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MODELS OF GOVERNMENT DEFICITS IN DEVELOPING COUNTRIES:
THE ROLE OF CHANGES IN GOVERNMENTAL REGIMES

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Abstract

Models of Government Deficits in Developing Countries:

The Role of Changes in Governmental Regimes

The purpose of this paper is to develop models of change in the size of government deficits in developing countries. The paper analyzes the role of changes in government regimes as explanatory variables in models that also include economic variables. Regression equations are estimated for detrended time series data for eight countries for the period 1967-1981. Government regime change provides considerable explanatory power for some countries' deficits. However, weak relationships between regime change and changes in deficits are found for most countries in the study. The paper demonstrates the importance of explicitly considering political variables in the development of empirically based mathematical models of political economy.

I. Introduction

One of the greatest challenges in the development of empirically based mathematical models of political economy is to incorporate political as well as economic phenomena in sets of explanatory variables.

There are, of course, many theoretical analyses that integrate political and economic phenomena into a single analytic framework. Lindblom's work (1980) is a conspicuous example. Yet, it is also true that the inclusion of political variables along with economic variables in rigorous empirical analysis is often difficult because of measurement problems encountered when trying to do research involving political variables. Econometric forecasting models, for instance, neglect political variables because of the difficulty of devising operational indicators of some of the pertinent political conditions and because of the difficulty of collecting reliable and valid data. Such difficulties, however, need not and should not preclude serious efforts to develop empirically based models of political economy.

This paper incorporates both political and economic variables in models of government budget deficits in developing countries. The paper is focused on the following question: Does the inclusion of variables that reflect changes in governmental regimes contribute to the explanatory-predictive power of models of government budget deficits?

Fiscal policy instability in developing countries has been the object of much previous empirical research by Aghevli and Khan (1978), Kanesa-Thanan (1954), Kelly (1982), Mansfield (1980),

Morgan (1979), and others. That research, however, has been focused on government deficits as cause or consequence of economic conditions. The present paper includes economic conditions as explanatory variables in models of government deficits, but it also incorporates political conditions. The emphasis of the paper is on the role of political variables in the models.

II. Changes in Governments and Changes in Budget Deficits

The particular political variables included in the study reflect changes in governments. A rich body of theoretical literature in political science--as well as common impressions--lead one to expect that changes in governments would tend to be associated with changes in fiscal policy.¹

By changes in government, we mean changes in the governing group and/or changes in the head of government. In some countries, changes in the governing group occur when government power shifts from one party to another. In other countries, the change occurs in the form of a shift from civilian to military rule, or vice versa. This paper specifically analyzes the association between changes in governmental regimes and changes in governments' budget deficits in developing countries.

Developing countries were chosen because of the widespread interest in instability in their fiscal policies, especially in light of external debt problems, and because of common assumptions about the relationship between political and economic instability in those countries. The eight particular countries in the study were selected because of their economic size and significance. In terms of GNP, they are eight of the twelve largest developing

countries. (The other four were excluded because of data limitations).²

The eight countries exhibited several different patterns of governmental change during the 1967-1981 period encompassed by the study.³ Some countries were marked by changes from civilian to military regimes and vice versa. Others experienced civilian regimes throughout, with at least one change in the ruling party. Yet other countries' governments were dominated by a single party throughout the fifteen-year period, with only changes in the head of the government. A final pair of countries had military regimes throughout, but with one or more changes in the particular military leader who headed the government. The individual countries and their basic patterns of governmental change are indicated in Table 1.⁴

Table
1
Here

In view of these different patterns of governmental change, one would expect that the relationship between regime change and deficits would differ across countries. Countries where different military and civilian regimes or political parties alternately hold power should exhibit a relatively strong relationship between regime change and deficits. On the other hand, countries with continuous military regimes or single party regimes would not be expected to exhibit much change in fiscal policy when the head of the government changes. Such differences among the countries, therefore, should be reflected in equations linking budget deficits to differences in governmental regimes.

III. Equations to be Estimated

Government budget deficits were measured as a percent of GDP.⁵ Annual time series data for the 1967-1981 period were de-

trended by a log-linear regression.⁶ The residuals from the trend are the dependent variables in OLS linear regression models; thus, the budget deficit residuals from the trend were regressed on political and economic variables for the years from 1967 through 1981.

The first set of models includes the percentage growth rate in real GDP plus dummy variables for the governmental regimes. Thus, the equation to be estimated for the countries with alternating civilian and military regimes was

$$\text{DEFICIT}_r = \alpha + \beta (\text{GDPCHG}) + \gamma_1 (\text{CIVIL}) + \varepsilon. \quad (1)$$

GDPCHG is the percentage change in real GDP, and CIVIL is coded 1 for years when civilian governments were in power and 0 for years when military governments were in power.

Similarly, the equation to be estimated for countries which had civilian regimes throughout, but two different parties in power at different times, was

$$\text{DEFICIT}_r = \alpha + \beta (\text{GDPCHG}) + \gamma_2 (\text{PARTY}) + \varepsilon. \quad (2)$$

In this case, PARTY is a dummy variable, coded 1 or 0 depending on the party in power.

For yet other countries, the equation to be estimated was

$$\begin{aligned} \text{DEFICIT}_r = \alpha + \beta (\text{GDPCHG}) + \gamma_3 (\text{CIVILHEAD1}) \\ + \gamma_3^{\dagger} (\text{CIVILHEAD2}) + \varepsilon. \end{aligned} \quad (3)$$

In these cases, the government variables represent different heads of government in countries where a single party enjoyed continuous governmental power throughout the 1967-1981 period.

For the final pair of countries, the equation to be estimated was

$$\begin{aligned} \text{DEFICIT}_r = \alpha + \beta (\text{GDPCHG}) + \gamma_4 (\text{MILHEAD1}) + \\ \gamma_4^{\dagger} (\text{MILHEAD2}) + \gamma_4^{\dagger\dagger} (\text{MILHEAD3}) + \varepsilon. \end{aligned} \quad (4)$$

For these countries, the governmental regime variables represent different military heads of government (of which there were four in the case of Brazil).

IV. Empirical Results

Table 2 Here The fitted regression lines are summarized in Table 2.⁷

The best fit is for Argentina. The results for Argentina indicate that deviations from the trend of government deficits are clearly related to both economic and political conditions. The $\hat{\gamma}_1$ coefficient of .322, with a t -statistic of 4.22, indicates that the civilian Peronist regime of 1972-76 tended to have larger budget deficits than its military predecessors and successors. In addition, however, the negative $\hat{\beta}$ coefficient suggests that fiscal policy in Argentina has tended to be somewhat counter-cyclical in as much as the size of the deficit and real increases in GDP are inversely related.

In Turkey, by contrast, civilian governments have not been notably more prone to experience large budget deficits than have military governments. Nor have the two principal parties in Turkey tended to pursue very different budget deficit policies (as a separate analysis not reported in Table 1 indicates). Government deficits in Turkey, however, have exhibited a slight tendency to be counter-cyclical.

In India and Venezuela, neither changes in governing parties nor changes in GDP appear to be related to changes in budget deficits. Although the Congress Party has been dominant in Indian politics since independence, there was a period (1977-1979) when there was a coalition government headed by Desai of the Janata

Party. Yet, there was virtually no relationship between differences in the party in power and differences in the relative size of the government's deficits.

In Venezuela, the socialist Democratic Action Party and the Christian Democrats (Copei) have alternated in power with regularity since the early 1960s; however, there was only a very slight tendency for the socialists' budget deficits to be large relative to their opponents' deficits.

In Mexico, changes in the head of government have made little difference in budget deficits, though the deficits did tend to be a bit higher under President Alvarez (1971-1976) than under his predecessor or successor. Generally, though, the size of Mexican budget deficits has not been dependent on which particular leader of the Partido Revolucionario Institucional has been President.

Nor did budget deficit tendencies change much in South Africa between the National Party regimes of Vorster and Botha.

Finally, the changes in the heads of the military regimes in Brazil and South Korea have not resulted in substantial changes in the basic tendencies of budget deficits. However, the Brazilian deficit was subjected to relative restraint in the early 1970s under General Média, as compared with earlier and later military regimes.

In light of the generally weak relationships between the governmental regime variables and the budget deficits for this first set of models, a second set of models was developed. These models incorporate a lag effect in changes in governments. The rationale for incorporating such a lag is that it may take a year

or so for a new government to make its impact felt on fiscal policy. Because of the substantial lead times in many government expenditure commitments and because of the political obstacles to imposing quick changes in government policies, it is reasonable to expect lags in the policy changes that might be associated with changes in government regimes.

Thus, four equations with one-year lags in the governmental regime variables that parallel the four unlagged equations were estimated. The results summarized in Table 3 include $\hat{\gamma}_L$ coefficients reflecting the lagged effects in lieu of the $\hat{\gamma}$ coefficients for the unlagged models of Table 2.⁸ In six of the eight countries, the lagged models fit the data better than their unlagged counterparts.

The exceptions are Brazil and Korea. In Brazil, in particular, changes in the head of the military governments showed much less of a lagged than unlagged relationship to changes in government deficits. This is perhaps not surprising in view of the underlying continuity in the military regime there. A new head of government can impose small changes in policy easily if that is his inclination.

Among the six countries where the models with lagged governmental variables fit better than the models with unlagged variables, the differences are notable in India, Mexico, and Argentina. An already reasonably good fit became even better (R^2 increased by .11) when the government variables were lagged for Argentina. For India and Mexico, the fits changed from very poor for the unlagged models to much less poor, albeit still weak. (R^2 increased by .11 for India and .19 for Mexico.)

Table
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Yet, one might ask, does the inclusion of these governmental regime variables (lagged or unlagged) provide much explanatory-predictive power beyond that which would be provided only by economic variables?

Evidence to answer that question is in Table 4, which contains comparative indications of the goodness of fit of five models. In the fourth and fifth columns of Table 4 are the results for the two sets of models that we have just considered; they include percentage change in real GDP and the governmental regime variables as the explanatory variables. The first column presents indications of the fit of simple bi-variate equations with the single explanatory variable, percentage change in real GDP. The second and third columns provide measures of the fit for models containing only the governmental regime variables, and not the percentage change in GDP.

The table presents the corrected \bar{R}^2 as well as R^2 since the number of explanatory variables varies across the five models. Although the results are mixed, the highlights can be summarized as follows: for Argentina and Mexico, the models with lagged government variables, in addition to the economic variables, clearly have substantially more explanatory value than the models with only economic variables. Moreover, strictly political models (reflected in the second and third columns of Table 4) show better fits than the economic models for Argentina and Brazil. The same is true for Brazil for the model with unlagged governmental variables.

For the other five countries, the addition of the political variables to the economic variables also increases the total

Table
4
Here

explanatory value of the model as indicated by R^2 . However, the increase is not sufficient to overcome the effects of adjusting the R^2 for the inevitable tendency of R^2 to increase as explanatory variables are added to the model. Thus, the corrected \bar{R}^2 is less for the models that include the political variables with the economic variables for five of the countries.

V. Conclusion

For most of the countries in the study, the additional explanatory power achieved by incorporating governmental change variables with economic variables is not commensurate with the loss of parsimony in the models.

Changes in governmental regimes are of course sometimes associated with changes in the relative sizes of government deficits. Especially if we include the lagged effect of changes in governments, we find that models incorporating governmental regime variables along with economic variables have explanatory-predictive power; this was true in particular for Argentina.

The preponderance of the evidence, however, suggests only very slight, weak relationships between changes in relative deficit sizes and changes in governmental regimes. Most of the time in most of these countries, deviations from basic trends in government deficits have not depended very much on who has been in power. This finding is true for countries with histories of periodic military takeovers or competitive party systems as well as countries with continuous military or single party regimes.

Whether this general absence of a strong relationship between changes in governmental regimes and changes in economic

policies is also true of other developing countries, other economic policies, and other time periods can only be determined by further attempts to incorporate political variables in models of economic policies. In the meantime, however, the results of this study suggest that changes in fiscal policy in developing countries are not so strongly associated with changes in governments as is commonly supposed.

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Footnotes

- ¹Two noteworthy items in the extensive literature of pluralist theory are Dahl (1982) and Harrison (1980).
- ²Iran, Nigeria, and Saudi Arabia were excluded because comparable budget deficit data were not available for the period of the study, 1967-1981. Indonesia was excluded because there was no change in the head of government or ruling group during the 1967-1981 period.
- ³1967 was the first year for which government deficit data was available for the countries in the study from the IMF's International Financial Statistics, and 1981 was the latest year for which data could be included at the time the study was undertaken.
- ⁴Data on governmental change were collected from Banks (1981), Economist Intelligence Unit (1983), Kurian (1982), and Paxton (1983).
- ⁵Data on government budget deficits and GDP were taken from International Monetary Fund (1983).
- ⁶A log-linear regression revealed a better fit with the data than did a simple linear regression for five of the eight countries.
- ⁷The Durbin-Watson tests for serial correlation indicate that the null hypothesis of no serial correlation cannot be rejected at the .05 level for any of the eight countries, though the results are indeterminate for four countries. Checks for

multicollinearity similarly reveal no problems; two-thirds of the correlation coefficients between explanatory variables are less than $|.30|$, and the largest is only .61. Finally, visual inspection of the scatterplots of the residuals indicated that neither heteroscedasticity nor non-linearity provided significant departures from the assumptions of the models.

⁸The evidence concerning the absence of serial correlation, multicollinearity, heteroscedasticity, and non-linearity for the lagged models is the same as that summarized in footnote 7 for the unlagged models.

Table 1

Countries Included in Study
Classified According to Type of Governmental Changes
1967-1981

| | |
|--------------|---|
| Argentina | A |
| Brazil | D |
| India | B |
| Korea | D |
| Mexico | C |
| South Africa | C |
| Turkey | A |
| Venezuela | B |

- Note. - A = Alternating military and civilian regimes
B = Civilian regimes with alternating parties
C = Civilian regimes with dominant party and
changing head of government
D = Military regimes with changing head of
government

TABLE 2

REGRESSION RESULTS FOR UNLAGGED MODELS

| TYPE A COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | $\hat{\gamma}_1$ | R ² | F-stat. (df) | D-W |
|---------------------|------------------|------------------|------------------|----------------|------------------|------|
| Argentina | -.042 (-1.03) | -.021 (-2.72) | .322 (4.22) | .66 | 11.71 (2, 12) | 1.89 |
| Turkey | .093 (.61) | -.028 (-1.61) | .071 (.61) | .25 | 2.02 (2, 12) | 1.32 |
| TYPE B COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | $\hat{\gamma}_2$ | R ² | F-stat. (df) | D-W |
| India | -.014 (-.28) | .005 (.87) | .010 (.18) | .06 | 0.38 (2, 12) | 1.69 |
| Venezuela | -.326 (-1.14) | .060 (.33) | .137 (.38) | .02 | 0.10 (2, 12) | 1.76 |

TABLE 2
(continued)

| TYPE C COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | $\hat{\gamma}_3$ | $\hat{\gamma}'_3$ | R ² | F-stat. (df) | D-W | |
|---------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------|-----------------|------|
| Mexico | -.216 (-.82) | .020 (.61) | .083 (.58) | .145 (1.07) | .10 | 0.41 (3, 11) | 1.58 | |
| South Africa | .168 (.99) | -.052 (-2.23) | .068 (.53) | | .35 | 3.20 (2, 12) | 1.92 | |
| TYPE D COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | $\hat{\gamma}_4$ | $\hat{\gamma}'_4$ | $\hat{\gamma}''_4$ | R ² | F-stat. (df) | D-W |
| Brazil | .002 (.01) | .003 (.15) | .182 (.86) | -.327 (-1.39) | .075 (.42) | .49 | 2.49 (4, 10) | 2.41 |
| Korea | .083 (.39) | -.017 (-.75) | -.076 (-.27) | | | .05 | 0.31 (2, 12) | 2.95 |

NOTE. - t-statistics are in parentheses.

TABLE 3
REGRESSION RESULTS FOR LAGGED MODELS

| TYPE A COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | \hat{Y}_{L1} | R ² | F-stat. (df) | D-W |
|---------------------|------------------|------------------|------------------|----------------|-----------------|------|
| Argentina | -.064 (-1.78) | -.015 (-2.37) | .355 (5.60) | .77 | 19.79 (2,12) | 1.56 |
| Turkey | .057 (.37) | -.028 (-1.66) | .108 (.87) | .27 | 2.28 (2,12) | 1.38 |
| TYPE B COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | \hat{Y}_{L2} | R ² | F-stat. (df) | D-W |
| India | .026 (.55) | .006 (1.17) | -.068 (-1.31) | .17 | 1.27 (2,12) | 1.74 |
| Venezuela | -.534 (-5.59) | .053 (.32) | .570 (.64) | .05 | 0.30 (2,12) | 1.96 |
| TYPE C COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | \hat{Y}_{L3} | R ² | F-stat. (df) | D-W |
| Mexico | -.386 (-1.28) | .038 (1.12) | .069 (.48) | .29 | 1.49 (3,11) | 1.51 |
| South Africa | .079 (.40) | -.048 (-2.05) | .144 (.95) | .38 | 3.67 (2,12) | 1.92 |

TABLE 3 CONTINUED

| TYPE D COUNTRIES | $\hat{\alpha}$ | $\hat{\beta}$ | $\hat{\gamma}_{L4}$ | $\hat{\gamma}'_{L4}$ | $\hat{\gamma}''_{L4}$ | R ² | F-stat. (df) | D-W |
|---------------------|----------------|-----------------|---------------------|----------------------|-----------------------|----------------|-----------------|------|
| Brazil | .097 (.54) | .017 (.61) | -.285 (-.94) | -.493 (-1.54) | -.130 (-.58) | .27 | 0.93 (4,10) | 1.31 |
| Korea | .128 (.71) | -.014 (-.77) | -.07 (-.23) | | | .05 | 0.30 (2,12) | 3.03 |

NOTE.- t-statistics are in parentheses.

TABLE 4
COMPARISONS OF GOODNESS OF FIT OF FIVE MODELS

| | R^2/\bar{R}^2 FOR EACH MODEL | | | | |
|------------------|--------------------------------|-----------------------|---------------------|------------------------|----------------------|
| | ECONOMIC | POLITICAL UNLAGGED | POLITICAL LAGGED | ECON.-POL. UNLAGGED | ECON.-POL. LAGGED |
| Argentina (A) | .16/.16 | .45/.45 | .66/.66 | .66/.60 | .77/.73 |
| Turkey (A) | .23/.23 | .09/.09 | .11/.11 | .25/.13 | .27/.15 |
| India (B) | .06/.06 | .00/.00 | .08/.08 | .06/- .10 | .17/.04 |
| Venezuela (B) | .01/.01 | .01/.01 | .04/.04 | .02/- .15 | .05/- .11 |
| Mexico (C) | .01/.01 | .07/- .08 | .21/.08 | .10/- .14 | .29/.09 |
| South Africa (C) | .33/.33 | .08/.08 | .16/.16 | .35/.24 | .38/.28 |
| Brazil (D) | .07/.07 | .50/.36 | .24/.04 | .49/.30 | .27/- .02 |
| Korea (D) | .04/.04 | .00/.00 | .00/.00 | .05/- .11 | .05/- .11 |

TABLE 4 CONTINUED

NOTE. - Letter in parentheses after country name refers to type of governmental change pattern, as in Table 1. Economic model refers to model with percent change in real GDP as explanatory variable. Political model refers to model with dummy variables for governmental regimes as explanatory variables. Economic-Political models include both types of explanatory variables. In the lagged models, government regime variables are lagged by one year. For all models, the dependent variable is the residuals from the trend in log-linear time series regressions of the government deficit as a percent of GDP.