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DEMOCRACY AND GROWTH

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ABSTRACT

Growth and democracy (subjective indexes of political freedom) are analyzed for a panel of about 100 countries from 1960 to 1990. The favorable effects on growth include maintenance of the rule of law, free markets, small government consumption, and high human capital. Once these kinds of variables and the initial level of real per-capita GDP are held constant, the overall effect of democracy on growth is weakly negative. There is a suggestion of a nonlinear relationship in which democracy enhances growth at low levels of political freedom but depresses growth when a moderate level of freedom has already been attained. Improvements in the standard of living - measured by GDP, life expectancy, and education - substantially raise the probability that political freedoms will grow. These results allow for predictions about which countries will become more or less democratic in the future.

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Economic freedoms, in the form of free markets and small governments that focus on the maintenance of property rights, are often thought to encourage economic growth. This view receives support from the present study, which uses data from many countries since 1960. The results confirm the importance of economic freedom and provide some quantification of the linkages among growth rates, market distortions, the rule of law, and other variables.

The connection between political and economic freedom is more controversial. Some observers, such as Friedman (1962), believe that the two freedoms are mutually reinforcing. In this view, an expansion of political rights—more "democracy"—fosters economic rights and tends thereby to stimulate growth. But the growth retarding features of democracy have also been stressed. These features involve the tendency to enact rich–to–poor redistributions of income (including land reforms) in systems of majority voting and the enhanced role of interest groups in systems with representative legislatures.

Authoritarian regimes may partially avoid these drawbacks of democracy. Moreover, nothing in principle prevents nondemocratic governments from maintaining economic freedoms and private property. A dictator does not have to engage in central planning. Examples of autocracies that have expanded economic freedoms include the Pinochet government in Chile, the Fujimori administration in Peru, the Shah's government in Iran, and several previous and current regimes in East Asia. Furthermore, as stressed by Schwarz (1992), most OECD countries began their modern economic development in systems with limited political rights and became full–fledged representative democracies only much later.

The effects of autocracy on growth are adverse, however, if a dictator uses his power to steal the nation's wealth and to carry out nonproductive investments. Many governments in Africa, some in Latin America, some in the formerly planned economies

of eastern Europe, and the Marcos administration in the Philippines seem to fit this model. Thus, history suggests that dictators come in two types, one whose personal objectives often conflict with growth promotion and another whose interests dictate a preoccupation with economic development. The theory that determines which kind of dictatorship will prevail is presently missing.

Democratic institutions provide a check on governmental power and thereby limit the potential of public officials to amass personal wealth and to carry out unpopular policies. Since at least some policies that stimulate growth will also be politically popular, more political rights tend to be growth enhancing on this count. Thus, the net effect of democracy on growth is theoretically inconclusive.

Another question concerns the impact of economic development on a country's propensity to experience democracy. This issue requires a positive analysis of the choice of political institutions, but theoretical models of this process are not well developed. Nevertheless, a common view—supported by many case studies—is that prosperity tends to inspire democracy. The overall cross–country evidence considered in this study strongly supports this view; specifically, an increase in the standard of living tends to generate a gradual rise in democracy. In contrast, democracies that arise without prior economic development—sometimes because they are imposed from outside—tend not to last.

Framework of the Empirical Analysis

The framework for the growth analysis is an extension of the neoclassical growth model to include governmental functions and other elements.[1] The long-run or steady-

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[1]The theory comes from Ramsey (1928), Solow (1956), Swan (1956), Cass (1965), and Koopmans (1965). For an exposition, see Barro and Sala–i–Martin (1994, Chs. 1 and 2). Previous empirical applications of the model include Barro (1991), Mankiw, Romer, and Weil (1992), and Barro and Sala–i–Martin (1994, Ch. 12).

state level of per-capita output depends in this model on an array of choice and environmental variables.[2] The private sector's choices include the fertility and saving rates, each of which depends on preferences and costs. The government's choices involve spending in various categories, tax rates, the extent of distortions of markets and business decisions, maintenance of the rule of law and property rights, and the degree of political freedom. Also relevant is the terms of trade, typically given to an individual country by international conditions.

For a given initial level of per-capita output, an increase in the steady-state level of per-capita output raises the per-capita growth rate over a transition interval. For example, if the government improves the climate for business activity—say by reducing the burdens from regulation, corruption, and taxation, or by enhancing property rights—the growth rate increases for awhile. Similar effects arise if people decide to have fewer children or (in a closed economy) to save a larger fraction of their incomes. In all of these cases, an increase in the long-run level of per-capita output translates into a transitional increase in the economy's growth rate. Moreover, because the transitions tend to be lengthy, the growth effects persist for a long time.

For given values of the choice and environmental variables, a higher starting value of per-capita output leads to a lower per-capita growth rate. This relation reflects primarily the presence of diminishing returns to capital in the neoclassical model. As an economy prospers, the return on investment declines, and the growth rate tends accordingly to decrease. This effect may be modified by endogenous responses of the saving rate, fertility, work effort, and migration. However, if diminishing returns apply, then the force toward lower growth rates tends eventually to dominate.

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[2]With exogenous, labor-augmenting technological progress, the level of output per worker grows in the long run, but the level of output per *effective* worker approaches a constant.

The inverse relation between the growth rate and level of per-capita output leads to a well-known convergence property: poor economies tend to grow faster per capita than rich ones and tend thereby to catch up to the rich ones. The discussion already implies that this convergence force applies in the neoclassical model only in a conditional sense. For given values of the choice and environmental variables, a lower starting value of per-capita output tends to generate a higher growth rate. But a poor country that has a low steady-state level of per-capita output—because, for example, it has political institutions that are inhospitable to investment—need not grow faster than a rich country. Since countries are likely to be poor or rich precisely because the underlying determinants of their steady states are unfavorable or favorable, the model does not predict any clear pattern of simple correlation between growth rates and starting positions.

The diffusion of technology provides another force toward convergence. Since imitation is usually cheaper than innovation, follower countries have an advantage here. However, as the stock of adaptable but uncopied ideas decreases, this advantage declines. The growth rates of follower economies tend accordingly to decrease with the level of per-capita output much as in the neoclassical growth model with diminishing returns to investment. The convergence predicted by technological diffusion is also conditional on government policies and other elements that influence the returns from introducing modern techniques to a follower economy. For example, a backward country that does not respect property rights and has little infrastructure services will not import much modern technology and will not grow rapidly.

The capital stock accumulated in the neoclassical model can be broadened to include human capital (in the forms of education, experience, and health), as well as physical capital and natural resources. (See Lucas [1988], Rebelo [1991], Caballe and Santos [1993], and Barro and Sala–i–Martin [1994, Ch. 5].) The economy tends toward

target ratios for the various kinds of capital, but these ratios may depart from their target values in an initial state. The extent of these departures generally affects the rate at which initial per-capita output approaches its steady-state value. For example, a country that starts with a high ratio of human to physical capital (perhaps because of a war that destroyed mainly physical capital) tends to grow rapidly because physical capital is more amenable than human capital to rapid expansion. A supporting force is that the adaptation of foreign technologies is facilitated by a large endowment of human capital (see Nelson and Phelps [1966] and Benhabib and Spiegel [1993]). This element implies an interaction effect whereby a country's growth rate is more sensitive (inversely) to its starting level of per-capita output the greater is its initial stock of human capital.

Empirical Findings on Growth across Countries

Table 1 shows the results from regressions that use the framework of the previous section. See Table A1 in the appendix for means and standard deviations of the variables that appear in the analysis. The regressions apply to a panel of roughly 100 countries observed from 1960 to 1990. The dependent variables are the growth rates of real per-capita GDP over three periods: 1965–75, 1975–85, and 1985–90.[3] (The first period begins in 1965, rather than 1960, so that the 1960 value of the level of real per-capita GDP can be used as an instrument; see below.) Henceforth, the term GDP will be used as a shorthand to refer to real per-capita GDP.

[3]Most of the GDP figures are from version 5.5 of the Summers-Heston data set (see Summers and Heston [1991, 1993] for general descriptions). These values adjust for estimated differences in purchasing power across countries. World Bank figures on real GDP growth rates (based on domestic accounts only) are used for 1985–90 when the Summers-Heston figures are unavailable.

The estimation uses an instrumental-variable technique, where some of the instruments are earlier values of the regressors.[4] This approach may be satisfactory because the residuals from the growth-rate equations for the various periods exhibit little correlation. In any event, the regressions describe the relation between growth rates and prior values of the explanatory variables.

The regression shown in column (1) includes explanatory variables that can be interpreted as initial values of state variables or as choice and environmental variables. The state variables include measures of human capital in the form of schooling and health and the initial level of GDP. This GDP level reflects the endowments of physical capital and natural resources (and also depends on effort and the unobserved level of technology). The choice and environmental variables are the fertility rate, government spending for consumption and education,[5] the black-market premium on foreign exchange, an index of the maintenance of the rule of law, the ratio of gross investment to GDP, and the change in the terms of trade. A later analysis adds an index of democracy.

Initial Level of GDP

For given values of the other explanatory variables, the neoclassical model predicts a negative coefficient on initial GDP, which enters in the regression in logarithmic form.[6]

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[4]Countries are equally weighted in the regressions, but the estimation allows for different error variances for each period and for correlation of the errors across the periods. The results are virtually identical, however, if the error terms from the different periods are treated as independent. See the notes to Table 1 for additional information.

[5]Data problems prevent consideration of marginal tax rates and some other components of government spending, such as transfers and infrasructure services. See Easterly and Rebelo (1993) for a discussion of these data. The ratio of defense spending to GDP turned out to be insignficant in the growth regressions.

[6]The variable log(GDP) in Table 1 refers to 1965 in the first period, 1975 in the second period, and 1985 in the third period. Five-year earlier values of log(GDP) are used as instruments. The use of these instruments lessens the estimation problems associated with temporary measurement error in GDP.

The coefficient on the log of initial GDP has the interpretation of a conditional rate of convergence. If the other explanatory variables are held constant, then the economy tends to approach its long-run position at the rate indicated by the magnitude of the coefficient. The estimated coefficient of −.0290 (s.e. = .0029) is highly significant. This estimate implies a conditional rate of convergence of 2.9% per year.[7]

Initial Level of Human Capital

Initial human capital appears in four variables in the regressions: male and female average years of attainment in secondary and higher schools for the adult population at the start of each period, the log of life expectancy at birth at the start of each period, and an interaction between the log of initial GDP and an overall human–capital variable. Overall human capital is the sum of the levels of male and female school attainment and the log of life expectancy, where each variable is multiplied by its coefficient in the regression.[8]

The column (1) regression indicates a significantly positive effect on growth from initial human capital in the form of health; the coefficient on the log of life expectancy is .042 (.012). The results on education show the puzzling pattern described in Barro and Lee (1994) in which the estimated coefficient on male attainment is significantly positive, .015 (.004), whereas than on female attainment is significantly negative, −.014 (.005). If life expectancy is included in the regressions, as in Table 1, then it seems to proxy for the level of human capital; the *level* of educational attainment then has no

[7]This result is only approximate because the growth rate is observed as an average over ten or five years, rather than at a point in time. The implied instantaneous rate of convergence is slightly higher than the value indicated by the coefficient. See Barro and Sala–i–Martin (1992) for a discussion.

[8]The interaction term measures log(GDP) and human capital as deviations from sample means. This procedure makes it easier to interpret the regression coefficients on log(GDP), male and female schooling, and log of life expectancy.

additional explanatory power for growth. An additional positive effect on growth emerges, however, when male attainment is high *relative* to female attainment. A possible interpretation is that the gap between male and female schooling is an indicator of an economy's backwardness and that greater backwardness induces a higher growth rate through the familiar convergence mechanism.

The interaction term between initial GDP and human capital is significantly negative, –.65 (.22), in column (1) of the table. This result indicates that a country with more overall human capital tends to converge faster toward its long–run position. The estimated coefficient on the interaction variable turns out, however, to be dominated by a small number of outlying observations and is accordingly sensitive to minor changes in specification. Therefore, this estimated effect may not be reliable.

Educational Spending

A likely difficulty with the educational variables is that they measure years of attainment but do not adjust for school quality. The construction of a broad data set on measures of quality—including school days per year, estimated salaries of teachers in relation to country wage rates, teacher–pupil ratios, and the frequency of school dropouts and repeaters—is ongoing. The ratio of public educational spending to GDP, included in the regressions in Table 1, is intended as an imperfect proxy for school quality. The estimated coefficient of this variable, .18 (.09), is positive and marginally significant.

Fertility Rate

If the population is growing, then a portion of the economy's investment is used to provide capital for new workers, rather than to raise capital per worker. For this reason, a higher rate of population growth has a negative effect on the steady-state level of

output per effective worker in the neoclassical growth model. Another, reinforcing, effect is that a higher fertility rate means that increased resources are devoted to childrearing, rather than to production of goods (see Becker and Barro [1988]). The regression in column (1) shows a significantly negative coefficient, −.015 (.005), on the log of the total fertility rate.

Fertility decisions are surely endogenous; previous research has shown that fertility typically declines with measures of prosperity, especially female education (see Schultz [1989], Behrman [1990], and Barro and Lee [1994]). The estimated coefficient of the fertility rate in the regression of column (1) can be interpreted as the response of growth to higher fertility, for given schooling, life expectancy, GDP, and so on. Since the average of the fertility rate over the preceding five years is used as an instrument, the coefficient likely reflects the impact of fertility on growth, rather than vice versa. (In any event, the reverse effect would involve the level of GDP, rather than its growth rate.) Thus, although population growth cannot be described as the most important element in economic progress, the results do suggest that an exogenous drop in birth rates would raise the growth rate of per-capita output.

Government Consumption

The regression in column (1) also shows a significantly negative effect on growth from the ratio of government consumption (measured exclusive of spending on education and defense) to GDP. The estimated coefficient is −.13 (.03). (The period-average of the ratio enters into the regression, and the average of the ratio over the previous five years is used as an instrument.) The particular measure of government spending is intended to approximate the outlays that do not enhance productivity. Hence, the conclusion is that a greater volume of nonproductive government spending—and the

associated taxation—reduce the growth rate for a given starting value of GDP. In this sense, big government is bad for growth.

Measures of Market Distortions: The Black–Market Premium and the Rule-of-Law Index

The black-market premium on foreign exchange is a widely available and apparently accurate measure of a particular price distortion (the gap between the official exchange rate and the rate available to nonfavored market participants). The premium likely serves as a proxy for governmental distortions of markets more generally. One difficulty with the variable is the likelihood of reverse causation; economic difficulties may pressure governments into exchange controls and other policies that lead to high black-market premia. This problem is mitigated by the use of an average of the premium over the previous five years as an instrument. (The period-average of the premium appears in the regressions.) The estimated coefficient, −.022 (.006), is significantly negative, thereby suggesting that distortions of markets are adverse for economic growth.

Knack and Keefer (1994) discuss a variety of subjective country indexes prepared for fee-paying international investors by International Country Risk Guide. The measures gauge the maintenance of the rule of law, political corruption, risk of repudiation of contracts, and so on. The rule-of-law index (measured on a 0 to 6 scale, with 6 the most favorable) appeared, a priori, to be the most relevant of these indicators for gauging the attractiveness of a country's investment climate. Thus, the rule-of-law variable is entered into the column (1) regression and has a significantly positive coefficient, .0043 (.0010). (The other measures of investment risk are insignificant in the growth regression if the rule-of-law index is also included.) The desired interpretation is that greater maintenance of the rule of law is favorable to growth.

A major problem is that the figures on the rule of law and the other subjective indicators are available from International Country Risk Guide starting only in the early 1980s.[9] The results shown in Table 1 use a single observation—that for the earliest year available in the 1980s—for each country. The equations for growth in 1965–75 and 1975–85 therefore use as an explanatory variable a later or contemporaneous value of the rule-of-law index. The justification for this procedure is that a country's institutional structure that governs the enforcement of laws and contracts tends to persist over long periods. Therefore, the value for the early 1980s is typically a good proxy for the values that prevailed earlier and later. The possibility of reverse causation—low growth stimulating the deterioration of law enforcement (or influencing the perceptions of International Country Risk Guide)—is, however, especially serious for the 1965–75 regression.

Knack and Keefer (1994) provide information from another consulting service for the early 1970s on the quality of the bureaucracy, the degree of contract enforcement, and some other variables. The figures apply, however, to a much smaller number of countries. These data can be used as instruments for the rule-of-law index for the 1975–85 equation. The system then loses the 82 observations for 1965–75, has 44 observations (instead of 89) for 1975–85, and retains 84 observations for 1985–90 (for which the rule–of–law variable enters as an instrument). In this case, the estimated coefficient on the rule-of-law variable is .0031 (.0019), now only marginally significant, but not significantly different from the value shown in column (1) of Table 1. Since the point estimate changes little when these instruments are used, it is plausible that the estimated coefficient in column (1) reflects mainly the effect of the rule of law on growth, rather than vice versa.

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[9]The information appeared contemporaneously starting in the 1980s and could not therefore be influenced by a country's subsequent experience, including its rate of economic growth.

Another issue is the use of the rule–of–law index as a cardinal variable. As already mentioned, the index takes on the 7 possible integers from 0 to 6. Although the values may be meaningful on an ordinal scale—that is, a higher number signifies more respect for the rule of law—there is no guarantee that the variable has a cardinal meaning. Thus, even if the relation between the growth rate and some cardinal measure of the rule of law were linear, the relation with the ordinal index need not be linear.

Linearity can be checked by using dummy variables: specifically, one dummy variable is defined to equal 1 for places in rule–of–law categories 0, 1, and 2 and to equal 0 otherwise; another dummy equals 1 for places in categories 3 and 4 and equals 0 otherwise. Places with values of 5 and 6 have both dummies set to 0. The mean value of the rule–of–law index over the relevant sample of countries is 1.2 for the first group (only Guyana and Haiti have index values of 0), 3.5 for the second group, and 5.8 for the third group.

The system from column (1) of Table 1 was reestimated with the two dummy variables replacing the rule–of–law index. The estimated coefficient on the first dummy is −.021 (.004) and that on the second is −.016 (.004). (The other results are similar to those shown in column [1].) Thus, the countries in the lowest groups for the rule–of–law variable had the worst growth performance, those ranked in the middle came second, and those ranked highest did the best. If the relation were linear, then the coefficient on the first dummy would be roughly twice that on the second dummy (based on the means of the rule–of–law index within each group). A test of this restriction has a p–value of .05. Thus, although strict linearity would be barely rejected at the 5% level, the hypothesis is not greatly at odds with the data. The remainder of the analysis therefore retains the form in which the rule–of–law index enters directly as a regressor.

Investment Ratio

In the neoclassical growth model for a closed economy, the saving rate is exogenous and equal to the ratio of investment to output. A higher saving rate raises the steady-state level of output per effective worker and thereby raises the growth rate for a given starting value of GDP. Some empirical studies of cross-country growth have also reported an important positive role for the investment ratio; see, for example, DeLong and Summers (1991) and Mankiw, Romer, and Weil (1992).

Reverse causation is, however, likely to be important here. A positive coefficient on the contemporaneous investment ratio in a growth regression may reflect the positive relation between growth opportunities and investment, rather than the positive effect of an exogenously higher investment ratio on the growth rate. This reverse effect is especially likely to apply for open economies. Even if cross-country differences in saving ratios are exogenous with respect to growth, the decision to invest domestically, rather than abroad, would reflect the domestic prospects for returns on investment, which would relate to the domestic opportunities for growth.

The regression in column (1) of Table 1 contains the period-average investment ratio as an explanatory variable but uses the average of the investment ratio over the preceding five years as an instrument. The estimated coefficient, .031 (.023), is positive, but not statistically significant. In contrast, the estimated coefficient is more than twice as high and statistically significant if the period-average investment ratio is included as an instrument. These findings suggest that much of the positive estimated effect of the investment ratio on growth in typical cross-country regressions reflects the reverse relation between growth prospects and investment. The direct effect of exogenously higher investment on growth—which is perhaps shown by the estimated coefficient in column (1)—is much smaller than usually thought. (Blömstrom, Lipsey, and Zejan [1993] reach similar conclusions in their study of investment and growth.)

Terms of Trade

Changes in the terms of trade have often been discussed as an important influence on developing countries, which typically specialize their exports in a few primary products. The effect of a change in the terms of trade—measured as the ratio of export to import prices—on GDP is, however, not mechanical. If the physical quantities of goods produced domestically do not change, then an improvement in the terms of trade raises real domestic income and probably consumption, but would not affect real GDP. Movements in real GDP result only if the shift in the terms of trade stimulates a change in domestic employment and output. For example, an oil-importing country might react to an increase in the relative price of oil by cutting back on its employment and production.

The result in column (1) of Table 1 shows a significantly positive coefficient on the growth rate of the terms of trade: .12 (.03). (The change in the terms of trade is regarded as exogenous to an individual country's growth rate and is therefore included as an instrument.) Thus, an improvement in the terms of trade apparently does stimulate an expansion of domestic output.[10]

Dummies for Africa, Latin America, and East Asia

Previous research, such as Barro (1991), indicates that countries in Sub Saharan Africa and Latin America grow at significantly lower rates even after holding fixed a set of explanatory variables in a regression. This kind of analysis suffers from a selection bias in that the choice of which dummy variables to consider for geographical areas is

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[10]Barro and Sala–i–Martin (1994, Ch. 12) consider some other regressors. One variable included in that framework and in Alesina and Perotti (1993) is political instability, measured by the frequencies of revolutions and other disruptions. The political–instability variables are, however, not significantly related to growth when the rule–of–law index is also included in the regressions. King and Levine (1993) explore the effects of financial development, and Cukierman (1992) assesses the influences from inflation and central-bank independence.

dictated by the prior observation that some places have especially low or high growth rates. Nevertheless, the confidence in the growth-rate specification would be enhanced if the included regressors already explained why the typical country in Sub Saharan Africa and Latin America grew at below-average rates.

The regression in column (2) of Table 1 adds dummy variables for Sub Saharan Africa, Latin America, and East Asia (a high-growth area). The result is that only the estimated coefficient for Latin America, −.009 (.004), is individually statistically significant at usual critical levels. The coefficient for Sub Saharan Africa is negative, −.005 (.004), but insignificant, whereas that for East Asia is positive, .004 (.004), but also insignificant. A joint test that the coefficients of all three dummy variables are zero has a p−value of .031. Thus, although there is still an indication of an omitted adverse effect on growth in Latin America, the present specification accounts well for the high average growth in East Asia and is much better than previous specifications in explaining the low average growth in Sub Saharan Africa.

Democracy

The measure of democracy is the indicator of political rights compiled by Gastil and his followers (1982–83 and subsequent issues) from 1972 to 1993. A related variable from Bollen (1990) is used for 1960 and 1965.[11] The Gastil concept of political rights is indicated by his basic definition: "Political rights are rights to participate meaningfully in the political process. In a democracy this means the right of all adults to vote and compete for public office, and for elected representatives to have a decisive vote on

[11]The discussion in Bollen (1990) suggests that his measures are comparable to Gastil's. It is difficult to check comparability directly because the two series do not overlap in time. Moreover, many countries—especially those in Africa—clearly experienced major declines in the extent of democracy from the 1960s to the 1970s. Thus, no direct inference about comparability can be made from the higher average of Bollen's figures for the 1960s than for Gastil's numbers for the 1970s.

public policies." (Gastil, 1986–87 edition, p. 7.) In addition to the basic definition, the classification scheme counts as less democratic countries that have dominant political parties in which minority groups have little influence on policy.

Operationally, the concept of political rights is applied on a subjective basis to classify countries annually on a scale from 1 to 7, where 1 is the highest level of political rights. The classification is made by Gastil and his associates based on an array of published and unpublished information about each country. Unlike the rule–of–law index discussed before, the subjective ranking is not made directly by local observers.

The original ranking from 1 to 7 has been converted here to a scale from 0 to 1, where 0 corresponds to the fewest political rights (Gastil's rank 7) and 1 to the most political rights (Gastil's rank 1). The scale from 0 to 1 corresponds to the system used by Bollen.

Figure 1 shows the time path of the unweighted average of the democracy index for 1960, 1965, and 1972–93. The number of countries covered rises from 98 in 1960 to 109 in 1965 and 134 from 1972 to 1993. The figure shows that the mean of the democracy index peaked at .66 in 1960, fell to a low point of .44 in 1975, and rose subsequently to .57 in 1992–93.

Figures 2 and 3 demonstrate that the main source of the decline in democracy after 1960 is the experience in Sub Saharan Africa. Figure 2 indicates that many of the African countries began with democratic institutions when they became independent in the early 1960s, but most had evolved into nondemocratic states by the early 1970s. (See Bollen [1990] for further discussion.) For countries outside of Sub Saharan Africa, Figure 3 shows that the average of the democracy index fell from .69 in 1960 (72 countries) to .54 in 1975 (91 countries) and then returned to .68 in 1990–92 (but fell to .67 in 1993).

The discussion in the introduction indicated that the net effect of more political freedom on growth is theoretically ambiguous. Column (3) of Table 1 shows the regression results when the democracy index is included as an explanatory variable in the growth equations. The estimated coefficient, −.0074 (.0060), is negative, but not statistically different from 0 at conventional critical levels. The point estimate implies that a one–standard–deviation increase in democracy (by 0.3 in the indicator, see Table A1) reduces the growth rate by .002 per year. Thus, the results are consistent with a moderate adverse influence of democracy on growth.

Some previous studies, such as Kormendi and Meguire (1985) and Scully (1988), report favorable effects of political freedom on growth. It is possible to replicate these kinds of results within the present framework by eliminating some of the other independent variables from the regressions. For example, if the variables for the rule of law, schooling, life expectancy, and fertility are omitted, then the estimated coefficient of democracy becomes significantly positive, .0141 (.0067). A reasonable interpretation is that democracy looks favorable for growth in this specification only because democracy is positively correlated with some omitted country characteristics that are themselves growth enhancing. Once these other variables are held constant, the marginal contribution of democracy to growth becomes moderately negative.[12]

Democracy may also influence growth indirectly by affecting some of the explanatory variables that are held constant in the regressions. For example, more political rights might stimulate female education (by promoting equality among the sexes), which in turn reduces fertility and thereby promotes growth. However, if fertility and female schooling are omitted from the growth equations (but male

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[12]A possible argument is that the index of political freedom has so much measurement error that true democracy is more correlated with some of the other variables than with the democracy variable. It is unclear, however, that the subjective measure of political rights is less accurate than some of the other variables, especially for the poorer countries.

schooling, life expectancy and the rule-of-law index are retained), then the estimated coefficient on the democracy variable is still negative, −.009 (.006). Hence, the channel through female schooling and fertility is not sufficient for democracy to show up as a positive influence on growth.

Another possibility is that democracy encourages maintenance of the rule of law. Tests of this hypothesis are hampered by the limited availability of time-series information on the rule-of-law concept. For a sample of 47 countries, it is possible to consider the dynamic relation between the rule-of-law index, which applies to the early 1980s, and the previously discussed measures of bureaucratic delay and contract enforcement, which apply to the early 1970s. A regression for the rule-of-law variable that includes these two measures, along with log(GDP) for 1975, log(life expectancy) for 1970–74, and democracy for 1975 has a coefficient of −.61 (.71) on democracy. Thus, this limited evidence suggests that democracy does not promote the maintenance of the rule of law.

The analysis thus far has considered only linear relations between growth and democracy. The relation may be nonlinear because the democracy index—based on Gastil's (1982–83) seven subjective categories—has only an ordinal meaning and also because the true relation between growth and democracy could be nonlinear. For example, in the worst dictatorships, an increase in political rights might be growth enhancing because of the benefit from limitations on governmental power. But in places that have already achieved a moderate amount of democracy, a further increase in political rights might impair growth because of the intensified concern with income redistribution.

Column (4) of Table 1 shows the results when the democracy index is replaced by two dummy variables. The first dummy equals 1 if the democracy index is between 0 and .33 and equals 0 otherwise, and the second dummy equals 1 if the index is between

.33 and .67 and equals 0 otherwise. If the democracy index exceeds .67, then both dummies equal 0. The estimated coefficients are .005 (.004) for the first dummy and .016 (.004) for the second. The p–value for the joint significance of the two dummy variables is .001. (The hypothesis of linearity—requiring that the coefficient of the first dummy be roughly double that of the first—is strongly rejected.)

The results indicate that the middle level of democracy is most favorable to growth, the lowest level comes second, and the highest level comes third. The strongest part of this finding is the superiority of the middle level over the other two; the lowest and highest groups do not have significantly different growth rates (given the values of the other independent variables).

Similar conclusions emerge if the democracy index is entered directly in a quadratic form. Column (5) of Table 1 shows that the estimated coefficient on the linear term is positive, .053 (.027), whereas that on the squared term is negative, –.056 (.024). The p–value for joint significance of the two terms is .02. In this form, the results suggest that, at low levels of democracy, more political freedom enhances growth. The growth rate reaches a peak at a middle level of democracy—the point estimate is .47—and then diminishes if democracy continues to rise.

Figure 4 shows the nature of the partial relation between the growth rate and the level of democracy. The vertical axis plots the part of the growth rate that is unexplained by the independent variables other than the democracy index and its square (from the regression in column [5] of Table 1). The scatter diagram shows how this "partial residual" relates to the democracy index. An inverse u–shape can be discerned in the plot, with many of the low and high democracy places exhibiting negative residuals. Only a few of the countries with middle levels of democracy (Argentina and Peru) have negative residuals. However, the overall relation is far from perfect; for example, a number of countries with little democracy have large positive residuals.

Also, the places with middle levels of democracy seem to avoid low growth rates but not to have especially high growth rates. Thus, at this point, there is only the suggestion of a nonlinear relation in which more democracy raises growth when political freedoms are weak but depresses growth when a moderate amount of freedom is already established.

Sources of Growth

Table 2 uses groups of slow– and fast–growing countries to illustrate how the fitted growth rates break down into contributions from the individual explanatory variables. The countries considered fall into the lowest or highest quintiles of growth rates from 1965 to 1990. Group I in the table has 15 slow–growing Sub Saharan African countries, group II has 6 slow–growing Latin American countries, group III has 9 fast–growing East Asian countries, and group IV has 6 fast–growing European countries. The table can be used to see how the model "explains" or fails to explain the sharp differences in growth performance among the four groups of countries.

The fitted growth rates in Table 2 come from a regression that excludes the democracy variable; that is, the one shown in column (1) of Table 1. These fitted values are expressed relative to the sample mean in each period (see Table A1). For a typical poor country, the contribution to fitted growth from log(GDP) is positive, but this effect is offset by negative contributions from human capital and fertility (because GDP is strongly positively correlated with human capital and strongly negatively correlated with fertility). For this reason, it is helpful to think of a net convergence effect, which combines the contributions from log(GDP) with those from human capital and fertility. The contribution to fitted growth from this net convergence effect is shown along with the individual elements in Table 2.

The table shows that the net convergence effects for the African and European countries are each close to zero in the 1965–75 period. For Africa, the positive effect

from low GDP is offset by low values of human capital and high values of fertility, whereas in Europe, the negative effect from high GDP is offset by high values of human capital and low values of fertility. In contrast to these experiences, the East Asian countries have a substantial positive contribution from net convergence, .019, because human capital (especially male schooling) starts out high *relative* to GDP.

For the Latin American countries, a noteworthy result is the adverse contribution from high market distortions, especially toward the end of the sample. For 1985–90, the contributions to growth are –.013 from the black–market premium and –.008 from the rule–of–law index (which does not vary over time). The African countries also suffer from large distortions, whereas the East Asian and European countries benefit from small distortions. High government consumption is another negative contributor for Africa. The terms–of–trade change, although often mentioned as a key element in Africa, is not a major element for any of the groups.

Table 3 uses the same approach to illustrate sources of growth by time period for 35 individual countries. In this case, the breakdown by components is less detailed, consisting of the net convergence effect, the total influence of government consumption and public education (a government spending effect), the combined impact from the rule–of–law index and the black–market premium (an overall distortions effect), the influence of the investment ratio, and the effect of the change in the terms of trade.

Effects of Economic Development on Democracy

Theories of how democracy expands or contracts seem to be missing. A look at the data suggests, however, that countries at low levels of development typically do not sustain democracy. For example, the political freedoms installed in most of the newly independent African states in the early 1960s did not tend to last. Conversely, nondemocratic places that experience substantial economic development have a

tendency to become more democratic. Examples include Chile, Korea, Taiwan, Spain, and Portugal.

Table 4 contains regressions that test the hypothesis that prosperity stimulates the development of democratic institutions. The dependent variables are the averages of the democracy indexes over three periods of roughly a decade, 1965–74 (based on data for 1965 and 1972–74), 1975–84, and 1985–93. The explanatory variables are indicators of the level of the standard of living; GDP, life expectancy at birth, and educational attainment. The schooling figures that turn out to be important here are the years of attainment at the primary level for males and females.

The framework amounts to an error-correction model: the long-run target for democracy depends on the standard of living, and democracy tends to rise or fall depending on whether the target is above or below the current level of democracy. Thus, column (1) of Table 4 includes as a regressor the lagged value of democracy; 1960 in the 1965–74 equation, 1972 (1970 is unavailable) in the 1975–84 equation, and 1980 in the 1985–93 equation. The measures of standard of living refer, respectively, to 1965, 1975, and 1985.

The significantly positive coefficients on log(GDP) and log(life expectancy) indicate that the target level of democracy is increasing in these indicators of the standard of living.[13] Female school attainment is also significantly positive, whereas male attainment is significantly negative. This finding is reminiscent of the results in the growth regressions, where a larger gap between male and female attainment was viewed as a signal of greater backwardness. In Table 4, a smaller excess of male over female attainment signals less backwardness—that is, a more advanced society—and thereby raises the target level of democracy.

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[13]Helliwell (1992, Table 1) finds that the Gastil measures of political rights and civil liberties are positively related to levels of GDP and secondary–school enrollment ratios.

In column (1) of Table 4, the estimated coefficient on the lag of democracy, .46 (.04), is significantly positive, but also significantly less that one. This result indicates that a country's level of democracy tends to move in a decade roughly half the way toward the value associated with its standard of living.

In column (2), the process of adjustment is related to two lags of democracy. (Because of lack of data before 1960, this system includes only two equations.) The estimated coefficients on the lagged democracy variables, .36 (.05) and .13 (.05), are each significantly positive. Thus, this pattern of adjustment depends not only on the most recent value of democracy but also on the longer term history. The pattern still implies that democracy adjusts gradually toward the values implied by the indicators of the standard of living. The estimated coefficients on these indicator variables in column (2) are similar to those in column (1).

The results from Table 4 can be used to forecast changes in the level of democracy from the last value observed, 1993, into the future. These forecasts are based on 1990 values of GDP and life expectancy and on 1985 values of educational attainment (the latest figures available). The projections can be viewed as applying roughly to the year 2000.

Table 5 displays the results for cases in which the forecasted change in democracy has a magnitude of at least .14, which corresponds to a shift by 1 category in the Gastil ranking. For the equation from column (2) of Table 4, 20 of 101 countries with all of the necessary data are projected to increase democracy by at least .14, whereas 15 are projected to decrease by at least .14.

The group with large projected increases in democracy, on the left side of Table 5, includes some countries that have virtually no political freedom in 1993. Some of these are among the world's poorest countries, such as Sudan and Haiti, for which the projected level of democracy in 2000 is also not high. Sudan is forecasted to raise its

democracy from 0 in 1993 to .24 in 2000, and Haiti is also expected to go (perhaps with the assistance of the United States) from 0 to .24. Some other countries that have essentially no political freedom in 1993 are more well off economically and are therefore forecasted to have greater increases in democracy; for example, the projected value in 2000 is .43 for Indonesia, .33 for Algeria, and .32 for Syria.

Expectations for large increases in democracy also apply to some reasonably prosperous places in which the measured level of political freedom lags behind the standard of living. Singapore is projected to increase its democracy index from .33 in 1993 to .61 in 2000, Mexico is expected to go from .50 to .72 (a change that has probably already occurred with the 1994 elections), Fiji is anticipated to advance from .50 to .68, and Taiwan is forecasted to rise from .50 to .64. Japan, which fell from 1.00 in 1992 to .83 in 1993 because of the political corruption scandals, is projected to return to .97 by 2000. For Peru, where the democracy index declined from .83 in 1989 to .33 in 1993 (and in which economic freedoms were strengthened), the model projects an increase to .51 in 2000.

South Africa is also included on the left side of the table, with a projected rise in the democracy index from .33 in 1993 to .47 in 2000. However, the political changes in South Africa in 1994 have probably overshot the mark, and the model would likely forecast a substantial decline of political freedom in this country after 1994.

The examples of large expected decreases in democracy, shown on the right side of Table 5, consist mainly of relatively poor countries with surprisingly high levels of political freedom in 1993. Many of these cases are African countries in which the political institutions recently became more democratic; Mali, Benin, Zambia, Central African Republic, Niger, and Congo. The regression predicts that, as with the African experience of the 1960s, democracy that gets well ahead of economic development will not last. Three other African countries, The Gambia, Mauritius, and Botswana, have

maintained democratic institutions for some time, but the regression still predicts that political freedoms will eventually diminish in these places. (A military coup in July 1994 has already reduced the Gambia's level of political freedom.)

For poor, but relatively democratic countries outside of Africa, the forecast for large decreases in democracy applies to Bangladesh, Bolivia, Nepal, Pakistan, and Papua New Guinea. Hungary, which has a higher standard of living, is projected to decline from its fully democratic condition of 1.00 in 1993 to .81 in 2000.

Concluding observations

The interplay between democracy and economic development involves the effect of political freedom on growth and the influence of the standard of living on the extent of democracy. With respect to the determination of growth, the cross-country analysis brings out favorable effects from maintenance of the rule of law, free markets, small government consumption, and high human capital. Once these kinds of variables and the initial level of GDP are held constant, the overall effect of democracy on growth is weakly negative. There is some indication of a nonlinear relation in which more democracy enhances growth at low levels of political freedom but depresses growth when a moderate level of political freedom has already been attained.

With respect to the effects of economic development on democracy, the analysis shows that improvements in the standard of living—measured by a country's real per-capita GDP, life expectancy, and education—substantially raise the probability that political institutions will become more democratic over time. Hence, political freedom emerges as a sort of luxury good. Rich places consume more democracy because this good is desirable for its own sake and even though the increased political freedom may have a small adverse effect on growth. Basically, rich countries can afford the reduced rate of economic progress.

The analysis has implications for the desirability of exporting democratic institutions from the advanced western countries to developing nations. The first lesson is that more democracy is not the key to economic growth, although it may have a weak positive effect for countries that start with few political rights. The second message is that political freedoms tend to erode over time if they are out of line with a country's standard of living.

The more general conclusion is that the advanced western countries would contribute more to the welfare of poor nations by exporting their economic systems, notably property rights and free markets, rather than their political systems, which typically developed after reasonable standards of living had been attained. If economic freedom can be established in a poor country, then growth would be encouraged and the country would tend eventually to become more democratic on its own. Thus, in the long run, the propagation of western-style economic systems would also be the effective way to expand democracy in the world.

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Table 1

Regressions for Per-Capita Growth Rate

Variable	(1)	(2)	(3)	(4)	(5)
log(GDP)	-.0290 (.0029)	-.0266 (.0031)	-.0264 (.0029)	-.0247 (.0029)	-.0247 (.0029)
male schooling	.0149 (.0038)	.0096 (.0040)	.0168 (.0037)	.0141 (.0037)	.0164 (.0036)
female schooling	-.0139 (.0052)	-.0080 (.0041)	-.0142 (.0052)	-.0122 (.0050)	-.0134 (.0049)
log(life expectancy)	.0419 (.0120)	.0413 (.0131)	.0443 (.0120)	.0432 (.0126)	.0442 (.0128)
log(GDP)*human capital	-.65 (.22)	-.75 (.29)	-.53 (.17)	-.45 (.19)	-.38 (.17)
log(fertility rate)	-.0149 (.0054)	-.0123 (.0057)	-.0126 (.0054)	-.0163 (.0056)	-.0138 (.0054)
govt. consumption ratio	-.127 (.028)	-.111 (.028)	-.111 (.027)	-.104 (.027)	-.107 (.026)
public educational spending ratio	.178 (.089)	.140 (.090)	.150 (.088)	.200 (.089)	.206 (.092)
black-market premium	-.0221 (.0056)	-.0216 (.0051)	-.0231 (.0054)	-.0208 (.0053)	-.0210 (.0052)
rule-of-law index	.00432 (.00096)	.00403 (.00097)	.00403 (.00094)	.00360 (.00092)	.00423 (.00092)
terms-of-trade change	.117 (.028)	.098 (.029)	.127 (.028)	.130 (.028)	.138 (.029)
investment ratio	.031 (.023)	.022 (.023)	.035 (.021)	.023 (.021)	.024 (.022)
democracy index	--	--	-.0074 (.0060)	--	.053 (.027)
democracy index squared	--	--	--	--	-.056 (.024)
dem. index dummy for (0, .33)	--	--	--	.0046 (.0044)	--
dem. index dummy for (.33, .67)	--	--	--	.0155 (.0044)	--
Sub Saharan Africa	--	-.0049 (.0044)	--	--	--
Latin America	--	-.0090 (.0035)	--	--	--

Table 1 continued,

Variable	(1)	(2)	(3)	(4)	(5)
East Asia	--	.0035 (.0041)	--	--	--
R^2	.65, .61, .24	.64, .63, .32	.66, .62, .24	.69, .55, .30	.66, .59 .29
number of observations	82, 89, 84	82, 89 84	78, 89 84	78, 89 84	78, 89 84

Notes to Table 1: The system has three equations, where the dependent variables are the growth rate of real per-capita GDP for 1965-75, 1975-85, and 1985-90. The variables GDP (real per-capita gross domestic product), schooling (years of attainment at the secondary and higher levels), and life expectancy at birth are observed at the beginning of each of the periods. The rule-of-law index applies to the early 1980s (one observation for each country). The terms-of-trade variable is the growth rate over each period of the ratio of export to import prices. The variable log(GDP)*human capital is the product of log(GDP) (expressed as a deviation from the sample mean) and the estimated effect of the schooling and life-expectancy variables (also expressed as deviations from sample means). The other variables are measured as averages over each period. These variables are the log of the total fertility rate, the ratio of government consumption (exclusive of defense and education) to GDP, the ratio of public educational spending to GDP, the black-market premium on foreign exchange, the ratio of gross investment (private plus public) to GDP, and the democracy index. The first dummy variable for democracy takes on the value 1 if the average of the democracy index is between 0 and .33 and 0 otherwise. The second one takes on the value 1 if the average of the democracy index is between .33 and .67 and 0 otherwise. The variables Sub Saharan Africa, Latin America, and East Asia are dummies, which take on the value 1 for countries in the respective area and 0 otherwise. Individual constants (not shown) are estimated for each period. Estimation is by instrumental variables. The instruments are the five-year earlier value of log(GDP) (for example, for 1960 in the 1965-75 equation); the actual values of the schooling, life-expectancy, rule-of-law, and terms-of-trade variables; and earlier values of the other variables. For example, the 1965-75 equation uses as instruments the averages of the black-market premium and government spending and investment ratios for 1960-64. The estimation allows for different error variances in each period and for correlation across these errors. The estimated correlation of the errors for column (1) is -.03 between the 1965-75 and 1975-85 equations, .06 between the 1965-75 and 1985-90 equations, and .25 between the 1975-85 and 1985-90 equations. The pattern is similar for the other columns. The estimates are virtually the same if the errors are assumed to be independent over the time periods. Standard errors of the coefficient estimates are shown in parentheses. The R^2 values and numbers of observations apply to each period individually.

Table 2

Sources of Growth for Slow and Fast Growers

I. 15 slow-growing Sub Saharan African countries

	1965-75	1975-85	1985-90
per-capita GDP growth rate	.000 (15)	-.022 (15)	-.010 (15)
growth relative to sample mean	-.030 (15)	-.034 (15)	-.021 (15)
fitted growth, relative to mean	-.020 (6)	-.031 (7)	-.025 (7)
contributions to fitted growth:			
net convergence effect	.000 (10)	.004 (10)	.009 (10)
of which:			
initial GDP	*.024 (15)*	*.032 (15)*	*.042 (15)*
male schooling	*-.010 (10)*	*-.014 (10)*	*-.018 (10)*
female schooling	*.007 (10)*	*.011 (10)*	*.015 (10)*
life expectancy	*-.014 (15)*	*-.012 (15)*	*-.011 (15)*
*initial GDP*human capital*	*-.003 (10)*	*-.005 (10)*	*-.008 (10)*
fertility rate	*-.005 (15)*	*-.007 (15)*	*-.009 (14)*
government consumption	-.012 (13)	-.010 (13)	-.009 (11)
educational spending	-.001 (11)	-.001 (11)	-.002 (11)
rule of law	-.003 (10)	-.003 (10)	-.003 (10)
black-market premium	-.002 (12)	-.010 (13)	-.005 (14)
investment ratio	-.004 (15)	-.004 (15)	-.003 (15)
terms of trade	-.001 (14)	.000 (14)	-.002 (14)

II. 6 slow-growing Latin American countries

	1965-75	1975-85	1985-90
per-capita GDP growth rate	.014 (6)	-.023 (6)	-.027 (6)
growth relative to sample mean	-.016 (6)	-.035 (6)	-.038 (6)
fitted growth, relative to mean	-.016 (5)	-.016 (6)	-.015 (6)
net convergence effect	-.008 (6)	-.001 (6)	.008 (6)
of which:			
initial GDP	*-.006 (6)*	*-.002 (6)*	*.008 (6)*
male schooling	*-.005 (6)*	*-.005 (6)*	*-.006 (6)*
female schooling	*.002 (6)*	*.003 (6)*	*.002 (6)*
life expectancy	*.000 (6)*	*.001 (6)*	*.001 (6)*
*initial GDP*human capital*	*.003 (6)*	*.004 (6)*	*.004 (6)*
fertility rate	*-.002 (6)*	*-.002 (6)*	*-.001 (6)*
government consumption	.000 (6)	.000 (6)	.001 (6)
educational spending	-.001 (6)	-.001 (6)	-.001 (6)
rule of law	-.008 (6)	-.008 (6)	-.008 (6)
black-market premium	.000 (5)	-.003 (6)	-.013 (6)
investment ratio	-.001 (6)	-.001 (6)	-.001 (6)
terms of trade	.002 (6)	-.002 (6)	.000 (6)

Table 2, continued

III. 9 fast-growing East Asian countries

	1965-75		1975-85		1985-90	
per-capita GDP growth rate	.059	(9)	.052	(9)	.058	(9)
growth relative to sample mean	.028	(9)	.040	(9)	.047	(9)
fitted growth, relative to mean	.031	(8)	.031	(8)	.022	(8)
net convergence effect	.019	(8)	.012	(8)	.001	(8)
of which:						
initial GDP	*.004*	*(8)*	*-.002*	*(9)*	*-.013*	*(9)*
male schooling	*.008*	*(8)*	*.007*	*(8)*	*.012*	*(8)*
female schooling	*.000*	*(8)*	*.000*	*(8)*	*-.005*	*(8)*
life expectancy	*.002*	*(9)*	*.004*	*(9)*	*.004*	*(9)*
*initial GDP*human capital*	*.003*	*(8)*	*.001*	*(8)*	*-.001*	*(8)*
fertility rate	*.001*	*(9)*	*.005*	*(9)*	*.007*	*(9)*
government consumption	.004	(8)	.006	(8)	.007	(8)
educational spending	-.001	(8)	-.001	(8)	-.001	(8)
rule of law	.005	(8)	.005	(8)	.005	(8)
black-market premium	.002	(8)	.004	(8)	.005	(8)
investment ratio	.001	(9)	.003	(9)	.003	(9)
terms of trade	.001	(9)	.000	(9)	.001	(9)

IV. 6 fast-growing European countries

	1965-75		1975-85		1985-90	
per-capita GDP growth rate	.050	(6)	.026	(6)	.038	(6)
growth relative to sample mean	.020	(6)	.014	(6)	.027	(6)
fitted growth, relative to mean	.019	(6)	.013	(6)	.013	(6)
net convergence effect	.004	(6)	-.004	(6)	-.007	(6)
of which:						
initial GDP	*-.017*	*(6)*	*-.023*	*(6)*	*-.028*	*(6)*
male schooling	*.002*	*(6)*	*.002*	*(6)*	*.007*	*(6)*
female schooling	*-.002*	*(6)*	*-.002*	*(6)*	*-.005*	*(6)*
life expectancy	*.010*	*(6)*	*.009*	*(6)*	*.008*	*(6)*
*initial GDP*human capital*	*.002*	*(6)*	*.001*	*(6)*	*.001*	*(6)*
fertility rate	*.009*	*(6)*	*.009*	*(6)*	*.011*	*(6)*
government consumption	.004	(6)	.004	(6)	.003	(6)
educational spending	.000	(6)	.000	(6)	-.001	(6)
rule of law	.006	(6)	.006	(6)	.006	(6)
black-market premium	.003	(6)	.004	(6)	.006	(8)
investment ratio	.004	(6)	.003	(6)	.002	(6)
terms of trade	-.001	(6)	.000	(6)	.004	(6)

Notes to Table 2: The groups of countries are selected from those in the lowest or highest quintile of growth rates of real per-capita GDP from 1965 to 1990. The 15 slow-growing Sub Saharan African countries are (in increasing order of growth rates) Chad, Mozambique, Madagascar, Zambia, Uganda, Zaire, Somalia, Benin, Niger, Mauritania, Comoros, Central African Republic, Sierra Leone, Ghana, and Sudan. The six slow-growing Latin American countries are Nicaragua, Guyana, Venezuela, Peru, Haiti, and Argentina. The nine fast-growing East Asian countries (in decreasing order of growth rates) are South Korea, Singapore, Taiwan, Hong Kong, China, Indonesia, Japan, Thailand, and Malaysia. The six fast-growing European countries are Malta (included with Europe), Portugal, Ireland, Italy, Greece, and Finland. Fitted values are from the growth-rate regression shown in column (1) of Table 1. The figure in parentheses is the number of observations over which the value is averaged (reflecting the availability of data). The fitted values (expressed as deviations from sample means) are broken down into components, which correspond to the explanatory variables in the regression. See the text and the notes to Table 1 for definitions of variables. The net convergence term encompasses the effects from initial real per-capita GDP, male and female secondary and higher school attainment, life expectancy, the interaction between initial real per-capita GDP and human capital (schooling and life expectancy), and the fertility rate. Since the rule-of-law index has only one observation per country, the estimated contribution from this variable does not vary over time.

Table 3 Sources of Growth for Selected Countries

I. 1965-75

Country	per-cap. growth rate	growth rel. to smpl mean	fitted value	net converg.	govt. spending	distor-tions	invest. ratio	terms of trade
Botswana	.085	.055	.024	.016	.002	.009	.002	-.006
Ghana	.001	-.029	.000	.015	.003	-.017	-.004	.003
Kenya	.031	.001	-.001	.012	-.004	-.007	.000	-.002
S. Africa	.032	.002	-.008	-.011	-.001	.005	.001	-.002
Zaire	.015	-.015	-.024	.012	-.011	-.018	-.005	-.002
Canada	.035	.004	.004	-.029	.013	.016	.002	.002
Haiti	-.005	-.035	-.022	.007	-.010	-.010	-.005	-.003
Mexico	.034	.003	-.003	-.013	.004	.007	-.001	.000
U.S.	.015	-.015	-.010	-.039	.014	.016	.002	-.002
Argentina	.019	-.011	-.011	-.004	.002	-.006	-.002	-.001
Brazil	.064	.034	.011	.005	.002	.005	.001	-.002
Chile	-.012	-.042	-.029	-.008	-.004	-.012	-.004	-.001
Peru	.021	-.009	-.012	-.008	.004	-.008	.000	.000
Venezuela	.000	-.030	-.013	-.036	.008	.003	-.001	.013
Hong Kong	.047	.017	.030	.007	.005	.015	.000	.002
India	.010	-.020	.003	.014	-.002	-.006	-.001	-.002
Indonesia	.046	.016	.013	.015	.003	-.011	-.003	.009
Iran	.054	.024	-.002	-.018	.009	-.007	-.001	.016
Japan	.064	.034	.025	-.001	.006	.016	.006	-.002
S. Korea	.081	.051	.050	.045	.005	.000	.001	-.001
Malaysia	.047	.017	.022	.013	.004	.007	.000	-.003
Philippines	.028	-.002	-.004	.013	-.004	-.008	-.002	-.003
Singapore	.097	.067	.056	.025	.009	.015	.004	.002
Taiwan	.061	.031	.036	.031	-.008	.014	.001	-.002
Thailand	.040	.010	.019	.017	.001	.003	.000	-.001
Finland	.039	.009	.015	-.017	.009	.016	.006	.000
France	.033	.003	.001	-.025	.006	.016	.004	.000
W. Germany	.023	-.007	.000	-.024	.004	.016	.004	.000
Ireland	.040	.010	.009	-.010	.004	.011	.003	.000
Italy	.037	.007	.004	-.014	.005	.011	.004	-.003
Portugal	.059	.029	.030	.011	.002	.015	.003	-.001
Spain	.046	.016	.004	-.009	.002	.011	.004	-.003
Sweden	.024	-.006	-.003	-.029	.008	.016	.003	.000
U.K.	.020	-.010	-.005	-.024	.004	.016	.001	-.002
Australia	.026	-.004	-.005	-.032	.009	.016	.004	-.002

Table 3, continued

II. 1975-85

Country	per-cap. growth rate	growth rel. to smpl mean	fitted value	net converg.	govt. spending	distor-tions	invest. ratio	terms of trade
Botswana	.051	.040	.003	.002	-.003	.007	.003	-.005
Ghana	-.015	-.026	-.037	.031	-.010	-.051	-.004	-.002
Kenya	-.006	-.017	.005	.010	-.003	-.003	-.001	.002
S. Africa	-.004	-.016	-.010	-.012	-.001	.005	.001	-.003
Zaire	-.035	-.047	-.019	.014	-.005	-.025	-.004	.001
Canada	.024	.012	.005	-.029	.014	.017	.002	.000
Haiti	.007	-.004	-.003	.016	-.009	-.008	-.003	.002
Mexico	.013	.002	.006	-.010	.005	.006	.000	.004
U.S.	.021	.009	.005	-.029	.015	.017	.001	.001
Argentina	-.014	-.026	-.013	-.007	.006	-.007	-.001	-.005
Brazil	.013	.002	-.001	-.005	.003	.003	.001	-.004
Chile	.011	.000	.005	.004	-.003	.010	-.002	-.004
Peru	-.018	-.029	-.006	-.002	.001	-.003	.001	-.004
Venezuela	-.019	-.031	-.008	-.025	.008	.000	.001	.008
Hong Kong	.065	.053	.026	.002	.006	.017	.001	-.001
India	.023	.011	.028	.032	-.002	.001	.000	-.003
Indonesia	.055	.044	.019	.019	-.001	-.005	.001	.005
Iran	-.023	-.034	-.020	-.019	.010	-.022	.002	.008
Japan	.034	.022	.017	-.015	.010	.017	.005	-.001
S. Korea	.061	.049	.050	.035	.009	.003	.003	-.001
Malaysia	.044	.033	.039	.013	.010	.009	.003	.003
Philippines	-.006	-.018	-.004	.014	-.007	-.006	.000	-.006
Singapore	.049	.037	.040	.004	.010	.017	.006	.002
Taiwan	.057	.046	.034	.020	-.003	.017	.003	-.002
Thailand	.037	.026	.020	.017	.001	.004	.000	-.003
Finland	.021	.010	.009	-.021	.007	.017	.005	.000
France	.015	.004	.005	-.024	.008	.017	.003	.001
W. Germany	.021	.010	.006	-.018	.005	.017	.003	.000
Ireland	.023	.011	.013	-.012	.008	.013	.003	.001
Italy	.027	.015	.006	-.014	.004	.013	.002	.001
Portugal	.014	.003	.019	.003	.001	.015	.002	-.001
Spain	.002	-.010	.006	-.013	.004	.013	.002	.000
Sweden	.012	.000	-.001	-.027	.007	.017	.001	.000
U.K.	.021	.010	.008	-.018	.006	.017	.000	.003
Australia	.016	.005	.001	-.028	.011	.017	.003	-.002

Table 3, continued

III. 1985-90

Country	per-cap. growth rate	growth rel. to smpl mean	fitted value	net converg.	govt. spending	distor-tions	invest. ratio	terms of trade
Botswana	.055	.045	--	-.004	-.006	.009	.000	--
Ghana	.013	.002	-.002	.034	-.016	-.009	-.004	-.008
Kenya	.033	.022	.013	.019	-.002	.000	-.001	-.001
S. Africa	-.010	-.020	-.003	-.007	-.002	.008	.000	-.002
Zaire	-.025	-.036	.024	.027	-.005	-.005	-.003	.010
Canada	.021	.010	.003	-.034	.014	.019	.004	.001
Haiti	-.029	-.040	-.018	.016	-.011	-.022	-.003	.001
Mexico	.003	-.007	-.002	-.008	.004	.007	-.001	-.003
U.S.	.021	.010	.002	-.037	.017	.019	.002	.001
Argentina	-.021	-.031	-.003	-.002	.007	-.007	-.003	.001
Brazil	-.002	-.013	.006	-.006	.004	.000	.000	.008
Chile	.042	.031	.027	.006	.004	.011	-.001	.007
Peru	-.039	-.050	.008	.011	.003	.001	.000	-.007
Venezuela	-.009	-.020	-.023	-.016	.009	-.014	.000	.000
Hong Kong	.060	.050	.010	-.018	.006	.019	.001	.002
India	.034	.024	.042	.040	-.003	.004	.000	.001
Indonesia	.035	.025	.007	.014	-.003	-.005	.004	-.003
Iran	-.052	-.062	-.052	-.007	.007	-.056	.002	.003
Japan	.042	.032	.019	-.023	.010	.019	.006	.007
S. Korea	.087	.076	.044	.020	.012	.005	.005	.002
Malaysia	.037	.026	.025	.004	.012	.010	.003	-.004
Philippines	.028	.017	.008	.017	-.006	-.004	-.001	.001
Singapore	.059	.048	.025	-.012	.011	.019	.006	.001
Taiwan	.077	.067	.025	.008	-.002	.018	.003	-.001
Thailand	.075	.064	.025	.014	.001	.006	.001	.003
Finland	.032	.021	.010	-.025	.006	.019	.005	.004
France	.027	.016	.009	-.026	.009	.019	.003	.003
W. Germany	.029	.018	.010	-.023	.005	.019	.003	.005
Ireland	.046	.035	.012	-.014	.008	.015	.002	.001
Italy	.028	.018	.007	-.017	.002	.015	.003	.005
Portugal	.052	.041	.030	.006	-.001	.017	.001	.006
Spain	.049	.039	.022	-.005	.004	.015	.003	.004
Sweden	.017	.006	.000	-.030	.006	.019	.002	.003
U.K.	.032	.021	.004	-.023	.005	.019	.001	.002
Australia	.009	-.001	.005	-.030	.010	.019	.004	.002

Notes to Table 3: See the notes to Tables 1 and 2. The growth rate is for per-capita real GDP. The net convergence term is the combination of the effects from initial real per-capita GDP, male and female school attainment at the secondary and higher levels, life expectancy at birth, and fertility. The government spending term combines the effects of government consumption (exclusive of defense and education) and public educational spending. The distortions term includes the rule-of-law index and the black-market premium on foreign exchange.

Table 4

Regressions for Democracy Index

Variable	(1)	(2)
constant	-1.56 (.37)	-1.66 (.50)
$democ_{t-1}$	.457 (.037)	.365 (.050)
$democ_{t-2}$	--	.129 (.046)
log(GDP)	.054 (.024)	.048 (.031)
male primary schooling	-.077 (.022)	-.086 (.027)
female primary schooling	.081 (.021)	.085 (.026)
log(life expectancy)	.37 (.12)	.40 (.16)
R^2	.76, .70, .75	.72, .76
no. of observations	72, 95, 102	87, 102

Notes to Table 4: System (1) has three equations, where the dependent variables are the average value of the democracy index for 1965-74 (estimated from the observed values in 1965 and 1972-74), 1975-84, and 1985-93. System (2) contains only the two equations for 1975-84 and 1985-93. The variable $democ_{t-1}$ is for 1960 in the 1965-74 equation, 1972 in the 1975-84 equation, and 1980 in the 1985-93 equation. System (2) includes also $democ_{t-2}$, the value for 1960 in the 1975-84 equation and 1972 in the 1985-93 equation. The variables log(GDP), male and female primary schooling (years of attainment at the primary level), and life expectancy at birth apply to 1960 in the 1965-74 equation, 1970 in the 1975-84 equation, and 1980 in the 1985-93 equation. Each system contains only one constant, as shown. Estimation is by the seemingly-unrelated technique. The estimated correlation of the errors is .00 between the 1965-75 and 1975-84 equations, .22 between the 1965-74 and 1985-93 equations, and .12 between the 1975-84 and 1985-93 equations. The estimates are virtually the same if the error terms are assumed to be independent over the time periods. Standard errors of the estimated coefficients are shown in parentheses. The R^2 values apply to each period individually.

Table 5

Countries Forecasted to Experience Major Changes in Democracy

Projected to Be More Democratic			Projected to Be Less Democratic		
Country	Democracy 1993	Democracy 2000	Country	Democracy 1993	Democracy 2000
Indonesia	.00	.43	Mali	.83	.44
Bahrain	.17	.52	Benin	.83	.50
Hong Kong	.33	.67	Zambia	.67	.35
Algeria	.00	.33	Cent. Afr. Rep.	.67	.36
Syria	.00	.32	Niger	.67	.37
Singapore	.33	.61	Gambia	.83	.54
Iran	.17	.41	Bangladesh	.83	.56
Yugoslavia	.17	.41	Bolivia	.83	.58
Sudan	.00	.24	Congo	.67	.42
Haiti	.00	.24	Nepal	.83	.60
Mexico	.50	.72	Hungary	1.00	.81
Tunisia	.17	.38	Pakistan	.67	.48
Iraq	.00	.21	Mauritius	1.00	.81
Swaziland	.17	.35	Papua New Guinea	.83	.65
Fiji	.50	.68	Botswana	.83	.66
Sri Lanka	.50	.67			
Peru	.33	.51			
South Africa	.33	.47			
Japan	.83	.97			
Taiwan	.50	.64			

Notes to Table 5: Democracy 1993 is based on the 1993 value of the Gastil concept of political rights, as described in the text. The measure runs from 0 to 1, with 0 representing the fewest rights. Democracy 2000 is the projected value for roughly the year 2000, based on the regression from column (2) of Table 4. The countries listed on the left side of the table are the 20 of 101 included places with projected increases of at least .14 in the democracy indicator. Those on the right side are the 15 with projected decreases of at least .14.

Appendix

Table A1

Means and Standard Deviations of Variables

I. 1965-75 period, 87 observations or as indicated

Growth rate of GDP, 1965-75	.030	.023
log(GDP), 1965	7.56	.94
GDP, 1965	2943	2838
Male primary school, 1965[a]	3.17	1.84
Female primary school, 1965[a]	2.53	2.04
Male secondary school, 1965	.74	.68
Female secondary school, 1965	.52	.64
Male higher school, 1965	.113	.125
Female higher school, 1965	.053	.091
log(life exp. at birth, 1960-64)	4.00	.21
log(fertility rate), 1965-74	1.53	.45
govt. consumption ratio, 1965-74	.092	.065
pub. educ. spend. ratio, 1965-74	.038	.015
black-market premium, 1965-74	.147	.200
rule-of-law index[b]	3.2	2.0
terms-of-trade change, 1965-75	.000	.036
investment ratio, 1965-74	.199	.099
democracy index, 1965-74[c]	.56	.30

II. 1975-85 period, 97 observations or as indicated

Growth rate of GDP, 1975-85	.011	.026
log(GDP), 1975	7.83	.96
GDP, 1975	3873	3556
Male primary school, 1975[d]	3.26	1.84
Female primary school, 1975[d]	2.64	2.05
Male secondary school, 1975	1.05	.94
Female secondary school, 1975	.78	.91
Male higher school, 1975	.176	.197
Female higher school, 1975	.089	.133
log(life exp. at birth, 1970-74)	4.05	.20
log(fertility rate), 1975-84	1.37	.53
govt. consumption ratio, 1975-84	.101	.072
pub. educ. spend. ratio, 1975-84	.045	.017
black-market premium, 1975-84	.224	.357
rule-of-law index[e]	3.1	2.0
terms-of-trade change, 1975-85	-.013	.035
investment ratio, 1975-84	.193	.085
democracy index, 1975-84	.53	.34

Table A1, continued

III. 1985-95 period, 97 observations or as indicated

Growth rate of GDP, 1985-90[f]	.011	.033
log(GDP), 1985	7.95	1.04
GDP, 1985	4597	4404
log(GDP), 1990[f]	8.02	1.10
GDP, 1990[f]	5193	5091
Male primary school, 1985[d]	3.79	1.68
Female primary school, 1985[d]	3.10	1.96
Male secondary school, 1985[d]	1.42	1.08
Female secondary school, 1985[d]	1.10	1.04
Male higher school, 1985[d]	.268	.246
Female higher school, 1985[d]	.159	.193
log(life exp. at birth, 1980-84)	4.12	.18
log(life exp. at birth, 1985-89)	4.15	.17
log(fertility rate), 1985-89	1.26	.55
log(fertility rate), 1990	1.23	.54
govt. consumption ratio, 1980-84	.101	.074
pub. educ. spend. ratio, 1980-84	.046	.018
black-market premium, 1985-89	.301	.514
terms-of-trade change, 1985-90	-.009	.046
investment ratio, 1985-89	.171	.086
democracy index, 1985-93	.61	.33
projected democ. index, 2000	.65	.28

[a]81 observations

[b]82 observations for figures from early 1980s.

[c]83 observations, based on data for 1965, 1972-74.

[d]96 observations.

[e]89 observations for figures from early 1980s.

[f]95 observations. Some of the data for GDP in 1990 come from the World Bank, rather than Summers and Heston.

Notes: The data and detailed definitions of the variables are contained in the Barro-Lee data set available from Ingrid Sayied, Economics Department, Harvard University, Cambridge MA 02138.

Figure 1 Democracy in the World, 1960–1993

(values plotted for 1960, 1965, 1972–93)

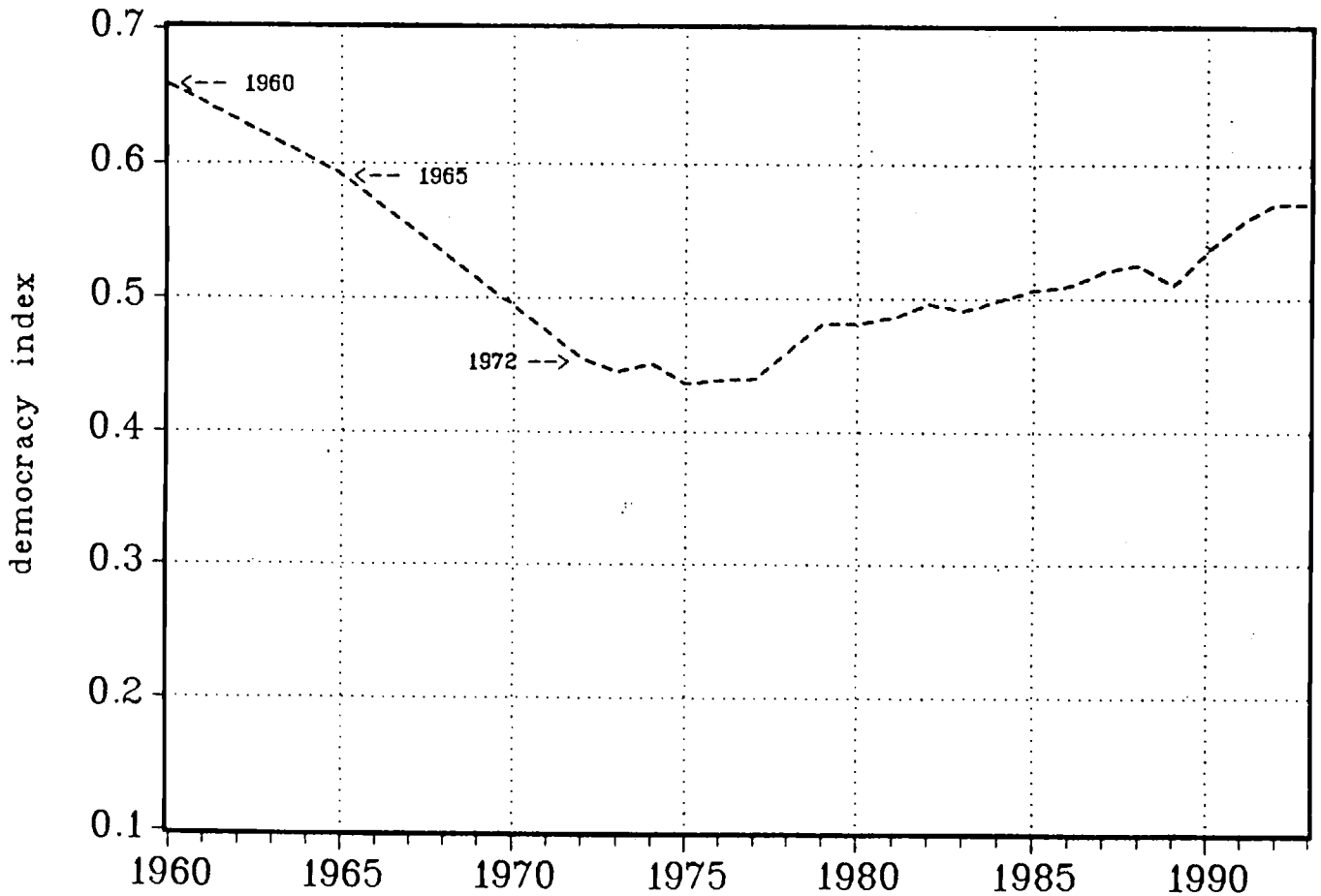

Figure 2 Democracy in Sub-Saharan Africa, 1960-1993

(values plotted for 1960, 1965, 1972-93)

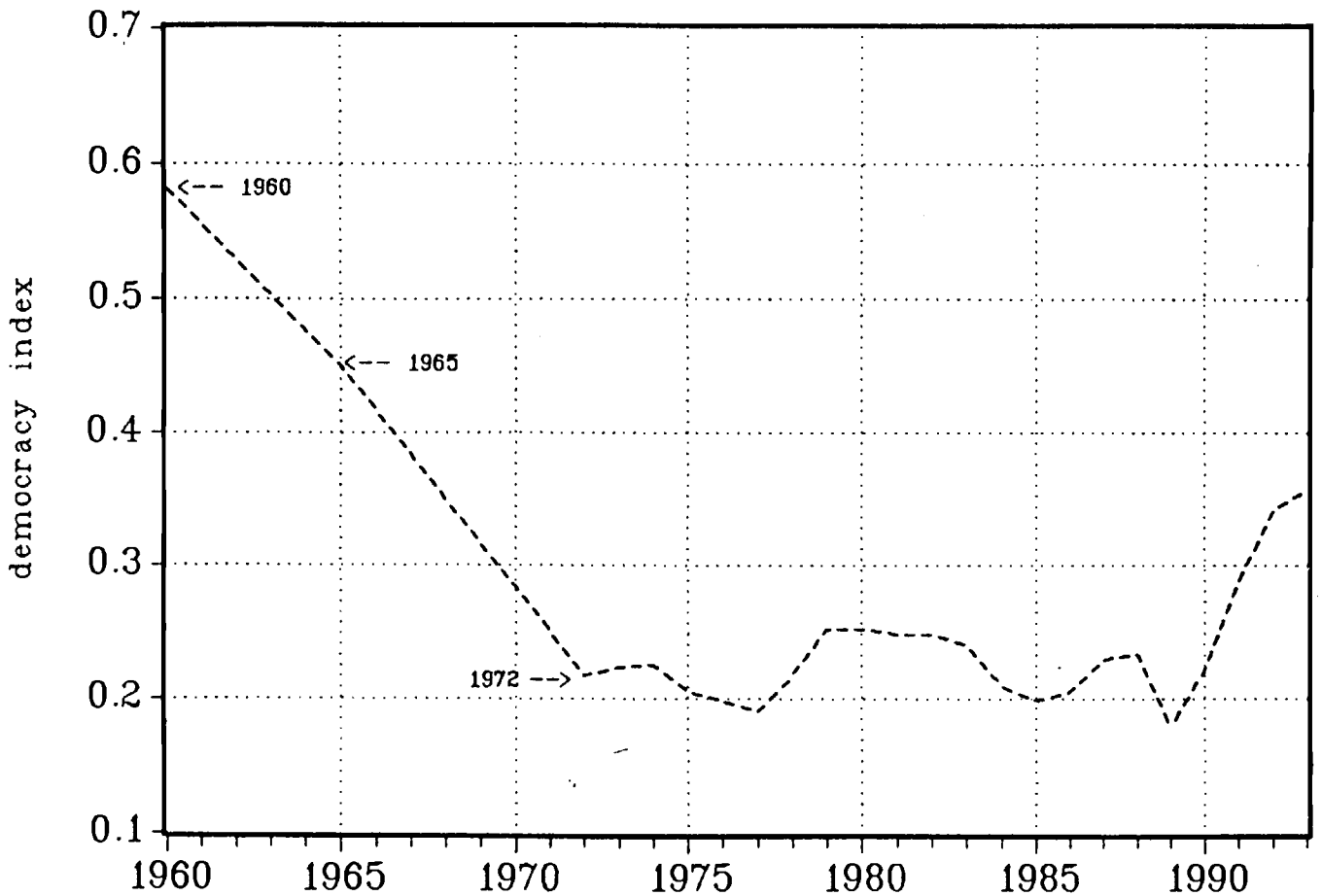

Figure 3 Democracy Outside of Sub-Saharan Africa, 1960-1993

(values plotted for 1960, 1965, 1972-93)

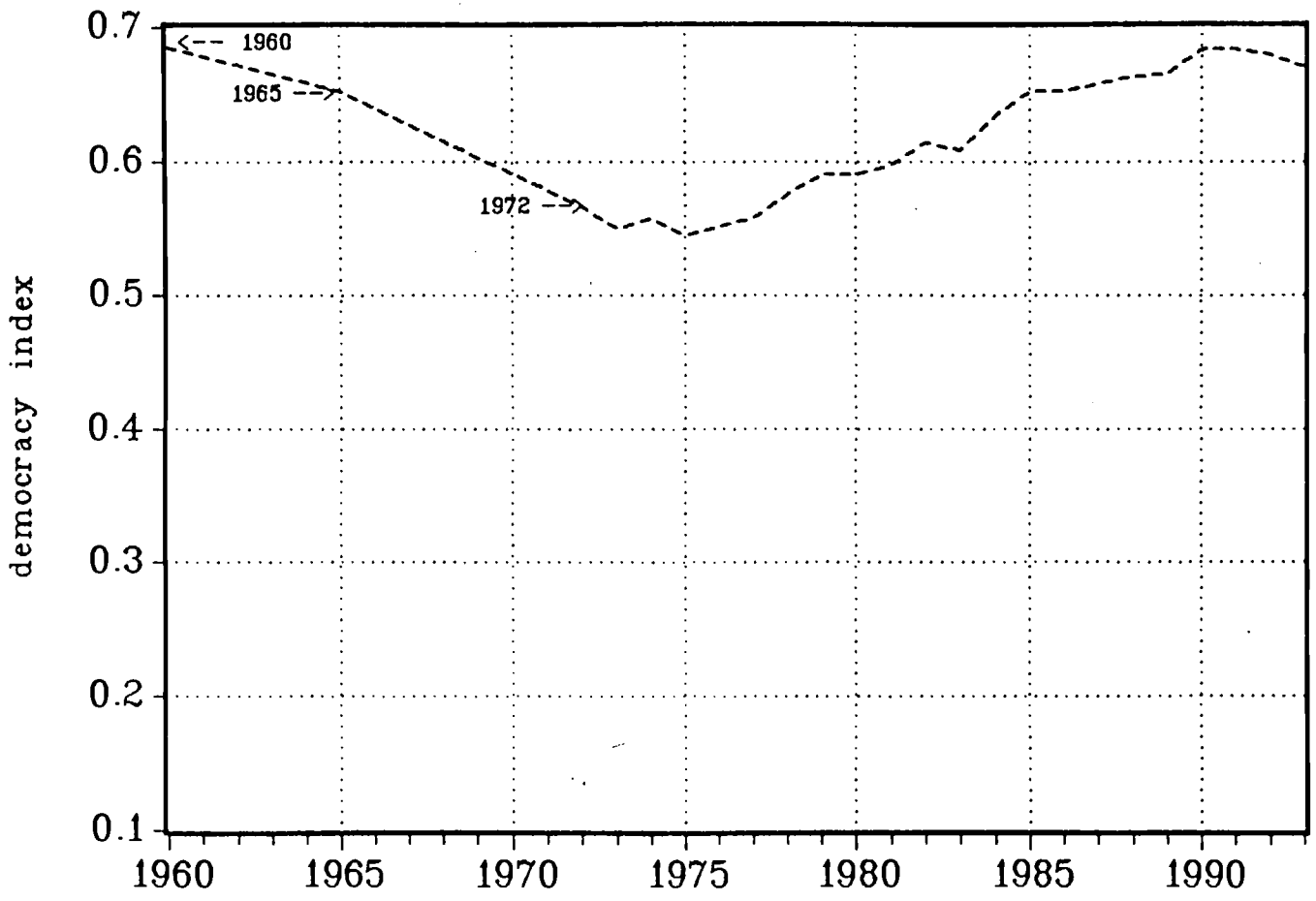

Figure 4 Partial Relation between Growth Rate and Democracy