

Repression, Rationality and Relative Deprivation; A theoretical and
empirical examination of Cross-National Variations in Political Violence

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Abstract

This paper develops a theory of political violence that is based on the rationality of individual agents. Violence is shown to be negatively related to the availability of alternative means of acquiring political goods and to the availability of alternative economic opportunities. Under quite general assumptions, the theory also predicts that the level of political violence in a society will have an inverted U-shaped relationship to the level of state repression; violence will be low under low- and high- levels of repression and will peak at middling levels of repression. In a series of tests using pooled cross-sectional/time series data, the model is shown to outperform a number of existing relative deprivation and social disorganization theories of political violence.

Driven by both normative and political considerations, social thinkers have long sought to grapple with the causes of political violence. Indeed attempts by political theorists to explain the phenomenon of political violence have a vintage that dates back to Ancient Greece and the very beginnings of political science. In this paper, a model of political violence, based on traditional rational choice assumptions will be developed. This theory will then be contrasted with a number of alternative non-economic theories of political violence and will be tested using cross-sectional/time series data collected from 138 countries over the period 1970-1985.

The rational choice theory that is developed will be shown to predict a negative relationship between both the level of per capita GDP and its growth rate and to posit an inverted U shaped relationship to the level of political repression. It will be shown that, over the data in question, the model that is constructed outperforms competing Structural, Relative Deprivation, and Social Disorganization theories of political violence.

Theoretical Approaches to Political Violence

A) Rational Choice/Economic Theories of Political Violence

The rational choice approach is firmly rooted in methodological individualism. Political violence is assumed to be subject to the same cost-benefit calculations that govern all the actions of rational individuals. The decision to engage in political violence will be made by individuals with competing consumption objectives who face and act upon the basis of differently-priced production possibilities. When the opportunity cost of political violence

falls and/or the rewards from political violence increase then the rational individual will devote greater resources to violent political activities.¹

In one sense rational choice can be compatible with each of the three other approaches to political violence (Muller and Weede 1990). For example, Social Disorganisation or a feeling of Relative Deprivation can act upon the individual's utility function to reduce the conscience costs borne by the individual from engaging in violence. However competing theories, where political violence is usually a reflexive response to social or psychological forces, the rational individual will expressly consider the opportunity costs of engaging in political violence.

For the purpose of this paper, the costs of violence will be classified into two categories:

- 1) falling victim to coercive measures instituted by the state (or its allies).
- 2) the opportunity cost of devoting resources that are used in generating political violence to either the securing of non-political goods or to acquiring political goods by peaceful means.

A Model of Rational Political Violence

The individual is assumed to maximise a sum of goods (M) made up of non-political goods (G) and political goods (P).

$$M = G + P$$

¹Although earlier writings contain elements of the rational choice approach, the classic work is Gordon Tullock, *The Social Dilemma*, (Blacksburg: Center for Study of Public Choice, 1973)

The individual has a fixed stock of time (labelled T) that can be used for the production of non-political (or economic goods) (W), for peaceful political agitation (A), or for violent political activity (V).

$$T = W + A + V$$

Allocation of resources to W is effective in increasing the quantity of G available to the individual and the allocation of resources to activity A and activity V is effective in raising the quantity of good P. All of these inputs are assumed to be subject to decreasing returns.

The individual's maximisation problem is surmised:

$$\text{Max } G(W) + P(A, V)$$

$$\text{st. } T = W + A + V$$

where $G(W), P(A), P(V) > 0$

and

$G(W), P(A), P(V) < 0$

The first order conditions for the optimal allocation of resources by the individual are:

$$\frac{dG}{dW} = \frac{dP}{dA} = \frac{dP}{dV}$$

An optimizing individual will allocate resources so that the Marginal Product of all activities are equal. Henceforth the three derivatives listed above will be labelled:

$$MP_w = MP_a = MP_v$$

(I) The Effect of the level and growth rate of per Capita GDP

Additional assumptions regarding the relationship between these variables can now be introduced. A high level of GDP per capita (Y) implies that the reward to devoting effort to economic activity is increased because of higher wage rates. An increased GDP growth rate not only increases the level of GDP but can also be hypothesised to create extra unrealised profit opportunities for entrepreneurs that can be exploited by devoting greater time to the production of economic goods. Hence:

$$\frac{dMP_w}{dY} > 0$$

The net effect of an increase in per capita GDP (Y) is to increase the Marginal Product of W .²

The model's first prediction is that, given an increase in Y , individuals will reduce the resources devoted to A and V and reallocate them to economic activity up to the point where the Marginal Products of W , A and V are again equalised. The empirical implication is that a negative relationship exists between the level of political violence (V) and both the level of GDP per capita and growth in GDP per capita.

II) The Effect of the Repression on Political Violence

² Y is also assumed to have no effect on the production function of P (i.e. $P(A, V)$).

Case 1: Repression is Effective Only Against Peaceful Agitation

As a regime moves along the spectrum from liberalism to totalitarianism, it is usually the case that different levels of repression has varying levels of effectiveness against A and V. Generally, milder forms of repression (such as censorship or restrictions on political organisations) are much more effective against peaceful activities than against violent political action. A state moving towards greater repression will initially concentrate its scarce resources on relatively low cost activities such as suppressing such highly visible and peaceful activities as demonstrations and dissident newspapers. One widely observed corollary of this generalization, is that while few violent political organisations choose to adopt peaceful means in the wake of repression, hitherto violent groups commonly renounce violence in the wake of liberalisation.

In this section, it is assumed that repression (R) is ineffective in reducing the effectiveness of political violence. However it is effective in reducing the productivity of peaceful agitation through either coercion or by reducing the influence that public opinion influences over policy.

$$\frac{dMP_A}{dR} < 0$$

In this model, an increase in repression causes a fall in the Marginal Product of Agitation. The agent will reallocate resources away from Agitation towards both V and W until the Marginal Product of these activities falls to match that of A.

Case 2: Repression (R) is effective against both V and A

In this section it is assumed that as repression increases its effectiveness against political violence eventually increases. The degree of control and the harsh coercion imposed by a fully authoritarian society can raise the costs of engaging in political violence as well as those of engaging in non-violent agitation. It is still assumed however that Repression has a proportionately greater negative effect on the product of non-violent agitation than on political violence, hence:

$$\frac{dMP_A}{dR} < \frac{dMP_v}{dR} < 0$$

Making use of the First Order Necessary Condition that $MP_w = MP_a = MP_v$ the following total derivative of the effect of an increase in R can be derived.

$$\frac{dMP_w}{dW} dW = \frac{dMP_v}{dR} dR + \frac{dMP_v}{dv} dV = \frac{dMP_a}{dR} dR + \frac{dMP_a}{da} dA < 0$$

(equation 1.1)

Given that $\frac{dMP_A}{dR} < \frac{dMP_v}{dR} < 0$ and that $\frac{dMP_w}{dR} = 0$ and assuming that that $\frac{dMP_w}{dW} < 0$, then it

is unambiguously the case that an increase in repression the individual will allocate more time towards production of non-political goods (i.e. $dW > 0$).

Given that $dW + dA + dV = 0$ and that $\frac{dMP_v}{dR} dR > \frac{dMP_a}{dR} dR$ and that $MP_v = MP_a$ then dA is

unambiguously less than zero, implying that less resources are devoted to peaceful political activities.

However the direction of change in the level of political violence is less definite. From equation 1.1 the following can be derived:

$$\frac{\frac{dMP_w}{dW}dW - \frac{dMP_v}{dR}dR}{\frac{dMP_v}{dV}} \dots dV \quad (\text{equation 1.2})$$

The sign of dV is dependent on the relative magnitude of $\frac{dMP_v}{dR}dR$ and $\frac{dMP_w}{dW}dW$ which respectively represent the magnitude of the effect of the repression on the Marginal Product of V and the magnitude of the rate at which the Marginal Product of W decreases. The greater the magnitude of decreasing returns to W and the lower the effect of repression on the effectiveness of Violence, the greater the likelihood that dV will exceed zero.

From this analysis an inverted U curve relationship between political violence and repression/coercion can be drawn.

If we assume that:

a) Repression is always more effective against the effectiveness of A than against V (i.e.

$$\frac{dMP_A}{dR} < \frac{dMP_v}{dR}).$$

b) there is a initial space over which $\frac{dMP_v}{dR}$ is either equal to zero or sufficiently close to zero

such that the relationship between repression and political violence is positive (i.e. $dV > 0$)

c) that $\frac{dMP_V^2}{dR^2} < 0$ such that, as the level of repression is increased, its marginal impact on the effectiveness of V increases up to and beyond a point (R*) beyond which dV becomes less than zero.

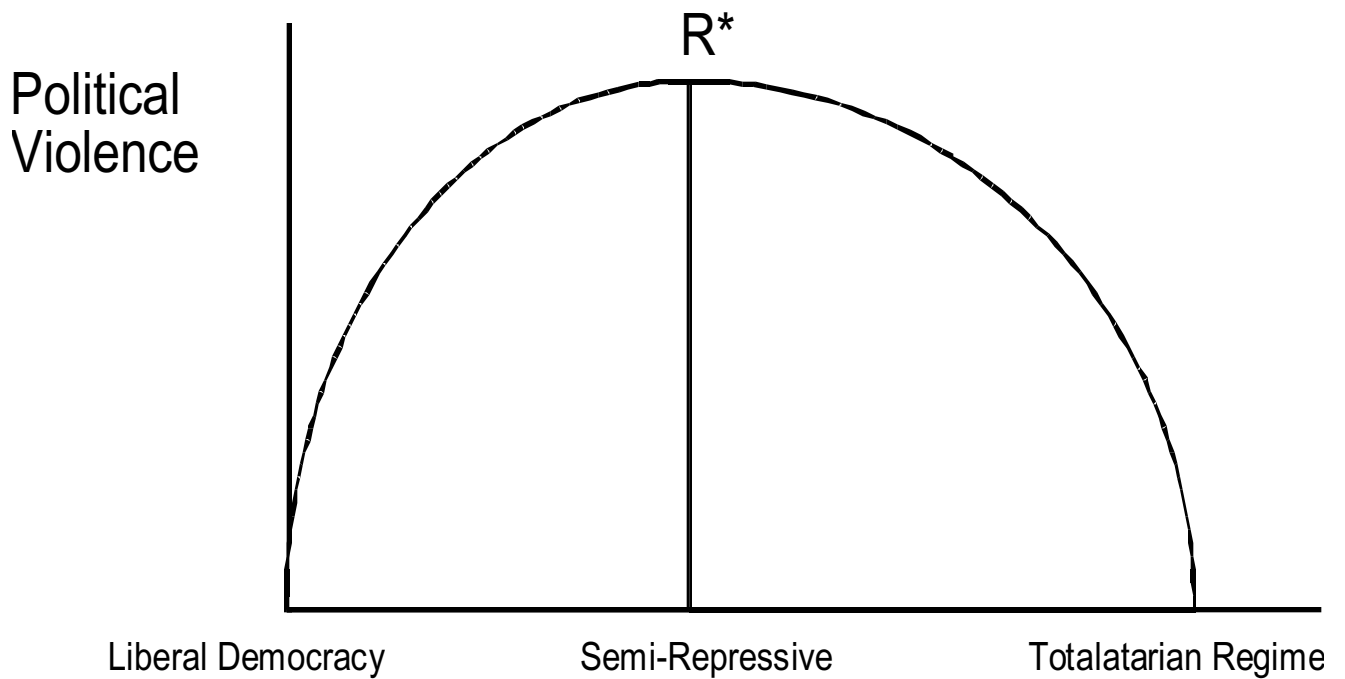


Figure 1

This relationship is shown in Figure 1 and will be tested statistically. Up to the point R*, increases in repression cause increases in Political Violence (ie $dV > 0$). Beyond R* an increase in repression causes a fall in the level of resources devoted. to V.

B) Theories of Social Disorganisation

The idea that political violence is generated by rapid social change can be traced to Aristotle. More recent proponents have included Olson (1963) who hypothesised that rapid economic growth causes social dislocation that can radicalise large segments of the population. However, the most prominent advocate of this theory is Samuel Huntington who has argued that rapid social and economic change, can topple the balance of structures on which a political system rests (Huntington, 1968).

Within this paradigm, a number of causal relationships between social and economic change and political violence can be hypothesised. Upheaval in a society can undermine the traditional institutions and norms that either stifle conflict or canalise it into non-violent forms. Economic change can also lower the status of large segments of the population. In the case of rapid economic growth, social dislocation advocates could argue that while the winners in a society may outnumber the losers, the losers are likely to form a significant proportion of society and are now more likely to resort to violence.

In empirical terms, the social disorganisation approach suggests that political violence will vary positively with indicators of societal change. In this paper, the relationship between violence and two measures of social and economic change (the real annual rate of GDP growth and the annual population growth rate) will be examined.

While social change is a vague concept (in many cases the literature describes it as encompassing non-quantifiable cultural and attitudinal factors), growth in GDP per capita and population are widely accepted as being indicators of social change. If social disorganisation theories of the causes of political violence are accurate descriptions of reality, then a positive relationship between political violence and the rates of per capita GDP growth and population growth will exist.

C) Relative Deprivation Theory

Within the literature, theories that link political violence to feelings of relative deprivation have enjoyed most currency in recent years. Advocates of this paradigm have included Gurr (1970) and Feirabend, Feirabend and Gurr (1972). In this approach, political violence results from the social frustration that occurs in the wake of relative deprivation. The approach is itself based directly on theory and evidence from clinical psychology that links frustration to aggression in individual behaviour.

Relative Deprivation is said to occur when the outcomes experienced by individuals are inferior to those that: a) they expected to receive or b) felt that they were entitled to receive. It is the inconsistency between outcomes and expectations and/or the prevalence of outcomes that are regarded as unjust that constitutes Relative Deprivation. Low levels of income (i.e. absolute deprivation) alone are an insufficient condition for creating violence. Rather violence occurs when the individual feels deprived because income fails to match expectations and/or is regarded by the individual as being so low as to constitute an injustice.

This theory, unlike the social disorganisation approach to political violence does possess analytical micro-foundations that are rooted in the behaviour of individuals (although these are drawn from psychology rather than from the rational choice/economic paradigm). While levels of absolute deprivation can be easily measured, this is not the case with the expectations and norms held by individuals. Nevertheless relative deprivation theorists have made a number of factual predictions.

Among the most common empirical claim made by relative deprivation theorists is that violence is related to GDP per capita in the form of an inverted U curve (Feirabend and Feirabend, 1966). At very low levels of income, groups and individuals, although poor, are

not conscious of deprivation. However at middling levels of income, they become aware of the potentialities created by greater levels of income and so become discontented. It has also been claimed that political violence can increase when people become relatively well educated but fails to receive a commiserate level of income. This theory would predict high levels of political violence where a society's population have low income levels relative to their level of education (Gurr, 1980).

Feelings of relative deprivation are also said to occur whenever individuals or a group are denied what they consider to be, a rightful degree of access to the levers of political power. In empirical terms theorists have predicted that violence will result when a population that is relatively rich or well educated is confronted with a repressive and autocratic political system. Less educated and poorer individuals are not as likely to feel as aggrieved in such a situation, it has been argued. Others have argued that political violence is reduced when governments engage in spending to reduce inequalities and social tensions.

In this paper the hypothesis of an inverted U curve relationship between GDP per capita and political violence is tested. The relationships between violence and the ratio of GDP per capita to education and between political violence and the ratio of political repression to both GDP per capita and education are also tested. This theory predicts that countries with a relatively low ratio of GDP per capita relative to the education of its population and a relatively low level of democracy relative to its GDP per capita and level of education will experience higher levels of political conflict. The relationship between the two independent variables of per capita GDP growth and Government Expenditures and the level of political violence is also examined.

D) Structural Theories of Political Violence

The Structural approach to political violence eschews generalised theorising about the causal relationships behind political violence based on micro-foundations which are derived from a theory of individual behaviour. Rather this approach focuses on finding underlying structures, sometimes unique to an individual country, which make violence more likely to occur.

Despite its focus on individual case studies, a number of generalised predictions have been made by theorists within this school (see Ross, 1993). These predictions have usually been made on an *ad hoc* basis and are derived from intuitive reasoning. Political violence has been posited to be linked to the degree of ethnic hostility within a country. Increased levels of education are said to reduce this phenomenon. Involvement in an external war is also held to increase political violence; internal coercive restraints are said to be weakened by the war effort and external enemies can fund or even create internal dissident groups. A number of relationships between GDP per capita and political violence have been posited. It has been claimed for example that higher levels of GDP increase violence by increasing the amount of resources available to dissident groups. On the other hand it has also been posited that high levels of GDP reflect societies which are more sophisticated and possess better conflict resolution mechanisms. It has also been predicted that a larger government sector represents a larger prize for political combatants and is likely to lead to more intense and violent political conflict.

The effect of all of these variables, apart from ethnic hostility which cannot be fully quantified (and which in any case can be treated as an effect rather than a cause of the same processes which generate all political violence) on the level of political violence is tested.

It should be noted that many of the predictions of the structural approach to political violence are also consistent with those of other schools. For example the positive relationship between the level of violence and the level of resources available to a terrorist group (proxied by GDP per capita) is a result which can also be generated within the rational choice framework. Involvement in an external war can often cause social upheaval and therefore the positive relationship between involvement in foreign wars and political violence is also consistent with social disorganisation theory.

As such, due to the malleability its pragmatic approach and the heterogeneity of its predictions (which indeed often contradict each other), this econometric analysis serves only to test only some of the individual predictions of rather of the structural school, rather than the entire paradigm.

Cross-National Empirical Analysis of Political Violence

I) The Countries and Time Period

Cross-Sectional/Time-Series data collected primarily from the Barro-Lee 138 country data set was used to test the hypotheses (Barro 1994).³ The data were aggregated into three five-year time periods; 1970-74, 1975-79 and 1980-84. For the period 1970-4 there were 88 valid observations, for 1975-79 there were 89 valid observations and for 1980-84 a total of 99 valid observations. For each model four regressions were carried out; one each representing the periods 1970-74, 1975-79 and 1980-84 and a pooled regression that used data from each of the three periods.

³The Barro-Lee Dataset is available at <http://www.nuff.ox.ac.uk/Economics/Growth/barlee.htm>

II) Variables

a) Dependent Variable

In each case the dependent variable is **Number of political assassinations per million population per year** in each country. This represents an accurate measure of both the quantity and the intensity of political violence within a country.

b) Independent Variables

1) **Real GDP per Capita:** The level of per capita GDP refers to that prevailing in that nation at the start of each five-year period. Real GDP per Capita was adjusted to 1985 US Dollars at purchasing power parity.

2) **Growth:** Economic growth is measured by the average annual percentage rate of growth of **Real GDP Per Capita** (as described above) during the five year period.

3) **Education:** A society's level of education is measured by the average number of years of schooling for the total population aged 25 and over. The data refers to the initial year of the five-year period covered by the observation.

4) **Population Growth:** This data refers to the average annual percentage growth rate of the country's population over the period covered by the observation.

5) **War:** The fraction of time over the period 1960-85 that a country was involved in an external war. The variable the intensity of any external conflict in which the country may have been involved during and before the period included in this analysis.

6) War Dummy: A dummy variable, with value 1 for countries that participated in at least one external war over the period from 1960-85.

7) Political Rights: The mean value of Gastil's Index of Political Rights score during the period covered by the observation. The index ranges from 1 to 7; with 1 being equal to most liberal. The Index was not produced prior to 1972 and so the value for the observation for the time period 1970-4 is the average value of the index over 1972-4.

8) Civil Rights: This variable is the mean annual value of Gastil's index of civil rights in the covered by the observation. The index ranges from 1 to 7; with 1 being equal to most freedom. The Index was not produced prior to 1972 so the value of the observation for the time period 1970-4 is represented by the average value of the index for 1972-4.

9) Democracy: This variable is the mean annual value of an Index of Democracy in the five year period covered by the observation. The index ranges from 1 to 3; with 1 being equal to fully democratic. The data is not included in the Barro-Lee set, but is taken from Alesina, Ozler, Roubini, and Swagel (1996).

10) Government Consumption: Mean annual government expenditures (net of spending on Defence and Education) as a percentage of GDP for the period covered by the observation.

11) Total Government: Mean annual share of nominal government expenditures (including spending on Defence and Education) as a percentage of nominal GDP for the period covered by the observation.

12) **PER2 and PER3 Dummy Variables:** Two dummy variables, for use only in the pooled regressions, with values 1 for period 2 (1975-9) and period 3 (1980-4) respectively.

c) **Interaction Variables**

A number of interaction variables were also used. (Freidrich, 1982).

1) **Political Rights*Political Rights, Civil Rights*Civil Rights** and

Democracy*Democracy: To test the hypothesis of an inverted U curve relationship between the repression and political violence, the square of the value of the political rights, civil rights and democracy indexes was added to the set of independent variables. If an inverted U curve relationship does exist, the value of the parameter estimate for the measure of repression will be positive and that for the square of the measure of repression will be negative. Given that higher values of the variable **Political Rights**, **Civil Rights** and **Democracy** imply lower levels of freedom, the inverted U curve thesis would suggest that the relationship of these values to political violence is positive while that between political violence and the square of these variables will be negative.

2) **GDP per Capita*GDP per Capita:** To test the hypothesis of an inverted U curve relationship between GDP per Capita and political violence, the square of GDP per Capita was added. If the hypothesis holds we should expect to see a positive relationship between GDP per Capita and political violence and a negative relationship between the square of GDP per Capita and political violence.

3) **Education/GDP per Capita:** Versions of the Relative Deprivation hypothesis suggest that political violence can increase where a relatively well-educated population experiences

relatively low levels of economic welfare. If this is the case political violence will be positively related to the level of Education divided by the level of GDP per capita.

4) **Political Rights *GDP per Capita and Political Rights* Education:** Some relative deprivation theories suggest that political violence is more likely to occur where a relatively well educated population or rich population are denied access to the political system. If this is the case there should be a positive relationship between political killings and the product of political rights (higher values of which represent greater levels of repression) and Education and between political killings and the product of political rights and GDP per Capita.

Model Specification and Results

Many of the independent variables are listed above almost identical in conceptual terms. The multicollinearity generated by the inclusion of such variables is likely to reduce the explanatory power of the model, so in order to test the theories in a comparative manner it was decided to specify two tightly defined models. The first model, henceforth named the **Base Model** contains all of the variables suggested by a rational choice model of political violence and a number of the key variables suggested by the structural and social disorganisation theories. The second model, named **Relative Deprivation Model**, is an extension of the **Base Model** and is specified so as to test the Relative Deprivation thesis. In each case 4 separate regressions for each model will be run: a pooled test for all of the observations over the period 1970-84 and three purely Cross-Sectional regressions for 1970-4, 1975-9 and 1980-4. The constant was allowed to vary by period (through the use of the PER2 and PER3 variables) but not by country (no country specific dummy variables were used).

I) Specification of the Base Model

The specification of the Base Model involved the exclusion of variables that were conceptually similar and multi-collinear. Firstly, the Period Variables (PER2 and PER3) were removed from the pooled regression because of lack of significance. This was followed by the exclusion of Total Government and War Dummy. The concepts measured by these variables are already captured in the term Government Consumption and War Time variables.

Government Consumption, unlike Total Government, excludes expenditures on defence which may occur in response to political unrest, offers the advantage of being exogenous with respect to political violence. War Time offers finer detail on the magnitude of a country's involvement in external war compared to the variable War Dummy.

The next step was to exclude those variables specific to the Relative Deprivation hypothesis in order to create the base model against which the Relative Deprivation model can be compared.

In testing the rational choice model, there are three possible measures of a regime's level of repression: Political Rights, Democracy and Civil Rights. Each of these variables can be said to quantify concepts that are close to being identical. This impression is further strengthened by the degree of multicollinearity between them. To specify a model that maximised explanatory power, while avoiding unnecessary duplication of independent variables, the pooled Base Model was estimated using various combinations of these variables.

Adjusted R-Squared was maximised when only Political Rights and its square are contained in the model. In every regression, the use of other combinations of political variables leads to a fall in adjusted R-Squared. The case for the inclusion of both of these variables is further strengthened by the results of a Redundant Variables F-test of political rights and its

square on the Base Model, in which the null hypothesis of their having no explanatory power is strongly rejected. The optimal functional form for the model was also determined. After evaluating a number of logged and semi-logged forms, it was found that the linear model best approximated the data.

II) Results from the Base Model

The parameter estimates from the final version of the Base Model are presented in Table

1. The final version of Base Model includes 8 independent variables (plus an intercept term).

| Table 1 Regression Results from Base Model | | | | |
|--|--------|---------|---------|--------|
| Time Period | Pooled | 1970-75 | 1975-80 | 1980-5 |
| Adjusted R-Squared | 0.182 | 0.180 | 0.250 | 0.112 |
| F-Statistic | 8.623 | 3.415 | 4.624 | 2.540 |
| <i>p-value</i> | 0.000 | 0.002 | 0.000 | 0.015 |
| White's Heteroskedacity Corrected | Yes | Yes | Yes | Yes |
| Parameter Estimates | | | | |
| Constant | 0.072 | 0.021 | 0.110 | 0.042 |
| <i>p-value</i> | 0.145 | 0.824 | 0.147 | 0.556 |
| Real GDP per Capita | -0.001 | 0.000 | 0.000 | 0.000 |
| <i>p-value</i> | 0.121 | 0.265 | 0.555 | 0.504 |
| Growth | -1.123 | -1.491 | -1.065 | -1.331 |
| <i>p-value</i> | 0.004 | 0.109 | 0.016 | 0.096 |
| Education | -0.003 | 0.010 | -0.010 | -0.006 |
| <i>p-value</i> | 0.431 | 0.252 | 0.111 | 0.548 |
| Population Growth | -5.824 | -5.748 | -3.880 | -7.186 |
| <i>p-value</i> | 0.014 | 0.190 | 0.043 | 0.105 |
| War Time | 0.258 | 0.198 | 0.257 | 0.301 |
| <i>p-value</i> | 0.071 | 0.221 | 0.133 | 0.398 |

| | | | | |
|--|--------|--------|--------|--------|
| Political Rights | 0.096 | 0.112 | 0.072 | 0.101 |
| <i>p-value</i> | 0.001 | 0.050 | 0.037 | 0.065 |
| Political Rights*Political Rights | -0.011 | -0.013 | -0.010 | -0.011 |
| <i>p-value</i> | 0.001 | 0.054 | 0.023 | 0.070 |
| Government Consumption | -0.042 | -0.139 | -0.034 | 0.028 |
| <i>p-value</i> | 0.673 | 0.557 | 0.757 | 0.942 |
| Chow Breakpoint F-Test Value | 0.464 | NA | NA | NA |
| <i>p-value</i> | 0.986 | | | |
| Number of Observations | 276 | 89 | 88 | 99 |

Test results from four regressions are presented; a pooled regression containing all of the observations for the three 5 year periods during 1970-84, and individual regressions the three separate five year periods 1970-4, 1975-9 and 1980-4. In each regression, evidence of heteroskedasticity exists and so all significance tests in this paper incorporate White's correction.

In general, the results support of the Rational Choice theory developed earlier in this paper. The results also tend to be contrary to the predictions of the Social Disorganisation approach and to be ambiguous on a number of the predictions generated by the structural approach. Consistent with the rational choice model, evidence exists of a negative linear relationship between political violence and real per capita GDP growth. In each of the four regressions this relationship is negative and significant at the 11% significance level or lower. In the pooled regression, the relationship is negative and significant at the 1% level.

Evidence in favour of the inverted U shaped relationship between increased repression and political violence is even stronger. The parameter estimates for political rights, (higher values of which imply greater repression of these rights), are positive and that for its square is negative in every case. The sign of these relationships is significant at the 7% level or lower in every case and at the 0.1% level in the pooled model.

The one unfavourable result for the rational choice theory is the lack of strong evidence in favour of a negative relationship between the level of GDP per capita and political violence. This relationship is negative as predicted but in no case is it significant at the 10% level. However, it could be speculated that this result can be interpreted as evidence that it is the dynamism of the economy in generating new and unexploited profit opportunities and upward mobility opportunities (which it can be hypothesised are better measured by the

growth rate of GDP rather than its level) rather than a per capita wage that best represents the true opportunity cost of expending effort on political violence. Alternatively the insignificance of the relationship between the level of GDP and political violence, alongside a significant negative relationship between the economic growth rate and the level of GDP does lend some support to the relative deprivation theory.

Various predictions of the structural model do not seem to find statistically significant support. The relationship between Government Consumption and Education and violence is, in each case, highly insignificant. Involvement in a foreign war does seem to be positively correlated with violence, but it is only significant at the 10% level in the case of the pooled regression.

The social disorganisation model fares worst of all. Stronger economic growth and positive population growth, two key measurements of social transformation, are strongly and negatively correlated with the level of political violence.

The results of this model do seem to be fairly robust across time. While the explanatory power of the model peaks in the period 1975-80 (with an adjusted R-squared of 0.25), the Chow breakpoint test performed on the Pooled Regression (breaking the observations into the three groups corresponding to the three five year periods) returns a p-value of 0.9859. This is strong evidence in support of structural stability. Generally the parameter estimates for the independent variables do not range more than 30% from the values estimated in the other regressions and only in two cases (Government Consumption and Education) do they change sign.

III) Testing the Relative Deprivation Model

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|---|
| Table 2 Regression Results from the Relative Deprivation Model |
|---|

| Time Period | Pooled | 1970-75 | 1975-80 | 1980-5 |
|--|---------|---------|---------|---------|
| Adjusted R-Squared | 0.173 | 0.152 | 0.230 | 0.090 |
| F-Statistic | 5.806 | 2.314 | 3.167 | 1.805 |
| <i>p-value</i> | 0.000 | 0.014 | 0.001 | 0.060 |
| White's Heteroskedacity Corrected | yes | yes | yes | yes |
| Parameter Estimates | | | | |
| Constant | 0.033 | 0.032 | 0.142 | -0.107 |
| <i>p-value</i> | 0.589 | 0.779 | 0.181 | 0.383 |
| Real GDP per Capita | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>p-value</i> | 0.529 | 0.490 | 0.730 | 0.591 |
| Real GDP per Capita*Real GDP per Capita | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>p-value</i> | 0.233 | 0.237 | 0.887 | 0.631 |
| Growth | -1.115 | -1.543 | -1.092 | -1.530 |
| <i>p-value</i> | 0.005 | 0.128 | 0.015 | 0.080 |
| Education | -0.003 | -0.044 | -0.003 | 0.002 |
| <i>p-value</i> | 0.568 | -0.997 | 0.634 | 0.859 |
| Population Growth | -5.564 | -5.566 | -3.748 | -7.063 |
| <i>p-value</i> | 0.019 | 0.206 | 0.075 | 0.109 |
| War Time | -0.270 | 0.209 | 0.248 | 0.336 |
| <i>p-value</i> | 0.072 | 0.227 | 0.171 | 0.377 |
| Political Rights | 0.107 | 0.087 | 0.070 | 0.177 |
| <i>p-value</i> | 0.008 | 0.161 | 0.245 | 0.082 |
| Political Rights*Political Rights | -0.012 | -0.010 | -0.010 | -0.018 |
| <i>p-value</i> | 0.005 | 0.130 | 0.159 | 0.081 |
| Government Consumption | -0.044 | -0.073 | -0.052 | 0.006 |
| <i>p-value</i> | 0.666 | 0.751 | 0.680 | 0.987 |
| Education/GDP per Capita | -11.269 | -0.044 | -23.501 | -11.891 |
| <i>p-value</i> | 0.151 | 0.998 | 0.191 | 0.496 |
| Political Rights*Real GDP per Capita | 0.000 | 0.003 | 0.000 | 0.000 |
| <i>p-value</i> | 0.140 | 0.322 | 0.924 | 0.196 |
| Political Rights*Education | -0.001 | 0.003 | 0.000 | -0.002 |
| <i>p-value</i> | 0.602 | 0.322 | 0.882 | 0.712 |
| Chow Breakpoint F-Test Value | 0.415 | Na | na | na |
| <i>p-value</i> | 0.995 | | | |
| Number of Observations | 276 | 89 | 88 | 99 |

The Base Model was then expanded to investigate the validity of the relative deprivation approach. Education/GDP, Political Rights*Real GDP per Capita, Political Rights*Education and the square of Real GDP per Capita were added. The results from the four regressions are reported overleaf.

If the theories advanced by this school are to be borne out, there will be a positive relationship between Political Violence and the Education/GDP, Political Rights*Real GDP per Capita, and Political Rights*Education variables. Real GDP per Capita will be related to Political violence by means of an inverted U curve. In none of these cases is the prediction strongly supported by the statistical evidence. In each case Education/GDP is fairly insignificant and negatively related to political violence. In three of the four cases the parameter estimate for Political Rights*Real GDP per Capita is negative. The Political Rights*Education variable is positively related in three of four cases but is highly insignificant. The signs for real GDP per Capita and its square do conform to the inverted U-shaped relationship posited between GDP and political violence in every period save 1975-9 but are highly insignificant.

The verdict of the Base Model on the validity of the other three approaches is little changed by the introduction of the new variables. Education and Government Consumption remain statistically insignificant. The significance of GDP per capita declines somewhat (most likely due to the multi-collinearity with a number of the new variables that were introduced.) The negative relationship between Population Growth and Economic Growth and the level of political violence remains strong as does the inverted U curve relationship between repression and political violence. The inter-temporal stability of these results also seems to be strong, with a Chow test p-value of 0.995 being generated.

The overall empirical performance of the predictions from the relative deprivation model is poor. The addition of the four extra Relative Deprivation variables causes the adjusted R-Squared to fall in the case of each of the four regressions. The p-value of the F-value of each of the four regressions added separately falls relative to the base model and none is statistically significant in the direction predicted by the theory. The extension of the model also fails to alter the major results of the base model regarding the validity of the competing theories.

As noted earlier, one result from the Base Model can be used in support of the Relative Deprivation paradigm, namely the relative insignificance of the relationship between the level of GDP and political violence, alongside a significant negative relationship between the economic growth rate and the level of political violence. This might suggest that the feeling of relative deprivation caused by low (or negative) growth rates outperforms the level of per capita GDP as an indicator of both the opportunity cost of time and effort and of Absolute Deprivation.

However as we have seen in the previous section this empirical finding is not wholly irreconcilable with the Rational Choice model. The inverted U curve relationship found to exist between Political Rights and Political Violence also constitutes strong evidence that agents tend to act rationally in the face of the shifting incentives posed by varying levels of repression and freedom. This is not possible given the wholly reflexive view of human nature reflected in the Relative Deprivation approach.

And, as has been noted earlier, it is possible to incorporate Relative Deprivation (and other theories) as a subset of the Rational Choice approach; the utility function of individuals may contain the motivational elements as postulated by Relative Deprivation theorists.

However, rational choice theory suggests that even when affected by such factors, individuals will still respond systematically to changes in relative costs and benefits.

Conclusion

The results of this empirical and theoretical analysis lend support to the economic view of political violence at the expense of its major competitors. They also tend to weigh against the social disorganisation theories of political violence and against some of the Structural school's predictions regarding a relationship between political violence and government consumption and Education. A theoretical rationale for and empirical evidence in support of the existence of an inverted U curve between repression and political violence and a negative relationship between per capita GDP growth and political violence has been presented and confirmed in the data. Indeed these empirical results have already been replicated by other researchers using alternative measures of repression and political violence (Gupta, Singh and Sprague, 1993).

The contribution of this paper has been to expand the range of human activity that can be claimed to be consistent with rational optimizing behavior. Even within a category of political action often thought to be dominated by fanatical and irrational individuals who act on mere reflexive impulse, there is strong body of evidence that agents engage in the process of responding systematically to the constraints and opportunities that they face.

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