

An Empirical Examination of the Relationship between Democracy and Economic Growth

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I. INTRODUCTION

The democracy-economic growth hypothesis has attracted attention from many social scientists. While one line has argued in favor of a democracy-economic growth trade-off, the other has suggested a strong positive correlation. The former argument can be expressed in the following manner: under democratic governments, the demands for redistributive policies by various pressure groups can lead to legislative deadlocks. Their demands may be resolved by the size of distributive programs rather than of productive expenditure. Furthermore, democratic institutions may be slow in responding to external shocks. Those who argue for a positive correlation between economic growth and democracy draw attention to the fact that, where there is no constitutional way to

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change leaders, political change often requires violence and disruption of market activities. In addition, criticisms allowed under democratic regime can prevent errors before the implementation of misled policies, resulting in more efficient allocation of resources (Pourgerami (1991), and Alesina and Perotti(1994)).

Empirical studies were undertaken to test the competing hypotheses. The empirical evidence examining the performance of the newly industrializing economies against their levels of democratization seemed generally to support the democracy-economic growth trade-off hypothesis. However, some studies using regression analysis challenged the conventional thought that rapid economic growth requires sacrifices to democratic government. According to Bilson(1982), civil liberties decline as the system becomes less democratic. Using cross-section samples based on Gastil's(1985) rankings, Pourgerami(1992) showed that the level of economic growth increases with improved political performance. Also using cross-section samples taken from Gastil(1985), Vorhies and Glahe(1988) regressed social development indicators such as GNP per capita on the degree of political liberty and concluded that political liberty has a small, though significant, relationship with the level of social development. Using the Freedom House(1993) political rights index, Goldsmith(1995) associated higher levels of democracy with higher GDP growth rates.

One of the problems in the current literature on the economic growth-democracy relationship is that most, if not all, of these implicitly assumed static responses between the concerned variables. Despite the fact that one of the variables, say, democracy may precede economic growth, the current literature assumes that these variables interact contemporaneously. This paper views both growth and democracy as processes and determines the impact of democratization on output expansion. More formally, recognizing the dynamic response, this paper focuses on examining whether there exists a causal relationship from changes in the level of democracy to economic growth.

Although most of the other survey results reported index comparison at a certain point of time, Arat(1991) provided time series survey results on the level of democracy. Here, real GDP growth rates and Arat's (1991) time series data set on the level of democracy are used to reveal any causality from changes in the level of democracy to economic growth. Since arbitrary lag specifications in tests acknowledging dynamic response can yield misleading results due to mis-specification of the model, Schwarz optimal lag selection criterion is used here to avoid such errors.

The article is composed of the following: Sections II and III provide the data and the model used: Section IV presents the empirical evidences: and Section V shows the conclusion.

II. THE DATA

Unlike most other studies which pursued cross-section work at one point in time, causality tests are performed in the current paper running from the level of democracy to economic growth, utilizing time series data. Arat (1991) records time series annual indices on the level of democracy based on surveys after the second World War.

As Arat(1991) defines democracy as the popular control of a government, a measurement of the level of democracy sensitive to the extent of popular control and emphasizing the extent of available measures of control must be based on principles that lead to higher levels of popular control. Popular sovereignty, or public control of government is perceived to have four components which can be identified as participation, inclusiveness, competitiveness, and civil liberties.

The level of participation measures the extent to which popular consent is sought in selecting people for decision-making positions in the legislative and executive branches of government. If the effective executive who exercises primary influence in the shaping of major

decisions affecting the nation's internal and external affairs is elected, the country is assigned one point. If the effective executive did not obtain the position through popular elections, the country is assigned no points for that year. If the legislative body is elected, two points are assigned. If instead the legislators were selected by the effective executive, or by means of heredity, one point is assigned. No point is assigned if there is no legislature. Moreover, the effectiveness of the legislative body is also taken into consideration. One point is assigned if the legislature is largely ineffective, two points are assigned if it is partially effective, and three points are assigned if it is effective. No points are assigned for the cases of no legislature. The legislative process is defined as effective if there is significant autonomy by the legislature, including substantial authority in regard to taxation and disbursement, and the power to override executive vetoes of legislation. For the competitiveness of the nomination procedure, no points are assigned for it in the absence of a legislature. One point is assigned if the nomination procedure for the legislature is essentially non-competitive, two points are assigned if the nomination procedure is competitive. The scores on these four items are added to generate the participation score.

The levels of inclusiveness of the process measures the degree of restrictions imposed according to gender, race, ethnicity, age, education levels, and property ownership. Theoretically, the range of scores for this component can vary between zero and one. No points are assigned if there is no suffrage, and a full point is assigned if all citizens aged 18 or over are allowed to participate in the elections without any further qualifications. If any restrictions are employed in a country, the estimated percentage of the population under restriction is subtracted from one.

The competitiveness score of the political system refers to the extent to which the electorate is provided with choice. Data on two characteristics of the system are used for this component: party legitimacy and party

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competitiveness. If there are no political parties, or all but a dominant party and satellites are excluded, the country is assigned zero for party legitimacy. If some parties are allowed but there is significant exclusion of parties, one point is assigned. If only some "extremist" parties are excluded, two points are assigned, and if no parties are excluded from the system, three points are assigned. If the largest party held less than 70 percent of the total votes in the latest national elections, two points are assigned to the country for party competitiveness. In case of no elections, or obtaining 70 percent or more of the votes, only one point is assigned. The sum of these two items provides the competitiveness score.

To obtain the coerciveness measure of government as an opposite indicator of civil liberties, the number of sanctions in a country is regressed on social unrest indicators. If a country employs more political sanctions than another given equal levels of unrest, Arat(1991) describes it as a more coercive government, but if it employs fewer coercive actions, it can be ranked as less coercive. Then the difference between actual and predicted values, the residuals, can provide a measure of coerciveness, or lack of liberties. The final score of the level of democracy is calculated by subtracting the degree of coerciveness from the sum of the other components: the level of democracy = [participation x(1 + inclusiveness) + competitiveness] - coerciveness. Annual data covering the years between 1948 and 1982 are reported in Arat(1991).

The data used in this paper are restricted to developing countries. Developed countries are excluded, as there is an insignificant, if any, change in the level of democracy in these countries over time in Arat's data set. Similarly in case of developing countries, those with the highest value of democracy less than 1.2 times those with the lowest value are excluded for the same reason. Two indicators are used as measures of economic growth rates: real GDP growth rates from the IMF, *International Financial Statistics Yearbook 1986* and per capita real GDP growth rates from the OECD(1996), *Monitoring the World*

Economy 1820~1992. The first set of data using real GDP growth rates, running from 1957 to 1982, is restricted to 19 countries whose real GDP as well as relevant indices on the level of democracy exist in this period: Bolivia, Burma, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Greece, Guatemala, Haiti, Honduras, Mexico, Pakistan, Panama, Philippines, Portugal, Thailand, Turkey and Venezuela. For the second set of data, the data period is extended to 1950-1982 and per capita real GDP is used as the measure of economic growth rates. Due to the extension of the data period, the number of countries whose data on democracy are available is reduced to eight: Chile, Colombia, Greece, Mexico, Portugal, Thailand, Turkey and Venezuela. All data used in this paper are annual.

III. THE MODELS

The Granger causality test is used to test whether changes in the level of democracy lead to changes in economic growth rates. A variable is said to cause the other variable in the Granger sense when the former precedes the latter. Granger's method for testing causality expresses the dependent variable as a function of its own lagged values and the lagged values of the variable suspected to influence the dependent variable. To test the hypothesis that democratization, DEM (represented by the annual percentage growth rates of the level of democracy indices), causes economic growth, GDP, I estimate

$$GDP(t) = a_0 + \sum_{i=1}^m a_{1i} GDP(t-i) + \sum_{j=1}^n a_{2j} DEM(t-j) + u(t) \quad (1)$$

, where the disturbance term $u(t)$ is assumed to have white noise properties.

Although the effects of contemporaneous innovations can also be technically tested using an instantaneous causality test, considering that democratization is not likely to affect economic growth instantaneously, no tests for contemporaneous causality are performed.

Granger causality tests involve testing the significance of the coefficients of DEM in equation (1), conditional on the chosen lag lengths. If they are equal to zero, then DEM has no effect on future GDP as is evident from equation (1); that is, DEM does not cause GDP. Thus, one may test the causal relationship from DEM to GDP by first estimating equation (1) by ordinary least squares(OLS) and obtaining the unrestricted residual sum of squares (RSS_u). Second, the restricted residual sum of squares (RSS_r) is obtained by estimating another equation under the null hypothesis that all the coefficients of the lagged values of DEM are zero. The statistic $((RSS_r - RSS_u)/n) / (RSS_u / (N - m - n - 1))$ has an F-distribution with $(n, N - m - n - 1)$ degrees of freedom, where N is the number of observations. According to the Granger causality test, if the null hypothesis cannot be rejected, the data will not show causality from DEM to GDP. If the null hypothesis is rejected, the causality can be interpreted as positive or negative. If the sum of the coefficients of democratization, $\sum_{j=1}^n a_{2j}$, has a positive sign in equation (1), democratization is said to cause higher economic growth. If it has a negative sign, democratization can be said to slow economic growth.

In the literature on causality tests, arbitrary lag specifications can produce misleading results. Therefore, instead of specifying the lag lengths a priori, Schwarz's (1978) lag selection criterion (SC) is used to choose the optimal lag lengths. In case of equation (1), it is defined by choosing the lag numbers "m" and "n" which minimize

$$SC = N \ln(RSS/N) + (m+n+1) \ln N \quad (2)$$

Schwarz criterion is used because it usually reaches a global optimum with parsimonious parameterization compared with the alternative lag selection criterion, Akaike's final prediction error criterion. Schwarz criterion is applied up to a maximum lag of 3.

Recently, several authors such as Abrams and Lewis(1995) and Haan and Siermann(1995, 1996) regressed economic growth on multiple variables including political freedom index. Abrams and Lewis'(1995)

work added economic systems dummy variables and income per capita at the beginning of the period as the right hand side variables and concluded that democracy has a positive impact on economic growth. However, their work is vulnerable to the criticism that an important production factor which is fundamental to explaining economic growth, i.e. investment, is missing, making the results unreliable. Haan and Siermann(1995, 1996) corrected the weakness by adding, among others, labor and capital(and export) to the right hand side of the equation and found little support for the view that political repression negatively affects economic growth.

Since equation (1) lacks production factors, capital and export are added to the right hand side of the equation and Haan and Siermann's (1995, 1996) framework is extended into a dynamic form to test the causality as follows:

$$GDP(t) = b^0 + \sum_{h=1}^p b_{1h} GDP(t-h) + \sum_{i=1}^q b_{2i} K(t-i) + \sum_{j=1}^r b_{3j} X(t-j) + \sum_{k=1}^s b_{4k} DEM(t-k) + v(t) \quad (3)$$

, where K and X denote capital stock and export, respectively, appearing in various issues of the World Bank, *World Tables*. The disturbance term $v(t)$ is assumed to have white noise properties.

The Granger causality test involves testing the significance of the coefficients, " b_{4k} "s, in equation (3), conditional on the chosen lag lengths. If the sum of the coefficients are equal to zero, then DEM has no effect on future GDP. Thus, one can test the causal relationship from DEM to GDP by first estimating equation (3) by OLS and obtaining the unrestricted sum of squares(RSS_u). Second, by estimating another equation under the null hypothesis that all the coefficients of the lagged values of DEM are zero, the restricted residual sum of squares (RSS_r) is obtained. The statistic $((RSS_r - RSS_u)/s)/(RSS_u/(N-p-q-r-s-1))$ is then found to have an F distribution. If the null hypothesis is not rejected, then the data will not show causality from DEM to GDP.

Since the results may be sensitive to the selection of the lag lengths

in the right hand side variables. Schwarz's(1978) criterion(SC) is again used to determine the optimal numbers of lags, i.e. values of p, q, r, and s. If the SC criterion is applied to equation (3), this criterion is defined by choosing the lag numbers, p, q, r, and s which would minimize

$$SC = N\ln(RSS/N) + (p+q+r+s+1)\ln N \quad (4)$$

IV. EMPIRICAL EVIDENCES

The results of Granger causality tests from equation (1) are shown in Table 1. Optimal lag numbers when Schwarz criterion is applied to equation (1) are revealed to be one or two. When examining the causality from changes in the level of democracy to real GDP growth, 3 out of 19 countries examined are shown to reject the null hypothesis at 5% or 1% level of significance: Chile, Colombia, and El Salvador. Of these, the estimated sums of coefficients of the growth rates in the level of democracy in equation (1) show positive signs in the cases of Colombia and El Salvador. Only one country, Chile, shows a negative sum of the coefficients of the growth rates of the level of democracy. That is, in most of the developing countries examined, the argument that democratization does not cause changes in economic growth is not rejected. When the data set is extended to 1950-1982 and per capita real GDP growth rate is used as the measure of economic growth, the null hypothesis that democratization does not cause changes in economic growth is rejected at 1 % level of significance in the cases of Chile, Colombia and Turkey. All of these three countries show that democratization causes faster economic growth. For the other five countries, the null hypothesis is not rejected at any reasonable level of significance. That is, when a change in the level of democracy occurs, it is likely not to cause a change in economic growth. In cases that the causality is found, democratization causes higher economic growth.

The results of Granger causality tests from equation (3) which acknowledge other factors contributing to economic growth such as capital stock and export are shown in Table 2. The data set runs from 1950 to 1982 and per capita real GDP growth rate is used as the measure of economic growth. Due to the availability of relevant data, six countries are examined: Greece, Mexico, Portugal, Thailand, Turkey and Venezuela. Optimal lag numbers when Schwarz criterion is applied to equation (3) are revealed to be one or, in some cases two. The resulting F-statistics show that, in most countries except Portugal, the argument that changes in the level of democracy does not lead to change in economic growth rates is not rejected at any reasonable level of significance. In the case of Portugal, the null hypothesis is rejected at 5% level of significance and the sum of the coefficients of the lagged variable DEM in equation (3) shows a positive sign, indicating that democratization causes faster economic growth.

Summarizing the empirical evidence in Tables 1 and 2, it can at least be said that democratization does not lead to slower economic growth, unlike the assertion of dictatorial leaders in some developing countries. Rather, democratization leads to faster economic growth in some developing countries.

V. CONCLUSION

Although most other researchers have used cross-section data to reveal the relationship between economic growth and democratization, the issue of causality has not been pursued, as Haan and Siermann (1996) acknowledge. In this study, Granger causality tests are performed on these two variables using time series data on the level of democracy taken from Arat(1991). Real GDP growth rates as well as per capita real GDP growth rates are used as the measures of economic growth. Schwarz lag selection method is adopted in order to choose the

optimal lag numbers in performing Granger causality tests.

The empirical evidence shows that, in more than half of the developing countries examined, no causal relationships are found between changes in the level of democracy and changes in economic growth rates. In countries where causal relationships are found, they are mainly found to have a positive influence, e.g. democratization leads to faster economic growth. The results were qualitatively the same regardless whether additional fundamental economic variables explaining economic growth such as capital and export are used. Many dictators in developing countries have tried to justify their political regime by arguing that dictatorship leads to faster economic growth. However, contrary to their assertions, the empirical evidences shown in the current paper generally reveal that economic growth in developing countries does not require sacrifice of another invaluable asset of human life, i.e. democracy.

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(Table 1) Granger causality test results(F statistics) from equation (1)

Countries	1957-1982 period ^a	1950-1982 period ^b
Bolivia	2.792 (-)	
Burma	3.376 (+)	
Chile	5.131* (-)	42.257** (+)
Colombia	5.332* (+)	11.825** (+)
Dominican Republic	.058 (-)	
Ecuador	.448 (-)	
El Salvador	8.518** (+)	
Greece	1.907 (+)	2.440 (-)
Guatemala	.035 (+)	
Haiti	.051 (+)	
Honduras	.197 (-)	
Mexico	.187 (-)	2.243 (-)
Pakistan	.117 (+)	
Panama	.211 (-)	
Philippines	.451 (-)	
Portugal	4.239 (+)	.110 (+)
Thailand	1.724 (-)	2.700 (-)
Turkey	.601 (+)	14.738** (+)
Venezuela	.037 (-)	.491 (+)

a economic growth as measured by real GDP growth rates

b economic growth as measured by per capita real GDP growth rates

Notes: Lag lengths were chosen by Schwarz's optimal lag selection criterion. The signs of the sums of the variables representing the level of democracy appear next to the F-statistics.

** indicates statistical significance at the 1% level.

* indicates statistical significance at the 5% level.

<Table 2> Granger causality test results(F statistics) from equation (3)

Countries	F statistics	optimal lag numbers ^a
Greece	$F_{1.24} = .017 (+)$	(1,1,1,1)
Mexico	$F_{1.23} = 1.452 (-)$	(1,2,1,1)
Portugal	$F_{1.20} = 6.780^*(+)$	(1,1,2,1)
Thailand	$F_{1.22} = .694 (+)$	(1,1,1,1)
Turkey	$F_{1.23} = .155 (+)$	(1,1,2,1)
Venezuela	$F_{1.23} = .006 (+)$	(2,1,1,1)

Notes : The null hypothesis is that changes in the level of democracy do not cause changes in economic growth. Real per capita GDP growth rates are used as the measure of economic growth over the data period 1950-1982. Lag lengths were chosen by Schwarz's optimal lag selection criterion. The signs of the sums of coefficients of the variables representing the level of democracy appear next to the F-statistics.

* indicates statistical significance at the 5% level.

a denotes optimal lag numbers of real per capita GDP growth rates, growth rates of capital stock, export, and democracy indices, respectively.

국 문 요 약

민주주의와 경제성장 간의 관계에 관한 경험적 연구

마 재 신

본 연구에서는 민주주의의 발전정도와 경제성장률 간의 동태적 관계를 감안하여 개발도상국들을 대상으로 한 인과관계 검증이 행해진다. 연구결과에 의하면, 조사대상 개발도상국들 중의 절반 이상의 국가들에 있어서 민주화의 진전과 경제성장 간에는 그레인저 의미에서의 인과관계(Granger causality)가 존재하지 않는 것으로 나타난다. 인과관계가 존재하는 것으로 나타나는 국가들의 경우 민주화는 경제성장률을 높이는 것으로 나타난다. 이러한 경험적 연구결과들은 자본저량이나 수출과 같은 기본적인 경제변수들이 추가되는지의 여부에 관계 없이 질적으로 동일하게 나타난다.

