

# Determinants of interest group formation

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**Abstract** It is widely recognized that interest groups affect both microeconomic and macroeconomic outcomes. However, few researchers have attempted to discern empirically the factors that contribute to interest group activity. This paper provides a test of several theories of group formation in a panel setting. A nation's stability, socioeconomic development, political system, size, and diversity all appear to contribute to interest group formation, as predicted by theory.

**Keywords** Interest groups · Formation

## 1 Introduction

In seminal work, Olson (1982) argued that special interest groups accumulate in greater numbers in stable societies with freedom to organize, and that these groups reduce economic income and growth. The latter hypothesis has been dubbed the theory of “institutional sclerosis,” and has spawned a large empirical literature. Much of this work has tested the theory of institutional sclerosis only indirectly, by exploring the relationship between political stability, political freedom and economic growth.<sup>1</sup> This approach uses stability and freedom as a proxy for groups, and thus *assumes* Olson's hypothesis that groups accumulate in stable, free environments. Despite its importance, the hypothesis that groups accumulate in stable

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<sup>1</sup> See Heckelman (2007) for a survey of this literature.

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and free environments has faced limited empirical scrutiny. More generally, although it is widely recognized that interest groups affect both microeconomic and macroeconomic outcomes, few researchers have attempted to discern empirically the factors that contribute to interest group formation at a macroeconomic level across countries. We seek to address this important gap in the literature, and provide a test of several theories of group formation in a panel setting.

Our research builds on the work of Murrell (1984) and, more recently, Bischoff (2003). Both authors sought to explain differences in the number of interest groups observed across countries, but came to strikingly different conclusions along important dimensions. A primary objective of our work is to provide more reliable and thorough tests of theories of interest group formation than have been offered to date due to data limitations, in order to clarify the factors that contribute to interest group formation. A second objective is to understand and reconcile the conflicting findings of Murrell and Bischoff. In addition, we address issues of measurement related to Olson's stability and freedom hypothesis. Everyone who applies Olson's ideas on group formation and institutional sclerosis confronts a similar challenge: how to operationalize and capture stability. We offer a measure of stability that is motivated directly by Olson's descriptions and discussions, and that differs along important dimensions from the stability measures employed by Murrell, Bischoff, and others.

We analyze an unbalanced panel of 140 countries at five points in time, as well as two pure cross-country samples. The samples include a diverse group of developing and developed nations. The panel consists of 618 observations; the two cross-country samples consist of 90 and 140 observations. In contrast, both Murrell (1984) and Bischoff (2003) examine small, pure cross-sectional samples of 24 and 21 OECD countries/observations, respectively.

The analysis indicates that interest group formation across countries is systematic, as the estimated models explain a substantial share of the variation in groups observed across countries and over time. The findings support Olson's hypothesis that stability fosters group formation as well as the hypothesis that group formation accompanies socioeconomic development, *pari passu*. We also find that political system, nation size, and societal diversity are positively correlated with the number of groups in a nation.

The remainder of the paper is divided into four sections. In Sect. 2 we briefly compare and contrast the work of Murrell (1984) and Bischoff (2003), to motivate our approach and analysis. Section 3 discusses data and measurement issues, and summarizes the hypotheses tested. In Sect. 4 we present empirical results. The final section offers concluding remarks.

## 2 Previous cross country tests of group formation

In his study of interest group formation, Murrell (1984) tests eleven hypotheses, exploring the impact of country size, the political system, government size, diversity in society, socioeconomic development, and the length of time of freedom and stability. Bischoff's (2003) approach is narrower in focus, and somewhat less agnostic. In particular, he cites case-based evidence against Olson's theory that political instability interrupts group formation, and advances the alternative (but not mutually exclusive) notion that group formation accompanies economic development. For development and details of these hypotheses, we refer readers to Murrell and Bischoff.

The findings of Murrell (1984) and Bischoff (2003) differ along two key dimensions. First, Murrell finds support for Olson's hypothesis that more groups form in stable environments characterized by freedom to organize. In marked contrast, Bischoff finds no evidence

at all to support Olson. Second, Murrell finds little evidence that socioeconomic development is associated with group formation, while Bischoff contends that the degree of socioeconomic development has a positive and significant effect on the formation of groups per capita.<sup>2</sup>

A primary weakness of the studies conducted by both Murrell (1984) and Bischoff (2003) is the limited size and nature of the samples used. Murrell's sample consists of 24 members of the OECD, and Bischoff's sample consists of 21 OECD countries. Such small sample sizes limit the applicability of a thorough multivariate analysis, which tests all hypotheses simultaneously. As a result, the findings may be biased due to the omission of relevant variables, and results may also be heavily influenced by individual observations. In addition, endogeneity of regressors poses a problem in small samples. Murrell attempts to control for simultaneity-induced bias with the use of two-stage least-squares. However, the instrumental variables estimator can have poor small-sample properties, especially when instruments are weak.<sup>3</sup>

The restriction of the sample to OECD countries limits not only the number of observations, but also the nature of the sample. Theories of group formation are generally expected to apply globally, not solely to developed nations. Indeed, Olson (1982) includes descriptive applications of his theory to several developing nations, including China, India, and South Africa. Moreover, the members of the OECD are relatively homogeneous in a number of important respects. In particular, there is limited variation in measures of stability and freedom as well as in measures of socioeconomic development across this group of countries. An analysis of a sample of both OECD and non-OECD countries, characterized by a significant degree of diversity, should therefore provide a stronger and more compelling test of both Olson's theory of group formation and the theory that socioeconomic development fosters group formation.

### 3 Data

Following Murrell (1984), we test six hypotheses:

- H1. *Stability*: stability is required for continued group formation
- H2. *Development*: group formation accompanies development
- H3. *Political system*: democracy (autocracy) may foster (deter) interest group formation
- H4. *Nation size*: larger nations accumulate more groups
- H5. *Government size*: larger government provides greater incentive for groups to form
- H6. *Diversity*: diversity in society encourages group formation

These hypotheses are quite general. As such, multiple variables may be appropriate for the purpose of testing any one of them, and the menu of potential regressors is extensive. Table 1 provides a list of all the explanatory variables examined, stratified by hypothesis, along with data-source information. We examine all of the variables included in Bischoff's (2003) analysis, and many of the variables explored by Murrell. Table 1 indicates those variables used by Murrell and Bischoff, with the designations M and B, respectively.

<sup>2</sup>Kennelly and Murrell (1991) provide an analysis of group formation across both industries and countries. Consistent with Murrell (1984), but not with Bischoff (2003), their analysis supports the Olson view of group formation. They do not, however, address the impact of socioeconomic development on groups.

<sup>3</sup>Bischoff attempts to avoid endogeneity problems by using lagged values for explanatory variables. However, in the presence of autocorrelation, lagged variables may not be independent.

**Table 1** Independent variables

<i>Stability</i>		
● Institutional Upheaval	–	Number of years since most recent fundamental regime shift, significant constitutional change, or independence; Encyclopedia Britannica; Wikipedia.
● Initial Takeoff Date	M	Number of years since the average of years in which “consolidation of modern leadership” and “economic and social transformation began”; Black (1966).
● Violent Turmoil	B	Number of years since last turmoil, as defined by Tang and Hedley (1998); Small and Singer (1982); Black (1966); Lacina and Gleditsch (2005).
<i>Development</i>		
● Income	M, B	Income per capita, beginning of period value (log form); World Bank’s <i>World Development Indicators</i> .
● Agriculture Share	M	Share of labor force in agriculture, average of three years prior to beginning of period; World Bank’s <i>World Development Indicators</i> .
● Urban Share	B	Urban share of population, average of three years prior to beginning of period; World Bank’s <i>World Development Indicators</i> .
● Import Share	B	Share of imports in GDP, average of three years prior to beginning of period; World Bank’s <i>World Development Indicators</i> .
● Newspapers	M	Daily newspaper circulation per capita, average of three years prior to beginning of period (log form); Banks Cross-National Time Series Data Archive.
● Telephones	–	Telephones per capita, average of three years prior to beginning of period (log form); Banks Cross-National Time Series Data Archive.
● Mail	–	Mail per capita, average of three years prior to beginning of period (log form); Banks Cross-National Time Series Data Archive.
<i>Political system</i>		
● Democracy	M <sup>a</sup>	Measure of democracy and autocracy, average of three years prior to beginning of period, 0 to 10 values reflect democracy, –10 to 0 values reflect autocracy; Polity IV.
● Number of Parties	M <sup>a</sup>	Measure of political fractionalization within the legislature, average of three years prior to beginning of period; Banks Cross-National Time Series Data Archive.
<i>Nation size</i>		
● Number of Industries	M	Number of industries, 1969, 1975, 1981, 1989, 1992 (log form); U.N. <i>Yearbook of Industrial Statistics</i> .
● Population	M, B	Population, beginning of period value (log form); World Bank’s <i>World Development Indicators</i> .
<i>Government Size</i>		
● Government Spending	B	Share of government consumption expenditures in GDP, average of three years prior to beginning of period; World Bank’s <i>World Development Indicators</i> .
<i>Diversity</i>		
● Linguistic Fractionalization	M <sup>a</sup>	Measure of linguistic fractionalization; Alesina et al. (2003).
● Ethnic Fractionalization	–	Measure of ethnic fractionalization; Alesina et al. (2003).
● Religious Fractionalization	–	Measure of religious fractionalization; Alesina et al. (2003)

Notes: M marks variables used by Murrell (1984); B marks variables used by Bischoff (2003)

<sup>a</sup>Indicates that Murrell examined the variable, but used a different data source than the one listed

Following Murrell (1984) and Bischoff (2003), we measure interest group formation with a count of the number of interest groups in a country. The primary source data for the counts is the *World Guide to Trade Associations* (Zils and Verrel 1973), published by K.G. Saur. The *Guide* consists of a list of “sectional groups,” to use Salisbury’s (1975) designation, by country. The groups listed are quite comprehensive with respect to association type, and include groups in the industrial, commercial, trade, and service sectors, professional organizations, consumer organizations, employers’ and labor groups, and organizations of service professionals. The *Guide* has been published six times. Unfortunately, the second edition is not organized in such a way as to be useful for the purposes of this project. We therefore use the first (1973), third (1985), fourth (1995), fifth (1999) and sixth (2002) editions, to construct group counts at five distinct points in time.

### 3.1 Measuring stability

To capture stability, Bischoff uses the number of years since the last turmoil (henceforth, Violent Turmoil), where a turmoil is defined, following Tang and Hedley (1998), to include foreign occupation and wars with significant battle deaths. In marked contrast, Murrell’s primary measure of stability reflects the onset of political and economic freedom, following Black (1966), who identifies the years in which “consolidation of modernizing leadership” and “economic and social transformation” began (henceforth, Initial Takeoff Date).<sup>4</sup> The simple correlation between Bischoff’s Violent Turmoil variable and Murrell’s Initial Takeoff Date variable, in the small sample of countries that they examine, is 0.17. This relatively low correlation suggests that these two proxies for stability are in fact quite different variables.

In chapter three of his *Rise and Decline of Nations*, Olson (1982) claims that “Stable societies with unchanged boundaries tend to accumulate more collusions and organizations for collective action over time.” Olson further suggests that stability constitutes the absence of upheaval that alters the fundamental institutional structures (the rules and rulers of the game) within which groups operate. Although the stability variables used by Murrell (1984) and Bischoff (2003) are common in the literature, they may not provide strong proxies for marking institutional change, as defined by Olson. Violent Turmoil captures the date of occupations and wars involving significant battle deaths (among other conditions). However, such events are not always sufficient for institutional change. For example, Olson argues that WWII was not associated with institutional upheaval in Britain, and thus should not be characterized as a source of “instability” or upheaval with respect to groups. Violent Turmoil may also be unnecessary for institutional change. For example, Olson’s (1983) account of the extent to which the power of entrenched interest groups in the southern US was swept away by Civil Rights legislation and the end of Jim Crow laws in the 1960s suggests that institutional upheaval can occur without war. Similarly, James’s (2003) analysis of an overhaul of the Canadian constitution indicates that entrenched interest groups were quite concerned about how changes would affect their power, suggesting again that violent upheaval is not a necessary condition for institutional change relevant to groups.

In contrast to Violent Turmoil, events captured by Initial Takeoff Date arguably constitute a necessary condition of group formation. However, Initial Takeoff Date may be a poor proxy for duration of stability in cases where institutional upheaval has occurred at some point after the consolidation of modern leadership and the onset of economic and social

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<sup>4</sup>Murrell also uses alternative measures of stability that are significant in bivariate regressions but not robust in multivariate regressions when the Initial Takeoff measure of stability is included.

transformation. For example, Black (1966) identifies Germany's and Japan's dates of consolidation of modernizing leadership and economic transformation as 1837 and 1907. According to Olson's (1982) narrative histories, however, the replacement of their totalitarian governments following World War II constituted an upheaval with respect to their domestic institutions. Consider also the case of Albania. Albania's initial takeoff date is 1919. However, in 1944, communists gained control of the government, and a long period of totalitarian rule followed. In 1991, democratic reforms were introduced and general elections held. Such events are not captured by Initial Takeoff Date, even though they seem likely to constitute institutional change.<sup>5</sup>

As an alternative measure of stability, we construct a variable that attempts to date the end of the most recent upheaval more directly and accurately. The dates we select correspond to fundamental regime shifts, significant constitutional changes, or independence. These institutional upheavals often coincide with events captured by Violent Turmoil, though not always. One of the benefits of our measure is that it does not confound stability and freedom effects, as does a measure restricted to dates that mark the end of non-democratic government. Nor does our variable link necessarily to violent upheavals that may or may not affect institutional change, like that of Bischoff (2003), Kang and Meernik (2005), and others.

A full set of dates and justifications for our measure of stability, referred to as Institutional Upheaval, is available upon request. We offer here a few examples to clarify the nature of our choices. Panama was a republic, albeit governed by a narrow group of elite commercial oligarchs, until 1968, when government by military junta, led by General Omar Torrijos, was established. Following Torrijos' death in a 1981 plane crash, General Manuel Noriega took control of both the military and the civilian government. The military governed political activity until Guillermo Endara won presidential elections in 1989. Although Noriega annulled the elections, he was subsequently removed during a US invasion, and Endara took office as the head of a multi-party government. We therefore adopt 1968 and 1989 as institutional upheaval points for Panama. In contrast, the variable Violent Turmoil uses Panama's 1903 date of independence as a stability takeoff point. For South Africa, we adopt 1948 as the Institutional Upheaval takeoff point for the 1973 group count, and 1992 as the takeoff point for group counts in 1995 and thereafter. The years 1948 and 1992 correspond to the implementation of Apartheid and its abolition, events that surely reflect profound changes in institutions, and hence stability takeoff points, although neither of these dates would qualify as a "turmoil" as defined by Tang and Hedley (1998). For Belgium, institutions appear to have remained effectively unchanged since the 1830 Belgian Revolution, although the country was occupied by the Germans during WWII. We therefore count 1830 as Belgium's stability takeoff point. In contrast, the WWII occupation qualifies as a turmoil, as defined by Tang and Hedley. We count 1944, the date when communists gained control, as Albania's initial takeoff point. That year brought important institutional change that may be relevant for groups, although it is associated with the onset, rather than the end of, non-democratic government. A variable designed to capture both stability and freedom, such as that used by Weede (1984), would not pick up this turning point. After witnessing the execution of former Romanian president Nicolae Ceausescu, the head of the communist party in Albania, Ramiz Alia, relaxed the control of the party in that country beginning in 1989. Elections were held in 1990 and a new constitution adopted in 1991. We therefore use 1991 as a new stability takeoff point for groups in 1995 and all subsequent years.

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<sup>5</sup>These events pertaining to Albania are also not captured by the variable Violent Turmoil, since the number of battle deaths associated with each upheaval was relatively low.

In general, nations exhibit less stability with respect to Institutional Upheaval than with respect to Violent Turmoil. In our sample, the average number of years since the last institutional upheaval is 25 compared to an average of 38 years of stability since the last event captured by Tang and Hedley's (1998) turmoil variable. In contrast, the average number of years since consolidation and transformation among our sample nations is almost 100 years.

Although the arguments above suggest that our Institutional Upheaval variable may be a more accurate proxy for the onset of stability than either Violent Turmoil or Initial Takeoff Date, we recognize the variable is not without drawbacks. In particular, the variable may be characterized by measurement error, to the extent that our subjective judgment of what constitutes "fundamental" regime shift or "significant" constitutional change is flawed or inconsistent across countries. In addition, as an anonymous reviewer pointed out to us, institutional upheaval may change the profitability of interest group activities, but may not threaten their existence, *per se*. As such, institutional upheaval, while presumably necessary, may not be sufficient for group destruction. In this case, our measure is biased against finding support for Olson's stability hypothesis.

### 3.2 Sample

The *Guide* lists groups for over 160 countries. However, data for the independent variables included in the analysis are not available for a number of these countries. As a result, the sample was first pared down to include all countries for which Income and Democracy data are available, for a given time period. After these deletions, a number of variables still contained missing observations. We have coded these missing observations with zero values, and created dummy variables to control for the impact of these zero values on coefficient estimates. This procedure allows nations with missing data to remain in the sample, and to influence coefficient estimates of variables for which data are available. Alternatively, we could have simply deleted all countries with any missing data from the sample. Doing so would have reduced the sample size fairly dramatically, as the variable Initial Takeoff Date is available for fewer than half of the countries in the sample. Moreover, countries in the sample with missing data clearly do not constitute a random sample, as they tend to be poor and characterized by a small number of groups. As such, dropping these countries from the sample could introduce selection bias.

### 3.3 Descriptive statistics

Descriptive statistics are provided in Table 2. Several of the variables, including the number of groups, are in natural log form, as specification experiments not reported here indicate this form best fits the data. The simple correlation between each explanatory variable and the number of interest groups is recorded in the last column. The correlations are generally consistent with theory. In particular, consistent with Olson's hypothesis, the correlation signs for the Stability variables indicate that groups accumulate over time in stable environments. The groups variable is much more highly correlated with Institutional Upheaval and Initial Takeoff Date than with Violent Turmoil.

With respect to socioeconomic development, all of the correlation signs are consistent with the notion advanced by Bischoff (2003) that group formation accompanies development, with the exception of the Import Share variable. The small and unexpectedly negative sign of the correlation between Import Share and groups may be the result of simultaneity between the variables (as interest groups may support policies that restrict imports) or

**Table 2** Descriptive statistics

	Mean	Std. dev.	Correlation with groups
<i>Indep. var.</i>			
Groups	3.12	1.93	
<i>Stability</i>			
Institutional Upheaval	25.07	35.08	0.61
Initial Takeoff Date	99.75	45.05	0.65
Violent Turmoil	37.96	41.96	0.38
<i>Development</i>			
Income	7.40	1.60	0.65
Agriculture Share	27.67	23.86	-0.49
Urban Share	49.18	23.74	0.45
Import Share	37.31	20.68	-0.30
Newspapers	5.73	2.02	0.59
Telephones	3.76	1.81	0.52
Mail	8.81	2.52	0.72
<i>Political system</i>			
Democracy	2.14	7.01	0.51
Number of Parties	4.51	3.08	0.34
<i>Nation size</i>			
Number of Industries	4.15	1.30	0.67
Population	16.13	1.50	0.42
<i>Government size</i>			
Government Spending	15.30	5.93	0.15
<i>Diversity</i>			
Linguistic Fractionalization	0.41	0.30	-0.27
Ethnic Fractionalization	0.46	0.26	-0.32
Religious Fractionalization	0.44	0.24	0.07

Note: Groups, Income, Newspapers, Telephones, Mail, Number of Industries, and Population in log form

because the correlation does not net out other influences. Three of the Development measures may be indicative of the costs of organization, as well as the level of development—newspapers, mail, and telephones. Olson (1965) emphasizes organizational costs as a determinant of group formation, and although Bischoff does not include a measure of such costs in his empirical analysis, he does argue that changes in such costs may help explain group formation. The correlations also indicate that polities that are more democratic are associated with more groups, as predicted by theory, and that larger nations accumulate more groups. The size of government and the degree of diversity are less strongly associated with the number of groups.

The simple correlations reported in Table 2 suggest that the number of interest groups does indeed vary systematically across countries, in ways consistent with the theories described by Murrell (1984) and Bischoff (2003). Of course, these simple correlations may not reveal any true causal relationships between the variables examined and groups, and may instead simply reflect spurious correlation. For example, stability may be positively associated with socioeconomic development. The positive correlation between socioeconomic devel-



opment and groups revealed in Table 2 may therefore reflect a positive relationship between stability and groups, rather than a direct relationship between groups and development (or vice-versa). Alternatively, the correlation may proxy for an actual relationship between income inequality and growth, as Shughart et al. (2003) have linked group influence to Gini coefficients across US states. The simple correlations may also reflect reverse causation in some cases. Endogeneity may be of particular concern with respect to the variables Government Spending, Import Share, and Income. For example, while socioeconomic development, as measured by income, may lead to an increase in the number of interest groups, the number of interest groups may also affect income. Indeed, Olson's theory of institutional sclerosis predicts that groups impede efficient allocation of resources as well as technological progress, and thus lower income. In order to determine whether the simple correlations reflect independent influence of potential explanatory variables on groups and to extract the exogenous contribution of explanatory variables, we estimate multivariate regressions using instrumental variable techniques.

#### 4 Regression analysis

As noted above, Murrell's (1984) findings suggest that "Olsonian" factors (measures of stability) are an important determinant of interest group formation. In distinct contrast, Bischoff (2003) argues that economic development is the true source of interest group formation. Since our study is in part motivated by these conflicting findings, our estimation scheme is designed to address these alternative, though not mutually exclusive, hypotheses.

The regression model takes the following form

$$\ln(\text{groups})_{it} = \alpha + \beta S_{it} + \gamma D_{it} + \lambda X_{it} + d_t + \varepsilon_{it} \quad (1)$$

where  $\alpha$ ,  $\beta$ ,  $\gamma$ , are parameters and  $\lambda$  is a vector of parameters to be estimated,  $S$  is a measure of stability,  $D$  is a measure of development,  $X$  is a vector of additional conditioning variables,  $d$  is a vector of time-period dummies,  $\varepsilon$  is a random error term,  $t$  indexes time, and  $i$  indexes individual countries.

We include in the vector  $X$  one variable for each of the hypotheses regarding Political System, Government Size, and Diversity, but we include two variables in  $X$  for the Nation Size hypothesis. As Murrell (1984) suggests, nation size may influence the number of groups directly as well as indirectly. In particular, an increase in country size may be associated with an increase in the number of industries, which in turn increases the number of groups. In order to capture this relationship, as well as direct effects of country size on groups, we include both the number of industries and population as regressors in all our specifications. We caution that the number of industries may proxy for both development and diversity in economic activity, in addition to country size.

Because population is one of our controls for nation size, we use the total number of groups as the dependent variable, following Murrell (1984) and Bischoff's (2003) first set of regressions, rather than converting it to per capita form and dropping population as Bischoff also considers. Both Murrell and Bischoff examine the raw number of groups. However, in our larger and more diverse sample, we find that the models fit the data much better when the dependent variable is the natural log of groups. We therefore use the natural log of groups in our analysis, and also take logs of all explanatory variables characterized by a substantial degree of dispersion, such as Income, Population, Number of Industries, and Newspapers.

An important empirical issue is the potential for endogeneity of several regressors. Because estimation by ordinary least squares may produce biased and inconsistent coefficient

estimates under this condition, we employ an instrumental variables estimator. We use lagged life expectancy, and the lagged shares of government expenditures and imports in GDP as instruments for Income, Government Spending, and Import Share, respectively. We also control for heteroskedastic disturbances, using the Eicher–Huber–White “sandwich” variance–covariance estimator.

The group count for 1973 includes chambers of commerce and local organizations while the counts for other years (1985, 1995, 1999, 2002) do not. We account for this definitional change in two ways. First, in the panel regressions we include a set of time dummies to capture this time-specific difference. Controlling for a time fixed effect also allows the cross-sectional variation in the data to drive the estimation results. Second, we analyze two pure cross-country samples (one for the 1973 sub-sample of the panel, and another for the 1999 sub-sample) and compare the findings to the panel results. This comparison serves as a general robustness check of the panel findings, as well as a control for the measurement differences in group counts across years. In addition, the cross-country analysis follows the approach of Murrell (1984) and Bischoff (2003), and thus provides an opportunity to reconcile and understand their conflicting findings.

#### 4.1 Results

Table 3 presents our primary findings, based on an analysis of the panel dataset. The results provide support for both Olson’s Stability hypothesis and the Development hypothesis. In columns (1–3) the stability proxies, Institutional Upheaval, Initial Takeoff Date, and Violent Turmoil, are each statistically significant, and of the anticipated sign. The magnitude of the coefficient estimates on Institutional Upheaval and Initial Takeoff Date are quite similar and over three times the magnitude of the coefficient estimate for Violent Turmoil. Thus each additional year of institutional stability following an institutional upheaval and following the initial takeoff date appears to have a larger marginal effect on group formation than an additional year of stability following the end of a violent turmoil. These findings are consistent with the suggestion in Sect. 3 that the violent upheavals captured by the variable Violent Turmoil may not always constitute events that disrupt group formation. As in Table 1, however, a distinction between Institutional Upheaval and Initial Takeoff Date with respect to group formation is not readily apparent. In columns 1–3 the development proxy, Income, also enters significantly. In columns 4–7 each of the alternate development indicators enters significantly as well, and with the expected coefficient sign, except for Import Share.

In addition, the findings indicate that more democracy, a larger population, a greater number of industries, and greater linguistic diversity are associated with larger numbers of groups, as predicted by theory.

We estimated additional regressions using the remaining explanatory variables listed in Tables 1 and 2. To conserve space, we summarize these findings here but do not report specific estimates in table format. The estimated coefficient on number of parties, which measures political fractionalization in the legislature, is positive and statistically significant, indicating that more divided legislatures are associated with more groups. We also find that both Ethnic and Religious Fractionalization are positively and significantly associated with group formation. In addition to Newspapers, we also examined mail and telephones, as proxies for development and communication costs. Both alternative proxies enter with the anticipated sign, mail at better than the 1% level and telephones at better than 5%.

In sum, the findings support the group formation hypotheses tested by Murrell (1984) and Bischoff (2003), with the exception of the hypothesis that larger government encourages group formation.

**Table 3** Panel results

	1	2	3	4	5	6	7
Constant	1.130 (0.000)	0.500 (0.035)	0.980 (0.000)	1.823 (0.000)	0.866 (0.000)	1.023 (0.000)	1.028 (0.000)
Institutional Upheaval	1.477 (0.000)			1.457 (0.000)	1.584 (0.000)	1.656 (0.000)	1.407 (0.000)
Initial Takeoff Date		1.489 (0.000)					
Violent Turmoil			0.435 (0.000)				
Income	0.117 (0.090)	0.211 (0.002)	0.271 (0.000)				
Agriculture Share				-0.017 (0.000)			
Urban Share					0.056 (0.013)		
Import Share						-0.002 (0.955)	
Newspapers							0.576 (0.000)
Democracy	0.730 (0.000)	0.694 (0.000)	0.775 (0.000)	0.657 (0.000)	0.753 (0.000)	0.767 (0.000)	0.670 (0.000)
Number of Industries	1.295 (0.000)	0.826 (0.000)	1.236 (0.000)	1.159 (0.000)	1.340 (0.000)	1.474 (0.000)	1.194 (0.000)
Population	0.241 (0.000)	0.297 (0.000)	0.315 (0.000)	0.275 (0.000)	0.225 (0.000)	0.208 (0.000)	0.244 (0.000)
Government Spending	0.039 (0.683)	0.075 (0.399)	0.179 (0.056)	0.039 (0.676)	0.040 (0.680)	0.073 (0.446)	0.035 (0.716)
Linguistic Fractionalization	34.014 (0.046)	51.270 (0.002)	59.334 (0.001)	33.465 (0.042)	25.838 (0.098)	18.903 (0.218)	37.856 (0.014)
Adj $R^2$	0.74	0.75	0.73	0.74	0.73	0.73	0.74

Notes:  $P$ -values in parentheses. Estimation by Instrumental Variables using lagged values of life expectancy, Government Spending, and Import Share as excluded instruments where appropriate. Regressions also include missing observation dummies for the variables Number of Industries, Government Spending, Linguistic Fractionalization, Initial Takeoff Date, Agriculture Share, Import Share, and Newspapers where appropriate. Individual year dummies are also included in all specifications

## 4.2 Pure cross-country results

In this section, we compare the panel results to the results of a pure cross-country analysis. As noted above, this analysis serves two purposes. First, we aim to determine if results are influenced by pooling the various cross-section years together. Second, a pure cross-country analysis follows the approach of Murrell (1984) and Bischoff (2003), albeit with a larger

sample, and provides an opportunity to reconcile and understand their conflicting findings. We conduct instrumental variable analysis on the 1973 and 1999 sub-samples of the panel, the same years analyzed by Murrell and Bischoff, respectively.

Our cross-country samples are relatively small, with 90 and 140 observations, respectively. As such, the standard errors produced by the Eicher–Huber–White “sandwich” estimator may be characterized by substantial downward bias (MacKinnon and White 1985;

**Table 4** 1973 cross-section results

	1	2	3	4	5	6	7
Constant	2.338 (0.000)	2.034 (0.000)	2.226 (0.000)	3.160 (0.000)	2.033 (0.000)	2.198 (0.000)	1.931 (0.000)
Institutional Upheaval	0.828 (0.069)			1.036 (0.007)	1.204 (0.004)	1.285 (0.002)	0.939 (0.019)
Initial Takeoff Date		1.438 (0.000)					
Violent Turmoil			0.206 (0.488)				
Income	0.382 (0.091)	0.178 (0.434)	0.480 (0.024)				
Agriculture Share				−0.016 (0.008)			
Urban Share					0.082 (0.097)		
Import Share						0.013 (0.922)	
Newspapers							0.817 (0.024)
Democracy	0.528 (0.001)	0.507 (0.000)	0.587 (0.000)	0.493 (0.001)	0.612 (0.000)	0.637 (0.000)	0.432 (0.005)
Number of Industries	1.193 (0.100)	1.160 (0.075)	1.142 (0.092)	1.580 (0.003)	1.718 (0.001)	1.979 (0.000)	1.552 (0.006)
Population	0.307 (0.078)	0.177 (0.311)	0.352 (0.023)	0.216 (0.146)	0.186 (0.155)	0.174 (0.330)	0.206 (0.162)
Government Spending	0.172 (0.538)	0.048 (0.835)	0.287 (0.337)	0.097 (0.720)	0.096 (0.710)	0.114 (0.659)	0.151 (0.557)
Linguistic Fractionalization	82.775 (0.057)	88.117 (0.019)	98.175 (0.018)	70.195 (0.083)	55.470 (0.129)	45.167 (0.253)	72.591 (0.051)
Adj $R^2$	0.83	0.85	0.81	0.82	0.82	0.81	0.82

Notes:  $P$ -values in parentheses. Estimation by Instrumental Variables using lagged values of life expectancy, Government Spending, and Import Share as excluded instruments where appropriate. Regressions also include missing observation dummies for the variables Number of Industries, Government Spending, Initial Takeoff Date, Agriculture Share, and Import Share where appropriate

Cribari-Neto and Zarkos 1999, 2001). For the cross-country analysis, we therefore use the bias-adjusted HC3 estimator as a basis for inference, which is favored by Chesher and Jewitt (1987) and Cribari-Neto et al. (2005).

The cross-country findings in Table 4 are generally consistent with the panel findings in Table 3. Estimated  $P$ -values are somewhat higher, which is to be expected given the smaller number of observations. A few important differences do emerge. In particular, the estimated coefficient on Violent Turmoil is no longer significant, and Income does not enter significantly in column 2. Linguistic Fractionalization loses significance in 5 (the lack of significance in 6 matches the panel result), although it remains significant more often than not. Thus, as with the panel analysis, we conclude that each of the tested hypotheses, except for government size, is supported by the data.

Closer inspection of Table 4 reveals that the results reconcile the conflicting findings of Murrell (1984) and Bischoff (2003). Income does not enter significantly in column 2, when the variable Initial Takeoff Date is included in the specification. In contrast, when Bischoff's (2003) Violent Turmoil variable or our Institutional Upheaval variable is used, the coefficient on Income is significant. These results suggest that Murrell's findings may not support the development hypothesis due to his use of the variable Initial Takeoff Date as a proxy for stability. Our results also suggest that Bischoff's results do not support the stability hypothesis due to his use of the variable Violent Turmoil as a proxy for stability. Both Murrell's proxy (Initial Takeoff Date) and our proxy (Institutional Upheaval) for stability enter significantly, while Violent Turmoil does not. Thus, while time since the most recent violent turmoil does not significantly affect the number of groups in 1973, time since the initial takeoff date and time since the most recent institutional upheaval are positively associated with group formation, consistent with Olson's (1982) stability hypothesis.

An analogous set of regressions was run using the 1999 sub-sample of the panel. Tables that detail these findings are available upon request. The findings are largely similar to those reported in Tables 3 and 4 for the panel and 1973 cross-section, respectively. The only difference of note is that the estimated coefficient on Linguistic Fractionalization is never significant. Estimated  $P$ -values for the 1999 cross-section are somewhat smaller in general, with the exception of Import Share, but do not otherwise affect the interpretations regarding significance of individual variables. The similarity of the findings suggests that the determinants of group formation have remained relatively stable over time.

#### 4.3 Additional sensitivity analysis

As noted by Bischoff (2003), because the *Guide* is produced in Germany, it may over-count the number of groups in that country relative to others. We have therefore dropped Germany from both the panel and the 1973 cross-section and re-estimated the models. We do not find substantive changes in the results. We have also conducted a more general sensitivity analysis on the 1973 cross-section, since influential observations may have a strong effect on results in this relatively small sample. We follow the procedure described by Greene (1993, pp. 287–288). In particular, we run the specification in column 1 of Table 3 without the  $i$ th observation. The resulting coefficient estimates are then used to compute a “modified” residual for the  $i$ th observation. This residual is then standardized. Observations with standardized residuals in excess of two are categorized as outliers. This procedure reveals four potential outliers—Austria, China, Morocco, and Portugal. We then re-estimate the model, excluding these observations from the sample. We do not find substantive changes in the results. Tables that detail these findings are also available upon request.

## 5 Concluding remarks

Our findings suggest that much of the variation in interest group formation across countries can be explained by a few key variables. A nation's stability, socioeconomic development, political system, size, and diversity all appear to contribute to interest group formation, as predicted by theory. The evidence does not support the hypothesis that larger government, at least when measured as government's expenditure share of GDP, contributes to the existence of more interest groups. These results hold in both panel and pure cross-country regressions.

In contrast to both Murrell (1984) and Bischoff (2003), our findings indicate that both institutional stability and economic development are related to interest group formation. Murrell found support for the former but not the latter, and vice versa for Bischoff. Our cross-section findings also indicate that the conflicting findings of Murrell and Bischoff may be attributable to differences in the way they operationalize and capture stability. In particular, Bischoff's failure to find a link between interest group formation and stability appears to be due to his reliance on Violent Turmoil as a measure of stability, rather than on a measure which may more directly capture institutional upheaval. Murrell's failure to find a link between income and interest group formation appears to be related to his use of consolidation of modern leadership and the beginning of economic and social transformation as the proxy for stability, which may also capture aspects of development thereby preventing national income from retaining a truly independent effect.

With respect to stability, our findings suggest that researchers interested in testing Olson's (1982) hypothesis regarding interest group formation or his theory of institutional sclerosis should take care to examine and construct measures of stability that directly capture institutional upheaval, as well as measures that capture violent conflict and occupations. In addition, although Olson suggests that both stability and freedom are key aspects of group formation, it may be of interest to control for these two very distinct effects separately, rather than to confound them within a single variable.

To date, studies of interest group formation and of the impact of interest groups that utilize count data have generally explored only small samples of OECD nations. For example, the only cross-national tests of Olson's theory of institutional sclerosis that feature group count data are based on small samples of original OECD-member countries (McCallum and Blais 1984; Coates and Heckelman 2003) or a maximum of 42 nations (Heckelman 2000). Our analysis suggests that such studies can and should be expanded to include developing nations. In work in progress, we extend these tests to a large sample of developing and developed nations. In addition, the richness of the data contained in the *Guide* should also be explored. Interest groups listed in the *Guide* are stratified by industry, and later editions include information on the date of establishment and membership that may be of use. Sector-specific studies of interest group formation and of the impact of interest groups may be of particular interest.

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