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DOES HIGH INCOME PROMOTE DEMOCRACY?

By JOHN B. LONDREGAN and KEITH T. POOLE*

INTRODUCTION

THE observation that authoritarian rule is prevalent among low-income countries, while democracy is more commonly found among wealthy countries, raises important questions about the causal relationship between regime type and income.[1] One interpretation of this regularity is suggested by Einstein's pithy remark that "an empty stomach makes a poor political advisor." From this viewpoint, democracy is simply an entailment of a high level of social and economic development. Others suggest to the contrary that the regularity does not reflect an underlying causal link. They point on the one hand to the ability of some low-income countries, such as India, to sustain democracy, albeit in a flawed version, and on the other hand to the resistance of the oil-rich monarchies of the Arabian peninsula to liberalizing constitutional reforms. According to this perspective, democratic political culture depends more on the institutional and historical context than on the level of economic development.

Important public policy decisions depend on how this question is resolved. If democracy is simply another element of social and economic development, then our policy toward countries with authoritarian regimes should embrace free trade and perhaps even foreign aid to foster the process of economic development, thereby hastening the eventual replacement of authoritarian regimes with more democratic

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[1] Seymour Martin Lipset, "Some Social Requisites of Democracy: Economic Development and Political Legitimacy," *American Political Science Review* 53 (March 1959); Phillips Cutright, "National Political Development: Social and Economic Correlates," in Nelson W. Polsby, Robert A. Dentler, and Paul A. Smith, eds. *Politics and Social Life: An Introduction to Political Behavior* (Boston: Houghton Mifflin, 1963); Robert A. Dahl, *Polyarchy* (New Haven: Yale University Press, 1971); Ross E. Burkhart and Michael S. Lewis-Beck, "The Economic Development Thesis," *American Political Science Review* 88 (December 1994); Adam Przeworski et al. "What Makes Democracies Endure?" *Journal of Democracy* 7 (January 1996).

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successors. By contrast, if democracy is not a by-product of economic and social development, promoting free trade may not be the route to free elections. From this perspective, democracies might do well to consider imposing various forms of conditionality in their trading relationships, requiring the observance of democratic political norms as a condition for free trade and foreign aid.

The robust regularity that wealthy countries tend to be more democratic than poor ones is not by itself enough to resolve this debate. Skeptics concede the empirical regularity but attribute its occurrence to other, hard-to-measure aspects of a country's historical background and political culture, such as the existence of democratic institutions and a history of democratic government. Not only are these variables difficult to measure, but if the skeptics are right, they are also sufficiently collinear with income to have produced the appearance that democracy is an entailment of a high level of economic development.

In this paper, we use statistical techniques to discriminate between these hypotheses. We construct and estimate a statistical model that allows for the joint endogeneity of the change of leaders and the change of regime type. This is important because national leaders are often replaced when regimes liberalize (as when effective executive power passes from a king to a prime minister) or become more authoritarian (as when an elected president is overthrown by a military junta). We also control for various aspects of the institutional environment, including biographical information about leaders. In addition, we include measures of economic performance and take account of unchanging aspects of the countries in our sample, such as the identity of the former colonial power, using country-specific "fixed effects."

We find that even after (1) correcting for various measures of the political context, (2) allowing for the simultaneity of leadership change and regime type, and (3) correcting for country-specific fixed effects, income has a small but statistically significant democratizing effect. The finding that a high level of economic development has stronger democracy-promoting effects in the European countries than in the remainder of the sample also survives the inclusion of our many controls.[2] However, even when we exclude the European countries plus the affluent European-settled former British colonies of Australia, Canada, New Zealand, and the United States, the democracy-promoting effect of income remains statistically significant, though it declines in magnitude.

Although we find the effect of income in promoting democracy is

[2] Burkhart and Lewis-Beck (fn. 1).

robust to the inclusion of a multitude of controls, the estimated magnitude of the democracy-promoting impact of income is not large. Even a permanent doubling of income leads to a fairly modest predicted movement toward democracy. We offer this as a benchmark against which other strategies of promoting democracy should be measured. For example, if trade sanctions could be shown to produce a substantial liberalization in the target country within a few decades, they would merit serious consideration as an alternative to a policy of promoting democracy by promoting economic growth in countries under authoritarian rule. We test Linz's hypothesis that parliamentary rule tends to solidify democracy.[3] While our coefficient estimate has the positive sign implied by Linz's hypothesis, we find the link to be only marginally statistically significant.

Our evidence highlights the distinction between instability of regime type and high rates of change among leaders. We find that rates of leadership change rise with the level of democracy. Even controlling for the level of democracy, prime ministers lose power at a higher rate than other leaders, while leaders with military backgrounds hold on to power longer than their civilian counterparts. We find that the probability of a leader losing power rises with the time the leader has spent in office, even after controlling for the requirements stipulated in many constitutions that limit the amount of time a leader can remain in power without new elections. This extends a similar finding by King et al.,[4] who focused on cabinets in parliamentary democracies, to a much wider set of national leaders. Our finding of exit risks that rise through time runs counter to a finding by Bienen and van de Walle, who emphasize the importance of leaders becoming more expert manipulators of the political process as they remain in office.[5] With the passage of time national leaders' support coalitions fray and atrophy even as the leaders themselves learn more about how to manage the resources of power to remain at the helm. Our finding of a rising probability of losing power suggests that the risk-enhancing effect of fraying coalitions outweighs the learning effects highlighted by Bienen and van de Walle. Our finding is robust to the inclusion of a control for the leader's age, which we also find increases a leader's risk of losing office.

[3] Juan Linz, *The Breakdown of Democratic Regimes: Crisis, Breakdown, and Reequilibration* (Baltimore: Johns Hopkins University Press, 1978).

[4] Gary King et al., "A Unified Model of Cabinet Dissolution in Parliamentary Democracies," *American Journal of Political Science* 34 (August 1990).

[5] Henry Bienen and Nicolas van de Walle, *Of Time and Power* (Stanford, Calif.: Stanford University Press, 1991).

We find that the well-known effect of economic performance on the political fortunes of leaders in North America and Western Europe applies elsewhere.[6] Our finding that the probability that a leader will lose power declines with the rate of economic growth is robust to the exclusion of the European and North American countries, and to the use of income rather than per capita energy consumption to measure the level of economic development. Instead of becoming weaker, the estimated effect of economic growth on the leader's political fortunes is actually higher in the non-European subsample.

In the next section of the paper we discuss our data, while Section II (which nontechnical readers may prefer to skim) presents the statistical model we use to analyze regime change and leadership transition. Results for this model appear in Section III. Section IV briefly discusses our findings on leadership exit; and our conclusions appear in Section V.

I. The Data

Our analysis calls for a reliable measure of regime type, for biographical information about leaders, for various additional measures of the institutional environment, and for systematic data on economic conditions. Accordingly, we combine data from a variety of sources, as well as collecting some of our own measures.

Measuring Regime Type

Essential for our analysis is a reliable measurement of democracy. Calibrating the degree to which regimes are democratic is the subject of a vast and active literature. Controversy surrounds the precise list of criteria that should be used in evaluating how democratic (or authoritarian) countries are. Some emphasize reliance on objective measures, such as voter turnout and national leaders' winning electoral margins.[7] Others note that such measures are prone to confuse democracy with other things. For example, low voter turnout, interpreted by Vanhanen as an indication of limited suffrage, may also result from heavy rainfall or a (democratic) decision not to penalize nonvoters.[8] Yet the use of more

[6] Robert Erikson, "Economic Conditions and the Presidential Vote," *American Political Science Review* 83 (June 1989); Michael S. Lewis-Beck and Tom W. Rice, "Forecasting Presidential Elections: A Comparison of Naive Models," *Political Behavior* 6, no. 1 (1984).

[7] Tatu Vanhanen *The Emergence of Democracy* (Helsinki: Societas Scientiarium Fennica, 1984); idem; *The Process of Democratization* (New York: Crane Russak, 1990).

[8] Kenneth A. Bollen, "Political Democracy: Conceptual and Measurement Traps," in Alex Inkeles, ed., *On Measuring Democracy* (New Brunswick, NJ: Transaction, 1991).

subjective measures may lead evaluators inadvertently to incorporate their own political biases in the evaluation of countries' regime types.

Many analysts incorporate stability in their definition of democracy, requiring a history of sustained democracy for a country to be coded as "democratic."[9] We agree with Bollen that this confuses two interesting but distinct concepts: the level and the persistence of democracy.[10] Some analysts categorize countries as being either "democratic" or "not democratic," while others use finely graded scales that treat the regime-type variable as essentially continuous.

Some of the most careful analyses are conducted for a cross section of countries for a single year,[11] while others report results for a small number of reference years.[12] Other results are only available on an annual basis for the past decade or two.[13] Perhaps the most comprehensive effort at measuring democracy is that of Gurr, who measures various aspects of regime type on an annual basis for a broad cross section of countries over the period 1800–1986.[14]

Gurr reports two measures of particular interest. His democracy measure, DEMOC, is a composite of underlying variables that measure the competitiveness of political participation and executive recruitment, the openness of executive recruitment, and the level of constraint on the chief executive. The second measure, AUTOC, geared toward discriminating among authoritarian regimes, is a composite of the same measures, with the addition of a variable that gauges the degree to which political participation is regulated. Because the democracy measure is designed to discriminate between democracies and near democracies, it accords points only to the democratic ends of the underlying scales, while the authoritarian scale registers points only at the lower ends of the scales.

By combining Gurr's measures of democracy and authoritarianism, we can recover more information about the entire range of regime types than is provided by either scale individually. Thus we create a 21-point measure of government type, GOVTYPE, which is defined as the difference between Gurr's two variables:

$$\text{GOVTYPE} = \text{DEMOC} - \text{AUTOC}.$$

[9] Lipset (fn. 1).
[10] Bollen (fn. 8).
[11] Dahl (fn. 1).
[12] Bollen (fn. 8).
[13] Raymond Duncan Gastil "The Comparative Survey of Freedom: Experiences and Suggestions," in Inkeles (fn. 8).
[14] Ted R. Gurr *Polity II: Political Structures and Regime Change, 1800–1986* (Computer File 9263) (Ann Arbor, Mich.: Inter-University Consortium for Political and Social Research, 1990).

The values on the underlying scales that contribute points to the DEMOC measure do not contribute points on the AUTOC scale, nor do categories according higher points on the AUTOC measure gain points on the DEMOC scale. Therefore the scales do not contain redundant information. Gurr's executive recruitment scale, for example, has four categories: regimes in the "closed" and "designation" categories gain a point on the AUTOC scale, and no points on the DEMOC scale, while regimes in the two electoral categories score a point on the DEMOC scale and no points on the AUTOC scale.

As has been noted elsewhere, democracy measures devised by different analysts tend to be highly correlated.[15] Table 1 presents correlations between our measure of government type, derived from Gurr, and several other measures. Bollen used a 100-point scale, with higher values corresponding to greater levels of democracy. In contrast, Gastil uses 7-point scales to measure civil and political rights, with 1 corresponding to the greatest level of freedom and 7 to the lowest. Gastil also reports a 13-point measure of freedom, which is simply the sum of his political and civil rights scales, running from 2 to 14. Gastil's measures were designed to permit comparison across countries in terms of differences in the government's respect for human rights, but his political rights scale takes account of the same considerations built into others' democracy measures. Gastil[16] and Poe and Tate[17] note that there is a close empirical association between respect for personal freedoms and regime type. Working with a 1985 cross section, Coppedge and Reinicke classify regimes along an 11-category polyarchy scale, built up from a portfolio of underlying measures, with the most democratic category corresponding to a value of "0", and the least to a classification of "10".[18]

Table 1 reveals high positive correlations between the government type measure we use and Bollen's essentially continuous scale among the countries for which we were able to obtain both measures. This is true for both the 1960 and 1965 cross sections reported by Bollen.[19] Using a cross section of countries for 1978, we find a strong negative correlation between our Gurr-based measure of government type (which assigns higher values to more democratic regimes) and all three

[15] Vanhanen (fn. 7, 1990).

[16] Gastil (fn. 13).

[17] Steven C. Poe and C. Neal Tate, "Repression of Human Rights to Personal Integrity in the 1980's: A Global Analysis," *American Political Science Review* 88 (December 1994).

[18] Michael Coppedge and Wolfgang H. Reinicke "Measuring Polyarchy," in Inkeles (fn. 8).

[19] Bollen (fn. 8).

TABLE 1
CORRELATIONS OF OUR REGIME-TYPE MEASURE WITH OTHER RATINGS

Rating		*Year*	*Correlation*
Bollen		1960	0.81
Bollen		1965	0.83
Gastil	political rights	1978	−0.89
	civil rights	1978	−0.85
	freedom	1978	−0.88
Coppedge & Reinicke		1985	−0.89

of Gastil's measures (which associate low values with greater freedom). We also find high negative correlations with Coppedge and Reinicke's polyarchy scores (like Gastil's measures, these assign higher values to more repressive regimes). Vanhanen reported similarly strong correlations between his measures and those of Gastil and of Coppedge and Reinicke.

If Bollen's more continuous scale were available on an annual basis throughout our sample period, we would be predisposed to use it. However, there is a great advantage of being able to trace year-to-year changes using the Gurr-based scale. It permits us to work with a much larger data set and to correct for country-specific fixed effects in ways we could not if our attention were restricted to only one or two annual cross sections. Accordingly, we work with our Gurr-based measures while noting that the high, if imperfect, correlations with other measures suggest, but do not prove, that we would obtain qualitatively similar results if we were able to work with annual versions of some of the other scales.

The 21-point GOVTYPE scale is nearly continuous. However, because it has a "floor" of -10, and a "ceiling" of 10, we need to be careful not to use a statistical mode that predicts values outside this range. A standard way to ensure this does not happen is to apply a logistic transform to the variable. Let S denote a score on the 21-point scale. Take the following variant of the logit transform of S:

$$T(S) = ln(S+10.5) - ln(10.5 - S).$$

This converts scores to a truly continuous scale.[20] A value of S at 10.5 would correspond to a T(S) of ∞, an S of −10.5 to a T(S) at −∞, while a value for T(S) of 3.71 corresponds to a regime type of 10.

[20] Robert S. Pindyck and Daniel L. Rubenfeld, *Econometric Models and Economic Forecasts* (New York: McGraw-Hill, 1991).

In extreme cases of civil war and foreign invasion, the political environment is in a chaotic state of flux, and Gurr classifies these transitions separately. In these cases, the government, let alone its type, is of a highly uncertain nature. We include a regime transition variable that codes expressly for transition periods. During these periods the government type variable is set to 0 and the regime transition variable equals 1. At all other times the regime transition variable is set equal to 0.

Biographical Information about National Leaders

An important source of our data on leaders is the comprehensive catalog compiled by Bienen and van de Walle.[21] Their data set includes information on 2,258 different leadership spells across more than 100 countries. While they cover some Latin American countries from the early nineteenth century onward, their coverage is nearly universal for the period since the end of the Second World War, with more recently independent countries included from their first leader onward. These data include objective biographical variables, such as the year the leader assumed power, the leader's age, and (for leaders not still in power in 1987) the year the leader lost power. They also code for leaders with substantial military backgrounds and characterize the means by which the leader attained power.

While our regime-type data from Gurr are reported annually (as are the economic data we use), leaders gain and lose power on a much more flexible schedule. During times of flux it is common for a country to have multiple leaders in a given calendar year. Because our interest is in merging our analysis of leadership change with our analysis of regime change, we convert the data in the leadership data set to an annual basis. With each annual observation for a given country we match the fate of the first leader to hold power during a given year. Except in unusual circumstances, such as the first year of independence, this is the leader who holds power at 12:01 A.M. on New Year's Day. This rule has the advantage of always coding an exit when one occurs. Other options could miss at least some years with exits. For example, using the leader who spends the most time in power would treat years whose only exit occurred before midyear as years without exits.

In the course of gathering data on some of our other variables, we discovered a few cases, mostly in Latin America, of leaders who had been missed and of entry and exit dates that needed correction. These changes are incorporated in our analysis.

[21] Bienen and van de Walle (fn. 5).

Bienen and van de Walle systematically record leaders' ages at coming to power. We use this to infer the leader's age during each year he continues to hold power. We also trace the number of years the leader has already spent in power. This variable has been variously interpreted by researchers. Some have found it to be important in predicting exit, with some finding "negative duration dependence," implying that leaders' exit probabilities decline with their time spent in power.[22] Others report that leaders' exit risks actually rise over time, once other factors have been controlled for.[23] Negative duration dependence may stem from learning by doing as more-experienced leaders learn to overcome threats to their continued hold on power and consolidate their support networks. The increasing risk of cabinet dissolution found by King et al. may stem from the progressive decay of legislative coalitions as their very successes weaken at least some members' need to continue the coalition.

Bienen and van de Walle code for whether a leader's primary career background was in the military. Most such leaders seized power with the backing of the armed forces, but there are exceptions. Dwight Eisenhower is coded as military because his primary career prior to assuming the presidency was in the military. By contrast, Eisenhower's successor, John Kennedy, is not coded as military, despite his having served in the armed forces, because his career prior to becoming president was primarily civilian.

Another interesting variable reported by Bienen and van de Walle identifies leaders who seized power by nonconstitutional means. Needless to say, this variable is correlated with our regime-type variable. None of the leaders classified as "democratic" using our Gurr-based codes were coded by Bienen and van de Walle as nonconstitutional. We emphasize that Bienen and van de Walle's constitutional/nonconstitutional dichotomy does not measure democracy: they code the brutal Duvalier regime in Haiti as "constitutional" on the technical grounds that the Duvaliers came to power under the preexisting system. Yet even though it does not measure democracy, Bienen and van de Walle's nonconstitutional rule variable does tell us something about the institutional framework within which a leader operates, so we include it in our analysis.

Other Measures of the Institutional Context

In addition to the leader variables coded by Bienen and van de Walle, we gathered information about when democratic (and semidemocratic)

[22] Ibid.
[23] King et al. (fn. 4).

leaders needed to renew their terms. For presidents this was simply the number of years remaining until the end of the current term, while for prime ministers, it was the time remaining in what King et al.[24] call the constitutionally mandated interelection period (CMIP), that is, the maximum amount of time the prime minister may serve until he or she must call a new election. We collected this variable for all leaders of regimes classified as –3 or higher using our 21-point scale of government types. The clock was restarted at each new election. We also altered the "time remaining" variable when constitutional reforms or special legislation led to changes in the CMIP within the same country, for example, the 1973 extension by four years of Finnish president Kekkonen's term of office.

We derived an "end-of-term" variable from our CMIP data; it was equal to 1 for leaders subject to a CMIP whose CMIP was scheduled to expire during the year in question. This end-of-term variable is set equal to 0 for all other leaders, including those who are not subject to a CMIP. We include these CMIP and end-of-term variables because we believe they provide important information about the pressures on leaders to leave office.

In addition, to allow for the possibility that a legally imposed CMIP changes a leader's underlying probability of losing power, relative to leaders who held power without such a constraint, we include a variable that equals 1 if the leader has a CMIP and 0 otherwise.

We code for prime ministers with a variable that equals 1 for national leaders whose title is prime minister and 0 otherwise. Authoritarian leaders seldom style themselves as prime ministers, although Thailand has provided some exceptions to this rule. We include this variable as an indicator for parliamentary regimes in an effort to learn more about whether parliamentary regimes are more stable than democratic presidential systems, holding constant the level of democracy, a position taken by Linz and recently questioned by Shugart and Carey.[25] We also expect the prime ministership variable to provide information about the leader's risk of losing power, as prime ministers' support coalitions always have the theoretical option of a vote of no confidence, whereas the constitutional measures that can be taken to remove a president before the end of his or her allotted term are often cumbersome.

[24] Ibid.

[25] Linz (fn. 3); Matthew Soberg Shugart and John M. Carey, *Presidents and Assemblies: Constitutional Design and Electoral Dynamics* (New York: Cambridge University Press, 1992).

Measuring Economic Conditions

Our economic data come from Summers and Heston, who provide annual economic data for over one hundred countries during the interval 1950–88; however, for most countries, only a subinterval of the thirty-nine-year sample frame is available.[26] These estimates of income were constructed with considerable sensitivity to the cross-cultural differences in lifestyle that impede the comparison of incomes across time and between countries. Real incomes are reported in 1985 U.S. dollars, with separate price deflators for consumption, investment, and government spending. This approach provides a more reliable indicator of real income than could be obtained by using a single price deflator.

We include in our analysis the log of the previous year's per capita income, the current rate of income growth, and the previous year's income growth rate. We chose not to work solely with the current level of income because we want to allow for the possibility that the level and growth rate of income have distinct effects. For example, rapid growth might forestall a military coup d'état even as low income makes a power seizure more likely. By separating the previous year's income from the current growth rate, we allow our estimator to treat these two effects asymmetrically. If this were unnecessary, so that income had the same effects whether it represented an increase or a decline from the previous year, the coefficients should be identical. Our analysis permits the growth rate and the lagged income level to have different regression coefficients, but it does not force these coefficient estimates to differ.

Coping with Omitted Variables

We have gone to some lengths to control for various features of the political environment, including among our explanatory variables not only the status quo level of democracy but also measures for leaders who seized power, leaders with military backgrounds, and the amount of time the leader has been in power. We code for parliamentary rulers and constitutionally mandated interelection periods; our measures take account of periods of uncertainty and transition, such as civil war, and we even include data on the age of the national leader. We are, however, under no illusion that we have incorporated all of the relevant variables in our analysis. We are convinced that there are hard-to-measure aspects of political culture that nevertheless play an important role

[26] Robert Summers and Alan Heston, "The Penn World Table (Mark5): An Expanded Set of International Comparisons, 1950–1988," *Quarterly Journal of Economics* 106 (May 1991).

in determining a country's level of democracy. Spain's democracy, for example, has surely been weakened by an active and often violent ethnic separatist movement but also strengthened by a royal family willing to put its prestige on the line against attempted military takeovers.

The list of intangible variables that affect regime type is a long one. While these intangibles vary greatly across countries, in many cases they change little or not at all during our sample period within particular countries: historical experience with colonial governments is undoubtedly important in sub-Saharan Africa, where the very national borders reflect nineteenth-century jurisdictional boundaries and often divide linguistically and culturally homogeneous groups. Likewise, colonial education policy, road building, and bureaucratic procedures have all left their mark on sub-Saharan Africa. Ethnic fractionalization and the distribution of income and control over resources among ethnic groups are also likely to have considerable bearing on the success of democratic institutions. By not including these factors that are likely to affect regime type and the strength of leaders' grasp on power, we risk what is known as "omitted variables bias" in our remaining coefficient estimates. It is to just such omitted variables bias that skeptics attribute the positive coefficient on income in regressions explaining countries' levels of democratization.

For some of the most important omitted variables in our regime-type equation all or most of the variation is between countries, so that by using fixed-effect estimators we can protect our parameter estimates from bias due to the omitted variables. Fixed-effect estimators use a country's own history to control for cultural and historical influences on regime type and leadership change. Thus, Argentina's relatively democratic government in 1983, which scores 5 on the government-type scale, is evaluated relative to that country's mean government type of −3.59 for the sample period (various years of military government scored −9). This approach is equivalent to including a Netherlands variable, a Thailand variable, and a variable for each of the countries in our analysis. We thereby allow each country's individual cultural and historical context to have a unique effect on the country's tendency toward democratic government. This permits us to disentangle the effects of the variables we measure and include in our analysis (for example, income) from the various country effects.[27] We find that country-specific controls are very important and have a significant impact upon our results.

[27] John Londregan, Henry Bienen, and Nicolas van de Walle, "Ethnicity and Leadership Succession in Africa" *International Studies Quarterly* 39 (March 1995).

The impact of ethnic fractionalization on a country's tendency to be democratic or authoritarian is a subject of keen interest. However, for many countries measures of ethnic fractionalization are only available for a single year.[28] Moreover, absent major cross-border refugee dislocations, ethnic fractionalization changes only slowly over the course of generations and is practically unchanged from one year to the next. Including country-specific fixed effects in our model controls for this slow-changing but important variable as effectively as would the alternative of using the cross section of observations gathered by Bruk and Apenchenko. One way to go further in exploring the effects of ethnicity is to incorporate information on the national leader's ethnicity relative to the ethnic fractionalization of the country. The national leader's ethnicity, and hence his position relative to the ethnic divisions within the country, often changes with the succession of leaders.[29] This effect remains even after controlling for country-specific fixed effects. Assembling ethnic data on national leaders for the entire sample is an important challenge for future work.

The Sample

Because countries that experience no changes in leaders provide us with no information about the influence of our explanatory variables on leader exit once we have controlled for the country-specific fixed effects, we exclude them from the data set. This point is discussed in greater detail below. We also omit the former Eastern bloc countries from our sample, as we suspect that the quality of the economic data for these countries during our sample period, which ends in 1985, is highly questionable, and we would not want anomalies in the data for these countries to drive our results.

Once we have matched data from the various sources—Gurr's regime-type data which end in 1985, the Summers and Heston economic data which limit us to the period after 1952, Bienen and van de Walle's leader data, and our own data on leader characteristics and constitutionally mandated interelection periods—we are left with 2,798 usable observations for the thirty-four-year time interval from 1952 through 1985. In each case the basic unit of observation is the country/year. Thus, Denmark in 1968 is treated as a separate data point from both Algeria in 1968 and Denmark in 1971. Our data encompass

[28] S.I. Bruk and V.S. Apenchenko. "Ethnic Composition of the World's Peoples," in *Atlas of the World's Peoples* (Moscow: Institute of Ethnography, 1964).

[29] Londregan, Bienen, and van de Walle (fn. 27).

one hundred countries, with an average of twenty-eight observations per country. Included are countries from Western Europe, Latin America and the Caribbean, sub-Saharan Africa, the Middle East, and Asia.

Summary statistics for our data set appear in Table 2. The average exit rate of 0.17 for leaders in our sample corresponds to about one exit every six years. For a typical country/year in our data set the leader is fifty-six and a half years old and has been in power for nearly five years. This does not contradict the exit rate of once every six years because leaders with long spells contribute more annual observations to the sample than their shorter-term counterparts.

The median value of our transformed government-type measure, GOVTYPE, is 0, exactly in the middle of the observed range for this variable [−3.71, 3.71]. Leaders who themselves came to power nonconstitutionally comprise fully a quarter of our observations. This of course does not include the leaders who assumed power under the rubric of an authoritarian "constitution" put in place by a predecessor who seized power: perhaps this is part of the reason almost a third (31 percent) of the leaders in our data set had military careers.

However, many of our leaders (49 percent of the sample) were subject to some form of constitutionally mandated interelection period, and for 29 percent of our sample the national leader was a prime minister. The mean time remaining in power for the leaders subject to constitutionally mandated interelection periods was just over two years, with a maximum of seven years. For 16 percent of the observations in our sample for which the leader was subject to a CMIP (or fixed term), the CMIP was scheduled to expire during the current year.

The average annual growth rate in real per capita incomes in our sample was 2.1 percent, ranging from Iraq's dramatic 52 percent annual decrease in 1981 during that country's bloody war with Iran, to Uganda's 48 percent growth rate for 1982, when it's draining civil war came to a temporary end. The average value for the log of per capita income in our sample is 7.72, corresponding to a geometric mean of $2,223 per capita. The log of per capita income ranges from a minimum of 5.04 ($154 in Uganda during 1980) to a maximum of 10.76 ($47,191 for Kuwait during 1966). Kuwait and some of the other small kingdoms of the Arabian Peninsula report very high per capita incomes with massive oil revenues in the numerator and a small number of citizens in the denominator (and an even smaller number sharing in the bounty). However, most of the high-income observations in our sample are for the industrial economies of Western Europe and the former English colonies of Australia, Canada, New Zealand, and the United States.

TABLE 2
SUMMARY STATISTICS

Variable	*Mean*	*Standard Deviation*	*Minimum*	*Median*	*Maximum*
Leader exits	0.17	0.37	0.00	0.00	1.00
Government type	0.56	2.39	−3.71	0.00	3.71
Transition	0.02	0.14	0.00	0.00	1.00
Nonconstitutional leader	0.25	0.44	0.00	0.00	1.00
Leader is a prime minister	0.29	0.45	0.00	0.00	1.00
Leader had a military career	0.31	0.46	0.00	0.00	1.00
Time since leader came to power	4.82	5.36	0.00	3.00	30.00
Leader has a CMIP[a]	0.49	0.50	0.00	0.00	1.00
Time remaining in leader's CMIP[b]	2.04	1.39	−1.00	2.00	7.00
Leader's CMIP expires this year[b]	0.17	0.37	0.00	0.00	1.00
Leader's age	56.50	11.14	20.00	56.00	89.00
Current economic growth rate	0.02	0.06	−0.52	0.02	0.48
Ln (per capita income)	7.72	1.01	5.04	7.68	10.81
Lagged economic growth rate	0.02	0.06	−0.52	0.02	0.48
N = 2,798					

[a] CMIP signifies "constitutionally mandated interelection period"; see the text for more details.
[b] These statistics are calculated for the subset of leaders subject to constitutionally mandated interelection periods.

The raw correlation in our data between government type and our measure of the log of the previous year's per capita income level is 0.56. At first glance our data confirm the observation that wealthy countries tend to be democratic. In the next section we develop a statistical model that helps us to disentangle the causal web linking high incomes and democratic regimes.

II. MODELING REGIME CHANGE

We model regime change using our 21-point scale, based on the difference between Gurr's DEMOC and AUTOC measures. Many regime changes also involve a change of leaders—with coups d'état and revolutions changing heads of state along with the institutional framework. To avoid confusing the causes of these two distinct forms of political change, it makes sense to model them as jointly determined and interacting processes. This is done using a latent variables approach. Let z_{it} denote the latent leader-change variable for country i during year t, while $GovType_{it}$ is the regime type variable for country i during year t. We assume these variables emerge from the following process:

$$z_{it} = \vec{x}_{it}'\vec{\beta} + u_{it} \tag{1}$$

$$y_{it} = \vec{a}_{it}'\vec{\alpha} + v_{it} \tag{2}$$

where the $\vec{x}_{it}$ and $\vec{a}_{it}$ vectors contain explanatory variables (including an intercept term in each). We will observe a leader change, δ_{it}, if $z_{it} > 0$, and no change of leaders, $\delta_{it}=0$, if $z_{it} < 0$. Recalling our discussion in the previous section, we work with $y_{it} = T(GovType_{it})$ to prevent our model making logically inconsistent predictions beyond the bounds of our 21-point regime-type scale.

To take account of the simultaneity of the process we allow for correlation between u_{it} and v_{it}, which we take to be normally distributed. The formulation for equation 1 is standard for probit models, except that in this case we allow for correlation between u_{it} and the residual for equation 2. We make the arbitrary but standard assumption that the variance of u_{it} is equal to 1, while we estimate both the correlation between u_{it} and v_{it} and the variance of v_{it}.

The log-likelihood function is given by:

$$l = \sum_{i=1}^{N}\sum_{t=1}^{T_i}\delta_{it} ln\Phi((\vec{x}_{it}'\vec{\beta} - \frac{\rho}{\sigma}y_{it} + \frac{\rho}{\sigma}\vec{a}_{it}'\vec{\alpha})/\sqrt{1-\rho^2})$$

$$+ \sum_{i=1}^{N}\sum_{t=1}^{T_i}(1-\delta_{it}) ln\Phi((-\vec{x}_{it}'\vec{\beta} + \frac{\rho}{\sigma}y_{it} - \frac{\rho}{\sigma}\vec{a}_{it}'\vec{\alpha})/\sqrt{1-\rho^2})$$

$$- \frac{N^*}{2}(ln(2\pi) + ln(\sigma^2)) - \frac{1}{2}\sum_{i=1}^{N}\sum_{t=1}^{T_i}(y_{it} - \vec{a}_{it}'\vec{\alpha})^2 \tag{3}$$

where $\Phi(z)$ is the cumulative density function for the standard normal distribution. In this setting, incorporating fixed effects means including country-specific indicator variables in $\vec{x}_{it}$ and $\vec{a}_{it}$. This creates a problem for countries such as Côte d'Ivoire and Zambia, which report no leadership changes within our sample period. For these countries the maximum likelihood fixed-effects estimates do not exist. This is because the algorithm attempts to attribute all of the lack of observed leadership changes in these countries to the country-specific effects, and accords no influence to the other variables in the analysis. Mathematically this corresponds to a fixed effect of $-\infty$. Since all of the effect is attributed to the country, and none to our other explanatory variables, no information about leadership exit is lost by excluding these no-exit countries from our analysis.

While the parameter estimates from the regime-type equation pertain to the logistic transform of our measure of government type, the impact multipliers for the original 21-point scale are easy to calculate (see the appendix for details).

Because our regime-type model includes the regime type of the previous period among the explanatory variables, we can rewrite equation 2 as:

$$\begin{aligned} y_{it} &= \vec{a}_{it}^{0\prime}\vec{\alpha}^{0} + \gamma y_{it-1} + v_{it} \\ &= \vec{a}_{it}^{\prime}\vec{\alpha} + v_{it} \end{aligned} \tag{4}$$

where $\vec{a}_{it}^{\prime} = (\vec{a}_{it}^{0\prime}, y_{it-1})$ and $\vec{\alpha}^{\prime} = (\vec{\alpha}^{0\prime}, \gamma)$. If there is a sustained change in one of the explanatory variables, say variable j shifts from a_{jit} to $a_{jit} + \Delta$, the effect on y_{it} will grow over time. The immediate impact will be $\alpha_j\Delta$. However, in the next period, not only will the value of variable j have changed by Δ, but the lagged value of y will be shifted by $\alpha_j\Delta$. Thus, the total effect on y_{it+1} of a permanent change of Δ in variable j that began in period t will be $\alpha_j\Delta(1 + \gamma)$. Over time the net effect will grow toward a limit of π_j:

$$\begin{aligned} \pi_j &= \alpha_j\left(\sum_{t=0}^{\infty}\gamma^{t}\right)\Delta \\ &= \frac{\alpha_j}{1-\gamma}\,\Delta. \end{aligned}$$

The approximate standard error of this estimated long-run impact can be calculated as:

$$\sigma(\hat{\pi}_j) = \sqrt{\frac{(1-\gamma)^2\sigma_{\alpha_j\alpha_j} + 2\alpha_j(1-\gamma)\sigma_{\alpha_j\gamma} + \alpha_j^2\sigma_{\gamma\gamma}}{(1-\gamma)^4}}.$$

Notice that when the covariance between $\hat{\alpha}_j$ and $\hat{\gamma}$ is negative we may obtain a more precise estimate of the long-run impact for variable j than we do for either α_j or for γ.

III. Results on Regime Change

We saw in Section I that there is a large positive correlation in our data between democracy and per capita income. The model we developed in Section II can now be used to help us sort out whether this relationship is robust to controlling for our other measured variables, for country-specific fixed effects, and for the simultaneity of leadership change and changes in regime type. We work with the logistic transform of the variable to prevent logically inconsistent out-of-sample predictions.

Column 3 of Table 3 reports parameter estimates for the regime-type equation, while column 5 reports estimated long-run impacts of permanent changes in the associated variables. Country-specific fixed effects were included in the specification, but to save space the fixed-effect coefficients are not reported in Table 3. From the standpoint of estimating the effects of our measured variables, the country-specific fixed effects are nuisance parameters. While we must control for them, since a likelihood ratio test for their exclusion leads to rejection at all standard significance levels, they are not central to our analysis.

To our surprise these estimates do not reveal a significant correlation between the residual term for the leadership change equation and the residual to the regime-type equation. A sudden decline in the national leader's political fortunes does not threaten the status quo democracy, nor does it undermine any authoritarian tendencies the government might have, after correcting for our other explanatory variables.

A detailed picture of leadership exit is afforded by the parameter estimates reported in Table 3, column 1. These estimates emerge as a by-product of our analysis, and we defer our discussion of them until the next section in order to maintain our focus on the determinants of regime type, especially the role played by economic development.

Democracy and the Institutional Context

The regime-type equation reported in column 3 of Table 3 reveals a high degree of serial persistence in our government type variable, with the status quo regime type (also transformed using the logistic function) earning a coefficient of 0.848. Relative to its estimated asymptotic standard error of 0.014, this coefficient corresponds to a t-statistic of 59.12, indicating significance at all standard significance levels. The coefficient for transition periods of 0.197 corresponds to a t-statistic of 2.83, which is significant at $\alpha = 0.01$. Interpreting this coefficient requires some caution, as the status quo regime type is set equal to 0 (and

TABLE 3
GOVERNMENT TYPE AND LEADERSHIP CHANGE

Independent Variables	*Leader Exit* Coeff. Est.	*Leader Exit* Std. Err.	*Regime Change* Coeff. Est.	*Regime Change* Std. Err.	*Regime Change* Sust. Impact	*Regime Change* Std. Err.
Status quo government type (logistic scale)	0.192	0.047	0.848	0.014	—	—
Transition	0.404	0.209	0.197	0.069	—	—
Nonconstitutional leader	−0.031	0.139	0.020	0.040	0.131	0.095
Leader is a prime minister	1.067	0.312	0.221	0.086	1.453	0.812
Leader had a military career	−0.346	0.124	0.093	0.036	0.611	0.178
Time since leader came to power	0.018	0.009	−0.004	0.002	−0.029	0.094
Leader has a CMIP	−0.396	0.213	−0.020	0.063	−0.130	0.132
Time remaining in leader's CMIP	−0.152	0.046	−0.017	0.013	−0.112	0.095
Leader's CMIP expires this year	0.977	0.146	−0.027	0.045	−0.177	0.108
(Leader's age)/10	0.259	0.044	0.011	0.012	0.075	0.945
Current economic growth rate	−1.548	0.608	−0.305	0.161	−2.011	2.131
Ln (per capita income)	0.022	0.115	0.119	0.032	0.783	0.179
Lagged economic growth rate	−0.182	0.600	−0.027	0.156	−0.177	0.202
ρ	0.015	0.030				
N = 2,798; Log-Likelihood = −2830.46						

hence so is its logistic transform) for transition years. Thus, a period of transition may be expected to end in a more democratic government only for status quo regimes in the lower half of the scale. For the remainder, civil war and other major disruptions are likely to leave less democratic governments in their wake.

Interesting evidence pertaining to Linz's hypothesis that parliamentary regimes are more "stable" than presidential democracies is found in the significant coefficient for our prime minister variable. These estimates suggest that countries led by prime ministers have a greater tendency to preserve democracy. Greater understanding of the effects of this variable can be had by noting that, according to our estimates, switching to a parliamentary government raises the expected logit transform of a regime's democracy rating by 0.221. If the government remains parliamentary in the subsequent period, the democracy score is expected to rise by 0.221 because of the direct effect of having a parliamentary regime, plus 0.848 times the 0.221 increase in this year's democracy score. The net increase would thus be $0.221 + 0.848 \cdot 0.221 = 0.4084$. The estimated eventual effect of a sustained shift to parliamentary government is

$$0.221 \cdot \sum_{k=0}^{\infty} 0.848^k = 0.221/(1 - 0.848) = 1.453$$

(see the estimated sustained impact in column 5). This says that a country at the sample median score of 0—for example, the Dominican Republic in 1960—that switches to a parliamentary system would be expected eventually to move upward to a rating of about 1.45, somewhere between the rating of 1 for Brazil in the mid-1970s and 2 for Guatemala at the end of the 1950s, hardly a breathtaking improvement. As Gurr accords more democratic scores to executives facing legislative constraints, all parliamentary systems are virtually guaranteed at least some points on his rating scale.

The positive coefficient for our variable measuring the leader's military background should be evaluated in light of the authoritarian nature of most status quo regimes with military leaders. All else being equal, military leaders may be more likely to liberalize than are other authoritarian rulers. Perhaps this is because among authoritarian rulers, those coming to power as the result of military intervention are constrained by the institutions of the military, which slightly, but only slightly, lessens the personalistic tendencies of authoritarian rule.

Income and Democracy

We find that the log of the previous year's per capita income level has a significant effect upon regime type. The estimated coefficient is 0.119 with a standard error of 0.032, so this coefficient is statistically significant at all standard confidence levels. The estimated long-run impact of a permanent increase in income is 0.783, with a standard error of 0.179. While we find that the tendency of high income levels to promote democracy is weaker than the raw correlation between these variables would suggest, our findings indicate it is a robust regularity. Even after controlling for the status quo level of democracy, for country-specific fixed effects, for an array of other features of the political context, and for the possible simultaneity of the processes of leadership changes and changes in regime type, higher incomes appear to be associated with more democratic government. However, the effect is fairly small: all else being equal, a permanent doubling of per capita income for a country at the sample median democracy score of 0—El Salvador in 1972, for example—will increase the steady state level of democracy to 2.78 points, a bit above the rating of 2 for Honduras in 1983 and slightly below Pakistan's rating of 3 in 1965.

Analysis of the Non-European Countries

An interesting claim of European exceptionalism has been advanced by Burkhart and Lewis-Beck, who find evidence that the democratizing effects of economic development work more powerfully among countries they consider to be at the core of the world system: basically the OECD countries of Europe, Japan, and a handful of affluent former English colonies.[30] Their finding is an interesting one, but they do not correct for country-specific fixed effects, nor for many of the other variables included in this analysis. To probe the robustness of their finding, we reestimate our model excluding Europe, Australia, Canada, New Zealand, and the Unites States. We refer to this resulting subsample as the non-European countries. This basically amounts to excluding Lipset's category of "European and English-Speaking Stable Democracies," except that in the generation that has intervened since Lipset conducted his analysis most of Western Europe has moved into the stable category.[31] Parameter estimates for the non-European remainder of our sample are reported in Table 4.

For the non-European subsample the observed democratizing effect of parliamentary regimes remains, but it is no longer statistically significant. While the data lean toward Linz's hypothesis that parliamentary government helps to stabilize democracy, the estimated effect is not large, nor does it remain statistically significant in the non-European subsample. Similarly, the effects of the amount of time the leader has been in power cease to be significant when we limit our attention to the non-European countries.

Military leaders continue to be marginally less authoritarian than their mufti-clad autocratic counterparts. As we suggested in the preceding discussion of this effect, the institutional structure of the military provides at least a minimal level of constraint on the military ruler.

As with the sample that includes the European countries, we find a small and statistically insignificant antidemocratic effect associated with the last year of a leader's term. While we might expect more "veto coups" at such times, with the military exercising its option to prevent an election winner it disliked from coming to power, our estimates indicate that any systematic tendency in this direction is weak.

The estimated democratizing effect of a sustained income rise remains statistically significant, but its estimated magnitude is just under

[30] Burkhart and Lewis-Beck (fn. 1).
[31] Lipset (fn. 1).

TABLE 4
GOVERNMENT TYPE AND LEADERSHIP CHANGE
NON-EUROPEAN SUBSAMPLE

	Leader Exit		*Regime Change*			
Independent Variables	*Coeff. Est.*	*Std. Err.*	*Coeff. Est.*	*Std. Err.*	*Sust. Impact*	*Std. Err.*
Status quo government type (logistic scale)	0.161	0.049	0.831	0.015	—	—
Transition	0.229	0.224	0.084	0.074	—	—
Nonconstitutional leader	−0.050	0.140	0.006	0.039	0.035	0.087
Leader is a prime minister	1.175	0.330	0.113	0.092	0.672	0.361
Leader had a military career	−0.389	0.126	0.077	0.037	0.457	0.138
Time since leader came to power	0.018	0.009	−0.003	0.002	−0.019	0.088
Leader has a CMIP	−0.446	0.215	−0.041	0.063	−0.244	0.154
Time remaining in leader's CMIP	−0.144	0.047	−0.015	0.013	−0.089	0.088
Leader's CMIP expires this year	1.026	0.147	−0.017	0.045	−0.102	0.092
(Leader's age)/10	0.025	0.004	0.002	0.001	0.136	1.878
Current economic growth rate	−1.649	0.615	−0.230	0.160	−1.364	1.299
Ln (per capita income)	−0.023	0.117	0.059	0.033	0.349	0.106
Lagged economic growth rate	−0.316	0.607	0.003	0.156	0.015	0.089
ρ	0.024	0.030				

N = 2,707; Log-Likelihood = −2688.92

half the magnitude for the sample as a whole. This confirms the insight of Burkhart and Lewis-Beck that the democracy-promoting effect of income is weaker outside a core group of mostly European countries. Even after allowing for our many controls, their empirical finding of a greater impact of income in the core countries is sustained. Notice that the short-run impact estimated in column 3 is not statistically significant (with a t-ratio of 1.807); however, because the estimated persistence parameter, γ, is negatively correlated with the parameter estimate for income, we obtain a more precise (and statistically significant) estimate of income's sustained impact than we do of its short-run effect.

The effects of a sustained doubling of income are reported in Table 5, with columns 1 and 2 reporting the effects for the whole sample, while columns 3 and 4 report the even more modest impacts for the non-European subsample. We use a nonlinear transformation of the underlying government-type variable, which accords a larger effect of income for government types near the middle of the scale than at the extremes. Even at the middle of the scale, however, the overall impact of increased income is quite small. Those expecting income growth to

TABLE 5
THE DEMOCRATIZING EFFECT OF DOUBLING PER CAPITA INCOME

Entire Sample		*Non-European Subsample*	
Status Quo Ex Ante	*Ex Post*	*Status Quo Ex Ante*	*Ex Post*
−10	−9.65	−10	−9.85
−9	−8.04	−9	−8.59
−8	−6.54	−8	−7.35
−7	−5.12	−7	−6.16
−6	−3.79	−6	−4.99
−5	−2.54	−5	−3.86
−4	−1.36	−4	−2.76
−3	−0.24	−3	−1.68
−2	0.82	−2	−0.63
−1	1.83	−1	0.39
0	2.78	0	1.38
1	3.36	1	2.35
2	4.55	2	3.30
3	5.37	3	4.22
4	6.16	4	5.12
5	6.91	5	6.01
6	7.63	6	6.87
7	8.31	7	7.71
8	8.97	8	8.53
9	9.60	9	9.33

promote the development of democratic political institutions must be very patient indeed.

Among the non-European countries the status quo at the beginning of the sample period was typically near the authoritarian end of the scale. During our sample period Egyptian per capita income more than quadrupled from $451 to $1,932, while there was a modest loosening of the authoritarian noose: government type rose from −7 to −1. Even by the end of our sample period, in 1985, Egypt remained in the authoritarian half of our scale of government type.

The Northern European countries were democratic throughout our sample, so why is the estimated impact of income growth so much larger within Europe? The answer, in fact, lies with the countries of Southern Europe. As the fixed-effect estimators respond to within-country changes in the variables, rather than to differences across countries, it is to Southern Europe (where most of the European regime changes of our sample occurred) that we must look for an explanation of why the effects of income are so much stronger when the European countries are included in the sample.

Consider the case of Spain. The sample period witnessed a dramatic threefold increase in per capita income, from \$2,215 to \$6,729. While Spain's government type of –7 was identical to that of Egypt at the beginning of the sample period, by 1985 Spain could be counted as genuinely democratic, with a rating of 9, while Egypt was still on the authoritarian end of our scale despite a quadrupling of income.

A closer examination of the process of democratization in Spain provides some valuable insights. Two factors are often mentioned as having been at work during the Franco regime. The first of these was internal. As Spain's economy modernized, the middle class expanded to include many blue-collar workers, with many Spaniards holding more prestigious jobs than their fathers and with greatly expanded opportunities for university education.[32] This middle-income paunch of bourgeois affluence made it much less likely that the Spanish electorate would exercise the option of voting for confiscatory redistribution. The reduced likelihood that democracy would mean confiscatory levels of redistribution made political liberalization less threatening to elites. The expansion of the middle class and the associated reduction in elites' fears about the policies that would be implemented by a democratic government is probably at work in any modernizing country.

In the Spanish case a second impulse toward democracy appears to have been at work. Entrepreneurs from the most dynamic part of the the private sector dreamed of an end to Spain's international status as a pariah. They understood that an end to the dictatorship could mean an opening of markets in the rest of Europe.[33] These businesspeople, largely from the more developed Basque and Catalan parts of the country, were especially interested in liberalization, not because they harbored more burning democratic yearnings than their countrymen, but because of the de facto sanctions imposed on Spain. If democracy was the price of membership in the European Community, then for those in the business community hungry for access to European markets, it

[32] Nancy Bermeo, "Redemocratization and Transition Elections," *Comparative Politics* 19 (January 1987).

[33] Luís Angel Rojo, "Panorama económico," reprinted in Jacinto Hombravella, ed., *Trece economistas españoles* (Barcelona: Okos-tau, 1975); Raymond Carr and Juan Pablo Fusi, *Spain: Dictatorship to Democracy* (London: George Allen and Unwin, 1981); Nancy Bermeo and José Garcia-Durán, "Spain: Dual Transition Implemented by Two Parties," in Stephan Haggard and Steven B. Webb, eds., *Voting for Reform: Democracy, Political Liberalization and Economic Adjustment* (New York: Oxford University Press, 1994).

was a price worth paying. As the Spanish economy grew, so did the potential gains from free trade with the rest of Europe and hence the costs of Spain remaining a dictatorship.

To the extent that Spain provides us with insight about the process of democratization in the rest of Southern Europe, it suggests the effects of income growth were higher for the Southern European countries than for the non-European countries in our sample because they operated on two channels. The first of these stems from the reduced intensity of redistributive conflicts between the rich and the poor as the middle class expands. The Southern European countries share this feature with other developing economies throughout the world. However, the Southern European countries also faced an environment in which very wealthy and geographically proximate trading partners imposed de facto sanctions: only countries that passed a democratic litmus test could aspire to EC membership. While these de facto sanctions probably slowed the growth of Spain in the short run, they may very well have sped the process of democratization by enlisting dynamic elements of the business community in the internal political struggle for democracy.

IV. Results on Leadership Change

The primary goal here is to explore the link between income and democracy. However, because a change of leader often accompanies a change of regime, we modeled these processes as jointly endogenous. Surprisingly, we found that the residual terms for our regime type and leadership change equations were uncorrelated. Nevertheless, our analysis reveals some interesting results on the structure of leadership exit. In contrast to our regime equation, the parameters of the leadership equation are fairly robust to the exclusion of the European sample, although correcting for fixed effects again proved important. We shall comment on the results for the whole sample, reported in column 1 of Table 3, and take note of the two points at which these results differ somewhat from those for the non-European subsample.

The estimated coefficient of 0.192 for the status quo type indicates that the more democratic the current regime, the greater the likelihood the current leader will be replaced, reinforcing the widely recognized distinction between leadership turnover and political instability. We find that, all else being equal, prime ministers face higher risks of losing power than do otherwise similar leaders (with prime ministers heading minority coalitions presumably facing the highest risks) while military leaders have a lower annual probability of being replaced than do otherwise similar heads of state.

The coefficient for the time remaining in the constitutionally mandated interelection period indicates that the more time the leader has left in his term, the smaller the likelihood he will lose power. This coefficient doubles for the non-European subsample, perhaps because it provides more insulation from the risk of exit for presidents than it does for prime ministers.

At the expiration of the interelection period, leaders are much more likely to be replaced, as indicated by the large positive coefficient estimate for the leader's end-of-term variable. This variable codes 1 both for leaders permitted to seek reelection and for those required to step down under the status quo constitution. A worthwhile future data-collection effort would distinguish between these two groups in the worldwide sample. Even leaders required to step down under the current constitution can, of course, seek a constitutional amendment, as did Argentina's Carlos Menem. Such leaders could likewise subvert the constitution entirely, as in the case of Peru's Alberto Fujimori. Nevertheless a no-reelection clause in the constitution adds an extra hurdle for any leader seeking to remain in power.

We find that a leader's risk of losing office rises over time, with the variable measuring the time since the leader came to power earning a coefficient of 0.018. A comparison of the estimates from column 1 of Table 3 and the corresponding estimates for the non-European subsample from column 1 of Table 4 shows that the effect is robust to excluding the European countries. This estimated effect of the passage of time is also robust to controlling for the leader's age, which we find also increases the leader's risk of losing power. These results are consistent with the findings of King et al., who showed that, for the group of European parliamentary democracies they analyze, the probability of cabinet dissolution rises with time.[34] While cabinet dissolution and leadership exit are not identical events, the factors that work to erode cabinets' support coalitions probably come into play to some extent for all leaders. The nature of leaders' key support networks varies widely. Some depend on legislative coalitions backed by a voting public. Others come to power at the behest of a group of coup conspirators. Over time, however, the concerns and grievances that united these supporters will dissipate and change. This leaves the leader more vulnerable to fresh challenges, whether by ballot or by bullet.

[34] King et al. (fn. 4).

Our findings run counter to those of Bienen and van de Walle. They emphasize the importance of learning by doing, contending that leaders become more adept political competitors the longer they remain in power. While we accept this point, our findings suggest that the crumbling of leaders' support coalitions does more to undermine leaders than on-the-job learning does to help them. The difference between our empirical findings and those of Bienen and van de Walle probably stems from our having corrected for country-specific fixed effects and for several other institutional variables not included in their analysis.

Our estimates indicate that the widely noted impact of economic performance on the political fortunes of national leaders is not restricted to the electoral democracies of Europe and North America.[35] The large and significant negative coefficient estimate for economic growth in the leadership exit equation actually increases when we calculate our estimates using only the non-European subset of countries. (See the coefficient estimates for the "current economic growth rate" variable reported in column 1 of Table 3 and the corresponding estimates in column 1 of Table 4.) These results again highlight the underlying similarity between support coalitions in democratic and authoritarian environments. Political alliances, whether they operate as mass-based parties or barracks conspiracies, are organized in pursuit of policy objectives, including of course the private benefits of office. One of these objectives is to replace national leaders whose performance is considered lacking. Our findings on the impact of growth on leadership succession indicate that regardless of latitude or longitude, few things serve to tarnish a leader's reputation more corrosively than a badly performing economy.

V. Conclusion

In this analysis we examine the empirical regularity that countries with high incomes are more likely to enjoy democratic political institutions than their low-income counterparts. Some argue that economic development promotes democracy, while others claim this regularity is simply a chance by-product of the fact that countries with democratic political cultures industrialized first. Using techniques that correct for an array of measures of the institutional context, for idiosyncratic features of individual country histories, and for the potential simultaneity of the processes of leadership change and regime change, we test

[35] See, for example, Erikson (fn. 6); or Lewis-Beck and Rice (fn. 6).

whether the democratizing effects of income are a mere by-product of failing to account for political and historical context.

We find that even after correcting for many features of the political and historical context, the democratizing effect of income remains as a significant factor promoting the emergence of democratic political institutions. However, the small magnitude of our estimated income effect suggests the democratizing effects of high income are modest. This is particularly true when we exclude the European countries from our analysis. We suggest a possible explanation for the more potent democratizing effect of income growth among the European countries, arguing that the role of international pressure was an important one. As the Southern European economies grew, so to did the impact of the European Community's insistence that potential member states pass a democratic litmus test.

Our findings indicate that policies that seek to increase the economic development of countries with authoritarian governments as a means of changing them into democracies, such as the current policy of many democracies toward China, may take more years to have an effect than current policymakers imagine. True, policies that make trade with authoritarian regimes conditional on political liberalization may be expected to impose greater costs in the short run. But the possibility that conditionality will substantially accelerate the pace at which countries are able to cast off the yoke of authoritarian rule deserves serious consideration and should be weighed against the higher short-run costs implied by trade sanctions.

Appendix

Matching the Data

The creation of our matched annual data set of economic and political variables was complicated by the differences between the reporting intervals for the economic and political variables. The beginnings and endings of leadership spells rarely coincide with the annual reporting interval of our economic data. Moreover, there are a number of cases of leaders who do not remain in power for an entire year. To handle multiple leaders, we assign the traits of the year's first leader to each annual observation. This means that some leaders do not show up in the matched data set: a leadership spell that began in January and ended in December of the same year would not be counted. Our data set on leaders contains 3,972 observations, covering 738 leaders in 135 countries.

A complication is posed by the occurrence of interregnums; it is possible that short gaps between leaders will be erroneously treated as part of an exiting leader's time in office. For example, a ruler who gains power in 1975 and has a length of time in power reported as two years could conceivably have remained in power until 1977 or 1978. If his successor took office in 1978, there may have been an interregnum beginning in 1977. Knowing only the integer number of years his predecessor ruled, but not the former leader's exact exit date, we cannot tell. Our algorithm for matching the economic and leadership data only counts caretaker governments as having occurred when no other interpretation of the data is supportable. The hypothetical leader we discussed above would be coded in the matched data as the head of state at the beginning of 1978; he could conceivably have remained in power until his successor's arrival in 1978. If instead his time in power were coded as 1, then we must conclude that an interregnum, beginning as early as 1976, but certainly before the end of 1977, must have intervened between the leader and his successor. In this case, we treat the leader as leaving during 1976, no longer according the benefit of the doubt to the longer possible leadership spell. We identified several gaps that can only be explained as interregnums, and we dropped them from our leadership data set. We also identified an interval of contested multiple leadership during the first four years of Zairian independence, which we also drop from the sample.

Our analysis incorporates both lagged income levels and lagged growth rates. Calculating the lagged incomes and growth rates requires two preceding years of economic data. Thus, for a country that reports economic data from 1950 to 1988, we are left with usable economic data from 1952 to 1988 once we have calculated the lags. After calculating lags for our economic data, we then match them with our political data according to the selection rules outlined above.

Estimation of the Continuous Model

For purposes of estimation we employ the reparameterizations $\vec{\beta}^* = \vec{\beta}/\sqrt{(1-\rho^2)}$ and $\theta^* = -\dfrac{\rho}{\sigma\sqrt{(1-\rho^2)}}$. This leaves us with the following likelihood function in the transformed parameters:

$$l = \sum_{i=1}^{N}\sum_{t=1}^{T_i}\delta_{it} ln\Phi(\vec{x}_{it}'\vec{\beta}^* + \theta^*(y_{it} - \vec{a}_{it}'\vec{\alpha})$$

$$+\sum_{i=1}^{N}\sum_{t=1}^{T_i}(1-\delta_{it})ln\Phi(-\vec{x}_{it}'\vec{\beta}^{*}-\theta^{*}(y_{it}-\vec{a}_{it}'\vec{\alpha}))$$

$$-\frac{N^{*}}{2}(ln(2\pi)+ln(\sigma^2))-\frac{1}{2}\sum_{i=1}^{N}\sum_{t=1}^{T_i}(y_{it}-\vec{a}_{it}'\vec{\alpha})^2. \qquad (5)$$

We maximize this by first estimating $\vec{\alpha}$ by ordinary least squares regression of y_{it} on a_{it}, and calculate the regression residuals: e_{it}. We then estimate a probit with δ_{it} as the dependent variable and obtain $\vec{\beta}^{*}$, and $\hat{\theta}^{*}$ as the coefficients for x_{it} and e_{it}. Next we recover the corresponding values of $\hat{\vec{\beta}}$ and $\hat{\rho}$ from $\hat{\vec{\beta}}^{*}$, and $\hat{\theta}^{*}$. We then maximize the likelihood function from equation (3) using $\hat{\vec{\beta}}$ and $\hat{\rho}$ as starting values. It can be proved theoretically that these starting values are the maximum likelihood parameter estimates, a result confirmed by the fact that the algorithm always converges at our starting values.[36]

RECOVERING IMPACT MULTIPLIERS

The impact multipliers for the original 21-point scale are easy to calculate. Starting with

$$T^{-1}(\hat{y}_{it}) = (21/2)(e^{\hat{y}it}-1)/(e^{\hat{y}it}+1)$$

we can differentiate to obtain (after a little manipulation):

$$T^{-1'}(\hat{y}_{it}) = (10.5+S_{it})\cdot(10.5-S_{it})/21$$

So, applying the chain rule:

$$\frac{\partial S_{it}}{\partial a_{jit}} = T^{-1'}(\hat{y}_{it})$$

$$= ((10.5+S_{it})\cdot(10.5-S_{it})/21)\alpha_j.$$

This facilitates easy computation of the impacts on the government-type scale implied by our estimates. What is key is that all variables have their largest impact for countries at the middle of the scale, while the effects attenuate at the ends.

[36] John B. Londregan and Keith T. Poole, "Poverty, the Coup Trap, and the Seizure of Executive Power," *World Politics* 42 (January 1990).