multiplication of all of the variables in (12) by NIG successfully removed heteroscedasticity. Given the sample size, however, the failure to find significant heteroscedasticity is not too surprising. We also examined the residuals for outliers. No residual was greater than twice the S.E.E. in absolute value, for equations 10–12, 1–3, and 5. In the remaining 5 equations, Switzerland appeared as a lone outlier. Switzerland's outlier status is discussed and allowed for below when we estimate the simultaneous equations model.

9. We chose a score of 70% on Bollen's index for 1965 as a cutoff. This seemed to be a natural cut-off point. While many countries fall in the 70s, few appear in the 50s and 60s on Bollens index. Venezuela (73) and Mexico (74) are the lowest scoring countries included while Zambia (67) and Brazil (61) are the highest-scoring countries excluded.

10. We tried the variable VOTE in the equation explaining NIG and it had no effect and thus these results are not reported.

11. The reader is reminded, however, that the t-statistics for 2SLS estimates from samples of this size are only suggestive of whether the coefficient is significant or not (see Maddala, 1977: 231–233, 237–242).

12. Interesting in this connection is Fratianni and Spinelli's (1982) observation that special government programs catering to business interest groups are becoming increasingly important in Italy.

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