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# A PRELIMINARY ANALYSIS OF INTERNAL INSTABILITY IN A LONG-RANGE FORECASTING MODEL

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13. ABSTRACT

Acts of internal instability are defined as those events where political violence is used to alter governmental policies or practices. Instability is defined in terms of two dimensions, turmoil and revolution, which correspond to the two classes of destabilizing acts described above. Turmoil is measured by occurrences of riots and demonstrations, while revolution is measured by armed attacks. Each of these measures is weighted for severity by deaths due to domestic violence.

Several endogenous and exogenous predictors are used to forecast turmoil and revolution. These endogenous predictors include a nation's trade, its trade concentration, the size of its economic and military power bases, and the extent of its major power alignments. Among the exogenous predictors of internal instability are population, the nation's history of negative government sanctions, and its history of regular power transfers.

Forecasts of the internal instability descriptor will indicate which European nations are most likely to experience severe turmoil and revolutionary activity in the period 1985-1994, and will detail the reasons behind these expectations. These forecasts will be grouped by current and expected future NATO and Warsaw Pact membership, and will compute expected levels of instability for NATO nations, Warsaw Pact nations, and other likely groupings of nations.

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| National power base | | | | | | |
| International alignment | | | | | | |
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## I. INTRODUCTION: THEORETICAL CONSIDERATIONS

During the last decade, the literature of quantitative social science has increasingly focused on various aspects of the performance of political and social systems. Political scientists, in particular, have begun considering the de facto operation of political systems in addition to the de jure organization of those systems. Students of comparative politics have begun comparing nations with regard to the nature of the outputs of the political systems. They have tried to relate those outputs to the characteristics of demands upon the systems' decision-making structures, and to the organization of those structures themselves.

One aspect of a political system's performance that has received fairly wide attention is the degree to which the system is able to maintain a reasonable degree of internal stability.[1] Theoretical and empirical

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[1] See, for example, R. J. Rummel, "Dimensions of Conflict Behavior Within Nations, 1946-59," Journal of Conflict Resolution, Vol. 10 (1966), pp. 65-73; Rudolph J. Rummel. "Dimensions of Conflict Behavior Within and Between Nations," General Systems Yearbook, Vol. 8 (1963), pp. 1-50; Raymond Tanter, "Dimensions of Conflict Behavior Within and Between Nations, 1958-60," Journal of Conflict Resolution, Vol. 10 (1966), pp. 41-64; Douglas P. Bwy, "Political Instability in Latin America: The Cross-Cultural Test of a Causal Model," Latin American Research Review, Vol. 3 (1968), pp. 17-66; Ivo K. Feierabend and Rosalind L. Feierabend, "Aggressive Behaviors Within Polities, 1948-62; A Cross-National Study," Journal of Conflict Resolution, Vol. 10 (1966), pp. 249-271; Betty A. Nesvold, "Scalogram Analysis of Political Violence," Comparative Political Studies, Vol. 2 (1969), pp. 172-194; Ted Robert Gurr with Charles Ruttenberg, The Conditions of Civil Violence: First Tests of a Causal Model (Research Monograph No. 28, Center of International Studies, Woodrow Wilson School of Public and International Affairs, Princeton University, 1967); Ted Robert Gurr, "A Causal Model of

examination of this performance characteristic has, for the most part, studied its absence, that is, internal instability. In that context several terms, among them turmoil, revolution, subversion, internal war, domestic conflict, and many others have been used to characterize internal instability. These terms have taken on rather precise and well-defined meanings in both the theoretical and empirical literature on internal instability, and have been operationalized and measured in surprisingly consistent manners as well.[2] Such consistency has enabled political theorists to generate and subject to empirical disconfirmation a wide variety of hypotheses about the conditions under which different types of instability are most likely to occur, and to do so in a wide variety of historical and contemporary settings.[3] The existence of this comparatively well-developed body of theoretical and empirical literature allows us to approach the problem of long-range forecasting of

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Civil Strife: A Comparative Analysis Using New Indices," American Political Science Review, Vol. 62 (1968), pp. 1104-1124; Ted Robert Gurr, Why Men Rebel (Princeton: Princeton University Press, 1970); Ted Robert Gurr, "Sources of Rebellion in Western Societies: Some Quantitative Evidence," Annals of the American Academy of Political and Social Science, Vol. 391 (1970), pp. 128-144; and Ted Robert Gurr and Muriel McClelland, Political Performance: A Twelve-Nation Study (Beverly Hills: Sage Publications, Inc., 1971).

[2] See Rummel, "Dimensions of Conflict Behavior Within Nations"; Tanter, "Dimensions of Conflict Behavior Within and Between Nations"; and Gurr, Why Men Rebel, and "A Causal Model of Civil Strife: A Comparative Analysis Using New Indices."

[3] See Feierabend and Feierabend, "Aggressive Behaviors Within Polities"; Chalmers Johnson, Revolution and the Social System (Stanford: The Hoover Institution on War, Revolution and Peace, 1964); Charles Tilly and James Rule, Measuring Political Upheaval, (Princeton: Center of International Studies, Princeton University, 1965); Harry Eckstein, Internal War: Problems and Approaches (New York: The Free Press, 1966); and Harry Eckstein, "On the Etiology of Internal Wars," History and Theory, Vol. 4 (1965), pp. 133-163.

these phenomena from a rather substantial base.

At the same time, however, we must recognize that previous examinations of internal instability focused upon rather instantaneous explanations of the phenomena. These studies developed and tested explanations of the occurrence of various forms of internal instability where the events or conditions hypothesized to "cause" instability occurred at nearly the same point in time as the instability itself. Models of this sort, while useful in generating hypotheses about short-term determinants of instability, are not readily usable for long-range forecasting purposes. Long-range forecasting requires models that focus upon longer-lagged determinants of instability and allow knowledge about the present state of the world to be used in generating expectations about future levels of instability in nations. This is not to imply that changes in public policies have no immediate or short-term effects on the extent of internal instability in nations, but rather that such changes in policy cannot be accurately foreseen by the long-range forecaster. Long-range forecasts, then, must generate expectations about future values of internal instability on the basis of present conditions while also suggesting public policy changes that can alter those expectations.

Accordingly, we seek to develop a long-range forecasting model of internal instability that considers two basic types of explanatory or predictor variables: those predictors that have a rather long-run impact on instability and whose present values are known to the forecaster; and those predictor variables that, although affecting internal instability almost instantaneously, are themselves subject to forecasting. Long-range forecasts, themselves, must be based on the known values of the long-lagged variables as well as on forecasts of short-term predictor variables. At the same time, the analyst must provide information about the

sensitivity of his forecast to various kinds of changes in public policy.

In this section of the Long-Range Environmental Forecasting study we seek to use state-of-the-art forecasting techniques to generate expectations about the levels of internal instability in the European nations in the 1980's. Consistent with previous theoretical and empirical work, we consider instability to be composed of two distinct dimensions, turmoil and revolution.[4] We view turmoil as those destabilizing activities intended to replace governmental policymakers or alter the structure of the policymaking process itself. These distinctions are not intended to impute motives to the actors who participate in various acts of instability. Rather, the distinctions rest upon that relatively well-developed body of theoretical and empirical literature on internal instability mentioned previously.

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[4] See Rummel, "Dimensions of Conflict Behavior Within Nations"; Tanter, "Dimensions of Conflict Behavior Within and Between Nations"; Gurr, Why Men Rebel, and "A Causal Model of Civil Strife: A Comparative Analysis Using New Indices."

## II. OPERATIONALIZING INSTABILITY

Six kinds of events have generally been used to measure turmoil and revolution. Turmoil has been operationalized with measures of anti-government demonstrations, riots, and political strikes, while revolution has been measured by occurrences of assassinations, coups d'etat, and armed attacks.[1] We have tried, in this analysis, to maintain consistency with these prior measurement attempts. However, the lack of widespread occurrences of assassinations, political strikes. and attempted coups in post-World War II Europe has prevented their inclusion as measures of internal instability in this analysis. Two of the components of turmoil mentioned above have proved useful: anti-government demonstrations and riots. Similarly, armed attacks were used as a measure of revolution. Data on the numbers of these kinds of occurrences were drawn from the New York Times Index for the years 1948-1971. A summary measure of turmoil events was constructed by summing the event counts for anti-government demonstrations and riots.

Unfortunately, these event counts only indicate the number of times destabilizing activities have occurred; they suggest nothing about their scope or severity. For example, a riot that involves a relatively small number of people and results in but slight property damage may receive the same event count as another riot that involves thousands of people and results in hundreds of deaths. In order to weight the

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[1] See R.J. Rummel, "Dimensions of Conflict Behavior Within Nations"; Tanter, "Dimensions of Conflict Behavior Within and Between Nations"; Gurr, Why Men Rebel, and "A Causal Model of Civil Strife: A Comparative Analysis Using New Indices."

event counts by their relative severity, the number of deaths resulting from domestic conflict, a measure obtained from the New York Times Index, was used as a weighting factor.

The event counts for turmoil and revolution were examined and found to be highly skewed. This skewness was reduced by subjecting both measures to a log (X + 1) transformation, which resulted in measures with a lower bound of zero, which corresponded to the complete absence of turmoil and revolutionary events respectively. We might note that this skewness, at least in part, reflects differential levels of reporting in the New York Times for the various European nations,[2] and that the logarithmic transformation counteracts this reporting bias in event data.

The number of deaths resulting from domestic conflict was also found to be a highly skewed measure of the intensity of internal instability. Accordingly, this measure was subjected to a log (X + 10) transformation, which resulted in an intensity measure with a lower bound of 1.0 and, for the 1948-65 time period, an upper bound of approximately ten, limits that are intuitively satisfying for a weighting factor. We

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[2] See Gordon Hilton with Farid Abolfathi, Robert Mahoney, and Herman Weil, "The Role of Customer Expectation in Political Science" (Northwestern University Mimeo: Spring 1972); and Farid Abolfathi "Data Collection in the Civil Strife Project" (Northwestern University Mimeo: Spring, 1972). See also Edward Azar, et al., "The Problem of Source Coverage in the Use of International Event Data," International Studies Quarterly (September 1972); Edward Azar, Richard Brody, and Charles McClelland, "International Events Interaction Analysis: Some Research Considerations," International Studies Series No. 02-001 (Beverly Hills: Sage Publication, 1972); Philip M. Burgess and Raymond W. Lauton, "Indicators of International Behavior: An Assessment of Events Data Research," International Studies Series No. 02-010 (Beverly Hills: Sage Publication, 1972).

suggest that a part of the skewness of deaths from domestic conflict resulted from differential levels of newspaper reporting. In this case, however, it is likely that rather exact death tolls were available for nations for which the New York Times provided extensive coverage, while exaggerated body counts were more likely where the newspaper coverage was much less intense. The log transformation also provided some reduction of this bias for the deaths from domestic conflict measure.

Table 1 below suggests that the biases resulting from differential levels of newspaper coverage do, in fact, operate in opposite directions for these two measures. For many nations, particularly those of Eastern Europe where low numbers of turmoil and revolutionary events may be a function of low reporting, the numbers of deaths reported are not only very high, but are given in numbers rounded off to the nearest thousand, a characteristic of gross, estimated, and often exaggerated body counts.

Levels of both turmoil and revolutionary activity were computed by multiplying the transformed event data for each category by the intensity weighting factor, that is, the transformed death tolls. Since the transformations in both cases adjusted for the expected direction of reporting biases, and those biases were in opposite directions, combining the two measures in a multiplicative manner further offset the effects of these biases. The composite measures of the levels of turmoil and revolution, then, are intended to tap two dimensions of instability: the number of destabilizing activities of each type that a nation experiences, as well as the relative scope and severity of those actions.

A word of caution is needed, however, concerning the interpretability

TABLE 1

RANKINGS ON MEASURES OF INTERNAL INSTABILITY, 1948-1965

| Country | Turmoil Events | Revolutionary Events | Intensity | Level of Turmoil | Level of Revolution |
|---|---|---|---|---|---|
| Albania | 21 | 16 | 3 | 11 | 9 |
| Austria | 13 | 13 | 17 | 17 | 14 |
| Belgium | 5 | 11 | 15 | 14 | 11 |
| Bulgaria | 20 | 23 | 21 | 21 | 23 |
| Czechoslovakia | 8 | 21 | 9 | 8 | 18 |
| Denmark | 17 | 20 | 14 | 16 | 20 |
| Finland | 18 | 22 | 19 | 19 | 22 |
| France | 2 | 2 | 7 | 5 | 3 |
| East Germany | 6 | 5 | 6 | 7 | 6 |
| West Germany | 3 | 6 | 17 | 13 | 10 |
| United Kingdom | 4 | 12 | 16 | 12 | 12 |
| Greece | 11 | 1 | 2 | 2 | 1 |
| Hungary | 14 | 4 | 1 | 1 | 2 |
| Iceland | 27 | 25 | 21 | 27 | 25 |

TABLE 1 (cont'd)

RANKINGS ON MEASURES OF INTERNAL INSTABILITY, 1948-1965

| Country | Turmoil Events | Revolutionary Events | Intensity | Level of Turmoil | Level of Revolution |
|---|---|---|---|---|---|
| Ireland | 23 | 9 | 20 | 22 | 15 |
| Italy | 1 | 3 | 8 | 4 | 5 |
| Luxembourg | 28 | 25 | 21 | 28 | 25 |
| Netherlands | 24 | 25 | 21 | 24 | 25 |
| Norway | 24 | 23 | 21 | 24 | 23 |
| Poland | 7 | 7 | 4 | 3 | 4 |
| Portugal | 15 | 15 | 12 | 15 | 16 |
| Rumania | 16 | 14 | 0 | 20 | 19 |
| Spain | 9 | 8 | 11 | 9 | 8 |
| Sweden | 22 | 1 | 21 | 22 | 25 |
| Switzerland | 26 | 19 | 21 | 26 | 21 |
| Turkey | 11 | 16 | 10 | 10 | 13 |
| U.S.S.R | 10 | 10 | 5 | 6 | 7 |
| Yugoslavia | 19 | 16 | 13 | 18 | 17 |

of these composite measures. If event data had been used without being weighted by an intensity factor, the forecasts that would have been generated could have been retransformed so that they constituted predictions about the numbers of riots, demonstrations, and armed attacks expected in the various European nations during the 1980's. Analyses of levels of turmoil and revolution, however, cannot be similarly interpreted. Forecasts generated on the basis of these composite measures must be interpreted in a relative sense since they reflect the levels of instability expected for a nation relative to the other European nations. In short, although these scores have interval properties and can be analyzed using powerful parametric statistical techniques, there are no observable occurrences in the world that correspond exactly to any given unit of turmoil or revolution. Thus, the measures should be interpreted as ordinal and used for comparing the levels of instability among the various European nations. In forecasting instability from these composite measures, the most appropriate kind of output would be rankings of the European nations. Rankings suggest comparative levels of expected instability and in no way imply expected absolute event counts.

Table 1 presented rankings of the European nations on the composite measures of the levels of turmoil and revolution for the period 1948-1965. During that time span, these measures were nearly uncorrelated with each other, suggesting that our characterization of them as distinct aspects of internal instability is consistent with the observations generated by our measuring instruments. We suggest that this near-zero correlation, coupled with previously cited theoretical and empirical evidence of the distinctiveness of these two dimensions of internal instability validates the use of such measuring instruments. That is, we regard measuring instruments as valid to the extent that

they produce data that behave in accordance with our theoretical expectations and with previous empirical findings.[3] If the data we have generated do not evidence obvious signs of invalidity, they may be used to examine internal instability and therefore to generate a long-range forecasting model of internal instability.

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[3] Cronbach and Meehl note that, "To make clear the meaning of a concept is to set forth the laws--relationships--within which it occurs," so that validation is the examination of these relationships. See Lee J. Cronbach and Paul E. Meehl, "Construct Validity in Psychological Tests," Psychological Bulletin, Vol. 52 (1955), p. 290. See also T.R. Gurr, Politimetrics (Englewood Cliffs: Prentice-Hall, Inc., 1972), pp. 47-48; and James A. Caporaso, "Theory and Method in the Study of International Organization," International Organization, Vol. 25 (1971), pp. 228-253.

## III. METHODOLOGICAL CONSIDERATIONS

The nations that comprise Eastern and Western Europe constitute a rather unique political system in that they represent, at the present time at least, two major military and economic blocs. The nations of Eastern Europe are tied quite closely to the Soviet Union, both in terms of military agreements and in terms of economic interaction patterns. To a more limited extent, the nations of Western Europe are similarly associated with the United States, although there are reasons for believing that the strength of these ties is decreasing. Nonetheless, for the past twenty years social scientists have viewed these groups of nations as two power blocs. The nations comprising these blocs are often thought to differ greatly on ideological bases, economic transaction patterns, and on the nature of the outcomes of public policies of their respective political systems. Whether or not such differences are in fact real, they present certain obstacles to the social scientist who desires to utilize them as the basis for comparisons.

Nonetheless, what we plan to develop here is a general forecasting model for the European nations that will permit integrated forecasting of the five central environmental descriptors. That is, we are attempting to construct a forecasting model that will generate forecasts on the relative extent to which internal instability is expected in the European nations--a model that will permit comparisons of those nations with regard to their levels of turmoil and revolution, and one that will consider the linkages between instability and the other descriptors under examination. The construction of such a model does not need to ignore these unique aspects of the European context. Rather, special consideration of that context should be made to insure a truly comparative

model, as the problem of data comparability between Eastern and Western European nations suggests. This is not to imply that all relevant aspects of the European milieu have been considered in the construction of the system-wide comparative model. We have, however, addressed ourselves to these kinds of questions and have generated solutions to the extent that our resources allow.

## A. STRUCTURE OF THE MODEL

As we mentioned earlier, an integrated forecasting model for five central environmental descriptors is the goal of this work. We hope to forecast each of these descriptors in such a way that the linkages between them will be used as explicit components of those forecasts. The forecasting model, then, takes the form of a set of non-recursive simultaneous linear equations, with one or more equations developed for each descriptor. Multiple regression analysis will be the basic quantitative technique employed in our attempt to estimate the parameters of each equation. Such estimates, if made for all important linkages between instability and the other descriptors, and for all important relationships between instability and the exogenous variables, will provide a viable postdictive model to serve as the basis for forecasting.

Separate multiple regression equations will be developed and analyzed for the levels of turmoil and revolution. A series of independent variables drawn from the theoretical and quantitative literature on internal instability will serve as the potential predictors of our two dependent variables. Some of these predictors, of course, will be other central environmental descriptors. On the basis of their relative explanatory value, a subset of those independent variables will be selected for

inclusion in the predictive forecasting model. What follows is a brief description of the potential predictors considered, their conceptual definitions, suggested operationalizations, and the logic behind their initial inclusion in the analysis.

## IV. PREDICTORS OF INTERNAL INSTABILITY

### A. OTHER CENTRAL ENVIRONMENTAL DESCRIPTORS

#### 1. Previous Levels of Internal Instability

Nearly all empirical research into the causes of internal instability in nations has found that previous levels of instability are strongly linked to the present level of internal instability.[1] Rubin, in fact, has found that past levels of domestic conflict are the dominant predictors of internal instability at any given point in time.[2] Obviously one can see that turmoil or revolutionary activity which began in one time period and continues into the next time frame under analysis produces a strong relationship between instability in the two time frames. Probably more significant, however, is the pressure at the present time that results from arguments that justify internal instability on the basis of its past success.[3] That is, if a nation has a history of high levels of instability which has brought changes in governmental policies and practices, or in the governmental structure itself, that history of success provides an impetus for utilizing turmoil or revolution to solve present problems or to relieve present dissatisfactions. In short, successful use of destabilizing activities reinforces the tendencies for their use.

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[1] Gurr, "A Causal Model of Civil Strife: A Comparative Analysis Using New Indices"; Rummel, "Dimensions of Conflict Behavior Within Nations"; Tanter, "Dimensions of Conflict Behavior Within and Between Nations"; and others.

[2] Theodore Rubin, "Summary: Environmental Information Service" (Santa Barbara, Calif.: TEMPO), p. xv.

[3] T. R. Gurr, Why Men Rebel.

Previous levels of turmoil and revolution are measured in the same manner as the dependent variables under examination here. Event counts of riots and demonstrations are summed and subjected to a log (X+1) transformation, and event counts of armed attacks are transformed to log (X+1) as well. Both transformed event scores are then multiplied by the intensity weighting factor, computed by subjecting deaths due to domestic conflict to a log (X+10) transformation. These measures are valid representations of the levels of turmoil and revolution to the extent that measures of the dependent variables, themselves, were considered valid.[4]

2. Economic Interdependence

We suggest that nations that are highly dependent upon the foreign sector for a large proportion of their gross national product are in a more economically precarious position than those not so dependent. This is especially true of any nation whose dependence is upon only one or a few foreign powers, because changes in the foreign government's policies that severely reduce or stop the flow of trade can seriously affect the dependent nation's economy.[5] That is, when the economic base of a nation can be very seriously disrupted by the activities of a single foreign power, or small group of foreign powers, that nation's economy has relatively low resiliency. To the extent that such dependence is recognized by the nation in question, and to the extent that the nation's citizens consequently feel economic insecurity,

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[4] Cronbach and Meehl, "Construct Validity in Psychological Tests"; Gurr, Politimetrics; and Caporaso, "Theory and Method in the Study of International Organizations."

[5] Gurr, Why Men Rebel.

political instability could result. The Cuban economy, for example, was highly dependent upon the production and exportation of cane sugar during the decade of the 1950's. Most of the sugar produced in that nation was exported to the United States. In the very early 1960's the U.S., for political reasons, stopped importing Cuban cane sugar, and Cuba's economy suffered serious consequences. The threat of economic collapse in Cuba was, in fact, quite real at that point in time, and carried with it the potential for internal instability.

Economic interdependence will be operationalized in two ways to test this hypothesis. First, the economic interdependence descriptor will provide forecasts of the levels of trade for the European nations. These forecasts can be used to generate expected values of trade relative to the nation's GNP. This will provide forecasts of economic interdependence. The concentration of that interdependence among one or a few nations will be operationalized by using the forecast values of dyadic trade to generate expected concentration of trade ratios that measure the extent to which a nation's trade is centered with one or a few other nations. Specifically, then, we hypothesize that internal instability varies directly with the quantity of a nation's trade relative to its GNP, and that this relationship is mediated directly by the concentration ratio of its trade.

3. National Power Base

The relationships between instability, trade as a percentage of GNP, and trade concentration are, we think, mediated by the value of a nation's power base, particularly the economic component of that power base. That is, economic interdependence is viewed here as a relative matter. A nation can have a large percentage of its economy

interdependent with the foreign sector and that interdependence can be concentrated among a few nations; but if the nation's economy is very large and very strong, such a situation does not put the nation in such a perilous economic situation.

By utilizing the economic power component of the national power base descriptor, we hypothesize that the relationship between internal instability and economic interdependence is inversely mediated by the value of the nation's economic power base. Moreover, we believe that a nation's power base, both the economic and military components, directly affect the nation's level of internal instability. Gurr, among others, has found that a government's ability to suppress instability varies inversely with the level of instability experienced by that nation.[6] Specifically, he finds that as the relative size of the regime's military forces and internal security forces increases, the level of observed instability in that nation decreases. We regard a regime's capacity to suppress internal instability best measured by the level of its military power base within the context of this interactive forecasting model. The work of Gurr and other students of internal instability, then, leads us to hypothesize that the levels of turmoil and revolution in a nation vary inversely with the value of its military power base.

Several theorists have also argued that the extent of a nation's economic development also affects its level of internal instability. Gurr specifically finds that instability is sensitive to the level of a nation's GNP, its GNP growth rate, the level of energy consumption per capita in the country, the extent to which its economy provides technical and

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[6] T.R. Gurr, "A Causal Model of Civil Strife: A Comparative Analysis Using New Indices."

professional jobs, and the level of investment in the nation's economy.[7] Taylor has found that the probability of revolutionary activity decreases with greater GNP per capita, and with greater rates of growth in GNP.[8] The Feierabends have also found that a positive rate of change in income is correlated with increasing internal stability.[9]

This set of variables is best represented by the economic power base descriptor within the context of our integrated forecasting model. As measures of the level of economic development, these variables are usually highly correlated, and are used here as components of a nation's economic power base. Accordingly, we hypothesize that high values of a nation's economic power base will be related to low levels of internal instability in the nation, and vice versa.

4. International Alignment

It has been suggested that instability is related to the degree to which a nation is aligned with major powers.[10] Since nations that are highly aligned with major powers are given added legitimacy by virtue of that alignment, and since, to some extent at least, their military forces are freed from external defense requirements for use in suppressing internal

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[7] Ibid.

[8] Charles L. Taylor, "Turmoil, Economic Development and Organized Political Opposition" (paper delivered at the Annual Meetings of the American Political Science Association, September 1970.)

[9] Feierabend and Feierabend, "Aggressive Behavior Within Polities."

[10] Jonathan Wilkenfeld, "Domestic and Foreign Conflict," Conflict Behavior and Linkage Politics, ed. by Jonathan Wilkenfeld (New York: David McKay Company, Inc., 1973).

instability, we expect nations so aligned to evidence lower levels of observed instability than would otherwise be expected. Again, however, the power base at a nation's disposal is expected to modify this relationship; nations which have the economic and military resources to deal with instability on their own need not depend upon alignment with major powers as an aid in suppressing destabilizing activities. In short, we expect nations that are more aligned with major powers to show fewer signs of instability than would otherwise be expected, except when those nations have the resources to suppress that instability without the assistance of alignments.

Specifically, analysis of the international alignment descriptor will yield forecasts of the extent to which nations are aligned with major powers. We hypothesize, then, that internal instability varies inversely with the extent of a nation's major power alignment, and that this relationship is mediated inversely by the summed value of a nation's economic and military power bases.

## B. EXOGENOUS PREDICTORS OF INTERNAL INSTABILITY

In addition to the previously mentioned predictors of internal instability that are, themselves, descriptors of interest here, several predictors of instability will be examined that are exogenous, or outside, the integrated forecasting model. These variables lie outside the forecasting model since their values are predetermined with respect to that model; they are not themselves being forecast in this endeavor. The exogenous predictors of instability considered here include negative government sanctions, regular power transfers, and population.

## 1. Negative Government Sanctions

As noted earlier, we hypothesize that the level of internal instability in a nation is inversely related to the government's resources for suppressing such instability. Also of importance, however, is the government's willingness to utilize its capacities in a coercive manner, that is, the government's willingness to employ political violence itself. Negative government sanctions are used as a measure of the tendency to employ coercive capabilities in the suppression of perceived threats to the regime. The two components of the level of negative government sanctions are: (a) government executions; and (b) other government sanctions, defined as "...actions taken by the authorities to neutralize, suppress, or eliminate a perceived threat to the security of the government, the regime, or the state itself."[11] Other government sanctions, then, are themselves a summary measure comprised of censorship, restriction on political participation, and espionage activities of the regime in power.

More specifically, we view a history of high levels of negative government sanctions as directly related to the levels of present turmoil and revolution. That is, a nation with a history of numerous government sanctions is likely to experience a very high level of internal instability. Negative government sanctions tap the government's contribution to the overall level of political violence that characterizes a particular society. While such sanctions are probably a reaction to previous levels of turmoil and revolution, we are particularly interested here

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[11] Charles L. Taylor and Michael C. Hudson, World Handbook of Political and Social Indicators II (First ICPR ed.; Ann Arbor, Michigan: Inter-University Consortium for Political Research, 1971), p. 15.

in the degree to which they serve as a spur to further internal instability.

Consistent with our previous methodological discussion, let us note that negative government sanctions are a long-lagged exogenous variable. That is, it is not the present level of government sanctions that is hypothesized to affect the present level of internal insecurity, but rather a history of government sanctions that is expected to serve as a useful predictor of turmoil and revolution.

2. Regular Power Transfers

Major and minor regular transfers of power are used here as measures of the legitimacy of a nation's government. Gurr and McClelland have suggested that the maintenance of authority, operationally defined as the replacement of governments without disruptive conflict, is a prime component of a regime's legitimacy, and that the degree of internal instability in a nation is negatively related to the degree of legitimacy bestowed upon the national government.[12]

A major regular power transfer is defined as, "...a change in the office of national executive from one leader or ruling group to another that is accomplished through conventional, legal, or customary procedures and unaccompanied by actual or directly threatened physical violence."[13] Minor regular transfers of power subsume events that modify the

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[12] Gurr and McClelland, Political Performance: A Twelve-Nation Study.

[13] Taylor and Hudson, World Handbook of Political and Social Indicators II.

membership of a national executive body but do not represent a transfer of formal power from one group or leader to another.[14] It can be viewed as one way to adapt to perceived political pressures short of losing formal control of the government. Minor transfers of power are viewed here as similar to major transfers in that they both measure the degree to which a government exhibits long-term flexibility and long-term legitimacy. As was the case with negative government sanctions, major and minor power transfers can be either responses to or causes of internal political instability. Again, however, we shall be concentrating our efforts on forecasting internal instability and shall view major and minor regular power transfers as predictors of instability.

Just as negative government sanctions were not expected to have instantaneous impacts on instability, regular power transfers are not viewed as simultaneous causes of internal instability. That is, we do not regard the occurrence of a regular power transfer, or a series of regular power transfers, as predicting relatively low levels of internal instability in the subsequent period. Rather, we view the history of power transfers in a nation as relevant to the forecasting of internal instability. We hypothesize that nations with histories of regular, rather than irregular, power transfers view their governments as relatively more legitimate and are, accordingly, less susceptible to high levels of internal instability. Regular power transfers, then, fit into the category of a long-lagged predictor of internal instability.

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[14] Ibid., pp. 85-86.

3. Population

Taylor suggests that the size of a nation is an important factor in accounting for its level of internal political disturbance. His hypothesis is that a state with more people has a greater probability of a high level of instability than does one with fewer people simply because there are more individuals who may potentially become involved in destabilizing activities.[15] The present population of the nations examined in this study ranges from about two to three hundred thousand in Iceland and Luxembourg to more than 230 million in the Soviet Union. Such wide variation permits us to consider population as a potentially useful predictor of internal instability in the context of Eastern and Western Europe.

In a very strict sense, population is not a long-lagged predictor of internal instability, but rather a variable that affects the level of instability more-or-less instantaneously. That is, the population of a nation at a given year determines the potential number of individuals in that nation who may participate in destabilizing activity. We maintain that a nation is likely to experience high levels of instability if it is presently very large, not because it was very large fifteen years ago. More practically, however, population size is a highly autocorrelated time series. That is, population size at one year can strongly predict population size at a later year. In part, of course, this is due to the fact that the size of a nation's population, aside from changes due to immigration and emigration, is a function of its

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[15] Charles L. Taylor, "Political Development and Civil Disorder," (paper presented at the Annual Meeting of the American Political Science Association, September 1969), p. 7.

population growth rate and the previous size of its population. Although population does not strictly fit into our category of long-lagged exogenous predictors, the characteristics of this measure permit it to be used as such.

As with the components of turmoil and revolution, population was found to be a highly skewed measure. Accordingly, it was also subjected to a log (X+1) transformation. Specifically, then, we hypothesize that this transformed measure of population size is positively linked to levels of turmoil and revolution.

## V. STRUCTURE OF THE INSTABILITY EQUATION

Eight variables, four of which are other central environmental descriptors, have been initially selected as potentially useful predictors of internal instability. These eight will be used to construct a postdictive regression model of internal instability. That equation, shown below, takes into account the hypothesized linkages between each of the eight predictors and the level of internal instability in nations. The equation will be examined for two dependent variables--the levels of turmoil and revolution in the European nations--and will be altered, if necessary, in accordance with criteria for good estimation. Parameter estimates developed from the final equations will then be utilized to generate forecasts of turmoil and revolution in the European nations for the period 1985-1994.

$$Y_1 = \beta_0 + \gamma_1 Y_{1_{t-1}} + \gamma_2 \frac{(Y_2 X_4)}{Y_3} - \gamma_4 \frac{Y_4}{(Y_3+Y_5)} \gamma_3 (Y_3 + Y_5) + \beta_1 X_1$$

$$-\beta_2 X_2 + \beta_3 X_3 + \epsilon_1$$

where:

$Y_1$ = internal instability

$Y_2$ = foreign trade as % GNP

$Y_3$ = economic power base

$Y_4$ = level of major power alignment

$Y_5$ = military power base

$X_1$ = negative government sanctions

$X_2$ = regular power transfers

$X_3$ = population

$X_4$ = Michaely concentration ratio

What we intend, then, is to evaluate this equation for both turmoil and revolution with a view toward removing those predictors that do not evidence strong linkages with turmoil and revolution. Estimates of the direction and strength of the linkages for those remaining predictors will be developed with minimum-information, maximum-likelihood methods. These estimates will be used to generate forecasts of the levels of turmoil and revolution for the European nations during the 1985-1994 time period.