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The political economy of investment: Sclerotic effects from interest groups

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ABSTRACT

We investigate the relationship between interest group activity and investment by analyzing an unbalanced panel of observations on 126 countries over three time periods. We find that the number of interest groups in a nation is negatively related to investment, consistent with a sclerotic effect due to rent-seeking by interest groups. Our findings are robust to the inclusion of a variety of additional common controls in the specification, to potential outlying observations, and to varied sample-selection procedures. We do find, however, that the sclerotic impact of groups on investment is stronger across developed OECD countries than for the developing non-OECD countries. Effects also tend to be stronger in democratic nations, but are dependent upon how strict a definition of democracy is used.

1. Introduction

The role of interest groups in society has been a fertile ground for study among economists, political scientists, sociologists, and historians, among others. For economists, the focus has mostly been on the participants themselves, or their effect on immediate markets. In seminal work on economic growth, however, Mancur Olson (1982, 1983a,b) outlined the macroeconomic consequences of rent-seeking by interest groups. Building on his earlier contributions (Olson, 1963, 1965), which borrowed liberally from the other social sciences, Olson argued that special interest groups form and accumulate over time in stable societies, and use their privileged positions to influence policy, preserve the status quo, and protect their interests. In the process, groups hinder economic progress, through their impact on public policy and private choices as well as through the diversion of resources from productive activity to rent-seeking efforts. In an extension of Olson's argument, Mokyr (2000) shows how entrenched interests have contributed to technological inertia throughout history.[1]

Olson's theory continues to receive a lot of attention, but as documented by Heckelman (2007), the vast majority of related empirical studies rely on relating economic performance to various measures of stability. Institutional stability over time is supposed to proxy for the accumulation of interest groups. The role of interest groups in these studies is thus implicit, and not directly captured in the analysis. A more recent wave of Olson tests utilizes explicit measures of interest group activity and formation. Knack and Keefer (1997) and Knack (2003) use data on group memberships from the World Values Survey to measure interest group activity.

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[1] In a separate literature, Parente and Prescott (1999), Herrendorf and Teixeira (2003), and Parente and Zhao (2006) also link rent-extraction by groups to technology adoption.

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Heckelman (2000), Coates and Heckelman (2003a,b), and Coates et al. (2007a) utilize counts of the number of interest groups listed in the *World Guide to Trade Associations*. A primary drawback of several of these studies is their limited sample size. Except for the last of these, the others feature a range of only 22 to 42 cross-sectional observations. In such small samples, concerns about bias attributable to sample selection and omission of relevant controls imply that findings cannot be interpreted as definitive. In contrast, the growth study by Coates et al. (2007a) contains a panel of 128 observations. A variety of robustness tests are used to confirm their findings that when placed within a full growth model, the number of interest groups is significantly inversely correlated with subsequent growth.

Following Olson's (1982) own lead, the empirical literature testing his theory focuses almost exclusively on comparative growth rates to capture economic performance, whereas only a few, such as Knack and Keefer (1997), Knack (2003), and Coates and Heckelman (2003b), have also investigated the impact of interest groups on investment.[2] In this study we extend the Coates and Heckelman (2003b) analysis of interest groups and investment to an unbalanced panel of 126 nations pooled over three time periods, for a total of over 300 observations. Our relatively large sample allows us to control for a variety of potential determinants and to better isolate the direct effect of interest groups on investment. While straightforward, this particular aspect of the extension is of key importance. Several of the determinants of the number of interest groups in a country are also potential determinants of a country's investment rate. Consider, for example, government spending. As a proxy for market distortions, government spending may be negatively correlated with the investment rate (Feng, 2003). As a proxy for redistribution opportunities, government spending may be positively correlated with the number of groups in a country (Murrell, 1984; Coates et al., 2007b). To the extent that both of these effects are present, failure to control for government spending may obscure the direct impact of groups on investment, and lead to a spurious lack of correlation between groups and investment.

Consider also the role of instability. Alesina and Perotti (1996) and Brunetti and Weder (1998) find that various measures of government, policy, and enforcement uncertainty are significantly inversely related to investment ratios. According to Olson (1982, 1983a,b), interest groups tend not to survive periods of significant governmental and constitutional upheaval, but flourish in a setting of long-term governmental stability. Thus, failing to control for stability may lead to a spurious negative correlation between groups and investment.

In addition, the effect of groups may differ depending on the level of development. Distributional coalitions are more likely to form when there is more at stake (Murrell, 1984; Bischoff, 2003; Coates et al., 2007b). In other words, countries with larger economies tend to have more groups. Economy size, though, may also reflect returns to investment, and therefore be related to the investment rate (Aysan et al., 2007). This suggests that groups may be more harmful to investment in more developed economies (Coates and Heckelman, 2003b).

Furthermore, Mauro (1995) and Feng (2003) have shown that nations with institutions that promote political freedoms devote more of their resources toward investment. Coates et al. (2007b) find that nations which are more democratic accumulate more interest groups. We therefore control for the degree of democratization, as well as investigate if the impact interest groups have on investment is dependent upon how democratic is the society in which they operate.

We also examine whether sample-selection bias affects our findings. Although it is ignored in most studies, sample-selection bias is a potential problem for all cross-country analyses of economic performance, as the requisite data are not available for all countries in the world. Moreover, the countries for which data are unavailable are typically the smallest and poorest. As a result, the samples employed in cross-country analyses of investment, growth, volatility, inequality, and the like, do not consist of a random sample of the total population of countries.

Our findings are consistent with Olson's hypothesis: the number of interest groups in a nation is negatively correlated with investment, consistent with a sclerotic effect due to rent-seeking by interest groups. The findings are robust to the inclusion of standard investment regression controls, are not driven by outlying observations, and do not appear to be characterized by significant sample-selection bias. While we find the negative correlation between groups and investment to be present for both developed and developing nations, it is statistically significant only among our sample of OECD economies. Finally, the sclerotic effect tends to be stronger in more democratic societies, but this result is only consistently found when democracy is defined based on regime authority, rather than on the degree of political rights and civil liberties granted to its citizens.

2. Evolution of the sclerosis literature

Olson first presented his theory of institutional sclerosis in 1978, at a conference hosted by his home institution, the University of Maryland. He offered an abbreviated version of his theory that institutional stability fosters distributional coalitions which in turn hamper growth, along with empirical evidence from the US states. His results confirmed significant negative correlations between stability and growth, stability and unionization, and unionization and growth. The conference paper eventually appeared in print in Mueller (1983), after the publication of Olson's book length treatment (Olson, 1982).

Due to a lack of cross-country data on interest group activity, and motivated by Olson's own approach in the US state context, early cross-country empirical studies attempted to test Olson's theory by relating stability and growth (see for example, Choi, 1983; Whitely, 1983; Weede, 1984). These studies took advantage of the theory's assumption that groups accumulate over time in stable environments, and used stability as a proxy for groups. However, such an approach is problematic for a number of reasons. For example, a number of scholars have argued that the indirect nature of stability does not properly capture Olson's main premise that interest groups are the cause of sclerosis (Abramowitz, 1983; Pryor, 1987; Gray and Lowery, 1988; Heckelman and Coates,

[2] Other exceptions include Paloheimo (1984) on inflation and unemployment, Chan (1989) on the degree of income inequality, and Quiggen (1992) on the level of GDP.

2003; Whaples, 2003). In addition, the definition of stability is inherently subjective in both design and measurement (Maddison, 1988; Holsey and Borcherding, 1997; Coates et al., 2007b). Indeed, Olson himself quickly became disillusioned with his own measure of institutional stability among the US states.[3] In early work, Olson (1982, 1983a) considered the Civil War and the period of Reconstruction as taking-off points for stability among the southern US states. In cross-country settings, many authors analogously considered the end of wars and "foreign" occupations as stability take-off points (Choi, 1983; Weede, 1984; Chan, 1987; Goldsmith, 1987). Olson, however, recognized the shortcoming of these approaches in his Southern Economic Association presidential address (Olson, 1983b), the year following publication of *Rise and Decline*. In particular, he noted that significant institutional upheaval occurred within the US south when Jim Crow laws were overruled via legislative fiat with such federal regulation as the Civil Rights Act of 1964 and the Voting Rights Act of 1965, and despite absence of war or alteration to political structures. Thus, he indicated that the sorts of instabilities that may upset interest group activity are much more diverse than his original work suggested.

Concerns about stability as a proxy for groups as well as questions of measurement motivated research that attempts to directly capture interest group activity. Early efforts by Lange and Garrett (1985) and Lane and Ersson (1986) follow Olson's choice of interest group proxy by focusing on labor organizations among OECD nations, and reveal findings consistent with Olson's theory. However, follow-up empirical studies of the US states by Gray and Lowery (1988) and Crain and Lee (1999) which combine unionization rates with business groups offer little support.

Beginning with Knack and Keefer (1997), several cross-country studies have utilized broader direct measures of interest group activity than those employed in earlier analyses. Knack and Keefer use counts of memberships in groups from the World Values Survey. For a sample of 26 almost exclusively OECD nations, they find that the number of group memberships has a negative but statistically insignificant correlation with both growth and investment. Theirs was also the first to empirically test for an Olsonian effect on investment. Using updated data on a slightly expanded sample size of 39 nations, Knack (2003) finds that aggregate group memberships do not affect growth, but are negatively related to investment at the 10% level of significance. However, Knack also separately examines the impact of memberships in two different types of groups: distributional coalitions ("Olson" groups, which should have a negative impact on growth) and social capital building groups ("Putnam" groups, which should have a positive impact on growth (Putnam, 1993)). Inconsistent with theory, he finds a positive and insignificant coefficient on memberships in Olson groups and a negative and borderline significant coefficient on memberships in Putnam groups in investment regressions.

In studies of growth and investment, respectively, Heckelman (2000) and Coates and Heckelman (2003b) also examine a broad direct measure of interest group activity — a count of trade associations for 42 nations, assembled from the *World Guide to Trade Associations*.[4] Heckelman finds that group counts are negatively correlated with growth, but that the relationship is not generally significant. Coates and Heckelman find that interest groups negatively affect investment only in a subsample of 22 original-OECD member nations.

Overall, scholarship using direct measures of interest groups has been less favorable to Olson's theory than studies which rely on more indirect proxies, such as length of institutional stability. A primary drawback of these recent studies that use direct measures of interest groups is sample size. All rely on relatively small samples for a single cross-sectional period. An exception is Coates et al. (2007a) who examine the relationship between interest group counts and growth in a sample of 86 nations pooled over two time periods. They find the number of interest groups in a nation to be significantly inversely related to growth. In this study, we conduct a similar analysis of the relationship between interest group counts and investment. The sample used covers up to 126 countries pooled over three time intervals, for a total of 323 observations.

3. Specification and data

We estimate a standard investment share regression using OLS estimation with White-corrected standard errors. Explanatory variables are drawn from the literature following Barro (1991, 1997), and include controls for initial conditions that may be related to investment opportunities (the level of GDP, interest rates, and years of schooling), measures of market distortions (government spending, inflation, and the black market exchange rate premium), and measures of the institutional environment (proxies for democracy, investment risk, corruption, political violence, and financial development). We supplement these standard explanatory variables with our primary variable of interest, the number of interest groups. To avoid endogeneity problems, the investment share is measured subsequent to the interest group counts and other explanatory variables. A full list of variables and sources as well as a list of the country-year combinations that comprise the sample are included in the Appendices A and B.

As in Coates et al. (2007a,b), we construct counts of the number of interest groups using the *World Guide to Trade Associations* (WGTA). The WGTA is an international directory of "trade associations", providing contact information for groups in the industrial, commercial, trade, and service sectors, as well as professional organizations, consumer organizations, employer and labor groups, and organizations of service professionals. Six editions of the WGTA have been published, beginning in 1973 through the latest in 2002. However, the criterion for inclusion in the WGTA changed with the third edition. As such, the groups listed in the first two editions are not entirely comparable to those listed in the more recent editions. We therefore rely on counts derived from the 1985 (third), 1995 (fourth) and 1999 (fifth) editions to explain subsequent investment ratios.[5] Following from the timing of the interest

[3] See also Heckelman and Coates (2003), Whaples (2003), and Rosser (2007) for the evolution of Olson's view on the role of distributional coalitions.

[4] Murrell (1984) first utilized count data from the *Guide* in a study of interest group formation among OECD nations.

[5] Data on chambers of commerce are available in the 1985 and 1999 editions, but not in the 1995 edition. We therefore exclude chambers of commerce from the counts.

Table 1
Descriptive statistics for Groups.

	N	Median	Mean	Std. dev.	Min.	Max.
Available data	572	11	128.87	523.94	0	5773
Main regression sample	323	25	222.01	683.09	0	5773
OECD sample	72	352	886.82	1236.80	39	5773
Non-OECD sample	251	18	31.31	52.92	0	408

group count data, we examine the average annual investment share over the subsequent five-year periods 1985–1989, 1995–1999, and 2000–2004. As with the group counts, we use the 1985, 1995, or 2000 values for all additional control variables.

As shown in Table 1, 572 country observations on group counts across the three time periods are available. The data are heavily skewed with the median countries having only 11 registered interest groups[6] whereas the average number of groups across all countries is almost 130. Complete data on the full set of regressors included in the main specification are available for 323 observations. Not too surprisingly, it is typically the smallest or poorest nations which are missing other needed data. In the main regression sample of 323 observations, the median countries have 25 groups,[7] and the mean number of groups nearly doubles as well.

Ideally, we would have data on group strength, rather than just group existence. Using the raw count data implicitly assumes that every additional group has equal effects on investment, but with some countries having thousands of interest groups this assumption is unlikely to hold true. Unfortunately, a measure of group strength is not available. We do allow for the possibility that the strength of an individual group diminishes with the total number of groups by using the natural log of interest groups[8] in the main specification, but also examine the impact of the raw group counts as part of our robustness tests.

We estimate several specifications. The more variables we include, the fewer observations remain. As a trade-off, we first estimate a base model and then engage in sensitivity analysis by adding additional variables, as well as other sensitivity tests described below.

In addition to the interest group variable, our main specification includes GDP per capita, the share of government expenditures in GDP, indexes of investment risk and perceived corruption, indexes of political rights and civil liberties, and two time-period dummies. As noted by Alesina and Perotti (1996), the expected estimate for the coefficient on GDP is ambiguous. In order for long-run income convergence to hold, the estimated coefficient should be negative. However, GDP is also representative of market size and can capture the effect of demand and supply of goods and services, and therefore indirectly the need for investment (Busse and Braun, 2003; Aysan et al., 2007). Wealthier nations also would have greater ability to devote resources to savings. If either of the latter effects dominate, then the estimated coefficient for GDP would instead be positive. Perhaps reflecting this ambiguity, the estimated coefficient on GDP in investment regressions is often not significant (e.g., Barro, 1991; Alesina and Perotti, 1996; Knack and Keefer, 1997; Aizenman and Marion, 1999; Feng, 2003). Nonetheless, the variable is almost always included in investment models. The share of government expenditures in GDP is included in the main specification as a proxy for market distortions (Barro, 1991; Feng, 2003). Indexes of investment risk and perceived corruption are included as proxies for enforcement uncertainty that capture the extent to which firms can be confident that property and contract rights will be enforced (Brunetti and Weder, 1998; Campos et al., 1999; Busse and Hefeker, 2007). Indexes of political rights and civil liberties are included as proxies for democracy. Typically, political rights alone or a combination index of political rights and civil liberties is used in investment regressions (e.g., Barro, 1991; Mauro, 1995; Busse and Braun, 2003; Feng, 2003). However, Adam and Filippaios (2007) find that civil liberties have a positive return to investment whereas political rights have a negative return. We therefore use both indexes in our regressions. Finally, because we pool separate cross-sections into a single unbalanced panel, time-period dummies are included to capture both unobserved world-wide investment shocks and differences in mean investment rates that can occur due to unmatched sample nations across the years.

A number of additional variables are typically featured in investment regressions, including a proxy for human capital, uncertainty in the form of inflation and domestic violence, interest rates, the black market exchange rate premium as another measure of market distortions, and proxies for financial market development. Data on these variables are available for only a subset of the otherwise 323 available observations. We therefore do not include these variables in our main specification described above. Rather, we run separate regressions that include these variables, both individually and collectively, as robustness checks on our main findings.

4. Results

In this section, we report results from our empirical analysis. We focus first on our main specification and sample, and then briefly describe results from sensitivity analysis on alternative specifications and samples. The investment profile and corruption

[6] There are six distinct countries with the median number of groups: Burundi (1985), Lebanon (1985), Martinique (1995, 1999), Papua New Guinea (1995, 1999), Latvia (1999), and Lithuania (1999).

[7] These are Equador (1995), Uruguay (1999), and Trinidad-Tobago (1999).

[8] Because five country observations in our regression sample have zero listed interest groups (Bahrain, Mozambique, Oman, Saudi Arabia, Sierra Leone — all in 1985), we use ln(1 + groups) for all countries to avoid losing observations.

Table 2
Correlation matrix for independent variables.

	GDP	Government	Investment profile	Corruption	Political rights	Civil liberties
Groups	0.486	0.144	0.261	0.319	0.309	0.327
GDP		0.306	0.429	0.592	0.512	0.600
Government			0.102	0.367	0.265	0.269
Investment profile				0.351	0.369	0.408
Corruption					0.499	0.532
Political rights						0.911

indices have higher values for better perceived levels of economic governance, whereas the political rights and civil liberties indices have lower values for better perceived levels of political governance. To ease comparative interpretations, we have inverted the political governance indices so that better ranked nations have higher values as well. The correlation matrix for all independent variables is presented in Table 2. The number of groups is most highly correlated with the level of development, as captured by GDP, but only weakly correlated with overall degree of government involvement, as measured by the share of GDP from government spending. Thus, even though most studies do not typically find GDP to be a significant regressor in explaining investment ratios, its inclusion becomes necessary for our specification to ensure our principal variable of interest, Groups, truly captures its own effect rather than an effect from differences in the degree of economic development.

4.1. Main specification

In Table 3 we report coefficient estimates for our main specification. Column I presents the main specification. In columns II–IV, we examine whether the marginal impact of groups differs across OECD and non-OECD countries. (These findings are discussed below in Section 4.4).

According to the estimates, GDP per capita is negatively but not significantly related to investment, suggesting poorer nations devote only an insignificantly larger portion of their production to investment, thus limiting the opportunities for long-run income convergence. Similar findings are reported by Barro (1991), Knack and Keefer (1997), Brunetti and Weder (1998), Feng (2003), and Aysan et al. (2007), although Knack (2003) generates a statistically significant negative coefficient.

Among the market distortion and institutional environment variables, the size of government is not found to influence the rate of investment, consistent with Brunetti and Weder (1998), but in contrast to Barro (1997) who finds a significant negative

Table 3
Determinants of investment ratios.

	I Base specification	II OECD interaction	III OECD sample	IV Non-OECD sample
Constant	17.172**	16.562**	24.174**	15.644 **
	(9.599)	(7.803)	(8.202)	(6.611)
Groups	−0.564**	−0.635**	−0.555**	−0.337
	(2.491)	(2.982)	(2.269)	(0.948)
Groups*non-OECD		0.215		
		(0.874)		
GDP	−0.018	0.009	0.019	0.038
	(0.403)	(0.173)	(0.372)	(0.439)
Government	−0.006	−0.002	−0.341***	0.036
	(0.098)	(0.032)	(5.242)	(0.522)
Investment profile	0.822***	0.821***	0.569*	0.795 ***
	(4.063)	(4.078)	(1.870)	(3.383)
Corruption	0.597*	0.641*	−0.218	0.896**
	(1.784)	(1.902)	(0.721)	(2.131)
Political rights	0.226	0.221	−0.302	0.120
	(0.634)	(0.616)	(0.465)	(0.303)
Civil liberties	−0.469	−0.462	0.676	−0.420
	(1.030)	(1.013)	(1.131)	(0.788)
yr1985	0.418	0.443	2.224**	−0.183
	(0.510)	(0.539)	(2.215)	(0.179)
yr1995	1.569*	1.562*	1.712	1.198
	(1.754)	(1.749)	(1.600)	(1.182)
n	323	323	72	251
Mean, dep var	22.03	22.02	21.87	22.06
$\bar{R}^2$	0.065	0.064	0.409	0.073
F-stat	3.36***	3.07***	6.33***	3.27***

Notes: *, **, and *** indicate significance at the 10, 5, and 1% level absolute *t*-statistics generated from White robust standard errors in parentheses.

relationship. We find that the degree of investment risk has a significant impact and, as expected, countries that are rated better (have higher values of the variable) do indeed have a greater share of GDP from investment. The same holds for Corruption, but its level of significance is weaker. However, in other results, we find that when investment risk is not included in the model, greater perceived corruption is associated with less investment at a much higher level of statistical significance ($p = 0.008$), consistent with Mauro (1995), Brunetti and Weder (1998), and Campos et al. (2007). In contrast to Barro (1997) and Harms and Ursprung (2002), we do not find that democracy explains investment. The high correlation between the political rights and civil liberties indexes (see Table 2), which proxy for democracy, does not appear to explain their lack of significance, as they are not jointly significant either. In additional regressions not reported here, we find that the estimated coefficients on the democracy variables are not significant even when only one of the two is included in the model. We have also checked an alternative measure of democracy from the Polity IV database, as used by Bond and Malik (2007).[9] We still find that democratization does not affect investment.

Our primary interest is the impact of interest groups. Consistent with Olson's (1982) hypothesis, we find that nations with more interest groups devote fewer resources toward investment. The estimated coefficient on Groups in column I of Table 3 is negative and statistically significant at almost the 1% level ($p = 0.016$). The magnitude of the coefficient translates to a one standard deviation increase in the number of interest groups reducing the investment/GDP ratio by 0.34 percentage points, which amounts to a 1.5% reduction from the mean. The statistical significance of the Groups variable contrasts strongly with the findings of Knack and Keefer (1997), Coates and Heckelman (2003b), and Knack (2003) that rely on single cross-sectional estimates based on a very limited sample of nations.

In the remainder of this section, we investigate the robustness of our main interest group result. In particular, we check for outlying observations and examine whether selection bias appears to play a role in the findings. We also explore alternative model specifications and differences across various subsamples.

4.2. Outliers and sample selection

We checked for outlier observations that may unduly influence the estimates by identifying those observations that are "leverage points", having more than twice the average leverage on the fitted values. Using the method described by Davidson and MacKinnon (2003, pp. 76–81), we identify 13 observations as potentially influential.[10] When these observations are excluded from the sample, the coefficient estimates in column I of Table 3 are only slightly affected. In particular, the estimated coefficient on Corruption, while roughly similar at 0.56, now has an estimated t-statistic of only 1.48, falling below the standard threshold for statistical significance. None of the other variable estimates is appreciably altered. Most important for the current analysis, Groups generates an estimated coefficient of -0.548, and an absolute t-statistic of 2.17, thereby retaining a similar interpretation as before. Thus our conclusion regarding the significant reduction to investment as a result of group formation remains, as does the positive contribution from a better investment risk, and the lack of importance from government size or democratic freedoms, but the importance of corruption perceptions is tempered.

As an additional check on the robustness of the interest group result to particular observations, we ran an experiment by randomly dropping 10% of the sample over 1000 regression trials. The distribution of the estimated coefficients and absolute valued t-statistics on Groups are shown in Figs. 1 and 2. The average value of the coefficient is -0.56 with a standard deviation of only 0.076, whereas the average and standard deviation for the associated t-statistics are 2.36 and 0.34. Only 14 of the 1000 trials generate a t-statistic below 1.64 in absolute value, indicating the coefficient on Groups is statistically significant 98% of the time at least at the 10% level.[11] Thus, we are confident that our main sample of data exhibits a consistent negative relationship between interest groups and investment which is not an artifact of outliers in the data.

As Table 1 indicates, 572 observations on group counts are available, but only 323 observations are available on investment rates and the full set of control variables included in the main specification. Moreover, the missing observations are generally associated with the smallest and poorest countries in the world. As a result, our sample (and the samples used in most cross-country analysis of growth and investment) is not a random draw from the available population of countries, and our findings may be characterized by sample-selection bias. To check for sample-selection bias, we estimate Heckman's selection correction model, using both ML and two-step procedures. We note that our selection equation does not satisfy an exclusion restriction (all of the variables in our selection equation are included in the main regression). As a result, the power of the test is low. That caveat stated, we find that Heckman's λ is not significantly different from zero. Thus, the data do not reveal evidence of selection bias.

4.3. Alternative specifications

We also check the robustness of our interest group finding to the inclusion of several additional controls and alternative specifications. To conserve space, in Table 4 we report only the estimates related to Groups for these modifications to the main specification.

[9] The number of observations drops to 309 when using the Polity measure.

[10] The observations are Bahamas, Israel, Panama, and South Africa for 1985, Nicaragua for 1995, Japan, Luxembourg, and Zaire for 2000, Kuwait for 1995 and 2000, and United Arab Emirates for all three years.

[11] The estimated coefficient for Groups is statistically significant at better than the 5% (1%) level in 89% (24%) of the iterations.

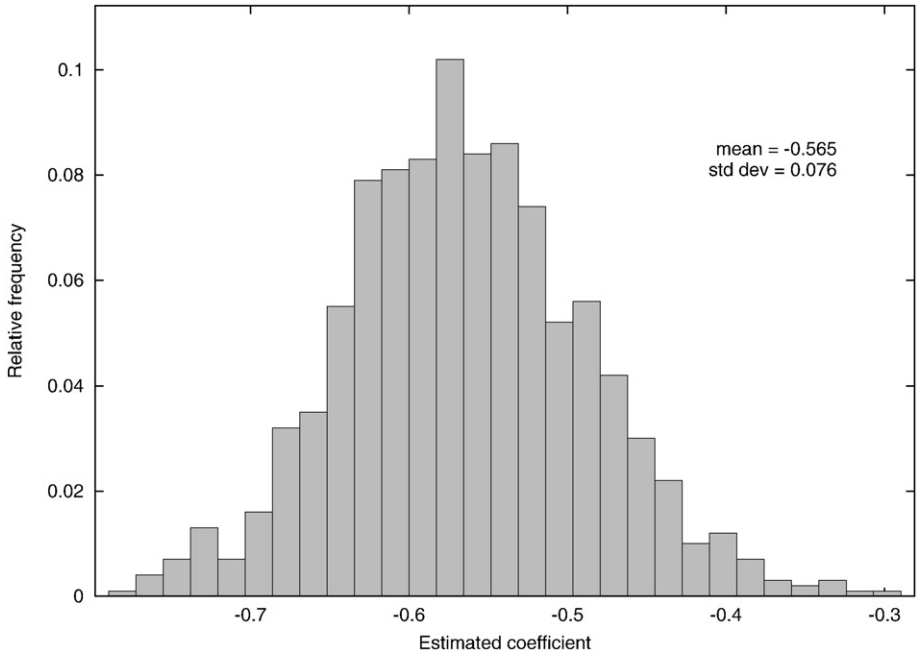

Fig. 1. Frequency plot for estimated coefficient of Groups variable. *Notes*: Each estimated coefficient is based on a random sample of 290 observations without replacement. The experiment was repeated 1000 times.

Currently missing from the specification are direct costs of investment which recent studies have begun to use. Two proxies we consider in rows 1 and 2 are the relative price of capital (Bond and Malik, 2007) and the real rate of interest (Aysan et al., 2007). These proxies capture different effects, as there is surprisingly practically zero correlation between them (correlation coefficient = −0.04). Inclusion of the former strengthens the marginal group effect by over 20% and raises the significance level to well beyond the 1% level. Including the latter, however, has the reverse effect. The coefficient on Groups becomes 13% smaller (in absolute terms) and its significance level falls to just barely above the 10% level. It turns out, however, that the latter finding is not directly due to controlling for interest rates but rather is an artifact of the vastly reduced sample due to missing interest rate data on 69 otherwise valid country observations, which represents a 20% non-random sample reduction. When the original specification (without interest rates) is replicated on the same regression sample of 253 country observations for which interest rates are available, the estimated coefficient and *t*-statistic of Groups remain almost exactly the same as reported in row 2. Thus, the inclusion of an interest rate variable actually has no effect by itself on the marginal effect of Groups.

We have used perceived investment risk and corruption as potential indicators of uncertainty. An alternative measure to capture uncertainty is the level of political violence which actually takes place (Brunetti and Weder, 1998; Asiedu, 2006; Bond and Malik, 2007). Our proxy for this variable (described in Appendix B) is taken from the Major Episodes of Political Violence database maintained by the Political Instability Task Force. Because social upheaval is a detriment to entrenched interest groups whereas political stability allows such groups to flourish (Olson, 1982, 1983a; Murrell, 1984; Coates et al., 2007b), it is possible that the estimated effect of Groups is merely capturing an inverse relationship between upheaval and investment. However, as indicated in row 3, it turns out that including a Political Violence variable actually enhances the estimated negative impact of Groups on investment.

Inflation can also capture uncertainty, of a different sort (prices), as well as policy effectiveness. Bengoa and Sanchez-Robles (2003) and Asiedu (2006) find the level of inflation to be harmful to investment, although Egger and Winner (2005) do not, whereas Brunetti and Weder (1998) use the standard deviation of inflation which they find is not important. Rows 4 and 5 reveal that we do not find either the level or standard deviation[12] to be significant, and controlling for these factors does not appreciably affect the negative and significant relationship between groups and investment.

Our main specification also excludes several variables that are commonly featured in investment regressions. In particular, an education variable to capture the human capital stock (Barro, 1991, 1997; Svensson, 1998; Aizenman and Marion, 1999; Bengoa and Sanchez-Robles, 2003; Knack, 2003; Asiedu, 2006), the black market exchange rate premium to capture market distortions (Barro, 1997; Feng, 2003) and a measure of financial market development (Ndikumana, 2000, 2005; Stasavage, 2002) are missing from the model. Data on these variables are available for only a subset of the observations available for other variables, and we therefore excluded them from the main specification in order to avoid a further reduction in sample size. Adding a human capital proxy reduces the original sample by over 20% (70 observations). The separate addition of the black market exchange rate

[12] The standard deviation is measured over the previous seven years.

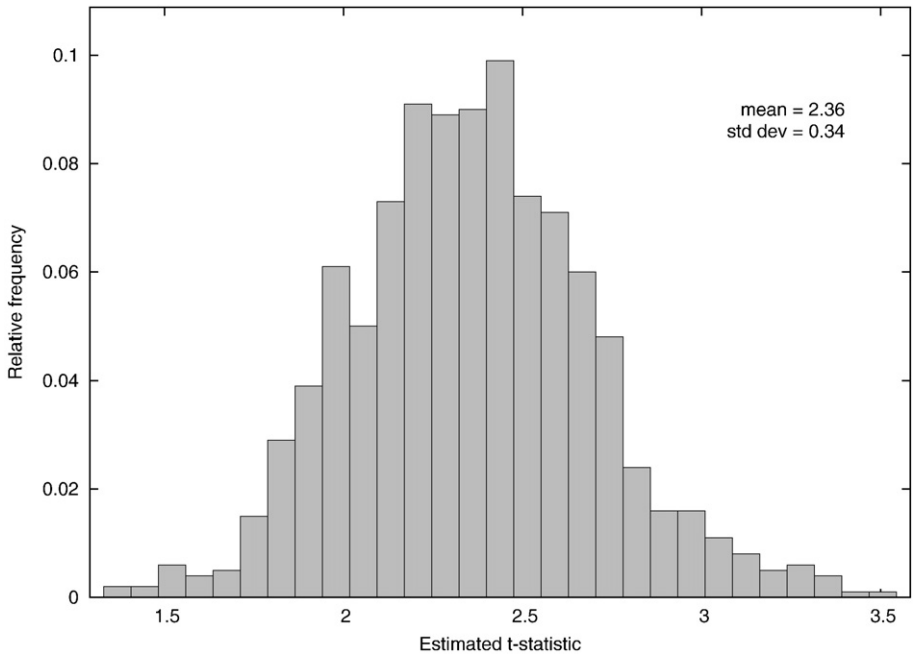

Fig. 2. Frequency plot for estimated *t*-statistics (absolute value) of Groups variable. *Notes*: Each estimated *t*-statistic is based on a random sample of 290 observations without replacement. The experiment was repeated 1000 times.

premium and the share in GDP of domestic credit provided by banks and other financial institutions as a measure of financial market development reduces the sample by 37 and 34 observations, respectively. As rows 6–8 of Table 4 indicate, the estimated coefficients on Groups remain statistically significant when each additional control is included in the model, although the inclusion of education reduces significance of Groups to just below the 5% level ($p = 0.06$). As with interest rates, the latter result may be influenced more by the large non-random reduction in sample than the introduction of a human capital proxy; when education is excluded for the same regression sample of 252 country observations, the estimated marginal impact of Groups falls slightly to -0.43, and the associated *t*-statistic is only -1.60, which does not quite manage to meet even a 10% cutoff ($p = .11$). Thus, the inclusion of education actually increases the importance of Groups for the sample of countries for which education data are available.

Regional dummies, in particular for Africa and Latin America, are also often included in investment regressions, as a control for otherwise unobserved heterogeneity (Barro, 1991, 1997; Mauro, 1995; Busse and Hefeker, 2007; Bond and Malik, 2007). However, in the growth context, Bertocchi and Canova (2002) find that colonial heritage is more important than geographic region. In addition, Acemoglu et al. (2003) use colonial heritage to explain the development of institutions across countries. We therefore

Table 4
Robustness results.

Specification change	*N*	Coefficient for Groups	*t*-statistic for Groups	$\bar{R}^2$
1. Add relative price of capital#	316	−0.681	3.129***	.083
2. Add real interest rate	253	−0.489	1.663*	.034
3. Add political violence	312	−0.624	2.546**	.065
4. Add inflation	301	−0.533	2.205**	.057
5. Add std. dev. of inflation	301	−0.549	2.257**	.061
6. Add private credit#	290	−0.643	2.635***	.082
7. Add black market premium	289	−0.455	2.053**	.075
8. Add education#	252	−0.486	1.836*	.125
9. Add colonial heritage dummies#	323	−0.623	2.703***	.104
10. Drop year dummies	323	−0.570	2.550**	.060
11. Unlog Groups (100s)	323	−0.094	3.861***	.059
12. All of the above	185	−0.098	3.809***	.121

Notes: *, **, and *** indicate significance at the 10, 5, and 1% level, # indicates added variable significant at the 10% level or better, absolute *t*-statistics generated from White robust standard errors.

add a series of colonial heritage dummies to our investment model. The dummies indicate if a country had been a colony of the historical European powers of Great Britain, France, Spain, or Portugal. We find that the coefficient estimates on the dummies for Great Britain, France, and Spain are statistically significant, suggesting that the other control variables do not pick up all relevant heterogeneity. As row 9 of Table 4 indicates, inclusion of the heritage dummies strengthens the estimated marginal impact and increases the significance level of the estimated coefficient on Groups.

We check two additional modifications to our main specification. First, we dropped the year dummies included in the main specification. As row 10 of Table 4 indicates, the estimated coefficient on Groups remains significant. Second, we use the raw count of interest groups, rather than the log form. The raw count specification forces the marginal effect of each additional group to be the same, whereas the log form is based on diminishing marginal impact. The regression using the unlogged Groups specification results in a much larger estimated effect from Groups compared to the log form, computed at the mean.[13] The coefficient estimate presented in row 11 implies that a one standard deviation increase in Groups is expected to reduce investment by roughly 2.9% from the mean, which is almost twice the estimated impact found before when using the log form for Groups. In addition, the coefficient estimate on the unlogged Groups variable is statistically significant at better than 1%.

Finally, in the bottom row of Table 4 we consider a specification in which all of the modifications described above are considered simultaneously. (The former Portuguese colony dummy has to be dropped because none of the remaining countries with complete data for all the variables qualifies.) The estimated coefficient on the unlogged Groups variable is roughly the same as without the additional changes and remains statistically significant at better than the 1% level. Note also that the sample for this last regression is almost 50% smaller than the original specification presented in column I of Table 4. Thus, we conclude that our main finding regarding the harmful impact of interest groups on investment is robust.

4.4. Difference between OECD and non-OECD nations

Although interest groups are most commonly viewed as rent-seekers and associated with inefficiency, Doner and Schneider (2000) suggest that the activities of interest groups in developing countries may actually promote efficiency. Consistent with this view, the empirical findings of Coates and Heckelman (2003b) indicate that interest groups harm investment in OECD nations, but have little (slightly positive) to no effect in non-OECD nations. We therefore examine whether the impact of Groups on investment in our sample differs across OECD and non-OECD nations.

Returning to Table 1, the bottom two rows report summary statistics for the number of interest groups stratified by OECD status.[14] The average (median) number of interest groups is vastly greater in the OECD countries, at almost 30 (20) times the average (median) number in non-OECD countries. Even the number of groups in the OECD nation with the fewest groups (Iceland) is well above the average and median of the non-OECD nations. Still, the range of counts within the two subsamples remains substantial, with the standard deviations exceeding the means.

In column II of Table 3, we report coefficient estimates for the main regression plus a variable created by interacting Groups with a developing nation indicator variable, defined by not being an OECD member country. In this specification, the estimated coefficient on Groups represents the impact of groups strictly among the OECD nations. The effect is enhanced both in terms of marginal impact and level of statistical significance, compared to the original Groups estimates in column I. The estimated coefficient for the interaction term is positive but smaller in absolute value than the Groups estimated coefficient, and not statistically significant. This might imply that the reduction to investment from groups is roughly equivalent for both OECD and non-OECD member nations. However, a *t*-test reveals the total effect of groups in non-OECD member nations, found by summing the estimated coefficients on Groups and the interaction term, is not statistically different from zero (p-value = 0.20). Thus we conclude that the harm done by interest groups to investment is worse in the developed OECD economies than originally estimated in column I, where it was somewhat masked by the less harmful effects on average from the rest of the sample nations, where the overall effect of groups within the developing nations is not significantly detrimental.

Use of the interaction term allows the estimated impact of interest groups to differ across OECD and non-OECD economies and we find significant differences. However, the specification forces equality of coefficients across the two groups of countries on the remaining variables. If OECD and non-OECD countries are also heterogeneous in their other parameters then the forced equality of coefficients in the pooled (by OECD status) sample would be inappropriate. For example, improvements in the institutional environment or the presence of market distortions may be more important to investment among the developing nations. Hineline (2008) shows parameter equality to be a problematic assumption in the case of growth regressions for some of the variables included in our base specification.[15] We therefore divide our sample into two subsamples, one for OECD countries and another for non-OECD countries, and determine whether the coefficient estimates on Groups or the other variables differ. Coefficient estimates from the separate subsamples are reported in the last two columns of Table 3. Here we find that the estimated impact of Groups among the OECD sample is similar to the full pooled sample result in column I, but for the developing non-OECD countries

[13] At the median of Groups, which is only about one-tenth of the mean, a one standard deviation increase in groups reduces investment by 3.6% using the log form specification, compared to 2.9% using the unlogged specification.

[14] The OECD sample consists of all 24 nations who were members prior to the start of our sample in 1985 but does not include those nations who joined OECD after that point.

[15] In particular, the estimated distribution of the impacts from initial GDP and government share are shown by Hineline (2008) to differ across OECD and non-OECD nations. This also applies to education, black market premium, and private credit that appeared in our supplemental regressions reported in Table 4. Adam and Filippaios (2007) also find that, among the variables included in our regression, the marginal impacts of initial GDP and the level of civil liberties differ between OECD and non-OECD samples.

Table 5
Effect of Groups among democracies and non-democracies.

	Democracy sample			Non-democracy sample		
	N	Coefficient for Groups	*t*-statistic for Groups	*N*	Coefficient for Groups	*t*-statistic for Groups
Democracy defined as:						
1. Average of PR, CL < 5	231	−0.432	1.598	92	−0.354	0.588
2. Average of PR, CL < 3.5	165	−0.718	2.336**	158	−0.002	0.005
3. Both PR and CL < 3.5	157	−0.784	2.588***	166	−0.031	0.082
4. Both PR and CL = 1	53	−0.312	0.971	270	−0.647	2.429**
5. Polity > 0	206	−0.847	2.494**	104	0.384	0.699
6. Polity > 5	175	−1.156	3.087***	135	0.226	0.502
7. Polity = 10	85	−1.479	3.575***	232	−0.364	1.255

Notes: *, **, and *** indicate significance at the 10, 5, and 1% level, absolute *t*-statistics generated from White robust standard errors. Regressions control for the same determinants listed in column I of Table 3.

the result is similar to that in column II which allowed only the group effect to vary but not the other variable effects. Together, the estimates in columns II–IV suggest that Olson's institutional sclerosis theory is more strongly supported within the developed nations but the effect of groups is smaller and more variable in the developing nations. Furthermore, the results are not consistent with Donor and Schneider's (2000) alternative perspective that interest groups are efficiency enhancing for the developing nations.

We also find support for the concern over parameter heterogeneity in general across the two subsamples. Investment risk appears to be far more important among the developing nations, and the significant effect of corruption perceptions previously found appears to have been due strictly to the developing nations. For the OECD nations, increasing government size appears to crowd out investment which does not occur to a significant extent among the developing nations. Finally, neither the initial level of wealth nor the level of democratization (as proxied by Freedom House measures for political rights and civil liberties) is a significant contributor to investment ratios for either collection of nations.

A Chow test easily rejects equality of the parameter estimates ($F(10, 303) = 3.32$; p-value $< .01$), and the model explains a much greater percentage of the variation in investment among OECD nations than for developing nations. Therefore, our general conclusion is that it is not appropriate to pool the separate subsamples together, and interest group effects are significantly harmful to investment among the OECD nations, but the harm done among the developing nations is much weaker.

4.5. Difference between democracies and non-democracies

An alternative consideration is that interest groups may have different effects in democratic nations. Most, although perhaps not all, of the OECD economies would be considered to be fully functioning democracies whereas many of the less developed economies tend to be less democratic. Thus, it is not clear if the OECD differences identified in the last two columns of Table 3 are truly capturing an effect from development, or if the OECD indicator is merely proxying for differences in democratic institutions. To check the latter, we next divide the sample into democracies and non-democracies. One caveat is that while membership in OECD is clear, identifying democratic nations is more subjective. We therefore consider two separate sources which measure the degree of democracy using alternative criteria, and several classification ranges. Therefore, in order to conserve space and focus on the interest group effects, only the estimated coefficient and *t*-statistics for Groups are presented in Table 5, but the specifications are otherwise identical to the OECD/non-OECD split sample regressions from Table 3. We consider the classification schemes adopted by Persson and Tabellini (2003) who found the determinants of GDP and factor productivity to differ depending on the definition of democracy. We use their classifications, and more restrictive classifications as well.

The Freedom House democracy score is defined as the average of their political rights (PR) and civil liberties (CL) index values. Freedom House labels a country as "free" if the average value of political rights and civil liberties is less than 3, and "partly free" if the average value is from 3 to 5. Persson and Tabellini create a "broad" definition of democracy as having a Freedom House democracy score less than 5, and a more "narrow" definition as the democracy average than 3.5. Results of the stratified "broad" democracy sample are presented in row 1 of Table 5.[16] For both democracies and non-democracies, Groups generates a negative coefficient. However, it is not quite statistically significant among democracies, and not close to significance for non-democracies. Thus, it might appear as if interest groups do not affect investment rates to a significant degree for either democracies or non-democracies.

Yet, this "broad" definition for democracy is probably far too broad. Indeed, more than 2/3 of the country observations qualify as democratic under this standard. Several countries which make the cutoff, such as Guatemala, Kuwait, and Morocco, and even South Korea prior to their reforms in the early 1990s, would be hard pressed to be considered democratic despite being considered "partly free" in respecting civil liberties and political rights by Freedom House criteria.

[16] To be clear, these are based on the original values assigned by Freedom House, prior to our inversion of the political rights and civil liberties indexes for regression estimation.

Applying the "narrow" definition eliminates almost 70 observations from the democracy classification. Row 2 reveals that interest groups significantly reduce investment among "narrow" democracies, and have zero effect among the non-democracies. The interpretation is the same as found for OECD versus non-OECD nations; however the marginal impact is much greater for the large collection of "narrow" democracies than for OECD economies, and the marginal impact for non-democracies is much smaller than for the non-OECD economies.

Still, even this categorization may be too broad, as it allows a good rank on the civil liberties scale to offset a bad rank on political rights and still be considered democratic. Instead, we prefer a "consistent" definition for democracy which requires *both* PR and CL to have a rank below 3.5, not just on average. This criterion reclassifies eight borderline observations from the "narrow" democracy sample into the non-democracy sample. As row 3 reveals, an even greater negative impact from interest groups is found among the slightly smaller set of "consistent" democracies than for the "narrow" democracies, and the non-democracies continue to be unaffected by interest groups. Comparing the first three rows seems to suggest that the tighter the definition of democracy utilized, the stronger the harmful impact of interest groups found.

The "pure" democracies are those which respect civil liberties and political rights the most, evidenced by top ratings for both categories. It might be argued that any restrictions on democratic freedoms significant enough to prevent a top ranking from Freedom House imply a nation is not completely democratic. Only 53 country-year observations (representing 23 distinct nations, although not every nation achieves the top rank every year) qualify for this distinction of "pure" democracy. Results for this classification are presented in row 4.[17] Although the estimated coefficient on Groups is still negative for the "pure" democracies, the marginal impact is reduced by more than half, and is far from statistically significant. Meanwhile, the remainder of the sample considered non-democratic is now found to have a significantly harmful effect from the presence of interest groups. Thus, the evidence on interest group effects in democracies is not robust, depending on the somewhat arbitrary classification scheme used to separate democracies from non-democracies. Neither the most generous nor most strict definitions reveal significant interest group effects among democracies, whereas the ranges in between do.

An alternative democracy indicator considered by Persson and Tabellini is based on Polity data. Rather than focus on political rights and civil liberties as done by Freedom House, Polity data capture regime authority for "executive recruitment, constraints on executive authority, and political competition."[18] The Polity scale ranges from −10 (hereditary monarchy) to +10 (consolidated democracy). Polity scores from −10 to −6 are considered "autocracies", scores from −5 to +5 are labeled as "anocracies" and those from +6 to +10 are "democracies". Persson and Tabellini's "broad" measure of democracy includes all observations with a positive Polity score and their "narrow" measure is limited to Polity scores >5. We consider these classifications, along with the most restrictive definition of only the top score of 10 (or "consolidated" democracies). Results from splitting the sample in these ways are reported in the bottom three rows of Table 5. Among democracies determined by the Polity criteria, the stricter the definition used, the stronger the estimated harm from interest groups and the larger the estimated *t*-statistic. In contrast, interest groups appear to generate a slight positive, albeit statistically insignificant effect, for non-democracies when using either the "broad" or "narrow" definition of democracy. Only when democracies are limited to "consolidated" does the non-democracy sample generate a negative estimated coefficient for Groups, but still statistically insignificant. Thus, unlike when using the Freedom House criteria, using Polity criteria reveals that the more democratic, the stronger the harm from groups on investment, and interest group effects within non-democracies are never significant.

5. Conclusions

Olson's (1982, 1983a) theory of institutional sclerosis indicates that distributional coalitions infiltrate the policy process in order to reassign public resources toward themselves at the expense of the rest of society. Special interest groups can also benefit themselves by locking in their privileged positions through enacting barriers to entry and blocking the potential for technological innovations (Mokyr, 2000). We test these theories and explore the relationship between rent-seeking and investment, using the number of interest groups as a proxy for special privilege and resources devoted to rent-seeking. Consistent with Olson's theory, regression analysis on our unbalanced sample of 126 countries over three time periods reveals a significant inverse relationship between groups and investment.

Our findings are generally robust to the inclusion of a variety of additional common controls in the specification, to potential outlying observations, and to varied sample selections. We do find, however, that the sclerotic impact of groups on investment is stronger across developed OECD countries than for the developing non-OECD countries. Finally, differences between the effect of interest groups in democracies and non-democracies are dependent upon how democracies are categorized.

[17] Because the PR and CL values are restricted to always equal 1 in the "pure" democracy sample, they cannot be included as explanatory variables in the regression. They are still included in the non-democracy sample; however they remain jointly insignificant and dropping them does not have an effect on significance levels for any remaining variables.

[18] Despite the different criteria used, it is commonly noted in the literature that Freedom House and Polity scores are highly correlated. For our sample, the correlation is (−)0.89.

Appendix A. Country list and years in the main sample

Country	1985	1995	1999	Country	1985	1995	1999	Country	1985	1995	1999
Albania	x	x	x	Guinea-Bissau		x	x	Panama	x	x	x
Algeria	x	x	x	Guyana	x	x	x	Papua New Guinea	x	x	
Angola		x		Haiti	x	x	x	Paraguay	x	x	x
Argentina		x	x	Honduras	x	x	x	Peru	x	x	x
Armenia	x	x	x	Hungary	x	x	x	Philippines	x	x	x
Australia	x	x	x	Iceland	x	x	x	Poland		x	x
Austria	x	x	x	India	x	x	x	Portugal	x	x	x
Bahamas	x			Indonesia	x	x	x	Romania		x	x
Bahrain	x			Iran	x	x	x	Russia		x	x
Bangladesh	x	x	x	Ireland	x	x	x	Saudi Arabia	x		
Belarus			x	Israel	x	x	x	Senegal	x	x	x
Belgium	x	x	x	Italy	x	x	x	Sierra Leone	x	x	x
Bolivia	x	x	x	Ivory Coast	x	x		Singapore	x	x	x
Botswana	x	x	x	Jamaica	x	x	x	Slovakia		x	x
Brazil	x	x	x	Japan	x	x	x	Slovenia			x
Bulgaria	x	x	x	Jordan	x	x	x	South Africa	x	x	x
Burkina Faso	x	x		Kenya	x	x	x	South Korea	x	x	x
Cameroon	x	x	x	Kuwait	x	x	x	Spain	x	x	x
Canada	x	x	x	Latvia			x	Sri Lanka	x	x	x
Chile	x	x	x	Lebanon		x	x	Sudan	x		
Colombia	x	x	x	Libya			x	Suriname		x	x
Congo, Republic	x		x	Lithuania			x	Sweden	x	x	x
Costa Rica	x	x	x	Luxembourg	x	x	x	Switzerland	x	x	x
Croatia			x	Madagascar	x	x	x	Syria	x	x	x
Cyprus	x	x		Malawi	x	x	x	Tanzania		x	x
Czech Republic		x	x	Malaysia	x	x	x	Thailand	x	x	x
Denmark	x	x	x	Mali	x	x	x	Togo	x	x	x
Dominican Republic	x	x	x	Malta		x	x	Trinidad	x	x	x
Ecuador	x	x	x	Mexico	x	x	x	Tunisia	x	x	x
Egypt	x	x	x	Moldova			x	Turkey	x	x	x
El Salvador	x	x	x	Mongolia		x	x	Uganda		x	x
Estonia			x	Morocco	x	x		Ukraine			x
Ethiopia		x	x	Mozambique	x	x	x	United Arab Emirates	x	x	x
Finland	x	x	x	Namibia		x	x	United Kingdom	x	x	x
France	x	x	x	Netherlands	x	x	x	United States	x	x	x
Gabon	x	x	x	New Zealand	x	x	x	Uruguay	x	x	x
Gambia		x	x	Nicaragua	x	x	x	Venezuela	x	x	x
Germany	x	x	x	Niger	x	x	x	Vietnam		x	x
Ghana	x	x	x	Nigeria	x	x	x	Yemen		x	x
Greece	x	x	x	Norway	x	x	x	Zaire		x	x
Guatemala	x	x	x	Oman	x			Zambia	x	x	x
Guinea		x	x	Pakistan	x	x	x	Zimbabwe	x	x	x

Appendix B. Variable descriptions and data sources

Variable	*N*	Description	Source
Groups	572	Log of (1 + the number of interest groups in a country) [does not include chambers of commerce]	World Guide to Trade Associations
Investment ratio	323	Gross Capital Formation as a percent of GDP [dependent variable]	World Bank
GDP	323	Real GDP per capita in USD (1000s)	World Bank
Government	323	Government spending as a percent of GDP	World Bank
Political rights	323	Index of relative ranking from one (best) to seven (worst) [inverted in regressions]	Freedom House
Civil liberties	323	Index of relative ranking from one (best) to seven (worst) [inverted in regressions]	Freedom House
Investment profile	323	Index of investment risk from 0 (very high risk) to 12 (very low risk)	International Country Risk Guide
Corruption	323	Index of perceived corruption from 0 (very high risk) to 12 (very low risk)	International Country Risk Guide
Year	323	Individual dummy variables for each cross section unit (=1 for 96 observations in 1985, =1 for 111 obs in 1995, =1 for 116 obs in 2000)	Constructed
Colonial	323	Individual dummy variables for most recent colonization by France (=1 for 46 obs), Portugal (=1 for 8 obs), Spain (=1 for 51 obs), UK (=1 for 103 obs)	Heckelman and Knack (2009) and CIA World Factbook
OECD	323	Dummy variable indicating OECD membership prior to 1985 (value=1 for 20 countries in each year for 60 total observations)	OECD
Polity	309	Index of the extent of regime authority from −10 (hereditary monarchy) to +10 (consolidated democracy)	Polity IV
Relative price of capital	316	Price index of investment divided by price index of GDP	Penn World Tables

(continued on next page)

Appendix B. (*continued*)

Variable	*N*	Description	Source
Political violence	312	Magnitude score of international, civil, and ethnic violence and warfare	Political Instability Task Force
Inflation	301	Domestic inflation rate	World Bank
Std. dev. of inflation	301	Standard deviation of domestic inflation rate for past 7 years	Calculated from World Bank data
Private credit	290	Domestic credit provided by banks and other financial institutions as a percent of GDP	World Bank
Black market premium	289	Log of (1 + difference between official exchange rate and black market rate)	Economic Freedom of the World (raw values courtesy of Robert Lawson)
Real interest rate	253	Lending rate adjusted for inflation	World Bank
Education	252	Average number of years of education	Barro and Lee (2001)

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