On the Relation of Economic Development to Democratic Performance*

The relationship between economic growth and democratic political development has been the subject of considerable study. While most analysts have argued that the latter is a positive function of the former, there has been disagreement over both the form of the relationship and the definition of democratic political development itself. The purpose of this paper is to specify and estimate some simple models describing the relationship for a cross-section of 60 non-Communist countries.

While the thesis that economic development fosters the emergence of democratic political institutions and processes has a long history in political thought, the first major attempt to assess it empirically was presented by Lipset in his well-known essay “Some Social Requisites of Democracy: Economic Development and Political Legitimacy.” Using a number of indices of economic development, Lipset concluded that:

Although the various indices have been presented separately, it seems clear that the factors of industrialization, urbanization, wealth, and education are so closely interrelated as to form one common factor. And the factors subsumed under economic development carry with it the political correlate of democracy.2

While he did not fully specify the form of the relationship, it appears from his discussion that Lipset regarded democracy as a linear positive function of economic growth.

However, these conclusions are limited in a number of ways, especially by the manner in which Lipset defined “democracy”. In effect, democratic countries were those European and English-speaking countries that had dem-

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2 Ibid, 80.
onstrated "an uninterrupted continuation of political democracy since World War I, and the absence over the past twenty-five years of a major political movement opposed to the democratic 'rules of the game'." Scoring as less democratic were those nations in the same area that had not met these criteria. Below them appeared Latin-American countries that had had "a history of more or less free elections for most of the post-World War I period". Classified as least democratic were "stable dictatorships" in Latin America. This categorization is first, ad hoc, and second, and more important, based more on the criterion of stability than on any well-defined notions of democracy. As well as being questionable on these theoretical grounds, Lipset's reliance on dichotomized tabular data makes his measures of both democracy and economic development unnecessarily insensitive. Consequently, a good deal of the potentially most interesting variance is removed prior to analysis. At the same time, judgment of the form of the relationship is foreclosed.

Cutright's paper on national political development is an attempt to test the relationship between economic and democratic development with a more sophisticated measure of the latter and with more detailed statistical analysis of continuous data. He defined a politically developed country to be one with "more complex and specialized national political institutions than a less politically developed nation". Utilizing this definition he scored his sample of 77 countries on the basis of the stability of their legislatures and the nature of their partisan composition as well as on the way in which their chief executives were selected. Using a number of measures of economic development in a linear multiple correlational analysis, he concluded that the Lipset thesis was essentially correct and that the form of the relationship was indeed linear.

More recently, Neubauer has criticized these studies on the grounds that the dependent variables they employ are not sensitive to variation between countries, especially at higher levels of democratic development, and also because their measures of the latter tend to equate political complexity and stability with political democracy. In order to resolve these two (related) problems Neubauer constructed an index of democratic development based

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3 *Ibid*, 73.
5 *Ibid*, 255.
on criteria derived from the definitional and empirical constructs of Dahl and Downs. Specifically, his index measures the proportion of adults eligible to vote, equality of representation, press freedom and diversity, and the extent of electoral competition, for a sample of 23 relatively democratic countries. The results of his linear correlational analysis relating this index to measures of economic development indicated that, contrary to Lipset and Cutright, the latter were at best only mildly related to the former. Noting that he had restricted his attention to more democratic countries, Neubauer accounted for his results by arguing that democratic political development may be a "threshold phenomenon":

"Certain levels of 'basic' socio-economic development appear to be necessary to elevate countries to a level at which they can begin to support complex, nation-wide patterns of political interaction, one of which may be democracy. Once above this threshold, however, the degree to which a country will 'maximize' certain forms of democratic performance is no longer a function of continued socio-economic development."^8

The major advantage of Neubauer's analysis over Cutright's lies in the refined measure of democratic development that he used. Cutright's index was more a measure of the institutionalization and complexity of parliametary forms of government and is not necessarily sensitive to other aspects of democratic development such as the extent of mass participation in politics and freedom of information—it is not at all clear, for example, that parliamentary forms of government are necessarily democratic. By contrast, Neubauer's index was specifically designed to take such values into account on the basis of prior theory and thus his criteria for including variables into his index are most specific.

However, Neubauer's analysis was limited by problems of data availability to more wealthy countries, and it therefore does not include the range of countries that Cutright examined. Thus, while the mean Gross National Product per capita for the 122 countries discussed in the World Handbook of Political and Social Indicators is $377 (median: $191.50), the mean for the 23 countries examined by Neubauer is $965 (median: $927.00).^10 Figure 1

^8Neubauer, "Conditions of Democracy," 1007.
illustrates the problem: The countries considered by Neubauer fall largely into the medium to high half of the economic development dimension, and it is clear that his hypothesis leads us to expect that the relationship between this dimension and democratic performance will tend toward zero for this restricted group of countries, which is exactly what Neubauer found. However, he was unable to test the non-linear hypothesis outlined in Figure 1 directly because his sample of countries was not sufficiently heterogeneous.\footnote{These issues are summarized in an exchange between Cutright and Neubauer: see “Communications,” American Political Science Review, 62 (June 1968), 579-81. More recent analyses have ignored Neubauer’s curvilinear hypothesis. For example, both Leon Hurwitz (“Democratic Political Stability: Some Traditional Hypotheses Reexamined,” Comparative Political Studies, 4 (January 1972), 476-90) and Tatu Vanhanen (“Distribu-}
The purpose of the following analysis is to specify and estimate some linear and non-linear models of the relation between economic development and democratic performance for a more heterogeneous cross-section of 60 non-Communist nations, and thus to evaluate the relative merits of these two competing hypotheses.

The measure of democracy in this analysis is designed to meet the criteria proposed by Dahl and Downs as they are discussed by Neubauer. It therefore has the following four components. First, the number of adults voting expressed as a proportion of the voting age population: this variable gives one indication of the extent to which the public participates in politics, and comes from the first World Handbook of Political and Social Indicators. Second is a variable describing the competitiveness of the party-voting system developed in the Dimensionality of Nations Project, which has five categories as follows (ranging from low to high): no voting takes place; only plebiscite voting with a single party and no effective primary occurs; there is a single party but channels for effective primaries exist; there is a multi-party system but bans on extremist parties exist; and finally, there is a multi-party system with no limitations on extremist party activity. Third is a measure of electoral irregularity, which ranges from rigged through substantially irregular to competitive or reasonably free. This variable is in the main data set and is based on judgments from parliamentary journals, new indices and country sources, in accordance with the conditions for free elections proposed by MacKenzie: i.e., an independent judiciary, an honest and non-partisan machinery for running the election, a developed party system, and a general acceptance of the 'rules of the game' that place limits on the struggle for power. The fourth and last component of the index of democratic
development is a measure of the freedom of the press which is also in the main data set. This measure, created by the School of Journalism at the University of Missouri, is “designed to measure the independence of a nation’s broadcasting and press system and its ability to criticize its own local and national governments.”  

It is comprised of the judgments of panels of native and foreign newsmen on 23 aspects of the press, such as extent of legal controls, licensing, government ownership, and criticism and censorship.

In order that they have equal weight in the final index, these four components were each scored so that they had similar ranges (i.e., from 0 to 100). The index of democratic development was then created by taking the mean of a country’s scores on those components for which data were available. This method of creating the index has two major advantages. First, the metrics of the original variables remain substantively meaningful within the new index (as they would not had we, for example, standardized them). Second, it is useful because it allows us to handle the small amount of missing data: if a country had data on all four components (as do most), the index is equal to the sum of the four scores divided by four; if data are present on only three components, the index is equal to the sum of those three scores divided by three.

Choosing a measure of economic development is much more straightforward: we have taken energy consumption (expressed in million metric tons of coal equivalents) per capita. Other measures available in the main data set such as Gross National Product per capita, or Gross Domestic Product per capita would have yielded the same results as these three variables are so highly intercorrelated (r≥.98) that they can be considered theoretically and empirically equivalent.

The adequacy of the linear (Lipset, Cutright) and curvilinear (Neubauer) hypotheses concerning the relationship of economic development to demo-

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cratic performance can be evaluated by comparing the regression estimates for the following equations.

1) \[ Y = a + b_1 X_1 + U \] Linear model

2) \[ Y = a + b_1 X_1 + b_2 (X_1)^2 + U \] Curvilinear Models

3) \[ Y = a + b_1 X_2 + U \]

Where: \( Y = \) Democratic Performance, 1960
\( X_1 = \) Economic Development, 1960
\( X_2 = \) Ln. Economic Development, 1960
\( U = \) Estimated Disturbances

If the linear model is correct, the parameter \( b_2 \) in equation (2) will be non-significant and the degree of fit achieved in equations (2) and (3) will not be significantly greater than that from (1). On the other hand, if Neubauer is correct, in equation (2) \( b_1 \) will be positive and significant and \( b_2 \) will be negative and significant.\(^{18}\) Moreover, the degree of fit achieved in (2) and (3) will be greater than that of (1).

Equations (2) and (3) imply a threshold interpretation of the kind proposed by Neubauer (outlined in Figure 1), the major difference between them being that if (2) gives a better fit than (3), levels of democratic performance may not only “flatten out” at higher levels of economic development, but beyond some threshold they actually decline. Equation (2) specifies a second-degree polynomial, with terms in \( X_1 \) and \( (X_1)^2 \): when the coefficient for the first term is positive while that for the second is negative, this curve begins with a positive slope which levels off and then becomes negative. By contrast, the natural logarithmic model specified in equation (3) implies (when \( b_1 \) is positive) that the impact of economic development on democratic performance decreases as the former increases. This curve may, for all practical

\(^{18}\) A parameter estimate is considered “significant” in this analysis if it is at least twice the magnitude of its standard error of estimate: this criterion is the same as examining the \( t \) ratios associated with each coefficient and rejecting those that are not significant at approximately the .05 level. Strictly speaking, this test is not fully appropriate given that the sample of nations in this analysis was not chosen randomly: however, it does provide a useful \textit{a priori} criterion in view of the fact that we are not treating the models as fixed.
purposes, level off at higher levels of economic development, but unlike the second-degree polynomial, the slope never becomes negative.\textsuperscript{19}

The least-squares estimates of equations (1), (2), and (3) are presented in Table 1. While the first model yields significant parameter estimates, it is clear that the second and third models provide much better fits.\textsuperscript{20} Not only does the amount of explained variance increase substantially when we estimate models (2) and (3), but the estimate of \( b_2 \) in the second model is significant (twice its standard error) and of the predicted sign (negative), indicating that the presence of curvilinearity is quite substantial.\textsuperscript{21} These considerations lead us to reject the linear model in favor of a threshold interpretation.

However, goodness-of-fit criteria do not enable us to choose which of the curvilinear models is more appropriate. In view of the fact that the \( \bar{R}^2 \) from model (2) is slightly larger than the \( R^2 \) estimated for (3), one might be tempted to argue that not only is there a threshold beyond which further increments in economic development fail to produce similar increments in democratic performance, but also that beyond some point, the latter may decline slightly with increases in the former. One problem with this argument is that the difference between even the uncorrected coefficients of determination (\( R^2 \)) for the two equations is not statistically significant at the .05 level.\textsuperscript{22} Another problem with it is that the intercept in the second model is


\textsuperscript{20} This judgment is based on comparisons of the raw coefficients of determination (\( R^2 \)) in models (1) and (3) with the corrected coefficient of determination (\( \overline{R}^2 \)) in model (2). \( R^2 \) adjusts the raw coefficient for the number of degrees of freedom lost through the addition of extra variables to the model, which is useful given that such additions necessarily produce some increment in the raw coefficient (see Rao and Miller, \textit{Applied Econometrics}, pp. 13-21). In the present context, the raw coefficient of determination estimated for model (2) is not directly comparable to those estimated for models (1) and (3). Note that the importance substantively of this adjustment is an inverse function of the number of observations in the analysis.

\textsuperscript{21} It is substantial because the criterion of statistical significance is stringent in this test given that \( X_3 \) and \( (X_1)^2 \) are highly collinear (\( r = .918 \)), and given that multicollinearity has the effect of making parameter estimates unstable and generally small vis-a-vis their standard errors: see Donald E. Farrar and Robert R. Glauber, \textquoteright Multicollinearity in Regression Analysis: The Problem Revisited,\textquoteright \textit{Review of Economics and Statistics}, 49 (February 1967), 92-107 for a discussion of this problem.

\textsuperscript{22} For the test used here, see Jacob Cohen, \textquoteright Multiple Regression as a General Data-Analytic Scheme,\textquoteright \textit{Psychological Bulletin}, 70 (December 1968), 426-43.
TABLE 1
Linear and Curvilinear Regressions of Democratic Political
Development on Energy Consumption per capita (N=60)

<table>
<thead>
<tr>
<th>Model</th>
<th>Intercept</th>
<th>$X_1$</th>
<th>$(X_1)^2$</th>
<th>$X_2$</th>
<th>$R^2$</th>
<th>$\bar{R}^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>57.98</td>
<td>.0059*</td>
<td>(.0013)**</td>
<td>(.5167)**</td>
<td>.2670</td>
<td></td>
<td>21.12</td>
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<tr>
<td>(2)</td>
<td>53.71</td>
<td>.0135353</td>
<td>-.0000013</td>
<td>(.0031033)</td>
<td>(.0000005)</td>
<td>.3483</td>
<td>.3255</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(.11790)</td>
<td>(-.7211)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>15.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.864</td>
<td>.3190</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.1509)</td>
<td>(.5648)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*parameter estimate
**standard error of parameter estimate
***standardized parameter estimate

$X_1$ = energy consumption per capita, 1960
$X_2$ = logarithm energy consumption per capita, 1960

Fairly close to that for the linear model (1), while the intercept for the logarithmic model is more consistent with our theoretical expectations as they are outlined in Figure 1. In fact, as Figure 2 shows, the curve from model (3) generally conforms more closely to our prior expectations than does the curve from (2), because the former has a steeper initial curve, while the relatively steep decline of the latter curve at higher levels of economic development is difficult to justify on substantive grounds. This decline may simply reflect the sensitivity of the second-degree polynomial curve to the single case of the United States. By contrast, the way in which the upper end of the logarithmic curve "levels off" seems, on visual grounds at least, to describe the relation in the data in the most satisfactory manner (see Figure 2); this pattern is also in line with Neubauer’s results. In short, while there are no straightforward statistical bases for choosing between the two curvilinear models, the logarithmic model may be more justifiable both on theoretical grounds and on the grounds that it seems (visually) to follow the pattern in the scatter-plot more closely.

Our basic conclusion, then, is that the threshold hypothesis fits the data
Figure 2: Effects of Economic Development on Democratic Performance (N = 60)

Note: Country numbers in Appendix; numbers in parentheses identify the models from which the curves were estimated.
much more closely than does the linear hypothesis. However, in view of the fact that the difference in achieved fit between models (2) and (3) is so marginal, it is difficult to justify empirically the interpretation that democratic performance declines at the highest levels of economic growth. Instead, theoretical considerations along with the results of the analysis lead us to the more modest conclusion that the data are much more consistent with Neubauer's argument for curvilinear effects than they are with the linear developmental hypothesis suggested by Lipset and Cutright.

List of Countries

1 Algeria 21 West Germany 41 Pakistan
2 Argentina 22 Greece 42 Panama
3 Australia 23 Guatemala 43 Paraguay
4 Austria 24 Honduras 44 Peru
5 Barbados 25 India 45 Philippines
6 Belgium 26 Ireland 46 Portugal
7 Brazil 27 Israel 47 Puerto Rico
8 Cambodia 28 Italy 48 South Africa
9 Canada 29 Jamaica 49 Spain
10 Ceylon 30 Japan 50 Sweden
11 Chile 31 Jordan 51 Syria
12 Colombia 32 South Korea 52 Taiwan
13 Congo-Leopoldville 33 Luxembourg 53 Thailand
14 Costa Rica 34 Mauritius 54 Trinidad & Tobago
15 Cyprus 35 Morocco 55 Turkey
16 Denmark 36 Mexico 56 U.A.R.
17 Ecuador 37 Netherlands 57 U.K.
18 El Salvador 38 New Zealand 58 U.S.A.
19 Finland 39 Nicaragua 59 Uruguay
20 France 40 Norway 60 Venezuela