Democracy's Effect on Economic Growth: A Pooled Time-Series Analysis, 1951-1980*

Charles Kurzman, Regina Werum, and Ross E. Burkhart

The relationship between democracy and economic growth has concerned social scientists since the 17th century, but recent democracy movements make this question especially important today. Do poor countries face a cruel trade-off between democracy and growth? Do democracy and growth go together as a "win-win" proposition? Or is democracy irrelevant to growth? Using pooled annual time-series data from 1951-1980 for 106 countries, including 88 non-core countries, we explore long-term and short-term direct and indirect effects of democracy on growth. Little or no direct effect emerges, but positive indirect effects appear via two mechanisms: a marginally significant effect via investment and a robust effect via government expenditure. Democracy also has a robust non-linear effect on economic growth via social unrest, inhibiting growth under non-democratic regimes and furthering it in highly democratic ones. Combining these findings, we conclude that democracy does not significantly hamper economic growth, and under many circumstances slightly boosts it.

Introduction

Democracy's effect on economic growth constitutes one of the oldest research problems in social science. It dates back to the 17th century, when the social sciences and the concepts of economic progress and democracy all

Charles Kurzman is assistant professor of sociology at the University of North Carolina at Chapel Hill, and is currently studying modernist Islamic movements and democracy movements in the early 20th century.

Regina Werum is assistant professor of sociology at Emory University. Her research interests center on political sociology, sociology of education, and racial/ethnic stratification.

Ross E. Burkhart is assistant professor of political science at Boise State University, and his research interests include cross-national democratization patterns, comparative political economy, and public policy.

Address for correspondence: Charles Kurzman, Department of Sociology, University of North Carolina, Chapel Hill, CB#3210, 155 Hamilton Hall, Chapel Hill, NC 27599-3210.

Studies in Comparative International Development, Spring 2002, Vol. 37, No. 1, pp. 3-33.

began to take their modern form. Two of the main positions still debated today were staked out in the 1650s, one side arguing that democracy hinders economic growth, the other side arguing that democracy promotes economic growth. We will refer to these positions as the "trade-off" and "win-win" perspectives—labels reflecting the positive normative connotations that democracy and economic growth both enjoy (Hirschman 1994).

Thomas Hobbes pioneered the "trade-off" perspective in *The Leviathan* (1651). Hobbes had little confidence in the farsightedness or benevolence of rulers, but argued that absolutist regimes were more likely to improve the public welfare simply because they could not promote their own interests otherwise. Regimes where power was limited, by contrast, divided into factions that stood to gain from the misfortune of the public. In Hobbes's words,

> no King can be rich, nor glorious, nor secure; whose subjects are either poore, or contemptible, or too weak through want, or dissention, to maintain a war against their enemies: Whereas in a Democracy, or Aristocracy, the publique prosperity conferres not so much to the private fortune of one that is corrupt, or ambitious, as doth many times a perfidious advice, a treacherous action, or a Civill warre. (Hobbes [1651] 1951: 241-42)

James Harrington's response to Hobbes, *The Commonwealth of Oceana* (1656), pioneered the "win-win" perspective. Against Hobbes's view of the shared interests of the absolute monarch with the country as a whole, Harrington viewed rulers as potential looters who took what they could. The central concern, then, was to limit the ruler's ability to beggar the country. In short, constitutional limits on power would protect the public welfare:

> For whereas a prince in a commonwealth [a constitutional ruler] deriveth his greatness from the root of his people, a monarch deriveth his from one of those balances which nip them in the root; by which means the Low Countries [the Netherlands] under a monarch were poor and inconsiderable, but in bearing a prince, could grow unto a miraculous height. (Harrington [1656] 1992: 257)

Although the concepts of democracy and economic growth have changed in the three centuries since, Hobbes's "trade-off" and Harrington's "win-win" positions continue to spar. Trade-off proponents—in both academic and political debates—argue that democracy is an inefficient luxury that only wealthy countries can afford. In this view, economic growth, especially among poor countries, requires what Gregor (1979: 306) calls "developmental dictatorship," in which "masses must be infused with a work, sacrifice, and obedience ethic, the dictatorship's functional analogue of the protestant ethic so successful during the more leisurely development of northern Europe and North America." Win-win proponents argue that dictatorship, however benevolent, undermines the rule of law needed for routine economic activity. In this view, economic growth requires what Sklar (1987) calls "developmental democracy," in which legal and electoral limits on arbitrary power give individuals the security to plan for their economic futures.

These two positions have been joined in debate by a third perspective of more recent origin, which holds that democracy has no significant effect on economic growth. This view, which we refer to as the "no-effect" position, suggests that economic growth is due primarily to economic production inputs such as investment. The difference between democratic or non-democratic regimes is held to be less important than the existence of pro-growth governmental policies.

The theoretical debate between these three positions has become so vast that no brief summary can do it justice. We refer readers instead to the most extensive and sophisticated recent work on the subject, which reviews and examines the three positions—though without the labels "trade-off," "win-win," and "no-effect"—and identifies several key debates within this literature (Przeworski et al. 2000). We turn next to these specific theoretical debates: democracy's effect on investment, on government spending, and on social unrest.[1] We then review the methodology of dozens of recent studies on the topic and suggest an approach that builds on the experience of this earlier work—studying time-series as well as cross-sections, variable as well as constant democracy levels, and indirect as well as direct effects. Finally, we attempt to estimate democracy's effect on growth—both direct and indirect—using a pooled time-series data set for 106 countries over 30 years (1951-1980).

Theorizing Democracy's Effect

The theoretical literature on democracy's effect on economic growth has focused on several mechanisms in particular by which such an effect might be transmitted (Przeworski et al. 2000: Chaps. 3-5): economic (investment), political (state expenditure), and social (social unrest). Though these are hardly the only issues in this literature, they are among the most widely debated and empirically tested. These variables also have the additional value of being measured in available pooled time-series data-sets. In this section, we review the arguments made by selected representatives of the "trade-off" and "win-win" perspectives with regard to each of these indirect effects. The "no-effect" position holds in each case that democracy should have no significant effect on any of these mechanisms.

Investment

Investment has long been seen as the crucial ingredient for economic development—at least since John Law's advice to King Louis XIV of France in 1715 (Trintius 1950: 216). Following World War II, development economists began to view investment as a virtual panacea. Although this is no longer the case, "it is nonetheless clear that even mildly robust growth rates in incomes can be sustained over long periods only when societies are able to maintain investment at a sizable proportion of GDP" (Gillis et al. 1992: 269). Sensitivity analyses of economic growth models have identified investment as the single strongest predictor of economic growth (Levine and Renelt 1992; Sala-i-Martin 1997).

The "trade-off" perspective argues that investment suffers in democracies because people will not voluntarily curtail their consumption or increase their savings and investment. To do so would require a long-term vision and a willingness to sacrifice today in exchange for future benefits. Democracies, in this view, dare not impose unpopular measures to increase investment. Only an authoritarian regime will be able to do so: "The resources necessary for investment cannot be accumulated by democratic means" (Rao 1984-1985: 74-75). From this point of view, economic growth should suffer in democracies because investment suffers.

The "win-win" perspective argues, by contrast, that democracy is good for investment and, in turn, has a positive indirect effect on economic growth. Investment will grow in a climate of liberty, free-flowing information, and property rights secure from the arbitrary power of the state. Goodell (1985), for example, argues that autocratic governments generate unpredictable economic conditions because there is no check on the autocracy's ability to change the "rules of the game" at any time. Under conditions of unpredictability, entrepreneurs will hesitate to invest.

State Expenditure

A second widely discussed mechanism for democracy's effect on economic growth is the role of state expenditure. As with under-investment, there is a near consensus among economists that overly high state spending imposes a heavy burden on economic growth. It reduces the national savings rate, diverts resources into interest payments, and if left unchecked may ultimately lead to debilitating debt crises (Gillis et al. 1992: 278, 297, 397).

The "trade-off" perspective focuses on the need to limit state social spending to facilitate economic growth. Yet social programs may be popular, and recipient groups may be well organized to defend their benefits. Democracies, in this view, are vulnerable to pressure from such groups and find it difficult to bring social spending under control: "Since authoritarian political arrangements give political elites autonomy from distributionist pressures, they increase the government's ability to extract resources, provide public goods, and impose the short-term costs associated with efficient economic adjustment" (Haggard 1990: 262).

The "win-win" perspective, on the contrary, does not focus on social but on military spending. The economic literature is less critical of military spending than of redistributionist expenditures, arguing that military spending may have some positive side effects, such as research, employment, and infrastructure construction. On balance, however, the economic literature argues that the net effect of military spending on growth appears to be negative (Deger 1987; Gillis et al. 1992: 297). Autocracies, in this view, spend excessively on the military, raise taxes to pay for these expenditures, and thereby reduce economic growth; democracies, on the other hand, rely on lower tax rates because they spend less on the military, and thus stimulate economic growth, even accounting for the burden of redistributionist social spending (Olson 1991).[2]

Social Unrest

A third widely noted mechanism for democracy's effect on economic growth is via social unrest. These disruptions are universally held to have negative effects on economic growth: they halt the production process, produce disincentives for long-term planning, and scare off potential investors (Gupta 1990).

As for democracy's effect on social unrest, there appear to be three prominent positions. The "trade-off" position holds that autocratic government facilitates growth through the forceful suppression of unrest. Hewlett's (1980) study of Brazil is one of the most forthright statements of this argument. The title of Hewlett's book, *The Cruel Dilemmas of Development*, reflects the proposition that economic progress requires the coercive subjugation of a large part of the population. Hewlett argues that Brazil's military government in the 1960s was able to stabilize the economy and achieve considerable economic growth only because it prevented social unrest through autocratic repression. However distasteful one may consider such tactics, Hewlett concludes, the government achieved its developmental goals.

The "win-win" perspective, by contrast, argues that democracies are able to avoid unrest by providing formal channels for the expression of grievances, thus affecting economic growth positively. The literature on this position derives from two lineages: (1) the liberal tradition, which argues that democracy allows increased political participation and therefore channels grievances into non-confrontational forums (Hayek 1944), and (2) the recent Marxist literature on class compromise, which argues that democracy allows mutually beneficial deals to be struck between capital and labor (Przeworski 1985).

A third perspective is the "inverted-U" relationship that social movement theorists have identified between repressiveness and violent protest. Muller (1985) argues that highly repressive and highly non-repressive regimes face less violent protest, while intermediate regimes face more. Muller operationalizes repressiveness using the Freedom House scales of political rights and civil liberties, which others have taken as a proxy for democracy (see Table 1). Combining this inverted-U effect on unrest with unrest's predicted negative effect on economic growth—though Muller's study does not make this step itself—we may develop an indirect effect of democracy on growth that is negative at low levels of democracy and positive at high levels of democracy.[3]

Recent Empirical Literature

Our study aims to combine the best features of previous studies examining democracy's effect on economic growth and to overcome several of the methodological problems faced by previous studies. We suggest that methodological difficulties may explain the variation in findings of previous studies, some of which have been reviewed elsewhere (Brunetti and Weder 1995; De Haan and Siermann 1995b; Przeworski and Limongi 1993; Ruttan 1991; Siermann 1998: 138-50; Sirowy and Inkeles 1990: 137-42). Of the 47 quantitative studies reviewed for this study (see Table 1), 19 found a positive relationship between democracy and growth, six found a negative relationship, and ten reported

Table 1
Quantitative Studies of Democracy's Effect on Economic Growth

	Democracy Measure						
Study	Categories	Periods	Years in Period	Years Covered	Growth Measure	Cases	Relationship
Adelman & Morris 1967	4	1	5	1957-62	Change in GNP per capita, 1950/51-63/64	74 less developed countries	Positive
Alesina et al. 1996	3	1	33	1950-82	Mean annual change in real GDP per capita, 1950-82	113 countries	Not significant
Alesina & Rodrik 1994	2	1	?	?	Mean annual change in real GDP per capita, 1960-85	41 countries	Not significant
Banks 1970	4	13	7	1868-1963	Railways, telegraphs per square mile, etc., 7-year periods, 1868-1963	36 American and Western European countries	Positive
Barro 1996, 1997	100	3	6 - 15	1960-75, 1975-85, 1985-90	Mean annual change in real GDP per capita, 1965-75, 1975-85, 1985-90	114 countries	Inverted-U
Berg-Schlosser 1984	4	1	?	?	Change in GNP per capita and PQLI, 1 period, dates not indicated	38 African countries	Positive or not significant
Bhalla 1994	13	1	20	1973-92	Mean change in real GDP per capita and total factor productivity, 1973-90	90 countries	Positive
Chatterji et al. 1993	85	2	1	1978, 1985	Log RGDP, 1985, controlling for RGDP and RGDP squared, 1960	85 less-developed countries	Positive
Cohen 1985	2	Various	Various	Various	Change in GDP per capita, 1945-76	3 South American countries	Negative
Cutright 1963	60	1	21	1940-60	Various economic indicators, 1957-60	77 countries	Positive
Cutright & Wiley 1969	60	4	10	1927-66	Socio-economic development scale, 10-year periods, 1927-66	40 countries	Positive
Dasgupta 1990 & 1993	7	1	7	1973-9	Change in real GNI per capita, 1970-80	51 poor countries	Positive though table reports incorrect sign
De Haan & Siermann 1995a	4 - 13	1	15 - 32	1973-88, 1961-92	Average annual change in real GDP per capita, 1960-88 and 1973-88	96 countries	Not significant
De Haan & Siermann 1995b	4	1	32	1961-92	Average annual change in real GDP per capita, 1961-92	110 countries	Positive indirect effect via investment
DeLong & Schleifer 1993	2	5	Various	1050-1800	Number and population of large cities, 5 periods, 1050-1800	9 Western European regions	Positive
Dick 1974	3	1	?	?	Change in real GDP per capita, 1959-68	59 countries	Positive
Feierabend & Feierabend 1972	6	1	13	1948-60	Rate of change index national income, radios, etc., 1935-62	76 countries	Negative or not significant

no statistically significant relationship. Seven studies found a combination of positive and non-significant results, depending on the model used and the cases included; two found a combination of negative and non-significant results; two found mixed positive and negative results; and one (Barro 1996, 1997) reported an inverted-U effect.

Table 1 (cont.)

Study	Democracy Measure: Categories	Periods	Years in Period	Years Covered	Growth Measure	Cases	Relationship
Feng 1997	11 - 100	1	21	1960-80	Change in real GDP per capita, 1960-80	96 countries	Mixed
Grier & Tullock 1989	2	1	5	1973-7	Change in real GDP, 5-year periods, 1961-80	113 OECD and other countries	Positive or not significant
Helliwell 1994	7 - 100	2	1	1960, 1976	Change in real GDP per capita, 1960-85	90 OECD and other countries	Not significant
Kormendi & Meguire 1985	2	1	6	1973-8	Average annual log difference in real GDP per capita, 1948-77	47 countries	Positive or not significant
Landau 1986	2	1	?	?	Change in GDP per capita, 1-, 4-, and 7-year periods, 1960-80	65 less developed countries	Negative
Leblang 1997	11	3	10	1960-9, 1970-9, 1980-9	Change in real GDP per capita, 1960-9 1970-9, 1980-9	70 countries	Positive
Lindenberg & Devarajam 1993	2	2	7 - 9	1973-81, 1982-8	Change in several GDP, foreign exchange, and other measures, 1973-81 and 1982-88	92 developing countries	Mixed
London & Williams 1990	100	1	6	1960-5	PQLI, 1970; Index of Net Social Progress, circa 1970	110 core and non-core countries	Positive
Marsh 1979	12 - 100	4	1 - 6	1957-9, 1962-6, 1960, 1965	Change in energy consumption per capita, 1960-70	93 less developed countries	Negative
Marsh 1988	7	1	7	1973-9	Mean annual change in real GNP per capita, 1970-78 and 1965-84	55 less developed countries	Not significant
Mbaku 1994	100	1	6	1960-5	Change in GNP, 1970-89, change in Human Development Index, 1970-90, change in PQLI, 1970-85	117 countries	Positive or not significant
McMillan, Rauser, & Johnson 1993	3	17	1	1972-88	Mean annual log difference of GDP per capita, 1972-88	125 countries	Positive
Meyer et al. 1979	4 - 100 ?	3	6 - 16	1950-55, 1957-65, 1955-70	Log of GNP and of energy consumption per capita, 1955	50 less developed countries	Negative or not significant
Moon & Dixon 1985	100	1	6	1960-5	PQLI, 1970	116 countries	Positive
Perotti 1996	2	1	26	1960-85	Mean annual change in real GDP per capita	67 countries	Not significant
Persson & Tabellini 1994	2	1	26	1960-85	Mean annual change in real GDP per capita	49 countries	Negative
Pourgerami 1988	5	1	3	1984-6	Mean annual change in real GNP per capita, 1965-84	92 countries	Positive

Sample Selection

We have attempted to gather data for the full population of independent countries with market economies for the period 1951-1980. This attempt is necessarily incomplete, as crucial information is not available for some countries

Table 1 (cont.)

Study	Democracy Measure: Categories	Periods	Years in Period	Years Covered	Growth Measure	Cases	Relationship
Pourgerami 1991	Various	1	?	?	PQLI, 1985, change in economic equality and GDP per capita, 1980-85	106 developing countries	Positive
Pourgerami 1992	Various	1	?	?	Change in GDP per capita and reduction in economic inequality, dates unclear	104 developing countries	Positive or not significant
Przeworski et al. 2000	2	40	1	195-90	Annual change in GDP per capita, 1950-90	141 countries	Not significant or positive
Przeworski & Limongi 1997	2	40	1	1950-90	Annual change in GDP per capita, consumption per capita, 1950-90	139 countries	Not significant or positive
Remmer 1990	2	1	7	1982-8	Change in GDP, 1982-88	11 Latin American countries	Not significant
Russett & Monsen 1975	3	1	?	?	Change in GNP and GNP per capita, 1950-65 and 1960-65	86 countries	Not significant
Sala-i-Martin 1997	7	1	?	?	Not reported	Not reported	Positive
Scully 1988 & 1992	2	1	8	1973-80	Compound growth of real GDP per capita, 1960-80	115 countries	Positive
Siermann 1998	2 - 7	1	20 - 32	1973-92, 1961-92	Change in GDP per capita, 1973-88 or 1961-92	96 countries and a sub-sample of 72 less-developed countries	Positive indirect effect via investment
Sloan & Tedin 1987	5	21	1	1960-80	Change in GDP per capita, 1960-79	20 Latin American countries	Negative
Weede 1983	100	2	1	1960, 1965	Change in GNP per capita and GDP, 1960-79	94 countries and a sub-sample of 74 less-developed countries	Negative
Weede 1993	13	1	7	1980-88	Change in GNP per capita, 1980-87	93 non-communist and non-oil countries	Not significant
World Bank 1991: 50	13	1	15	1973-87	Average change in GDP per capita, 1973-87	68 developing countries	Not significant
Present study	21	30	1	1951-80	Annual log difference in GDP per capita, 1951-80	106 countries with market economies, sub-sample of 88 non-core countries	Mixed

and some years. However, our efforts are intended to address the difficulties of case selection that are present in smaller-N, case-oriented studies. For instance, Sorensen (1991) compares the democracies India and Costa Rica with the non-democracies China and Taiwan, and finds certain forms of autocracy better-suited to economic growth. Kohli (1986) examines a set of five democratic regimes in the developing world (Costa Rica, India, Malaysia, Sri Lanka, and Venezuela) with a set of five non-democratic regimes (Argentina, Brazil, Egypt, Morocco, and South Korea), and finds that democracies perform no worse in terms of economic growth, and better in terms of economic equality and for-

eign debt. Maier (1986) compares fascist Italy and Nazi Germany with democratic European nations of the Interwar period, and with the same countries' economic performance prior to World War I, and finds similar rates of economic progress. Huntington and Dominguez (1975) compare several sets of cases for the 1950s and 1960s and conclude that growth in one-party systems exceeds that in competitive party systems, while growth in the latter exceeds that of non-institutionalized praetorian systems.

The variation in substantive conclusions highlights the difficulties inherent in the qualitative comparative approach. One possible solution might be to match democratic and non-democratic cases more carefully in terms of the theoretical issues noted in the previous section, or to examine "deviant" cases that do not conform to theoretically derived hypotheses regarding democracy's effects on growth. Another approach—adopted in this study—is to widen the sample to maximize the number of cases.

Longitudinal Design

The present study adopts a longitudinal approach to the issue of democracy's effect on economic growth, rather than the cross-sectional approach that most previous studies have adopted. Only four of the 47 studies (Cohen 1985; McMillan et al. 1993; Przeworski and Limongi 1997; Sloan and Tedin 1987) use a time-series approach, while five others use multiple cross-sectional panels (Banks 1970; Barro 1996, 1997; Cutright and Wiley 1969; DeLong and Schleifer 1993; Leblang 1997), and several others report multiple cross-sectional panels but analyze only the variation within each panel.[4]

One advantage of time-series approaches is that they are able to take account of changes in democracy over time. Cross-sectional studies that assign each country a single democracy rating over a multiple-year period, ranging up to 33 years, obscure sometimes dramatic variations in levels of democracy during the period. In addition, the use of a single cumulative or average measure of economic growth makes these studies vulnerable to "period effects." Unfortunately, the several studies that do account for changes in democracy over time suffer from other limitations that we discuss next.

A drawback to this study's longitudinal approach is the increased variation in the dependent variable, economic growth. As time periods shrink to account for over-time changes in democracy, economic growth becomes more difficult to model. But if democracy's effects remain significant despite this increased variation, that is additional evidence of their robustness. We present both 30-year cross-sectional findings, to estimate long-term effects of democracy on growth, and one-year time-series units, to estimate the short-term effects.[5]

Democracy Measures and Periodization

The present study uses a quasi-continuous measure of democracy that coincides with the periodization of the dependent variable. Democracy is a difficult concept to operationalize, but we propose that: (1) because "democracy is always a matter of degree" (Bollen and Jackman 1989: 619) and we can speak

of "shades of democracy" (Cutright 1963: 254), then for the purpose of investigating democracy's effect on economic growth, the measure of democracy should properly be continuous; (2) the period covered by the democracy measure should coincide temporally with the period covered by other measures. Nine of the studies under review measure democracy (the independent variable) *after* the beginning of the period measured for economic growth (the dependent variable), thus causing the causal arrow to run backwards (Sirowy and Inkeles 1990: 139-40). Seven studies use the near-continuous operationalizations developed by Kenneth A. Bollen (1980, 1991), but do not match the dependent variable to the dates of the Bollen data, 1960, 1965, and 1980 (Barro 1996, 1997; Helliwell 1994; London and Williams 1990; Marsh 1979; Mbuku 1994; Moon and Dixon 1985; Weede 1983).[6] Thirteen studies match time periods but use categorical operationalizations of democracy (Alesina et al. 1996; Alesina and Rodrik 1994; Banks 1970; Cohen 1985; DeLong and Schleifer 1993; Lindenberg and Devarajam 1993; McMillan, Rausser, and Johnson 1993; Perotti 1996; Persson and Tabellini 1994; Przeworski and Limongi 1997; Przeworski et al. 2000; Remmer 1990; Sloan and Tedin 1987). Thirteen studies use the 13-category Freedom House operationalization of democracy (a combination of two measures of political rights and civil liberties), which is reported annually and may represent a quasi-continuous scale (Gastil 1991). However, all of them reduce the Freedom House scale to two or three categories, mismatch the period measured for economic growth, or fail to take account of changes in the scale over time. The only study to use a continuous measure of democracy, matching time periods for economic growth, and a longitudinal design is three decades old and did not have access to contemporary methodological tools (Cutright and Wiley 1969).

Indirect Effects

The present study differentiates between direct and indirect effects of democracy on economic growth. One quarter of the studies under review discuss the possibility that democracy may have indirect effects on economic growth (Barro 1997; Berg-Schlosser 1984; Dasgupta 1990, 1993; De Haan and Siermann 1995a, 1995b; Feng 1997; Helliwell 1994; Lindenberg and Devarajam 1993; Marsh 1979, 1988; Pourgerami 1988, 1991; Przeworski and Limongi 1997; Przeworski et al. 2000; Siermann 1998; Sloan and Tedin 1987). The other studies under review examine only direct effects, administering statistical controls for investment rates and other potential mechanisms of democracy's indirect effect.

Data and Methods

Data Sources and Limitations

This study employs pooled time-series data on 106 countries with market economies for the period 1951 to 1980. Examining this era is important for several substantive reasons: (1) it constitutes the period during which international

development came to be a significant global norm and the subject of large-scale international efforts; (2) it encompasses the post-war period of decolonization; (3) it includes the oil boom and crisis of the 1970s; (4) it covers the rise and decline of the second global "wave of democratization" (Huntington 1991; Kurzman 1998).[7] However, the determining factor behind the selection of this time period was the availability of data on our theoretically relevant variables: economic data, 1950-1992, in the Penn World Table (1994); literacy, 1945-1989, in UNESCO (1957, 1990) and World Bank (1990) publications; life expectancy, 1950-1992, in World Bank (1993); several measures of social unrest, 1948-1982, in Taylor and Jodice's (1983) *World Handbook of Political and Social Indicators*; and a democracy measure, 1800-1994, from Jaggers and Gurr's (1996) Polity III dataset. The variables are described in the next section of this article.

These data sources also determined our selection of cases. We intended to cover the universe of independent countries, on the premise that colonies and other sub-national units do not enjoy sufficient political autonomy to make democracy meaningful. Two sets of independent countries are also excluded. First are countries with a population under one-half million, which do not appear in the Polity III dataset. The results presented here may not, then, be applicable to very small nations. Second, we exclude socialist and communist regimes because most annual observations and economic variables for these countries are missing in our dataset, which relies on the Penn World Table, the leading source of cross-national economic data. Following Bollen, Entwisle, and Alderson (1993), we seek to avert selection bias by intentionally excluding the remaining non-market economies. In analyses not reported here, we included these non-market economies and found results virtually identical to those reported here.

We present findings for our full sample (minus the cases just noted) and for a sub-sample of non-core countries, as later defined. We do not present findings for the core countries because the patterns of their economic growth are theoretically distinct from the issues of international development that motivate this article. In addition, the core countries have little variation on the democracy measure and exhibit almost no democracy effect on economic growth.

Variables

We present standard econometric growth models, supplemented by three political variables. While some cross-sectional studies of economic growth estimate economic production functions, we were unable to locate further time-series data that would allow us to maintain a majority of our observations for non-core countries.[8]

Economic growth (dependent variable). Our measure of economic growth is annual log difference in the Penn World Table's variable RGDPCH (real gross domestic product per capita, Chain Index, 1985 international prices) (see Summers and Heston 1991 for a description of this and other Penn World Table variables). Our measure is constructed as $GROWTH_t = \ln(RGDPCH_t/RGDPCH_{t-1})$, where t is a year from 1951 to 1980. We use the log difference rather than

annual percentage change in keeping with leading economic growth models (Barro 1997; Mankiw et al. 1992) and methodological arguments (Jackman 1980; Firebaugh and Beck 1994). Some econometric analyses operationalize growth as GDP divided by the number of people age 18-65 in a given country; however, annual data on this age group are not available, so we fall back on the per capita measure.[9] The mean annual growth rate in our sample is 0.026 (the mean annual percentage change is 2.87). Although GDP per capita is a commonly used proxy for economic development, this variable has several shortcomings: (1) it biases production over consumption; (2) it does not take into account the quality of production (self-sustaining, environmentally sound, etc.); and (3) it does not measure distributive or social aspects of development. We use GDP despite these drawbacks because theoretically preferable alternative indicators such as the physical quality of life index (PQLI) are not available in the same time-series format as our other variables (Morris 1979; Ragin and Bradshaw 1992).

Investment. Following standard econometric growth models, we measure investment as the natural log of the Penn World Table's I variable, the percentage share of real gross domestic investment, public and private, in GDP (in 1985 international prices). The mean in our sample is 2.616 (the mean of the unlogged variable is 16.7%); the single negative observation, Madagascar in 1962, represents the log of an original I value of 1.0. Unfortunately, complete data are not available for foreign investment or different forms of private investment, though these are of theoretical interest.

Government spending. We measure government spending as the natural log of the Penn World Table's G variable, the percentage share of real government expenditure in GDP (in 1985 international prices). The mean in our sample is 2.750 (unlogged mean = 17.3%).

Social unrest. Taylor and Jodice (1983) offer three time-series indicators of social unrest: political (as opposed to economic) strikes, non-violent protest demonstrations, and riots. To correct for skewness, we took the natural log of these measures, first adding one to prevent the exclusion of the large number of zero-value observations. After extensive experimentation with these measures, singly and in combination, we present only results for the riots variable, because the three measures are moderately correlated with one another, making it unfeasible to use more than one of the measures in the same model, and because the strike and protest measures generated few readily interpretable results.[10] The mean of our logged riot indicator is 0.620 (unlogged mean = 2.83 riots per country per year).

Human capital. Econometric growth models of the past decade insist on the inclusion of human capital indicators. We follow Barro (1996: 4; 1997: 19-22), who uses two human capital measures: school attainment as an indicator of education levels, and life expectancy as an indicator of public health. We take the latter from the World Bank's (1993) POPLIFE variable, which measures life expectancy at birth, in years. Taking the natural log of this variable, we get a mean in our sample of 4.025 (unlogged mean = 56.4 years). Lacking annual data on school attendance, we use instead a rough measure of the stock of education, namely adult literacy, operationalized as the natural log of the

percent of the population age 15 and above that can read and write. Although annual data on literacy rates are not available, we were able to construct our time series literacy measure by interpolating from data points reported by UNESCO (1957, 1990) and the World Bank (1990). In several cases, we have also used literacy rates reported in terms of the population age 10 and older, instead of 15 and older, in order to maximize data coverage. The mean in our sample is 3.878 (unlogged mean = 59.1%). An advantage of using literacy as a measure of human capital is that literacy does not fluctuate much each year, as people tend to not lose their literacy skills. Therefore, we feel justified in estimating missing data points through interpolation. Unfortunately, the use of interpolation prevents us from constructing a meaningful flow variable of annual change in literacy. As a result, we are forced to use a stock measure of human capital in equations that are otherwise made up of flow variables; fortunately, the bounded nature of the literacy variable is such that stock is strongly correlated with flow.[11]

Initial wealth. A country's level of development (initial wealth) is measured as the natural log of lagged real GDP per capita (as earlier), using a one-year lag. This variable is logged in keeping with standard econometric practice and to correct for the skewed distribution of national wealth. The mean in our sample is 7.327 (unlogged mean = US$3,112). To check whether simultaneous causation between the dependent variable and initial wealth was affecting our results, we replaced the one-year lag (t = n-1) with the value for t = 0 (1950 or first year of independence, whichever is later). The substantive findings were unchanged, suggesting that the effects of democracy on economic growth are not biased by simultaneous causation between growth and initial wealth.[12]

Population growth. In keeping with leading econometric growth models, we employ a flow measure for growth of the labor force, estimated by the annual log difference of population, using the POP variable from the Penn World Table. Since censuses are not performed annually, these figures are based largely on interpolations. The mean log difference in our sample is 0.022 (the mean annual percentage change is 2.2).

World system position. We adopted two binary variables—CORE and SEMIPER—proxying core and semiperipheral position in the world economic system from Snyder and Kick (1979), as amended by Bollen (1983). In analyses not reported here, we found that democracy's effect is similar when we include the semi-periphery dummy variable, so we have combined periphery and semi-periphery into a single category of non-core (CORE = 0).

Democracy. The Polity III democracy measure (Jaggers and Gurr 1996) uses a 21-point integer scale constructed from two subscales: DEMOC and AUTOC. DEMOC awards points (0 to 10) for various levels of Competitiveness of Political Participation (0 to 3 points), Competitiveness of Executive Recruitment (0 to 2 points), Openness of Executive Recruitment (0 to 1 point), and Constraint on Chief Executive (0 to 4 points). AUTOC (0 to 10) awards points for high levels of Regulation of Political Participation (0 to 2 points) and low levels of Competitiveness of Political Participation (0 to 2 points), Competitiveness of Executive Recruitment (0 to 2 points), Openness of Executive

Recruitment (0 to 1 point), and Constraint on Chief Executive (0 to 3 points). Subtracting AUTOC from DEMOC, as suggested by Polity III's authors (Jaggers and Gurr 1995: 473), generates a summary measure we are calling DEMAUT, with a range from -10 (most autocratic) to +10 (most democratic). We added 10 to DEMAUT to bring the minimum value to 0, avoiding complications in the construction of the squared term.[13] We find a mean level of 10.7 in our sample, close to the middle of the variable's 0-20 range. We use this measure as a continuous variable, in keeping with its authors' intentions (Gurr, Jaggers, and Moore 1991; Jaggers and Gurr 1995) and our theoretical conception of democracy, as discussed earlier.[14] The variable is highly correlated with other measures of democracy (Jaggers and Gurr 1995: 475).[15] However, the variable has been criticized for coding bias (Bollen 1993), and it is limited in that it captures only procedural aspects of democracy, focuses solely on national-level politics, and privileges competitive over consensual democratic procedures.

Modeling Issues and Estimation Procedures

In the sections that follow, we begin by replicating the cross-sectional design of previous studies, using ordinary least squares (OLS) procedures on 30-year means in case there are long-term effects that the annual data may be missing. We average our variables over the entire 30-year period, except for human capital and initial wealth, for which we follow Barro (1997) and standard econometric practice and use only the first year's observation for each country. These models take the form:

Table 2, Models 1-2: $$\text{MEAN(GROWTH)} = \text{CONSTANT} + b_1\text{MEAN(LNINV)} + b_2\text{LNLIT}_{t=0} + b_3\text{LNLIFE}_{t=0} + b_4\text{LNWEALTH}_{t=0} + b_5\text{MEAN(POPGROW)} + b_6\text{MEAN(DEMAUT)} + b_7\text{MEAN(LNGOV)} + b_8\text{MEAN(LNRIOT)} + e$$

where MEAN indicates the mean value for each country's time series. We then turn to the greater detail of the annual time series data. Breusch-Pagan Lagrange Multiplier tests for the OLS on means analyses (reported in Table 2, Models 1 and 2), and also for OLS models using annual data (not reported), are not significant at the .05 level, indicating that heteroskedasticity is not a problem in this data set. However, significant Durbin-Watson test scores in preliminary models using OLS with annual data indicated the presence of first-order autocorrelation. To control for first-order autocorrelation, we have chosen a maximum likelihood estimation (MLE) procedure that allows us both to correct for first-order autocorrelation and to deal with unbalanced time-series data. We use the AR1(TSCS) procedure in the TSP (version 4.4) software package, which differences each country observation except the first in the time series through the transformation V_t - rho(V_{t-1}), where V is the current observed variable, V_{t-1} is the observed variable for the previous year, and rho is the estimate of autocorrelation (that is, the regression coefficient of the lagged error term). The first observation for each country is transformed by the square root of (1-rho^2) and the maximum-likelihood Jacobian term. Parameter estimates based

on these transformations are consistent and efficient, and the coefficients reported are calculated in the original metric of each variable. These models take the form:

Table 2, Models 3-4: $GROWTH_t = CONSTANT + b_1LNINV_t + b_2LNLIT_t + b_3LNLIFE_t + b_4LNWEALTH_{t-1} + b_5POPGROW_t + b_6DEMAUT_t + b_7LNGOV_t + b_8LNRIOT_t + RHO(e_{t-1}) + e_t$

Our findings are fairly robust across different modeling procedures: fixed-effects (FE) and random-effects (RE) models with AR1 correction generated similar results, with occasional differences that are noted in the findings section.[16]

In order to test democracy's indirect effects on economic growth, the final part of our analysis consists of models measuring democracy's effect on the three intermediary variables identified in the theoretical literature. We offer separate equations with investment, government expenditure, and social unrest as the dependent variables. These equations take the same form as Models 3 and 4 in Table 2. For consistency, we have retained the same independent and control variables as in the direct-effects models (with the exception of the dependent variable in each equation). By combining democracy's effect on these intermediary variables with the intermediary variables' effect on economic growth (as measured in the direct-effects models), we can test democracy's indirect effects on economic growth.

Findings

Direct Effects of Democracy on Growth

We begin by attempting to reproduce the results of previous cross-sectional studies. Models 1 and 2 in Table 2 present the cross-sectional OLS results for the full sample of market economies and for the sub-sample of non-core countries. In the full sample and the non-core, only two variables have a statistically significant effect on mean growth rates: mean investment and initial life expectancy. The coefficients for both variables are positive, in keeping with the findings of the econometric literature. Contrary to the predictions of the literature, social unrest has no statistically significant effect on growth, and government spending has no significant effect in the non-core. Initial wealth—logged gross domestic product at 1950 or the first year of independence, if later than 1950—has a negative coefficient, just missing the .05 level of significance in the full sample. This finding partially confirms the econometric literature on "convergence," which holds that prior levels of wealth have a negative effect on economic growth because capital flow towards poor countries creates higher growth rates there.

In both samples, democracy has no statistically significant direct effect on growth. However, the inclusion of the three social and political variables adds explanatory power to the model; in analyses without these variables, not presented here, the adjusted R^2 remained consistently below .10. The explanatory power of Models 1 and 2, with adjusted R^2 statistics of .30 and .26, is equivalent to other econometric studies with similarly bare-bones models (Barro 1996:

Table 2
Direct Effects on Economic Growth in Market Economies, 1951-1980

	Model 1	Model 2	Model 3	Model 4
Countries Included	All (n=107)	Non-core (n=89)	All (n=107)	Non-core (n=89)
Estimation Procedure	OLS on 30-year means	OLS on 30-year means	MLE, ar(1) correction	MLE, ar(1) correction
Dependent Variable	Economic Growth	Economic Growth	Economic Growth	Economic Growth
Economic Variables:				
$Investment_t$	0.010**	0.009*	0.014**	0.013**
	(0.003)	(0.004)	(0.002)	(0.002)
$Literacy_{t=0}$	-0.002	-0.003	---	---
	(0.002)	(0.003)		
$Literacy_t$	—	—	-0.001	-0.002
			(0.003)	(0.003)
$Life\ Expectancy_{t=0}$	0.033**	0.035**	---	---
	(0.011)	(0.012)		
$Life\ Expectancy_t$	---	----	0.040**	0.034*
			(0.012)	(0.014)
$Initial\ Wealth_{t=0}$	-0.006+	-0.003	---	---
	(0.003)	(0.004)		
$Initial\ Wealth_t$	---	---	-0.010**	-0.007*
			(0.002)	(0.003)
$Population\ Growth_t$	-0.006	-0.003	-0.021**	-0.019*
	(0.017)	(0.221)	(0.007)	(0.008)
Social-Political Variables:				
$Democracy_t$	-0.0004	-0.0003	-0.0005*	-0.0004+
	(0.0004)	(0.0004)	(0.0002)	(0.0002)
$Government\ Spending_t$	-0.009+	-0.009	-0.012**	-0.012**
	(0.005)	(0.006)	(0.003)	(0.003)
$Riots_t$	0.003	0.003	-0.003*	-0.005**
	(0.003)	(0.005)	(0.001)	(0.002)
Rho	---	---	0.019	0.003
			(0.022)	(0.025)
Constant	-0.066	-0.086	-0.104**	-0.094*
	(0.052)	(0.069)	(0.038)	(0.044)
Adjusted R^2	0.299	0.259	0.047	0.041
Durbin-Watson	---	---	1.882	1.879
Breusch-Pagan	1.558	0.603	---	---
Breusch-Pagan p-value	0.212	0.437	---	---
N	107	89	2483	1958

OLS coefficients and maximum likelihood estimation (MLE) with first-order autocorrelation correction (rho indicates remaining autocorrelation); standard errors in parentheses.

+ marginally significant at the $p < .1$ level, * significant at the $p < .05$ level, ** significant at the $p < .01$ level (all tests two-tailed).

6; De Haan and Siermann 1995a; Helliwell 1994; Soysa and Oneal 1999). Adding the Penn World Table's capital-labor ratio to the model raises the adjusted R^2 statistic to .39, with little change in the coefficients of the other variables; but including this variable removes more than half of our observations.

If we tune down the time periods—from one 30-year period to three 10-year periods (1951-60, 1961-70, 1971-80), then six five-year periods (1951-5, ...,

1976-80), then 30 one-year periods—we find increasingly significant results at each step. The annual-data time-series results are presented in Table 2, Models 3 and 4. The adjusted R^2 is quite low, just under .05, reflecting the tremendous amount of "noise" in annual economic growth rates and possible underspecification of the model due to data constraints. However, we believe that the models are worthy of substantive interpretation, for several reasons: (1) Including additional econometric variables such as the capital-labor ratio, an indicator of market openness (imports plus exports as a percentage of GDP), and/or the lagged dependent variable does not raise the adjusted R^2 above .10, even with the drastic reduction in observations. We conclude from this that the "noise" in our models is not simply the result of missing variables. (2) Including these additional econometric variables does not change the direction or significance levels of our key variables' direct effects on growth, so we interpret these findings as relatively insensitive to model specification. (3) Similar substantive findings emerge with FE and RE methods, with an exception noted later, so we interpret our findings as relatively robust across statistical methods. (4) Running the same models with data averaged over five- and 10-year periods generates many of the same substantive findings, and does not remove the "noise" (R^2 higher, but still less than the 30-year cross-sectional analyses). We conclude that our findings are not simply an artifact of the annualized time series format. (5) Six of the eight independent variables have statistically significant coefficients in the directions predicted by the literature, including all three of the variables most commonly discussed as mechanisms of democracy's effect on economic growth: investment positive, government expenditure, and social unrest negative. The directionality holds for both the full sample (Model 3) and for non-core countries (Model 4).

Among the control variables, population growth has a negative and significant effect on economic growth, as is commonly reported in the econometric literature. Among the human capital indicators, life expectancy continues to have a positive effect, and literacy continues to have virtually no effect, even when the political variables are excluded from the model (equations not reported in this article). Initial wealth has a firmly significant negative effect on economic growth, confirming the "convergence" hypothesis for both samples.

Democracy has a small but significant negative direct effect on economic growth in the full sample and a marginally significant negative direct effect in the non-core sample, confirming the "trade-off" perspective. However, this negative effect is not confirmed in fixed-effect and random-effect models, not reported here, so we consider this evidence for the "trade-off" position less than robust. In addition, as we show in the next section, these direct effects must be weighed against statistically significant indirect effects of democracy on growth.

Indirect Effects of Democracy on Growth

Table 3 reports the effects that democracy and a set of other variables have on investment, government spending, and social unrest—the three factors identified in the theoretical literature as possible conduits for democracy's indirect

Table 3
Intermediary Effects on Economic Growth in Market Economies, Annual Data, 1951-1980

Dependent Variable	Model 1 Investment	Model 2 Government Spending	Model 3 Riots	Model 4 Riots	Model 5 Investment	Model 6 Government Spending	Model 7 Riots	Model 8 Riots
Countries Included	All (n=107)	All (n=107)	All (n=107)	All (n=107)	Noncore (n=89)	Noncore (n=89)	Noncore (n=89)	Noncore (n=89)
Economic Variables:								
$Investment_t$	---	-0.030** (0.011)	-0.034 (0.057)	-0.037 (0.056)	---	-0.017 (0.012)	0.008 (0.053)	0.005 (0.052)
$Literacy_t$	0.326** (0.049)	0.055+ (0.031)	0.155* (0.078)	0.110 (0.078)	0.314** (0.054)	0.051 (0.034)	0.140* (0.071)	0.090 (0.070)
$Life\ Expectancy_t$	0.166 (0.138)	-0.022 (0.075)	-0.374 (0.338)	-0.184 (0.336)	0.154 (0.153)	-0.015 (0.083)	-0.378 (0.310)	-0.154 (0.306)
$Wealth_t$	0.229** (0.042)	-0.020 (0.027)	-0.023 (0.065)	0.031 (0.065)	0.245** (0.052)	0.001 (0.033)	-0.062 (0.064)	-0.021 (0.063)
$Population\ Growth_t$	-0.018 (0.021)	-0.044** (0.011)	0.275* (0.108)	0.242* (0.108)	-0.017 (0.024)	-0.044** (0.013)	0.308** (0.113)	0.274** (1.112)
Social-Political Variables:								
$Democracy_t$	0.004+ (0.002)	-0.004** (0.001)	0.024** (0.005)	0.105** (0.023)	0.005+ (0.003)	-0.004* (0.001)	0.022** (0.005)	0.114** (0.021)
$Democracy_t^2$	---	---	---	-0.004** (0.001)	—	---	---	-0.005** (0.001)
$Government\ Spending_t$	-0.099** (0.036)	---	-0.078 (0.082)	-0.054 (0.081)	-0.056 (0.041)	---	-0.161* (0.076)	-0.139+ (0.075)
$Riots_t$	-0.010* (0.004)	0.001 (0.002)	---	---	-0.011* (0.005)	0.001 (0.003)	---	---
Rho	0.948** (0.005)	0.977** (0.003)	0.559** (0.017)	0.550** (0.017)	0.946** (0.005)	0.975** (0.003)	0.484** (0.021)	0.467** (0.021)
Constant	-0.911+ (0.488)	2.832** (0.299)	2.495* (1.030)	1.162 (1.077)	-1.065+ (0.568)	2.655** (0.348)	3.070** (0.992)	1.684+ (1.017)
Adjusted R^2	0.910	0.881	0.306	0.310	0.890	0.872	0.243	0.250
Durbin-Watson	1.684	1.544	2.123	2.115	1.674	1.541	2.071	2.059
N	2483	2483	2483	2483	1958	1958	1958	1958

Maximum likelihood estimation (MLE) with first-order autocorrelation correction (rho indicates remaining autocorrelation); standard errors in parentheses.
+ marginally significant at the $p < .1$ level, * significant at the $p < .05$ level, ** significant at the $p < .01$ level (all tests two-tailed).

effect on economic growth. Again, we discuss results for the full sample of market economies (Models 1-4) as well as the subset of non-core countries (Models 5-8). Multiplying the effects of democracy in these models with the direct effects of the hypothesized intervening variables, as presented in Table 2, enables us to gauge the presence and magnitude of indirect effects.[17]

Investment (Table 3, Models 1 and 5). As expected, literacy has a significant positive effect on levels of investment (though life expectancy's effect is not statistically significant), and riots have a negative relationship with investment. Government spending's coefficient is also negative, but is statistically significant only in the full sample. Population growth has no significant effect on investment in these equations. Contrary to what we would expect from its negative direct effect on growth in Table 3, initial wealth has a positive relationship with investment.

Democracy has only a marginally significant positive effect on levels of investment ($p = .066$ in Model 1, $p = .078$ in Model 5) and therefore a marginally positive indirect effect on economic growth via investment ($p = .077$ in the full sample, $p = .081$ in the non-core). This "win-win" effect drops out of statistical significance, however, in fixed-effects and random-effects models not presented here, and we consider it less than robust.[18]

Government expenditure (Table 3, Models 2 and 6). Among the control variables, we find that population growth (in the full and non-core samples) and investment (only in the full sample) have a significant effect on government expenditure, with negative coefficients.

Democracy has a statistically significant negative effect on government expenditure in both the full and the non-core samples. Combined with government expenditure's negative effect on economic growth, we find a statistically significant double-negative relationship between democracy and growth via reduced state spending. This finding also confirms the "win-win" perspective. This finding is confirmed in the fixed-effect and random-effect models, not reported here, except that the random-effect model's coefficient for the non-core sample just misses standard levels of significance ($p = .061$).

Social unrest (Table 3, Models 3-4 and 7-8). The adjusted R^2 for these models is lower than for the other indirect-effect models, suggesting that our variables do not predict social unrest as well as investment and government spending. Among the control variables, only literacy and population growth are significant at the .05 level for the full sample, as well as government spending for the non-core sample. Literacy and government spending effects lose statistical significance when we include the quadratic term (democracy squared) in the model.

In keeping with the theoretical literature, we attempt to model both linear effects of democracy on social unrest (Models 3 and 7) and curvilinear effects (Models 4 and 8). The linear effects are positive and significant for both the full sample and non-core sub-sample. Combining this positive effect with social unrest's negative effect on growth in the full sample and the non-core countries, we find a negative indirect effect of democracy on growth via increased social unrest. The curvilinear model, however, finds both democracy and democracy-squared to be significant in both samples (Models 4 and 8),

confirming the inverted-U relationship between democracy and unrest hypothesized by Muller (1985): middling levels of democracy are unable to reduce unrest through harsh repression, as in undemocratic regimes, or by channeling grievances into routine political institutions, as in full democracies. This inverted-U finding is confirmed also by fixed-effect and random-effect models.

Taking the derivative of Models 4 and 8 (Berry and Feldman 1985: 59), we calculate the tipping point—the democracy score that produces the most riots—at 12.54 for the non-core and 13.29 for the full sample. This tipping point is just above the middle of the democracy scale; it lies less than one decile above the median observed democracy score for all cases and less than two deciles above the median for the non-core. This finding suggests that democratization begins to have a dampening effect on social unrest at moderate levels of democracy, not just at the extreme end of the scale. Combining this finding with unrest's negative effect on economic growth, we find an indirect effect of democracy on growth via unrest that is negative below the tipping-point value of democracy and positive above this value: at low levels of democracy, increases in democracy are associated with higher levels of unrest and therefore lower rates of economic growth, while at high levels of democracy, increases in democracy generate less unrest and therefore more growth. This finding confirms the "win-win" perspective for high levels of democracy and the "trade-off" perspective for low levels of democracy.

Combining Direct and Indirect Effects

In all models, democracy's effect is small. A change of one standard deviation in the Polity III democracy scale generates a direct effect of -0.00382 on logged difference of economic growth in the full sample, or six percent of one standard deviation of the dependent variable (four percent and marginally significant in the non-core). The positive indirect effects are even smaller. A comparable change in democracy generates indirect effects on growth of 0.000451 ($p = .077$) via investment and 0.000329 ($p = .020$) via government spending in the full sample, less than one percent of the standard deviation of the dependent variable (similar in the non-core).

Democracy's non-constant indirect effect via riots makes a comparable standard-deviation change difficult to conceptualize. Instead, Figures 2a and 2b visually contrast the scale of the direct and indirect effects at different levels of democracy, plus the combined effect of direct and indirect effects. The coefficients for the indirect effect via riots appear as an upward sloping line, crossing from negative to positive at the tipping point of democracy's curvilinear effect on riots. The heavy solid line indicating direct + indirect effects (summing only those coefficients significant at the standard .05 level) slopes upward at low and high levels of democracy, and plateaus in the middle range of the democracy scale where the indirect effect via riots is not statistically significant (see Table 4).

Interestingly, these extremes correspond somewhat to the Polity III authors' heuristic division of their scale into "coherent autocracies" (DEMAUT<4) and "coherent democracies" (DEMAUT>16) (Jaggers and Gurr 1995: 474), sug-

Table 4
Democracy's Indirect Effects on Economic Growth, 1951-1980, Annual Data

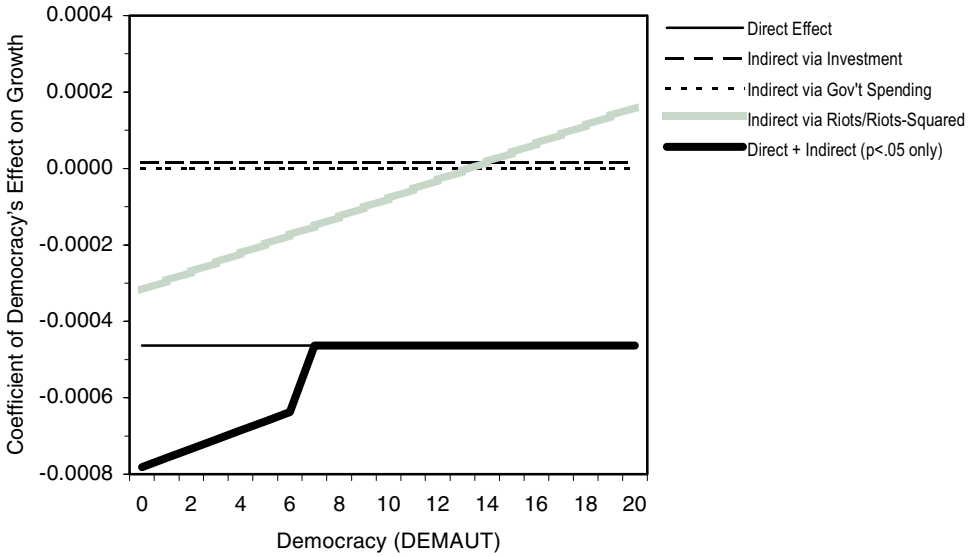
Intermediary variable	Sample	Coefficient (Standard Error)
Investment	All (n=107)	0.000059+ (0.000033)
Gov't spending	All (n=107)	0.000043* (0.000018)
Riots (DEMAUT=2)	All (n=107)	-0.000270* (0.000135)
Riots (DEMAUT=13)	All (n=107)	-0.000007 (0.000074)
Riots (DEMAUT=14)	All (n=107)	0.000017 (0.000066)
Investment	Non-core (n=89)	0.000059+ (0.000035)
Gov't spending	Non-core (n=89)	0.000042* (0.000021)
Riots (DEMAUT=5)	Non-core (n=89)	-0.000374* (0.000179)
Riots (DEMAUT=12)	Non-core (n=89)	-0.000027 (0.000126)
Riots (DEMAUT=13)	Non-core (n=89)	0.000023 (0.000117)
Riots (DEMAUT=16)	Non-core (n=89)	0.000172* (0.000083)

For indirect effects via riots, the following values are presented: the highest democracy level at which the indirect effect is negative and significant; the democracy levels at which the indirect effect crosses from negative to positive; and the lowest democracy level at which the indirect effect is positive and significant.

Standard errors in parentheses. + marginally significant at the $p < .1$ level, * significant at the $p < .05$ level (all tests two-tailed).

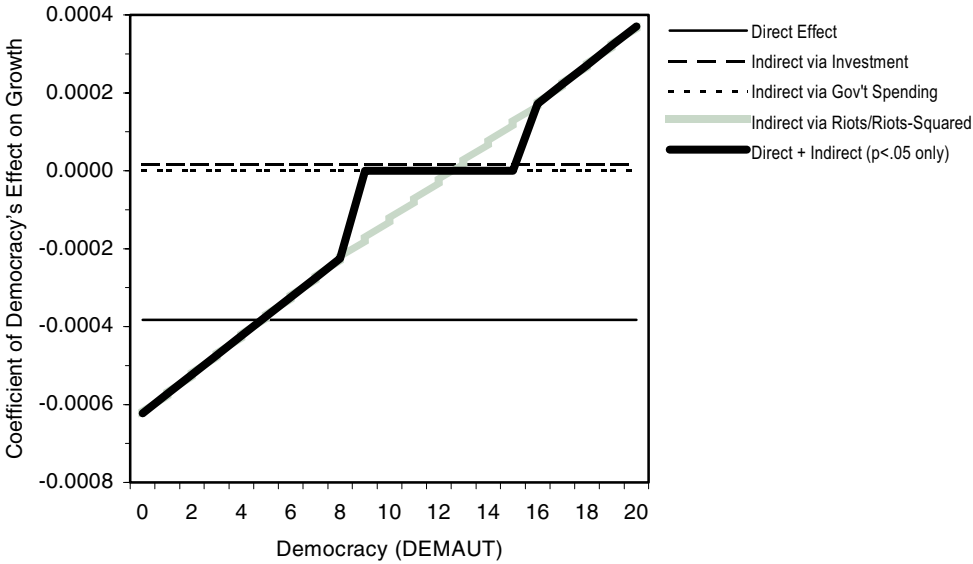
gesting that political institutions have a significant effect on economic growth via unrest only when they are "coherent" in Polity III terms—that is, when there is consistency among the various political institutions, either all-autocratic or all-democratic. Consistency at low levels of democracy cows potential protestors and reduces riots enough to improve economic performance, while consistency at high levels of democracy diverts potential protestors into institutional politics and reduces riots enough to improve economic performance. Inconsistent political institutions—the semi-democracies that our continuous variable allows us to measure, as opposed to dichotomous operationalizations of democracy—have somewhat higher levels of riots, but the slope of the inverted U-curve is gentle enough that the derivative is not statistically significant in the large middle regions of the scale. In other words, marginal shifts in semi-democracies do not influence social unrest sharply enough to affect economic growth.

Figure 1a
Democracy's Effect on Economic Growth, All Market Economies



Note: The line for Direct + Indirect effects sums only coefficients that are significant at the .05 level, and thus excludes indirect effects via investment and indirect effects via riots above the democracy rating of 2.

Figure 1b
Democracy's Effect on Economic Growth, Non-Core Market Economies



Note: The line for Direct + Indirect effects sums only coefficients that are significant at the .05 level, and thus excludes direct effects, indirect effects via investment, and indirect effects via riots between democracy ratings of 5 and 16.

In the full sample, direct + indirect effects are negative at all levels of democracy, implying support for the "trade-off" perspective; but the trade-off is reduced at the highest levels of democracy. That is, democratization hurts economic growth least at the highest levels of democracy. In the core countries, not reported here, democracy has no statistically significant effect on economic growth, direct or indirect—possibly because the variation in democracy is so small in the core. In the non-core sample, where the direct negative effect is excluded from the overall sum because it is only marginally statistically significant, the overall effects are positive for all but the lowest values of democracy; confirming the "win-win" perspective.[19] The upward slope among "coherent democracies" implies accelerating economic benefits generated by complete democratization.

Discussion

These findings illustrate the potential and the difficulties involved in using time-series data to solve methodological problems in the classic debate over democracy's effect on economic growth. This article identifies three areas for methodological improvement. First, we use a near-continuous measure of democracy, the Polity III scale, which allows for the conceptualization of semi-democracies and proves to be more sensitive to democracy's effect on growth than a categorical measure. Second, rather than using static indicators employed in cross-sectional studies, we employ pooled time-series data that account for the rise and fall of democracy during the period under study. However, this step imposes analytical constraints and may create misspecification problems because relatively few variables are available in annual time-series format. As a result of this limitation, the explanatory power of several of the models discussed in this article is less than it is sometimes observed in cross-sectional analyses of economic growth. Third, we distinguish between democracy's direct effect on growth and its indirect effects on growth via three mechanisms identified in the theoretical literature: economic (investment), political (state expenditure), and social (social unrest).

The direct-effects models using 30-year cross-sections find no long-term relationship between democracy and economic growth. As we scale down the time series into more finely grained units, taking account of year-to-year variations in democracy, significant effects emerge. Direct-effects MLE models using annual time-series data corrected for autocorrelation find a marginally statistically significant negative short-term relationship among the non-core countries—even this marginal finding, however, is not robust over fixed-effects and random-effects models corrected for autocorrelation, which are not shown here. (When core countries are included in the time series models along with the non-core, however, democracy has a significant negative direct effect on growth.) The marginal and non-robust significance of democracy's coefficients among non-core countries is theoretically significant, confirming econometric theories that de-emphasize political factors in the economic development of poor countries.

The indirect-effects models, by contrast, suggest that democracy may also have statistically significant and generally positive effects on economic growth, in both the full sample of market economies and in the non-core sample:

- Democracy has a marginally significant positive effect on investment, which in turn has a positive effect on economic growth, generating a positive but only marginally significant indirect effect via investment. This finding is not robust across fixed-effects and random-effects models.
- Democracy has a negative effect on government expenditure, which in turn has a negative effect on economic growth, combining to produce a small but robustly significant positive indirect effect of democracy on growth.
- Democracy has a robust non-linear, inverted-U effect on social unrest, which in turn has a negative effect on growth, producing an indirect effect of democracy on economic growth that is negative and significant at low levels of democracy (DEMAUT<=5 in the non-core, <=2 in the full sample, on a scale of 0 to 20); positive and significant at high levels of democracy (DEMAUT>=16 in the non-core, >=17 in the full sample); and close to zero and not significant in middle levels of democracy.

Combining the statistically significant effects, we find opposite effects in the full sample and the non-core sample. In the full sample, the statistically significant effects combine to an overall effect that is negative at all levels of democracy. In the non-core sample, the statistically significant effects combine to an overall effect that is tiny but positive at all levels of democracy except the lowest (DEMAUT<=5). In other words, democracy has more positive effects in the non-core than in market economies as a whole. This finding runs counter to "trade-off" theories that call democracy a luxury that only wealthy countries can afford.

These findings have interesting implications for the long debate on democracy's effect on economic growth. They show that democracy has its greatest effect in the short term, while economic growth is better understood in longer terms (as indicated by higher R^2 values). They suggest that the scale of democracy's short-term effects is relatively small: the net coefficient is on the order of 10^{-4} (with a democracy scale that runs from 0 to 20), while mean logged growth is on the order of 10^{-2}. Moreover, democracy has a variety of contradictory implications for economic growth that may contribute to the disparate findings in the literature reviewed in Table 1. For example, the "win-win" perspective on democracy and growth is confirmed for middle and high levels of democracy in non-core countries (DEMAUT>5). A normative reading of this finding suggests that complete democratization has more favorable economic repercussions than partial democratization. Finally, where democracy has a negative overall effect on growth, the "trade-off" is greatest at the lowest levels of democracy. A normative interpretation might conclude that less and less growth is sacrificed as democratization proceeds.

These complex findings do not settle the dispute over democracy's effect on economic growth, though small "win-win" results predominate in non-core countries. Democracy appears to have complex multiple effects on growth that will need to be further parsed as new variables become available in time-series format and new estimation procedures are developed for this work.

Notes

* The authors thank Kenneth Bollen, Guang Guo, Alexander Hicks, Michael Lewis-Beck, Brian Powell, Eric Riles, numerous other colleagues, and the anonymous reviewers for their assistance in the preparation of this article.

1. Przeworski et al. (2000) offer a further mechanism for democracy's effect on growth: the negative effect that it appears to have on population growth. We control for this factor but do not examine it as an intermediary variable because democracy's indirect effect on growth via population growth is only marginally significant in our data.
2. Olson's earlier work (1982: 38-47), by contrast, sounds a "trade-off" theme, suggesting that democracies become economically inefficient over time. This argument refers more to democratic stability than to democracy per se, however, and we follow Bollen and Jackman (1989) in viewing these variables as separate. In runs not presented here, we dichotomized our Polity III democracy measure and found no significant effects of age-of-democracy. Including age-of-democracy did not affect the direction or significance level of democracy's effects on economic growth.
3. As later described, the product of an inverted-U effect (democracy's relationship with riots) and a negative linear effect (riots' relationship with growth) is not an inversion of the U-curve, but an indirect effect that changes from negative to positive at the tipping point of democracy's curvilinear effect.
4. Research on economic development's effect on democracy has also largely relied on cross-sectional data (see Diamond 1992; Lipset 1959; Lipset, Seong, and Torres 1993). Only recently has a literature emerged that uses longitudinal data to examine economic development's effect on democracy (see Burkhart and Lewis-Beck 1994). This research tradition deals primarily with the level, not the rate, of economic development. We do not attempt to include simultaneous equations because (1) the determinants of democracy involve separate theoretical issues that we are addressing in other work, and (2) we are unable to identify suitable instrumental variables to specify a two-stage least squares model based on available pooled time series data.
5. As later noted, 5- and 10-year time-series units tell a similar story, with shorter periods approximating the 1-year short-term effects and longer periods approximating the 30-year long-term effects.
6. Helliwell (1994) acknowledges the temporal mismatch in his study and adopts statistical procedures to minimize its impact.
7. We tested for period effects, using annual, half-decade, and decade dummy variables, and found very few effects, and little change in our findings. Therefore we have omitted these dummy variables from our final models.
8. We tested the following variables but do not present our findings because of gaps in data coverage:
    - Capital stock per worker: KAPW in the Penn World Table, and a time series generated from 1965 capital stock (Benhabib and Spiegel 1994: 170-1) on a per-capita basis using the perpetual inventory method and a constant annual depreciation rate of 7 percent (Berndt 1996: 229).
    - Market openness: imports plus exports as a percentage of GDP (OPEN in the Penn World Table).
    - Technology: two indexes developed by Reynolds and Krivo (1996), which has few cases before 1970.
    - Foreign investment: data from IMF (1999) and the United Nations (1992-1996), also used by Kentor (1998) and Soysa and Oneal (1999), which have few cases before 1970.
    - School attendance: Barro and Lee (1994) and World Bank (1993) present data only in 5-year intervals beginning in 1960, and interpolation and extrapolation seem inappropriate given potential annual fluctuation.
    - Government military expenditure as a percentage of GDP: annual data reported by the Stockholm International Peace Research Institute (for 1952-1971, SIPRI 1974: 208-28; for 1972-1980, SIPRI 1982: 150-53) and 5-year data by Barro and Lee (1994) interpolated annually.
    - Government educational expenditure as a percentage of GDP: 5-year data reported by Barro and Lee (1994) interpolated annually, data beginning in 1960.
    - Alternative democracy measures: Arat (1991), which is constructed in part from the social unrest indicators that our model treats as separate variables; and the Freedom House (1987, 1989) scales of political rights and civil liberties, combined as suggested by the scales' founder (Gastil 1991: 24), which begin only in 1972.

9. We excluded one outlier, Oman in 1968, as its GDP appears to have more than doubled in one year. The findings are not affected by this omission.
10. We excluded three outlier observations for riots, India in 1966 and the U.S.A. in 1966 and 1967. The findings are not affected by this omission.
11. Literacy has a strong bivariate correlation (.74 to .86) with interpolated versions of the educational variables presented in Barro and Lee (1994) and World Bank (1993). Multicollinearity does not appear to be a problem with models including both literacy and life expectancy as measures of human capital because (1) removing either variable does not affect the direction or significance level of the remaining variable; and (2) regressing each variable on the remaining independent variables generates adjusted R-squared statistics of .49 and .43, below the level that would raise multicollinearity concerns.
12. In other analyses not reported here, we replaced the lagged GDP per capita variable with the core dummy variable later described, with virtually identical substantive results.
13. An alternative method—leaving DEMAUT with its original range of -10 to +10 and multiplying the squared term by the sign of DEMAUT—generates the same substantive findings.
14. We tested a dichotomized version of DEMAUT (1 if DEMAUT >= 16, in keeping with the cut-off point recommended by the scale's authors), which confirmed the continuous variable's direct effects, but was not sensitive to the indirect-effect findings.
15. We tested an alternative continuous measure, the Polyarchy Scale (Vanhanen 2000, 2001), which is constructed as the product of suffrage rates and electoral performance of non-ruling parties (range: 0-43). It confirmed DEMAUT's direct effects and the curvilinear indirect effect via unrest, but did not pick up the indirect effects via investment and government spending.
16. We ran the random-effects model in SAS because TSP does not include a random-effects procedure with autocorrelation correction.
17. The non-standardization of the variables presents no barrier to this calculation (Stolzenberg 1980). The equation for calculating indirect effects is simple for linear paths: $dY/dX = b_1 \times g_1$, where b_1 is the coefficient of the intermediary variable's effect on Y (the dependent variable, economic growth) and g_1 is the coefficient of X's (the antecedent variable, democracy's) effect on the intermediary variable. We calculated standard error via the delta method (Bollen 1987: 62; 1989: 391). The equation for the quadratic indirect effect via riots is somewhat more complicated: $dY/dX = b_1 \times g_1 + b_1 \times g_2 \times 2X$, where g_2 is the coefficient of the quadratic term X^2 (democracy-squared). Details on the estimation of the standard error for the quadratic indirect effect are available upon request.
18. Barro (1997: 34) reports an inverted-U indirect effect of democracy on investment that we were unable to reproduce.
19. If coefficients with $p<.10$ are allowed, the marginally significant negative direct effect in the non-core pulls the sum of direct + indirect effects down below zero for all values of democracy.

References (Data Sources)

Arat, Zehra F. 1991. *Democracy and Human Rights in Developing Countries*. Boulder, CO: Lynne Rienner.

Barro, Robert J. and Jong-Wha Lee. 1994. *Data Set for a Panel of 138 Countries*. Revised Version. Computer-Readable Format. Cambridge, MA: National Bureau for Economic Research [Distributor].

Benhabib, Jess and Mark M. Spiegel. 1994. "The Role of Human Capital in Economic Development." *Journal of Monetary Economics* 34 (October): 143-73.

Bollen, Kenneth A. 1983. "World System Position, Dependency, and Democracy: The Cross-National Evidence." *American Sociological Review* 48 (August): 468-79.

Freedom House. 1987, 1989. *Freedom in the World*. New York: Freedom House.

Jaggers, Keith and Ted Robert Gurr. 1996. *Polity III: Political Structures and Regime Change, 1800-1994*. Computer-Readable Format. ICPSR 6695. Boulder, CO: Keith Jaggers. College Park, MD: Ted Robert Gurr [Producers]. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [Distributor].

Penn World Table (Mark 5.6). 1994. Computer-Readable Format. Cambridge, MA: National Bureau of Economic Research [Distributor].

Reynolds, John R. and Lauren J. Krivo. 1996. "Change in Societal Technology and Development, 1950-1990." *Social Science Research* 25 (June): 95-124.
Snyder, David and Edward L. Kick. 1979. "Structural Position in the World System and Economic Growth, 1955-1970: A Multiple-Network Analysis of Transnational Interactions." *American Journal of Sociology* 84 (March): 1096-126.
Stockholm International Peace Research Institute (SIPRI). 1974. *SIPRI Yearbook 1974*. Cambridge, MA: The MIT Press; Stockholm, Sweden: Alqvist & Wiksell.
_____. 1982. *SIPRI Yearbook 1982*. London, UK: Taylor & Francis; Cambridge, MA: Oelgeschlager, Gunn & Hain.
Taylor, Charles Lewis and David A. Jodice. 1983. *World Handbook of Political and Social Indicators*, 3rd Edition. New Haven: Yale University Press.
United Nations Educational, Social, and Cultural Organization. 1957. *World Illiteracy at Mid-Century, A Statistical Study*. Paris, France: UNESCO.
United Nations Educational, Social, and Cultural Organization. 1990. *Compendium of Statistics on Illiteracy, 1990 Edition*. Paris, France: UNESCO.
World Bank. 1990. *World Development Report 1990*. New York: Oxford University Press.
_____. 1993. *World Tables of Economic and Social Indicators, 1950-1992*. Computer Readable Format. ICPSR 6159. Washington, DC: World Bank, International Economics Dept. [Producer]. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [Distributor].

References

Adelman, Irma and Cynthia Taft Morris. 1967. *Society, Politics and Economic Development: A Quantitative Approach*. Baltimore, MD: Johns Hopkins University Press.
Alesina, Alberto, Sule Özler, Nouriel Roubini and Phill Swagel. 1996. "Political Instability and Economic Growth." *Journal of Economic Growth* 1 (June): 189-211.
Alesina, Alberto and Dani Rodrik. 1994. "Distributional Politics and Economic Growth." *Quarterly Journal of Economics* 109 (May): 465-90.
Banks, Arthur S. 1970. "Modernization and Political Change: The Latin American and Amer-European Nations." *Comparative Political Studies* 2 (January): 405-18.
Barro, Robert J. 1996. "Democracy and Growth." *Journal of Economic Growth* 1 (March): 1-27.
_____. 1997. *Determinants of Economic Growth*. Cambridge, MA: The MIT Press.
Berg-Schlosser, Dirk. 1984. "African Political Systems: Typology and Performance." *Comparative Political Studies* 17 (April): 121-51.
Berndt, Ernst R. 1996. *The Practice of Econometrics*. Revised ed. Reading, MA: Addison-Wesley.
Berry, William D. and Stanley Feldman. 1985. *Multiple Regression in Practice*. Beverly Hills, CA: Sage.
Bhalla, Sujrit S. 1994. "Freedom and Economic Growth: A Virtuous Cycle?" Pp. 195-241 in *Democracy's Victory and Crisis*, ed. Axel Hadenius. Cambridge, UK: Cambridge University Press.
Bollen, Kenneth A. 1980. "Issues in the Comparative Measurement of Political Democracy." *American Sociological Review* 45 (June): 370-90.
_____. 1987. "Total, Direct, and Indirect Effects in Structural Equation Models." *Sociological Methodology* 17: 37-69.
_____. 1989. *Structural Equations with Latent Variables*. New York: John Wiley & Sons.
_____. 1991. "Political Democracy: Conceptual and Measurement Traps." Pp. 3-20 in Inkeles (1991).
_____. 1993. "Liberal Democracy: Validity and Method Factors in Cross-National Measures." *American Journal of Political Science* 37 (November): 1207-30.
Bollen, Kenneth A., Barbara Entwisle and Arthur S. Alderson. 1993. "Macrocomparative Research Methods." *Annual Review of Sociology* 19: 321-51.
Bollen, Kenneth A. and Robert W. Jackman. 1989. "Democracy, Stability, and Dichotomies." *American Sociological Review* 54 (August): 612-21.
Brunetti, Aymo and Beatrice Weder. 1995. "Political Sources of Growth: A Critical Note on Measurement." *Public Choice* 82 (January): 125-34.

Burkhart, Ross and Michael Lewis-Beck. 1994. "Comparative Democracy: The Economic Development Thesis." *American Political Science Review* 88 (December): 903-10.

Chatterji, Monojit, Brian Gilmore, Kurt Strunk and Jon Vanasin. 1993. "Political Economy, Growth and Convergence in Less-Developed Countries." *World Development* 21 (December): 2029-38.

Cohen, Youssef. 1985. "The Impact of Bureaucratic-Authoritarian Rule on Economic Growth." *Comparative Political Studies* 18 (April): 123-36.

Cutright, Phillips. 1963. "National Political Development: Measurement and Analysis." *American Sociological Review* 28 (April): 253-64.

Cutright, Phillips and James A. Wiley. 1969. "Modernization and Political Representation: 1927-1966." *Studies in Comparative International Development* 5: 23-44.

Dasgupta, Partha. 1990. "Well-Being and the Extent of Its Realisation in Poor Countries." *The Economic Journal* 100 (Supplement):1-32.

_____. 1993. *An Inquiry into Well-Being and Destitution*. Oxford, UK: Clarendon Press.

De Haan, Jakob and Clemens L. J. Siermann. 1995a. "A Sensitivity Analysis of the Impact of Democracy on Economic Growth." *Empirical Economics* 20 (2): 197-215.

_____. 1995b. "New Evidence on the Relationship between Democracy and Economic Growth." *Public Choice* 86 (January): 175-98.

DeLong, J. Bradford and Andrei Shleifer. 1993. "Princes and Merchants: European City Growth Before the Industrial Revolution." *Journal of Law and Economics* 36 (October): 671-702.

Deger, Saadet. 1987. *Military Expenditure in Third World Countries: The Economic Effects*. London, UK: Routledge & Kegan Paul.

Diamond, Larry. 1992. "Economic Development and Democracy Reconsidered." *American Behavioral Scientist* 35 (March): 450-99.

Dick, G. Williams. 1974. "Authoritarian versus Nonauthoritarian Approaches to Economic Development." *Journal of Political Economy* 82 (July): 817-27.

Feierabend, Ivo K. and Rosalind L. Feierabend. 1972. "Coerciveness and Change: Cross-national Trends." *American Behavioral Scientist* 15 (July): 911-27.

Feng, Yi. 1997. "Democracy, Political Stability and Economic Growth." *British Journal of Political Science* 27 (July): 391-418.

Firebaugh, Glenn and Frank Beck. 1994. "Does Economic Growth Benefit the Masses? Growth, Dependence, and Welfare in the Third World." *American Sociological Review* 59 (October): 631-53.

Gasiorowski, Mark J. 1993. *The Political Regime Change Dataset*. Baton Rouge, LA: Louisiana Population Data Center, Louisiana State University.

Gastil, Raymond Duncan. 1991. "The Comparative Survey of Freedom: Experiences and Suggestions." Pp. 21-46 in Inkeles ed. (1991).

Gillis, Malcolm, Dwight H. Perkins, Michael Roemer and Donald R. Snodgrass. 1992. *Economics of Development*, 3rd Edition. New York: W.W. Norton.

Goodell, Grace. 1985. "The Importance of Political Participation for Sustained Capitalist Development." *Archives Européennes de Sociologie* 26 (1): 93-127.

Gregor, A. James. 1979. *Italian Fascism and Developmental Dictatorship*. Princeton, NJ: Princeton University Press.

Grier, Kevin B. and Gordon Tullock. 1989. "An Empirical Analysis of Cross-national Economic Growth, 1951-80." *Journal of Monetary Economics* 24 (September): 259-76.

Gundlach, Erich. 1993. "Empirical Evidence for Alternative Growth Models: Time-Series Results." *Weltwirtschaftliches Archiv—Review of World Economics* 129 (1): 103-19.

Gupta, Dipak K. 1990. *The Economics of Political Violence: The Effect of Political Instability on Economic Growth*. New York: Praeger.

Gurr, Ted Robert, Keith Jaggers and Will H. Moore. 1991. "The Transformation of the Western State: The Growth of Democracy, Autocracy, and State Power Since 1800." Pp. 69-104 in Inkeles ed. (1991).

Haggard, Stephan. 1990. *Pathways From the Periphery: The Politics of Growth in the Newly Industrializing Countries*. Ithaca, NY: Cornell University Press.

Harrington, James. [1656] 1992. *The Commonwealth of Oceana and A System of Politics*, ed. J. G. A. Pocock. Cambridge, UK: Cambridge University Press.

Hayek, Friedrich. 1944. *The Road to Serfdom*. Chicago, IL: University of Chicago Press.
Helliwell, John F. 1994. "Empirical Linkages Between Democracy and Economic Growth." *British Journal of Political Science* 24 (April): 225-48.
Hewlett, Sylvia Ann. 1980. *The Cruel Dilemmas of Development: Twentieth Century Brazil*. New York: Basic Books.
Hirschman, Albert O. 1994. "The On-and-Off Connection Between Political and Economic Progress." *American Economic Review* 84 (May): 343-48.
Hobbes, Thomas. [1651] 1951. *Leviathan*, ed. C. B. Macpherson. Harmondsworth, UK: Penguin.
Huntington, Samuel P. 1991. *The Third Wave: Democratization in the Late Twentieth Century*. Norman, OK: University of Oklahoma Press.
Huntington, Samuel P. and Jorge I. Dominguez. 1975. "Political Development." Pp. 1-114 in *Handbook of Political Science*, *Vol. 3, Macropolitical Theory,* eds. Fred I. Greenstein and Nelson W. Polsby, Reading, MA: Addison-Wesley.
Inkeles, Alex, ed. 1991. *On Measuring Democracy: Its Consequences and Concomitants*. New Brunswick, NJ: Transaction.
International Monetary Fund. 1999. *International Financial Statistics* (October). Computer-Readable Format. Washington, DC: International Monetary Fund.
Jackman, Robert W. 1980. "A Note on the Measurement of Growth Rates in Cross-National Research." *American Journal of Sociology* 86 (November): 604-07.
Jaggers, Keith and Ted Robert Gurr. 1995. "Tracking Democracy's Third Wave with the Polity III Data." *Journal of Peace Research* 32 (November): 469-82.
Kentor, Jeffrey. 1998. "The Long-Term Effects of Foreign Investment Dependence on Economic Growth, 1940-1990." *American Journal of Sociology* 103 (January):1024-46.
Kohli, Atul. 1986. "Democracy and Development." Pp. 153-82 in *Development Strategies Reconsidered*, eds. John Lewis and Valeriana Kallab. New Brunswick, NJ: Transaction Books.
Kormendi, Roger C. and Philip G. Meguire. 1985. "Macroeconomic Determinants of Growth: Cross-Country Evidence." *Journal of Monetary Economics* 16 (September): 141-63.
Kurzman, Charles. 1998. "Waves of Democratization." *Studies in Comparative International Development* 33 (Spring): 37-59.
Landau, Daniel. 1986. "Government and Economic Growth in the LDC's: An Empirical Study for 1960-1980." *Economic Development and Cultural Change* 35 (October): 35-75.
Leblang, David A. 1997. "Political Democracy and Economic Growth: Pooled Cross-Sectional and Time-Series Evidence." *British Journal of Political Science* 27 (July): 453-72.
Levine, Ross and David Renelt. 1992. "A Sensitivity Analysis of Cross-Country Growth Regressions." *American Economic Review* 82 (September): 942-63.
Lindenberg, Marc and Shantayanam Devarajam. 1993. "Prescribing Strong Economic Medicine: Revisiting the Myths About Structural Adjustment, Democracy, and Economic Performance in Developing Countries." *Comparative Politics* 25 (July): 169-82.
Lipset, Seymour Martin. 1959. "Some Social Requisites of Democracy: Economic Development and Political Development." *American Political Science Review* 53 (March): 69-105
Lipset, Seymour, Kyoung-Ryung Seong and John Charles Torres. 1993. "A Comparative Analysis of the Social Requisites of Democracy." *International Social Science Journal* 136 (May): 155-75.
London, Bruce and Bruce A. Williams. 1990. "National Politics, International Dependency, and Basic Needs Provision: A Cross-National Analysis." *Social Forces* 69 (December): 572-87.
Maier, Charles. 1986. "The Economics of Fascism and Nazism: Premises and Performance." Pp. 57-88 in *Development, Democracy, and the Art of Trespassing*, eds. Alejandro Foxley, Michael S. McPherson and Guillermo O'Donnell. Notre Dame, IN: University of Notre Dame Press.
Mankiw, N. Gregory, David Romer and David N. Weil. 1992. "A Contribution to the Empirics of Economic Growth." *The Quarterly Journal of Economics* 107 (May): 407-37.
Marsh, Robert M. 1979. "Does Democracy Hinder Economic Development in Latecomer Developing Nations?" *Comparative Social Research* 2:215-48.
_____. 1988. "Sociological Explanations of Economic Growth." *Studies in Comparative International Development* 23 (Winter): 41-76.
Mbaku, John Mukum. 1994. "Political Economy of Development: An Empirical Analysis of the Effects of the Institutional Framework on Economic Development." *Studies in Comparative International Development* 29 (Summer): 3-21.

McMillan, John, Gordon Rausser and Stan Johnson. 1993. "Freedoms and Economic Growth: Transitional and Permanent Components." Washington, DC: Institute for Policy Reform, IPR27.
Meyer, John W. et al. 1979. "National Economic Development, 1950-1970: Social and Political Factors." Pp. 85-116 in *National Development and the World System*, eds. John Meyer and Michael Hannan. Chicago, IL: University of Chicago Press.
Moon, Bruce E. and William J. Dixon. 1985. "Politics, the State, and Basic Human Needs: A Cross-National Study." *American Journal of Political Science* 29 (November): 661-94.
Morris, Morris D. 1979. *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*. New York: Pergamon Press.
Muller, Edward N. 1985. "Income Inequality, Regime Repressiveness, and Political Violence." *American Sociological Review* 50 (February): 47-61.
Olson, Mancur. 1982. *The Rise and Decline of Nations*. New Haven, CT: Yale University Press.
_____. 1991. "Autocracy, Democracy, and Prosperity." Pp. 131-57 in *Strategy and Choice*, ed. Richard J. Zeckhauser. Cambridge, MA: MIT Press.
Perotti, Roberto J. 1996. "Growth, Income Distribution, and Democracy." *Journal of Economic Growth* 1, 2: 149-87.
Persson, Torsten and Guido Tabellini. 1994. "Is Inequality Harmful for Growth?" *American Economic Review* 84 (June): 600-21.
Pindyck, Robert and Daniel Rubinfeld. 1998. *Econometric Models and Economic Forecasts*. New York: McGraw-Hill.
Pourgerami, Abbas. 1988. "The Political Economy of Development." *Public Choice* 58 (August): 123-41.
_____. 1991. *Development and Democracy in the Third World*. Boulder, CO: Westview Press.
_____. 1992. "Authoritarian Versus Nonauthoritarian Approaches to Economic Development: Update and Additional Evidence." *Public Choice* 74 (October): 365-77.
Przeworski, Adam. 1985. *Capitalism and Social Democracy*. Cambridge, UK: Cambridge University Press.
Przeworski, Adam, Michael E. Alvarez, José Antonio Cheibub and Fernando Limongi. 2000. *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990*. Cambridge, UK: Cambridge University Press.
Przeworski, Adam and Fernando Limongi. 1993. "Political Regimes and Economic Growth." *Journal of Economic Perspectives* 7 (Summer): 51-69.
_____. 1997. "Democracy and Development." Pp. 163-94 in *Democracy's Victory and Crisis*, ed. Axel Hadenius. Cambridge, UK: Cambridge University Press.
Ragin, Charles C. and York W. Bradshaw. 1992. "International Economic Dependence and Human Misery, 1938-1980: A Global Perspective." *Sociological Perspectives* 35 (Summer): 217-47.
Rao, Vaman. 1984-1985. "Democracy and Economic Development." *Studies in Comparative International Development* 19 (Winter): 67-81.
Remmer, Karen. 1990. "Democracy and Economic Crisis: The Latin American Experience." *World Politics* 42 (April): 315-35.
Russett, Bruce M. and R. Joseph Monsen. 1975. "Bureaucracy and Polyarchy as Predictors of Performance: A Cross-National Examination." *Comparative Political Studies* 8 (April): 5-31.
Ruttan, Vernon W. 1991. "What Happened to Political Development?" *Economic Development and Cultural Change* 39 (January): 265-92.
Sala-i-Martin, Xavier X. 1997. "I Just Ran Two Million Regressions." *American Economic Review* 87 (March): 178-83.
Scully, Gerald W. 1988. "The Institutional Framework and Economic Development." *Journal of Political Economy* 96 (June): 652-62.
_____. 1992. *Constitutional Environments and Economic Growth*. Princeton, NJ: Princeton University Press.
Siermann, Clemens L. J. 1998. *Politics, Institutions, and the Economic Performance of Nations*. Cheltenham, UK: E. Elgar.
Sirowy, Larry and Alex Inkeles. 1990. "The Effects of Democracy on Economic Growth and Inequality: A Review." *Studies in Comparative International Development* 25 (Spring): 126-57.

Sklar, Richard L. 1987. "Developmental Democracy." *Comparative Studies in Society and History* 29 (October): 686-714.

Sloan, John and Kent L. Tedin. 1987. "The Consequences of Regime Type for Public Policy Outputs." *Comparative Political Studies* 20 (April): 98-124.

Sørensen, Georg. 1991. *Democracy, Dictatorship and Development*. London: Macmillan.

Soysa, Indra de and John R. Oneal. 1999. "Boon or Bane? Reassessing the Productivity of Foreign Direct Investment." *American Sociological Review* 64 (October): 766-82.

Stolzenberg, Ross M. 1980. "The Measurement and Decomposition of Causal Effects in Nonlinear and Nonadditive Models." *Sociological Methodology* 1980: 459-88.

Summers, Robert and Alan Heston. 1991. "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988." *Quarterly Journal of Economics* 106 (May): 327-68.

Trintzius, René. 1950. *John Law et la naissance du dirigisme*. Paris, France: SFELT.

United Nations. 1992-1996. *World Investment Directory*, 6 Vols. New York: United Nations.

Weede, Erich. 1983. "The Impact of Democracy on Economic Growth." *Kyklos* 36 (February): 21-39.

_____. 1993. "The Impact of Democracy or Repressiveness on the Quality of Life, Income Distribution, and Economic Growth Rates." *International Sociology* 8 (June): 177-95.

World Bank. 1991. *World Development Report 1991: The Challenge of Development*. Oxford, UK: Oxford University Press.