DEMOCRATISATION AND CRIME:

A MULTILEVEL ANALYSIS OF HOMICIDE TRENDS IN 44 COUNTRIES,

1950 TO 2000*

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ABSTRACT

This work investigates association between crime and democracy drawing on information for 44 countries during the second half of the 20$^{th}$ century. Crime is indicated by national homicide rates, which minimize reliability problems implicated in cross-national and/or longitudinal comparisons of police recorded crime rates. Democracy is measured by the set of indicators included in the Polity data set, University of Maryland, U.S. Multilevel or hierarchical repeated measures models of homicide rates over each democracy indicator are estimated while controlling for time, population profile, economic development and inequality as well as regional idiosyncracies. The multilevel specification allows for country and annual random variations of the predicted values and estimated relationships.

Apart from complete lack of any relationship three types of links are plausible between crime and democracy. Democracy may increase crime due to instability and lax state control over its citizens. It may reduce it owing to citizens' enhanced sense of communal responsibility and trust in their political institutions. Finally democracy and crime may exhibit an inverted-U relationship. The first and last relationships are evidenced in the present -and to the authors' knowledge only international- study on crime and democracy to date depending on the severity of autocracy democracy is contrasted with.
(201 WORDS)

Suggested running head: **Democratisation and Crime**

## 1. INTRODUCTION

Two of the most significant trends in the second half of the twentieth century are rarely discussed in the same sentence: the dramatic rise in the proportion of the world's countries that are democracies and the steady increase in global violent crime rates. The "third wave" of democratization (Huntington 1993) that got under way in the early 1970s has produced an unprecedented number of new democratic countries. This rapid political transformation began in Southern Europe in the 1970s, spread to Latin America and parts of Asia in the 1980s, and then moved on to parts of sub-Saharan Africa, Eastern Europe and the Soviet Union in the late 1980s and early 1990s (Potter 1997). While more countries than ever before have attained democracy in the sense of constitutionalism and multiparty electoral competition, an even larger number have adopted at least a partial framework for democratic governance. Annual Surveys by Freedom House (2002) show that in 1975, less than one-third of the world's countries had partially democratic regimes (including competitive elections and formal guarantees of political and civil rights); by 1995, nearly three-quarters did.

But during the same period, there is substantial evidence that global rates of violent crime have also surged. In a recent cross-national study of homicide victimization rates in 34 countries, LaFree and Drass (2002) found that on average, homicide rates doubled during the last four decades of the twentieth century. Similarly, Fukuyama (1999:4) claims that there was a "great disruption" among western industrialized countries beginning in the 1960's which created large increases in violent crime and social disorder among most industrialized countries of the world. More pointedly, there is at least some

evidence that rapid increases in violent crime have been especially pronounced in precisely those regions of the world in which democracy has recently taken hold, including Latin America (Fajnzylber, Lederman, and Loayza, 1998; Diamond, 1999; Mendez et al., 1999), Eastern Europe and the "break away" republics of the former Soviet Union (Hraba et al., 1998; Barak, 2000; Backman, 1999; Savelsberg 1995), and Sub-Saharan Africa (Reza Mercy and Krug 2000; Human Sciences 2002).

Despite the apparent correlation between the spread of democracy and levels of violent crime, we could find no study to date that has systematically examined whether the wave of democratization in the last half of the twentieth century can help explain the global rise in violent crime rates. The absence of research on connections between democracy and crime is surprising because several of the leading theoretical perspectives on cross-national crime are closely related to the rapid rise of market-based democratic societies. Thus, Elias's civilization perspective (1939) predicts that the spread of western-styled democratic regimes will transform systems of social control and greatly reduce violent crime rates; conflict theorists (Chambliss 1976; Bohm 1982) argue that the income inequality and poverty generated by market-based democratic countries will result in the explosive growth of crime; and Durkheim's modernization perspective (1933, 1950) predicts increases in crime as societies undergo the kind of rapid transformation that is the hallmark of democratization. In this paper we build on these competing perspectives to develop three hypotheses about the effect of democratization on violent crime rates. We then test these hypotheses via random effects multilevel repeated measures modelling using annual time series data on for 43 countries from 1950 to 2000.

A PARAGRAPH SELLING IT. CONTRIBUTION /VALUE ADDED: 1. THEORETICAL, 2. MODELLING & INTERPRETATION, 3. LARGE DATA SET.

The next section explores the relationship between crime and democratisation according to the aforementioned mainstream political perspectives and respective previous empirical results. Thereafter the data employed and statistical modelling of this study are discussed (sections 3 and 4 respectively). The results of the empirical modelling are presented in section 5. A re-assessment of the conflicting theoretical perspectives in the light of our empirical results, possible shortcomings of this analysis and suggestions for future research conclude this paper.

## 2. THEORETICAL STRANDS

Democracy, Civilization and Crime

While the argument that the growing strength of market economies will reduce interpersonal violence because such economies increasingly depend on the self control and rationality of their citizens can be traced directly to Weber (1920), Elias ([1939]1978) is probably best known for making the argument with specific regard to violent crime trends. And although Elias's civilization perspective does not directly reference the role of democratization in reducing crime, his arguments are nevertheless centered on a set of West European democracies (especially England, France, and Germany). Elias predicts long term declines in rates of violent crime among these West European democracies through two related processes. First, as modern democracies develop, they increasingly claim a monopoly on the legitimate use of violence. Thus, common crimes involving family members and close acquaintances that in earlier periods

were routinely avenged by relatives and friends of the perceived wronged party are increasingly regarded as public matters and the subject of formal penal law. Second, Elias argues that along with urbanization and the growing division of labor, citizens of West European democracies are embedded in increasingly complex social configurations such that advancing individual self interest less often requires the use of violence. Instead, more sophisticated action strategies are required, which result in increased levels of self control and declining violent crime rates.

To support his arguments about the declining levels of interpersonal violence in western democracies, Elias relied mostly on qualitative evidence of the growth of civilized behaviour through such indicators as advice in etiquette books and changes in children's literature. But more recently, historical analysis of long-term crime trends has been generally supportive of the conclusion that rates of personal violent crime among industrialized western countries declined from the early Middle Ages until the second half of the twentieth century (Gurr 1981; Osterberg 1996; Spierenburg 1996). In the most comprehensive study to date, Eisner (2001) examines homicide rates from the thirteenth through the twentieth centuries for England, the Netherlands, Belgium, the Scandinavian countries, Germany, Switzerland and Italy. For each analysis he finds evidence for substantial decline in homicide rates from the early Middle Ages until the mid-twentieth century.

However, Elias's predictions seem to be contradicted by crime trends following World War II. In their study of crime trends in four cities for 150 years, Gurr, Grabosky and Hula (1977:169) conclude that "some common social and political dynamics created public order over the course of a century in western societies, then went crazily unsprung

in a single generation".  More recently, LaFree and Drass (2002) show substantial increases in homicide rates for a sample of 34 mostly industrialized countries from 1958 to 1998.  Likewise, Eisner's (2001) analysis of seven West European democratic countries and regions all show an increase in homicide rates beginning after 1950.  Thus, while there is evidence that violent crime rates among western-styled democracies declined during much of the seven centuries leading into the twentieth century, violent crime rates seem to have increased in most western democracies since World War II.  However for our purposes, such conclusions must be tempered by the fact that no study to date has specifically examined connections between levels of democratization and violent crime rates for a large sample of countries.

Democracy, Market Economies and Crime

As with the civilization perspective, proponents of the conflict perspective (Taylor, Walton and Young 1973; Chambliss 1976; Bohm 1982) claim that the evolving economic structure of western democracies is a critical determinant of their violent crime rates.  However, instead of arguing that a growing reliance on market economies reduces violent crime by increasing rationality, mutual trust and self control, conflict theorists, instead argue that the capitalist market economies that have been widely associated with democratization have raised violent crime rates by increasing economic inequality, unemployment and social misery both within and between countries.  Within countries, the dominance of market economies encourages a growing gap between the rich and the poor, which raises violent crime rates by encouraging greed, selfishness and diffused aggression (Bonger 1916; Quinney 1977; Blau and Blau 1982:119).  Between countries

this gap is reproduced at the international level as the world economy increasingly separates an elite group of highly industrialized western democracies from a much larger group of poor, economically dependent countries.

As Neuman and Berger (1988) have pointed out, these conflict arguments can be readily combined with similar predictions from world system theorists (Wallerstein 1979; Hopkins and Wallerstein 1981; Chirot and Hall 1982), who conceptualize the world as divided between "core" countries that prosper by extracting raw materials and exploiting low cost labor from "peripheral countries". As the economic gap between the industrial "haves" and the developing "have-not's" widens, poverty, slums and unemployment become more commonplace among the latter. The growing expansion of global markets creates a fluctuating surplus population of unemployed and underemployed workers (Spitzer 1975; Applebaum 1978). The global system also constrains urban development in peripheral countries, which suffer increasingly from a shortage of decent housing, an absence of basic social services and a lack of living wages, all of which drive crime rates up. Thus, to the extent that democracies continue to be closely tied to market economies, the conflict perspective predicts that democratization should increase violent crime rates.

The same research on post-World War II violent crime trends that seems to challenge the civilization perspective (Fukuayama 1999; LaFree and Drass 2002) can be seen as supporting the conflict perspective. There are also a growing number of regional studies which are consistent with the idea that democratization has been associated with rapidly increasing violent crime rates. This connection is especially common in studies of the newly emerging democratic countries of Eastern Europe since the disintegration of the Soviet Union (Hraba et al., 1998; Barak, 2000; Backman, 1999). Thus, in a recent study

of crime trends in Poland, Bulgaria, Romania and Slovakia, Cebulak (1996:77) concludes

that there have been Aunprecedented and dramatic increases in crime.≅   Similarly,

Stamatel et al. (1998:243) warn that democratization and economic liberalization in the

Central Eastern European countries (Poland, Bulgaria, Romania, Slovakia and Hungary)

are leading to an AAmericanization≅ which is producing rapid crime increases.

However, as with the civilization argument, these studies do not directly measure levels

of democratization and the regional studies concentrate mostly on very recent crime

trends and hence, do not rule out the possibility that crime rates were equally high during

earlier periods.

Many researchers and social observers have also noted that the growing crime

problems of Latin American countries appear to have coincided with democratization in

this region ( Fajnzylber, Lederman, and Loayza, 1998; Diamond, 1999; Mendez et al.,

1999; Savelsberg 1995). Thus, Fajnzylber et al. (1998) use United Countries survey data

to conclude that after a period of relative stability during the 1980s, homicide rates in

Latin American countries rose sharply in the 1990s. This conclusion is echoed in a report

by the Mexican Health Foundation (1999) which shows that several Mexican states

experienced major crime increases following the economic crisis of the mid-1990s.

Similar warnings are being sounded with increasing frequency in the fledgling

democracy of South Africa (Human Sciences 2002). But again while informative, these

studies have thus far not explicitly measured levels of democratization, and have most

often relied on case studies or cross-sectional analysis.


Violent Crime and the Transition to Democracy

A modernization perspective on crime (Clinard and Abbott 1973; Shelley 1981; Neumann and Berger 1988) can be traced directly to Durkheim's ([1893] 1947) assessment of the transition from traditional to modern society. According to this view, crime results when modern values and norms come into contact with and disrupt older, established systems of role allocation. The emergence of new roles not yet fully institutionalized and integrated into society, make normative guidelines ambiguous and weaken traditional support mechanisms. These basic processes have been linked to rising crime rates and other forms of deviance through a range of distinct, yet closely related concepts, including anomie (Merton 1938; Messner and Rosenfeld 1997), social disorganization (Davies 1962; Smelser 1962), breakdown (Tilly, Tilly and Tilly 1975; Useem 1985), tension (Lodhi and Tilly 1973) and strain (Cloward and Ohlin 1960; Agnew 1992).

Nearly all the cross-national comparative tests of the modernization perspective to date have relied on cross-sectional multivariate analysis in which measures of development (most often, GNP or GDP) are included in statistical models that predict homicide rates (for reviews, see Neapolitan, 1997; LaFree, 1999; Gartner, 2000). In general, empirical support for a connection between economic development and homicide rates from these studies has been weak. In fact, contrary to the modernization perspective, most of these tests have found that measures of economic development either have no effect (Bennett, 1991; Messner, 1989) or a negative effect (Messner and Rosenfeld, 1997; Neapolitan, 1996) on crime rates leading Neumann and Berger (1988:300) to question the "continued dominance" of the perspective.

However, as LaFree and Drass (2002:774) note, it may be the case that most prior studies have not offered the most appropriate test of the modernization perspective. The idea of modernization is inherently longitudinal: As countries transition from traditional to modern, they experience a series of changes that weaken their social control mechanisms and make their normative guidelines ambiguous. All the research that has tested modernization views of crime to date has been based on cross-sectional designs that measure both crime rates and modernization measures at one point in time. By contrast, in their longitudinal study of homicide rates in 34 nations from 1956 to 1998, LaFree and Drass find considerable support for a modernization perspective: 70 percent of industrialized countries in the study had experienced homicide "booms" (defined as rates that increase rapidly and exhibit a positive sustained change in direction) during this period compared to fewer than 21 percent of industrializing countries.

Unlike predictions from either civilization or conflict perspectives, the modernization perspective predicts that the effects of democratization on crime should correspond only to the transitional phase of democratization. Thus, crime rates should increase as autocratic countries begin experimenting with democracy, but should again diminish once a fully democratic regime has emerged.

While we could identify no prior research that has explicitly examined the possibility that countries transitioning to democracy will experience elevated levels of violent crime but that these levels will diminish once a full democracy is established, there is some support for such a relationship between democracy and other types of crime and deviance. Thus, in an analysis of cross-national data for the period 1980 to 1983, Montinola and Jackman (2002) examine the relationship between measures of democracy

(from Bollen 1993) and perceived national levels of corruption and find that the highest

corruption levels were in transitional democracies rather than either fully democratic or

autocratic countries. Similarly, in a recent study of cross-national connections between

measures of democracy (from Freedom House) and perceived levels of organized crime,

Sung (forthcoming 2003, GARY IS THIS OUT BY NOW?) found that levels of

organized crime were highest among those democratic countries in transition from full

autocracy to full democracy.

To summarize then, our review suggests four competing hypotheses about the

relationship between levels of democracy and violent crime rates during the second half

of the twentieth century. The null hypothesis for this study is that there is no connection

between the two. A civilization perspective predicts that violent crime rates will decline

as autocratic regimes give way to democratic ones. A conflict perspective predicts that

the market economies associated with democratic countries will increase rates of violent

crime as they move away from autocracy and toward democracy. Finally, a

modernization perspective suggests that violent crime rates will be highest in countries

that are transitioning between autocracy and democracy.


## 3. DATA AND VARIABLE SELECTION

### 3.1. Homicide Data

Substantial variation across countries in legal definitions has increasingly lead

researchers (Archer and Gartner 1984; Huang and Wellford 1989; Lynch 1995) to rely on

homicide data in cross-national comparative research. There is now substantial agreement

(Kalish 1988; Neapolitan 1997; Messner and Rosenfeld 1997) that among the major

cross-national homicide data sources, those collected by the World Health Organization (hereafter WHO) are the most valid and reliable. WHO homicide data are based on cause of death reports submitted by participating countries.

Annual time-series data from WHO on homicide victimization rates per 100,000 residents for 44 countries for varying years between 1950 and 2000 are employed here. The length of the series and the countries included were determined by data availability. We did not extrapolate values to the beginning or the end of individual series and excluded countries that had missing data for more than three consecutive years. Rates for Israel are reported only for the Jewish population. We interpolated one year for Israel that included deaths from the Six-Day War (1967). Several political changes affected the geographical boundaries and perhaps the homicide rates of the countries included. Our analysis of Czechoslovakia is based on the Czech Republic after the political break up of 1992. Data for Germany refer to the Federal Republic of Germany until 1990 and the unified Germany afterwards. Similarly, French statistics include Algeria until 1962.

Table 1 shows the sample of countries and years employed in this study together with mean, standard deviation, minimum and maximum values of homicide rates for each country in the sample. There is considerable variability in the total number of years of data that are available for each country, ranging from a maximum of 51 years to a minimum of just eight years (for Estonia). In total of 1,827 country-year data points available for the analysis 31 countries (i.e. 70.4%) have at least 40 years of data.

Table 1 about here

Perhaps the most striking feature of Table 1 is the tremendous variation in average homicide rates represented by the countries in our study. Indeed mean homicide rates

range from a high of 37.36 per 100,000 (Colombia) to a low of 0.60 per 100,000 (Ireland and Spain). All eight countries with average homicide rates that are less than one per 100,000 are West European: Denmark, England/Wales, France, Iceland, Ireland, the Netherlands, Norway, and Spain. Another 18 countries (40.9%) have homicide rates between one and two per 100,000 over the time period examined. This group includes the rest of the West European countries (with the exception of Finland), all five of the Western Pacific countries, three of the five countries from Eastern Europe, Canada and Israel. Four countries have mean homicide rates between two and three per 100,000: Bulgaria, Finland, Hungary and Mauritius. Twelve of the fifteen countries with homicide rates over three per 100,000 are in the western hemisphere. These include all eleven Latin American/Caribbean countries of the sample, as well as the United States (henceforth U.S.), Estonia, the Philippines and Thailand.

Figure 1 shows average homicide rates from 1950 to 2000 for the 31 countries with at least 40 years of data. Since 1950 the average homicide rates across these 31 countries fluctuated around a low exponential trend, which has been accentuated due to doubling figures after 1998.

Figure 1 about here

The natural logarithm (*ln*) of homicide rates after moving up the series by 0.01 are modelled in the subsequent analysis to account for the highly skewed distribution[1] seen in Table 1 and controlling for time the exponential trend seen in Figure 1.


3.2. Democratisation Measures

The democratization measures employed in this analysis come from the Polity data originally collected by Gurr and his associates (Gurr 1974; Gurr and Jaggers, and Moore 1990; Jaggers and Gurr 1995; Marhall and Jaggers 2003). Two composite indicators, namely democracy and polity, and five individual measures, i.e. competitiveness of participation, executive recruitment competition, executive constrains, regulation of participation and openness of executive recruitment, are alternative constructs of democratisation employed in this study.

The Polity data defines *institutional democracy* in terms of: (1) institutions and procedures through which citizens can express effective preferences about alternative policies and leaders; (2) institutionalized constraints on the exercise of power by the chief executive; and (3) the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation (Marshall and Jaggers 2003:12). The institutional democracy index in the Polity data is an 11-point scale ranging from autocratic to fully democratic. Given the theoretical arguments in the previous section, the scale has been recoded to distinguish autocratic regimes (0), transitional regimes (1-9) and fully democratic regimes (10).

Since our sample includes nearly all major western democracies, it is unsurprising that fully democratic regimes were by far the most common outcome in the data, representing 58.8 percent of all country-year data points (see Table 2 below). By contrast, 17.1 percent of the country-years in the sample had autocratic regimes while the remaining 24.1 percent qualified as transitional democracies based on the Polity data set(see Table 2 below).

Figure 2 shows the mean democratization level across the same 31 countries as in

Figure 1 above with at least 40 years of data over the second part of the 20th century.

According to Figure 2, democratization levels fluctuated around a U-shaped trend since

1950 with minimum and maximum democracy values around 1973 and 1996,

respectively.

<div align="center">Figure 2 about here</div>

An alternative to institutional democracy index is the *polity* index. It is computed as

the difference between autocracy and institutional democracy indices. The former, i.e.

autocracy, reflects suppressed or restricted access to institutional structures for political

expression by non-elites, restricted or factional development of institutional structures for

political expression, chosen chief executives by hereditary succession, designation, or by

a combination of both, and unlimited authority up to slight to moderate limitations in the

operational independence of chief executive. The polity index was originally a scale

ranging from minus 10 to 10. Here it has been recoded into three categories: rather

autocratic regime (minus 10 to 0), rather democratic regime (1 to 9) and fully democratic

regimes (10) to reflect the theoretical arguments, which this work draws upon[2]. A graph

of average polity values across the 31 countries with at least 40 years of data drew a

similar to Figure 2 picture and thus it is not presented here.

The aforementioned composite democracy and polity indices have been constructed

from a set of individual indicators pertaining to various features of institutional

democracy. These individual democracy indicators are five. They are defined as follows:

➢ *Competitiveness of participation* measures "the extent to which non-elites are able to access institutional structures for political expression" ([www.cidcm.umd.edu](www.cidcm.umd.edu), Data and Codebook)

➢ *Executive recruitment competition* gives "the extent to which executives are chosen through competitive elections" ([www.cidcm.umd.edu](www.cidcm.umd.edu), Data and Codebook)

➢ *Executive constraints* measure the degree of "operational (de facto) independence of chief executive" ([www.cidcm.umd.edu](www.cidcm.umd.edu), Data and Codebook), which ranges from unlimited authority to executive parity or subordination,

➢ *Regulation of participation* assesses the "development of institutional structure for political expression" ([www.cidcm.umd.edu](www.cidcm.umd.edu), Data and Codebook) and finally

➢ *Openness of executive recruitment* represents "opportunity of non-elites to attain executive office" ([www.cidcm.umd.edu](www.cidcm.umd.edu), Data and Codebook).

Each individual democracy indicator has been classified into three categories to reflect the theoretical arguments that this study draws upon (see section 2) except for openness of executive recruitment, which is a binary variable due to effective lack of middle points (see Table 2 below).

Table 2 presents the observed distribution of each democracy indicator employed in our analysis. The majority of countries for the majority of the years in the sample have been fully democratic (58.8%), i.e. with competitive participation in the institutional structures for political expression (63.8%), election-based executive recruitment from two or more major parties or candidates (74.5%), executive parity or subordination to accountability groups (66.4 %), regulated participation (63.9%) and open executive recruitment (95%). As mentioned all democracy measures are categorical. The first

category of each indicator is used as the reference category or *base* in the empirical analysis below. This is indicated in brackets after the respective category in Table 2.

Table 2 about here

3.3. Control Variables

Prior quantitative research on cross-national crime rates (for reviews, see Neapolitan 1997; LaFree 1999; Gartner 200?) has most often included three types of measures: economic development, economic inequality, and population structure. Gross national product or gross domestic product has probably been the most commonly used economic development measures in past research (Bennett 1991; Fiala and LaFree 1988; Hansmann and Quigley 1982). Accordingly, the natural logarithm of Gross Domestic Product per capita [*ln*(GDPpc) henceforth] is included in our data.

A positive association between economic inequality (usually measured by the Gini coefficient) and homicide rates is probably the most consistent finding in the cross-national homicide literature (Messner and Rosenfeld 1997; Neapolitan 1996; see LaFree 1999 for a review). The Gini income inequality data employed in this study are from Deninger, Klaus and Squire (1999) while Professors Thor Herbertsson and Thorvaldur kindly provided Gini coefficients for Iceland. The mean value of the available *ln*(GDPpc) and Gini coefficients per country over the period under investigation are employed here due to missing annual observations. The unit of analysis of these variables is thus the country.

Based on the widespread assumption that young people commit a disproportionate amount of violent crime, most prior studies of cross-national homicide (Messner 1989;

Bennett 1991; Ortega et al. 1992) have included a measure of the proportion of young people in each country. The *percent population age 15 to 24 years old* from the United Nations WHO is employed here.

These measures are highly correlated especially the ones of economic development and inequality (*r=-0.85*). A composite indicator of a country's *Prosperity* enters the models of this study. Prosperity has been constructed as *{0.926[ln(GDPpc)-Gini]}* on centred *ln*(GDPpc) and Gini coefficients with loadings given by preliminary principal components analysis[3].

Several regional variables are included in the analysis to control for substantial differences in homicide rates and for political changes in the countries under investigation here. In particular three regional dummy variables distinguish East European, Latin American/Caribbean countries and, because it consistently has much higher homicide rates than other highly industrialized countries, the U.S. Three more dummy variables account for major historic events via identifying France (1963-1999) after Algeria is excluded from its homicide statistics, Germany (1991-1999) after unification and the Czech Republic[4]. If homicide rates are not significantly different between France and Algeria, former Federal Republic of Germany and the unified Germany or former Czechoslovakia and the Czech Republic these historic changes would be without consequence for our study. Indeed preliminary analysis showed effectively no effect of these "historic events" on homicide rates[5]. The respective dummy variables are thus excluded from subsequent discussion.

The frequency distributions of regional dummy variables are given in Table 2. This table also presents the overall mean, standard deviation, minimum and maximum values

of the percentage of population 15 to 24 years old, the composite indicator of Prosperity

and its individual components, i.e. *ln*(GDPpc) and the Gini coefficient, over the sample

of countries and years in this study. To facilitate interpretation of the results in the

discussion below these variables have been centred round their mean value. An indication

of the persistence of political regimes has also been included to account for the

theoretical notion of citizens' trust in their institutions. In particular *regime stability*

counts the number of years since the beginning of our data series, namely 1950, that the

democracy or polity indices remained unchanged. The description of this variable, which

was extracted from the Polity data set, ends Table 2. In the later estimated models regime

stability affects homicide rates only via its interaction with the democracy or polity

composite indicators. The source of each data series employed in this study is given

below Table 2.


## 4. STATISTICAL MODEL

The observations of this study stretch both over time and across countries

representing thus a data structure known as "unbalanced repeated measures" (Snijders

and Bosker 1999). Such data structures can be appropriately analysed using a multilevel

repeated measures approach[6] (Raudenbush 1995; Goldstein 1995). Apart from estimating

any fixed effects of time and/or country-specific explanatory variables on the dependent

variable (as in conventional regression analysis) this method allows also for the

estimation of any *within* and *between* subjects variability of the predicted values.

The units of analysis of the multilevel models of this study are at two levels[7]. Level 1

represents *time*, denoted by $t$=1, 2, …$T_i$, where $T_i$ is the number of years of annual data a

country possesses with a maximum of 51 (see also Table 1). Level 2 refers to the *country*,
denoted by  $i=1, 2, \ldots 44$ , where 44 is the total number of countries in the sample. Each
democratization measure, regime stability and the proportion of young persons operate at
level 1, i.e. time. The three regional dummy variables, i.e. East Europe, Latin America/
Caribbean and the U.S., as well as the indicator of prosperity are country-specific
covariates.

In the following empirical models the natural logarithm of homicide rates,
henceforth $ln(h_{ti})$, is a function of time, $F_i(t)$; a set of $s$ ($s=1, 2, 3, 4$) explanatory country-
level variables, denoted by $x_{qi}$; $l$ [$l=1, 2, 3$] year-level variables denoted by $x_{qti}$; and level
1 residuals, $e_{ti}$, which are assumed to have a joint normal distribution $N(0, \Sigma)$. In the
estimated models below the variance of level 1 residuals, ie. $e_{ti}$, is a quadratic function of
time, whereby $\text{var}[e_{0ti} + e_{1ti} (t\text{-}t_0)] = \sigma^2_{e0} - 2\, \sigma_{e01} (t\text{-}t_0) + \sigma^2_{e1}(t\text{-}t_0)^2$, (Goldstein *et al*.
1998).

The expected natural logarithm of the homicide rates is given by

$$ln(\hat{h}_{ti}) = X_{ti}b + \Sigma^{q=p}_{q=0} u_{qi}z_{qti} + \Sigma^{q=Q}_{q=p+1} u_{qi}z_{qi} \quad t=1, \ldots T_i, \qquad i=1,\ldots,44 \qquad (1)$$

where $q=0, 1, \ldots, Q$, with $Q+1$ being the total number of random coefficients in the
model including the intercept and time. $X_{ij}$ is a row vector of $K$ ($K{\geq}Q$) covariates for the
*ti*-th country-year combination, including the intercept, time and possible interactions. *b*
is a vector of K estimated coefficients or fixed effects on $ln(\hat{h}_{ti})$. $z_{0ti}=1$, $z_{1ti}=(t_{ti}-t_0)$,
$z_{qti}=x_{qti}$, for $q=2, \ldots, p$, are the time-country measured characteristics with random effects
for the *ti*-th country-year combination. $z_{qi}=x_{qj}$, for $q=p+1,p+2, \ldots, Q$, refer to the $Q\text{-}p{\leq}s$
country-specific covariates with random effects for the *i*-th country. $[u_{qi}]{\sim}N(0,\Omega_u)$ is the
random departure from the *i*-th country (Goldstein, 1995).

The estimated models below have been obtained using iterative generalized least squares (IGLS) estimation with first order marginal quasi-likelihood (MQL) approximation via the software package MLwiN (Goldstein *et al.*, 1998).

## 5. RESULTS

### 5.1. General Remarks

Tables 3 to 5 present multilevel random effects repeated measures models of *ln*(homicide rates) over selected democracy indicators controlling for population profile, country's prosperity, regional idiosyncrasies and regime stability. Apart from a baseline model, whereby $ln(h_{ti})$ is only a function of time, Table 3 gives the effects of the composite democracy and polity indicators. Tables 4 and 5 present the effects of the individual democracy indicators. In total apart from the baseline seven models are discussed in this paper.

*Deviance* statistics, which are effectively Wald tests following $\chi^2$ theoretical distributions (Greene, 1997), for each set of covariates, i.e. each democracy measure, youth population proportion and country's prosperity, regional idiosyncracies and any interactions with regime stability, with their appropriate degrees of freedom are presented under the corresponding set of covariates in Tables 3 to 5. Each set of covariates is highly statistically significant in comparison with $\chi^2$ theoretical distributions with the respective degrees of freedom (see Tables 3 to 5) implying that these explanatory variables and controls are important for the prediction of homicide rates. Each estimate, $b_k$ ($k=0, 1, ...K$), in the later Tables 3 to 5 has an indication of its statistical significance. This is based on Wald tests, which are $\chi^2$ distributed with one degree of freedom.

In the empirical models below (see Tables 3 to 5) each set of covariates, namely the democracy indicators and control variables, as well as any random variation of their individual components has been incrementally added to the baseline model. Any random variation of each covariate was compared with $\chi^2$ theoretical distributions with the respective degrees of freedom[8]. The respective Deviance statistics for each set of estimated random variances-covariances are displayed in the rows immediately following them in Tables 3 to 5. At least one category of each democracy indicator significantly affects the between countries random variation of predicted homicide rates except for openness of executive recruitment (see second part of Tables 3 to 5). In Tables 3 to 5 the estimated parameters of the random part of each model, i.e. variances-covariances, are presented together with their standard deviations, the latter in brackets. Deviance statistics for total fixed or random effects at each level, i.e. between or within countries, are also displayed.

Each estimated coefficient, $b_k$ $(k=0, 1, ...K)$, gives, in general, the change in the predicted dependent variable, $ln(\hat{h}_{ti})$, due to a unit increase in the respective covariate. Most covariates in this study are binary or nominal thereby $b_k$ reflects the change in the predicted dependent variable, $ln(\hat{h}_{ti})$, due to the respective characteristic as opposed to the reference characteristic or base (see above discussion on democratisation measures and Table 2). The dependent variable of this study is the natural logarithm of homicide rates. Therefore the exponent of each estimated coefficient, i.e. $exp(b_k)$, gives the multiplicative effect on predicted homicide rates due to a unit increase of the respective (quantitative) covariate or due to assuming the respective characteristic rather than the reference one. For instance, according to the Democracy model (third column of Table 3) transition to

democracy increases homicide rates by 0.833 [calculated as *exp*(0.606)-1] compared to autocracy, the base. In general *exp(b_k)* greater than one implies rising homicide rates whereas *exp(b_k)* less than one implies falling rates. Note that the slopes reported in this discussion are inflated by 0.01 due to the logarithmic transformation of (zero) raw homicide rates (see section 3.1).

Each coefficient, which has significant random between countries variation, gives the *average* effect of the respective covariate on homicide rates over the number of countries in the sample. This effect is assumed to be normally distributed with mean the estimated coefficient and standard deviation given by the square root of the respective estimated variance (see also section 4). For instance, 95% of the countries would experience a multiplicative effect on homicide rates between 0.674 and 4.983 or changing rates by – 0.326 and 3.983 [calculated as *exp*{[0.606-2(0.5)]-1} and *exp*{[0.606+2(0.5)]-1} respectively] during transition to democracy.

Between countries covariances of time-country characteristics imply that the respective coefficients are correlated (Goldstein 1995). A negative covariance between, say, transition and time would have implied that for countries with less than average (i.e. less than the respective estimated coefficient) annual rise of homicide rates transition to democracy would increase homicide rates more than average and vice versa. Positive covariances imply that any deviations from the respective estimated coefficients are of the same direction for the respective co-varing effects. The estimated coefficients and random variances-covariances of democracy indicators and control variables on homicide rates are discussed in the subsection after next.

Table 3 about here

## 5.2. The baseline model

A baseline random effects model, whereby $ln$(homicide rate) is only a function of time, was initially fitted. Its results are presented in the second column of Table 3. The natural logarithm of homicide rates is a linear function of time[9], namely $F_i(t)=g_{0i}+g_{1i}(t-t_0)$, where $t_0=1975$, the centre of the time series, and $i=1,...,44$. Alternatively homicide rates are an exponential function of time, i.e.

$$\hat{h}_{ti} = exp\ [F_i(t)] = exp(g_{0i})\ exp[(g_{1i})\ (t-t_0)] \qquad t=1,...T_i, \qquad i=1,...,44 \qquad (2)$$

where $u_{ji}=g_{ji}-b_{j0}, j=0,1$, are random departures from the $i$-th country, which are normally distributed, i.e. $N(0,\Omega_u)$ (Snijders and Bosker 1999). Therefore,

$$\hat{h}_{ti} = exp(b_{00})\ exp[(b_{10})\ (t-t_0)]\ exp(u_{0i})\ exp[(u_{1i})\ (t-t_0)],\ t=1,...T_i, \qquad i=1,...,44 \qquad (3)$$

The estimated average homicide rate over the 44 countries of our sample in 1975 (when $t-t_0=0$) is 2.20 [calculated as $exp(0.788)$] with a standard deviation of 1.199 [i.e. $\sqrt{(1.253+0.184)}$], when only time affects homicides rates.

Time exhibits significant fixed, albeit of low magnitude, effect and between countries (i.e. level 2) or between years (i.e. level 1) random variation as indicated by the respective p-value (less than 0.005) and Deviance statistics (16.936 and 52.027, respectively). Homicide rates increased very slowly, i.e. on average by 1.007 [$exp(0.007)$], per year with a standard deviation of 0.017 ($\sqrt{0.0003}$). This implies that in 95% of the countries $ln(h_{ti})$ changed between -0.027 [i.e. 0.007-2(0.017)] and 0.041 [i.e. 0.007+2(0.017)] per year during the second half of the 20th century. Alternatively 95% of the countries experienced annual changes in homicide rates between -0.027 [i.e. $exp(-$

0.027)-1] and 0.042 [*exp*(0.041)-1]. This result agrees with the picture of low exponential

growth of average homicide rates for most part of the 20th century (see Figure 1).

The between countries slope-intercept covariance is not statistically significant and so

no relationship between a country's initial homicide rate and its subsequent fluctuation is

implied. The between years estimated variance of $ln(h_{ti})$ is a quadratic function time,

whereby $^\wedge var[e_{0ti} + e_{1ti} (t-t_0)] = [0.184 - 0.0048 (t-t_0) + 0.0002 (t-t_0)^2]$. It implies that in

1987 the between years estimated variance of homicide rates attained its lowest value

while since that year homicide rates vary increasingly over time. The significant

estimated fixed and random effects of democracy indicators and control variables on

homicide rates are discussed henceforth.

5.3. Estimated Effects

*Composite Democracy Indicators*

The third column of Table 3 presents the estimated multilevel repeated measures

model of homicide rates over the composite democracy indicator and control variables.

The intercept implies that in 1975 the average expected $ln(h_{ti})$ for a hypothetical country

(apart from the US, East Europe or Latin America/Caribbean) of average percentage of

population 15-24 year old and prosperity under autocracy are –0.162 with a standard

deviation of 0.737 [calculated as $\sqrt{(0.566+0.171)}$]. The intercept however is not

statistically significant (while its random variation is) essentially implying unit [*exp*(0)]

homicide rates in 1975. If this fictitious country came from East Europe or Latin

America/Caribbean it would have had respective average homicide rates of 3.396 and

2.092 [calculated as *exp*(1.358-0.162) and *exp*(0.900-0.162) respectively][10]. As already

seen in Table 1 the East Europe effect is overwhelmingly due to Estonia[11]. Had the US
the sample average proportion of youth population and prosperity its 1975 homicide rates
would have been 4.919 [calculated as *exp*(1.755-0.162)]. The U.S. effect is effectively an
interaction between this country and democratic regime (Table 3) or its constituent
components (see later Tables 4 and 5), since according to each democracy indicator of
this study the U.S. has been a fully democratic regime during the entire second part of the
20th century.

As mentioned, the democracy indicator and its individual categories are highly
statistically significant as well as exhibit significant random between countries variation
according to the respective Deviance statistics and p-values. In comparison with
autocracy transition to democracy increases homicide rates on average by 0.834 whereas
immediate transform to democracy by 0.395. The respective standard deviations of the
effects on *ln*($h_{ti}$) are 0.500 and 0.294 [calculated as √0.250 and √0.087, respectively].

The average annual change of homicide rates is 0.004 with a small but statistically
significant between countries variance. The time-transition to democracy positive
covariance implies that for countries with higher (lower) than average homicide rates'
annual increase the effect of transition is also higher (lower) than average. During
democracy homicide rates rise by an additional 0.007 [calculated as *exp*(0.007)-1] per
year, while during transition homicide rates do not increase any different than due to the
average time effect.

The negative intercept covariance with each category of the composite democracy
indicator, i.e. transition and democratic regime, implies the following. Should the
countries, which during autocracy had lower (higher) than average homicide rates, move

away from autocracy they would experience higher (lower) than average increases of homicide rates. Put it plainly, the effect of transition or democracy on $ln(h_{ti})$ for these countries would be higher (lower) than the respective fixed effects (i.e. 0.834 and 0.395, respectively).

According to the highly significant effects of the control variables homicide rates are expected to increase by 20.92 per 10,000 due to one percent rise of population 15-24 year old whereas they would drop by 0.059 when prosperity rises by a unit.

The last column of Table 3 gives the estimated effects of polity, which accounts for levels of autocracy as well as democracy, and control variables on homicide rates. The basis or reference category here is "rather autocratic regime" which to some extent differs from the basis of the earlier composite democracy indicator[12]. "Rather democratic regime" increases homicide rates by 0.543 [calculated as *exp*(0.434)-1] when contrasted with "rather autocratic regime". This effect varied between countries with a standard deviation of 0.400. By contrast fully democratic regime does not have a significant mean effect on homicide rates[13] but exhibits significant between countries variation with a standard deviation of 0.635. Thus regime change from "rather autocracy" to established democracy may alter homicide rates both negatively or positively depending entirely on the country. In particular homicide rates are expected to change by between –0.701 [calculated as {*exp*[0.061-2*(0.635)]-1}] and 2.785 [calculated as {*exp*[-0.061+2*(0.635)]-1}] in the hypothetical case that a "rather autocratic regime" instantly changes to democracy.

The negative intercept covariances of "rather" or fully democratic regimes are interpreted as before. They imply that the higher (lower) the homicide rates for a "rather

autocratic" regime the lower (higher) the effect of "rather" or fully democratic regimes on a country's homicide rates. During "rather" or fully democratic regimes homicide rates increase annually by 0.009, according to interaction effects whereas the mean effect of time is not individually significant. The estimated effects of the percentage of young population, prosperity and regional idiosyncracies on homicide rates in the polity model differ marginally from the ones discussed earlier (i.e. in the democracy model).

Finally the estimated parameters of the quadratic function of time of the between years (level 1) variance of homicide rates are essentially unaltered in the models for democracy and polity compared to the baseline one. We now turn to the discussion of the effects of the individual democracy indicators on homicide growth rates.


*Competitiveness of Participation, Executive Recruitment Competition and Constraints*

Table 4 presents the estimated fixed and random effects of three individual democracy indicators, i.e. competitiveness of participation, executive recruitment competition and executive constraints, on *ln(h$_{ti}$)*. Apart from the first, each column of Table 4 gives the estimated parameters and related statistical tests of these effects of each indicator as well as young population proportion, prosperity and regional idiosyncracies. Executive constraints, competitiveness of participation and executive recruitment competition significantly affect homicide rates (in this order) according to the respective *Deviance* tests.

Table 4 about here

The expected average homicide rate of the fictitious country of reference (see first paragraph of the estimated effects sub-section) apart from the US, East Europe, and Latin America/ Caribbean in 1975 is essentially one had this country unregulated or suppressed or restricted transitional competitiveness of participation of non-elites to institutional structures for political expression, or unregulated /selective executive recruitment competition or unlimited authority of the executive committee. The respective standard deviations of the intercept are 0.791, 0.908 and 0.810 [calculated as $\sqrt{(0.452+0.173)}$, $\sqrt{(0.653+0.172)}$ and $\sqrt{(0.479+0.177)}$, respectively]. Had this country been the US or in East Europe or Latin America /Caribbean its expected average homicide rate would have been augmented by the estimated respective parameters for each model in Table 4. For instance, the expected average homicide rate of an East European country with unlimited authority of the executive committee and all other reference characteristics would have been 5.190 [calculated as {$exp$(-0.060+1.706)}] see last column of Table 4] in 1975. The intercept effect is highest for the US and lowest for Latin America/ Caribbean in all three models of Table 4. It may be worth repeating here that the US effect is essentially an interaction between this country and the most "liberal" category of each democratic indicator.

Improvements of competitiveness of participation, executive recruitment competition and executive constraints are associated with increases of homicide rates. In particular factional /transitional or competitive participation of non-elites to institutional structures for political expression are expected to increase homicide rates by 0.725 and 0.367 [calculated as $exp${(0.545)-1} and $exp${(0.313)-1}], respectively, in comparison with unregulated or suppressed or restricted transitional participation. Dual /transitional

executive recruitment competition or via elections rises them by 0.221 and 0.431

[calculated as *exp*{(0.200)-1} and *exp*{(0.358)-1}], respectively, compared to unregulated

or via selection executive recruitment competition. Similarly, executive parity or

subordination rather than unlimited authority accelerates homicide rates by 0.565

[calculated as *exp*{(0.448)-1}]. The aforementioned effects of factional /transitional

competitiveness of participation and executive recruitment via elections on homicide

rates vary significantly between countries with respective standard deviations of 0.493

($\sqrt{0.243}$) and 0.452 ($\sqrt{0.204}$). The covariance parameters reported in the second part of

Table 4 are interpreted as before (see previous sub-section).

Each year following (preceding) 1975 increases (drops) homicide rates by an average

minimum of 0.006 (in the executive constraints model) and a maximum of 0.009 (in the

competitiveness of participation model) with respective standard deviations of 0.014 and

0.01 [calculated as $\sqrt{0.0002}$ and $\sqrt{0.0001}$, respectively]. One per cent rise of the

population 15-24 years old in a country is associated with between 27.980 (executive

constraints model) and 31.031 (competitiveness of participation model) increase of

homicide rates [calculated as *exp*{(3.367)-1} and *exp*{(3.467)-1}, respectively] per

thousand people. One unit rise of Prosperity in a country would drop homicide rates by

between 0.077 (competitiveness of participation model) and 0.084 (executive constraints

model) [calculated as *exp*{(-0.081)-1} and as *exp*{(-0.087)-1}, respectively].


*Regulation of Participation and Openness of Executive Recruitment*

The effects of the last two individual democracy indicators, i.e. regulation of

participation and openness of executive recruitment, on *ln(h$_{ti}$)*, along with the usual

control variables, are given in Table 5 (second and third columns respectively).

Indications of statistical significance of fixed parameters, standard deviations of random

parameters and Deviance statistics are also presented in Table 5.

Table 5 about here

Had the fictitious reference country (see sub-section 5.3) multiple identity of

regulation of participation, i.e. fluid political participation or 'intense, hostile and

frequently violent' competition among political groups for political influence (see

www.cidcm.umd.edu/polity, CodeBook) its expected 1975 homicide rates would have

been 1.598 per 100,000 people [calculated as *exp*(0.468)] with a standard deviation of

0.865 [calculated as √(0.572+0.177), see second column of Table 5]. The expected 1975

rates of the fictitious country are essentially one in the case of unregulated executive

recruitment with a standard deviation of 0.769 [calculated as √(0.407+0.184), see last

column of Table 5]. As in the previous models of Tables 3 and 4, the US, East Europe

and Latin America /Caribbean countries have, in this order, higher average homicide

rates.

Democratising gradually regulation of participation exerts significant negative effects

on homicide rates, unlike any other democracy process examined in this study. In

particular, sectarian /restricted or regulated participation decreases rates on average by

0.185 and 0.155, respectively, [calculated as (*exp*(-0.205)-1) and (*exp*(-0.168)-1),

respectively] when contrasted with multiple identity. These effects vary between

countries with respective standard deviations of 0.327 and 0.370 [calculated as √0.107

and √0.137, respectively]. Open executive recruitment, by contrast, is related to 0.270

[calculated as *exp*(0.239)-1] higher homicide rates than unregulated recruitment and this

relationship does not vary between countries.

Time and the proportion of young population affect homicide rates positively whereas

a country's prosperity diminishes them, similarly to the models discussed in the previous

Tables 3 and 4. Finally, the quadratic function of time of the between years variation of

the homicide rates is essentially identical across the five models of Tables 4 and 5, as

well as similar to that of the baseline model above (see thus entitled sub-section 5.2).

## 6. DISCUSSION AND CONCLUSIONS

1. Most support for modernization/social disorganization perspectives:  Both
   modernization and social disorganization perspectives have been widely
   discredited in criminology in the past few decades. OR THE CONFLICT
   THEORY
   2.

--but part of the difficulty with these perspectives in terms of cross-national comparative

criminology is that we have lacked the data and methods to adequately test them.

--although modernization is clearly a longitudinal, processual concept, virtually all of the
research to date has been cross-sectional.

--Moreover, most studies of cross-national violent crime have been limited to a handful
of highly industrialized countries;
--while this study was also skewed toward industrialized countries, we were able to
include far more data from industrializing countries that is typically  the case in this type
of research.

3. Major contradiction of modernization theory when it comes to crime;  How do we
   explain examples of relatively high crime rates in countries that are nevertheless,
   highly industrialized liberal democracies?

--prominent examples:  The United States, Finland GARY IT'S DUE TO HIGHER
HOUSEHOLD GUN OWNERSHIP, SEE TSELONI+BASS 2002

--although most criminological tests of modernization theory have simply examined the
corss-sectional impact of level of economic development on crime rates, the theoretical

baseis of Djurkheim's arguments about modernization and crime is more broadly rooted in the concept of social disorganization.

Compared with industrialized societies, industrializing societies are more likely to experience rapid crime increases because of the transition from traditional to modern society is associated with a breakdown of the normative order characterized by growing social disorganization.

--this raises the possibility that it is not modernization that is driving crime, but social disorganization <u>and that while highly modernized countries tend to have low levels of social disorganization, this is not always the case.</u>
GARY I DIASGREE WITH THE UNDERLINED COMMENT: Isn't it that high industrialization also means a) high labour mobility or immigration and b) raised needs for imported labour or migration? Thus industrialization is associated with (any empirical research evidence?) national & international labour mobility, i.e. uprooting people and separating families, which in turn creates social disorganisation.

--similarly, it also means that some countries that score very low on modernization, may nevertheless have low levels of social disorganization, and correspondingly low levels of crime.

4. During the third wave of democratization among countries of the world, many countries have been extremely concerned with alarming increases in rates of crime.

--we hear these reports from the emerging democracies of eastern Europe and the former Soviet Union
GARY isn't this democratisation closely related to opening the markets for the international capital along with destroying the social protection net (see recent changes in the social welfare system of Russia and Germany) b/c it's now deemed to be over-expensive? This may support the conflict perspective.

--we hear these reports from the fledgling democracies of Latin America

--and we hear these reports from emerging democracies in Africa and Asia

--Our results suggest that this concern about crime in transitional societies are not merely alarmist over reactions

--it does appear that crime rates are higher in transitional democracies than in autocratic societies.

--but interestingly, the results also suggest that if transitional democracies can continue to move toward full democracy, their crime rates will eventually begin to decline; that high crime rates are a feature of democracies in transition.

SHORTCOMINGS: PROBLEMS WITH DEMOCRACY RATING (we mention the example of the US, France and Greece between 1972 and 1978) &
WHO HOMICIDE DATA.

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Table 1: Homicide rates per country and range of years

| Countries | Total Years | Years | | Homicide rate | | | |
|---|---|---|---|---|---|---|---|
| | Years | First | Last | Mean | Stdev. | Min | Max |
| Australia | 50 | 1950 | 1999 | 1.70 | 0.26 | 1.04 | 2.39 |
| Austria | 51 | 1950 | 2000 | 1.23 | 0.23 | 0.84 | 1.77 |
| Belgium | 43 | 1954 | 1996 | 1.19 | 0.46 | 0.57 | 2.15 |
| Bulgaria | 41 | 1960 | 2000 | 2.95 | 0.99 | 0.80 | 5.07 |
| Canada | 49 | 1950 | 1998 | 1.80 | 0.52 | 0.99 | 2.70 |
| Chile | 44 | 1954 | 1999 | 3.32 | 1.23 | 1.75 | 6.60 |
| Colombia | 28 | 1951 | 1994 | 37.36 | 22.15 | 14.45 | 89.50 |
| Costa Rica | 46 | 1955 | 2000 | 4.28 | 1.15 | 2.39 | 8.35 |
| Czechoslovakia - Czech Republic | 48 | 1953 | 2000 | 1.35 | 0.32 | 0.88 | 2.27 |
| Denmark | 49 | 1950 | 1998 | 0.89 | 0.32 | 0.39 | 1.45 |
| Dominican Republic | 25 | 1956 | 1985 | 5.05 | 1.64 | 2.08 | 9.38 |
| El Salvador | 24 | 1950 | 1993 | 33.86 | 6.63 | 24.31 | 51.53 |
| Estonia | 8 | 1991 | 1998 | 20.11 | 5.44 | 10.79 | 28.22 |
| Finland | 51 | 1950 | 2000 | 2.81 | 0.43 | 1.82 | 3.63 |
| France | 44 | 1950 | 1999 | 0.95 | 0.16 | 0.70 | 1.32 |
| Germany | 50 | 1950 | 1999 | 1.12 | 0.13 | 0.86 | 1.39 |
| Greece | 43 | 1956 | 1998 | 1.06 | 0.43 | 0.51 | 2.74 |
| Hungary | 45 | 1955 | 2000 | 2.54 | 0.70 | 1.56 | 4.09 |
| Iceland | 48 | 1950 | 1997 | 0.79 | 0.76 | 0.00 | 3.31 |
| Ireland | 50 | 1950 | 1999 | 0.60 | 0.32 | 0.18 | 2.00 |
| Israel | 40 | 1954 | 1998 | 1.27 | 0.60 | 0.12 | 2.43 |
| Italy | 50 | 1950 | 1999 | 1.49 | 0.45 | 0.81 | 2.84 |
| Japan | 50 | 1950 | 1999 | 1.28 | 0.55 | 0.55 | 2.37 |
| Luxemburg | 33 | 1967 | 2000 | 1.36 | 0.72 | 0.25 | 2.91 |
| Mauritius | 33 | 1968 | 2000 | 2.05 | 1.05 | 0.61 | 6.10 |
| Mexico | 39 | 1958 | 2000 | 18.88 | 4.97 | 9.78 | 32.28 |
| Netherlands | 50 | 1950 | 1999 | 0.74 | 0.34 | 0.21 | 1.36 |
| New Zealand | 50 | 1950 | 1999 | 1.28 | 0.54 | 0.00 | 2.40 |
| Norway | 50 | 1950 | 1999 | 0.78 | 0.34 | 0.26 | 1.56 |
| Panama | 34 | 1954 | 1987 | 4.14 | 1.63 | 1.73 | 7.24 |
| Paraguay | 18 | 1969 | 1987 | 11.71 | 3.56 | 6.54 | 16.60 |
| Philippines | 20 | 1957 | 1981 | 6.20 | 5.59 | 0.38 | 17.40 |
| Poland | 41 | 1955 | 2000 | 1.55 | 0.65 | 0.83 | 2.94 |
| Portugal | 48 | 1950 | 2000 | 1.29 | 0.29 | 0.73 | 1.88 |
| Singapore | 42 | 1959 | 2000 | 1.76 | 0.53 | 0.57 | 3.02 |
| Spain | 49 | 1950 | 1999 | 0.62 | 0.34 | 0.06 | 1.18 |
| Sweden | 50 | 1950 | 1999 | 1.01 | 0.28 | 0.56 | 1.50 |
| Switzerland | 50 | 1950 | 1999 | 1.04 | 0.38 | 0.54 | 2.84 |
| Thailand | 33 | 1955 | 1994 | 15.39 | 5.73 | 6.71 | 28.77 |
| Trinidad and Tobago | 30 | 1962 | 1994 | 6.09 | 2.30 | 2.10 | 11.43 |
| United Kingdom | 51 | 1950 | 2000 | 0.84 | 0.25 | 0.51 | 1.52 |
| United States | 50 | 1950 | 1999 | 7.51 | 2.12 | 4.50 | 10.55 |
| Uruguay | 32 | 1955 | 1990 | 3.81 | 1.00 | 1.99 | 5.68 |
| Venezuela | 47 | 1950 | 2000 | 9.75 | 3.62 | 5.02 | 26.35 |
| All Countries | 51 | 1950 | 2000 | 3.91 | 7.40 | 0.00 | 89.50 |

Table 2: Description of Variables

| DEMOCRACY INDICATORS | Frequency (%) |
|---|---|
| Composite Democracy Variable [a] | |
|     Autocratic Regime (base) | 17.1 |
|     Transition (in between values) | 24.1 |
|     Fully Democratic Regime | 58.8 |
| Composite Polity Variable (=Democracy-Autocracy) [a] | |
|     Rather Autocratic Regime (base, incl. Occupation) | 21.7 |
|     Rather Democratic Regime | 19.7 |
|     Fully Democratic Regime | 58.8 |
| Competitiveness of Participation [a] | |
|     Unregulated/Suppressed/Restricted Transitional (base) | 19.7 |
|     Factional/Transitional | 16.5 |
|     Competitive | 63.8 |
| Executive Recruitment Competition [a] | |
|     Unregulated/Selection (base) | 20.2 |
|     Dual/Transitional | 5.6 |
|     Election | 74.2 |
| Executive Constraints [a] | |
|     Unlimited authority (base) | 7.8 |
|     Intermediate categories | 25.8 |
|     Executive parity or Subordination | 66.4 |
| Regulation of Participation [a] | |
|     Multiple identity (base) | 12.1 |
|     Sectarian or restricted | 24.0 |
|     Regulated | 63.9 |
| Openness of Executive Recruitment [a] | |
|     Unregulated (base) | 5.0 |
|     Open | 95.0 |
| CONTROL VARIABLES | |
| East Europe | 10.0 |
| Latin America/ Caribbean | 20.1 |
| U.S. | 2.7 |

| | Mean | Std. Dev. | Min/Max |
|---|---|---|---|
| Ln{GDP per capita (mean per country)} [e] | 8.39 | 0.63 | 6.60/ 9.52 |
| Gini coefficient (mean per country) [c] | 35.56 | 8.03 | 22.25/ 55.28 |
| Prosperity (country level) [d] | 0.00 | 7.85 | -18.61/ 12.54 |
| Percent population 15 to 24 years old [b] | 0.16 | 0.03 | 0.11/ 0.24 |
| Years (since 1950) of Regime Stability [a] | 19.19 | 14.19 | 0/ 51 |

[a] Gurr data set, www.cidcm.umd.edu;
[b] World Health Organisation. 1998 "World Health Statistics" Geneva, Switzerland: WHO;
[c] Deininger, Klaus & Squire, Lyn. 1999. "Measuring Income Inequality: A New Database". The World Bank Group. Professor Tryggvi Thor Herbertsson has kindly forwarded Gini coefficients for Iceland;

[d] Composite variable calculated as {*0.926[Ln(GDP per capita)- Gini]*} at centred values;
[e] OECD,  www.oecd.org.

Table 3: Estimated multilevel effects of composite democracy indicators on the natural logarithm of national homicide rates during the second half of the 20$^{th}$ century across the world.

| | Baseline Model | Democracy | Polity |
|---|---|---|---|
| | Estimated Coefficients | | |
| Time (centred) | 0.0075$^{\#}$ | 0.0041$^{**}$ | 0.0015 |
| | | | |
| Democracy Indicator (base: Autocratic Regime) | | | - |
| Transition | | 0.6063$^{\#}$ | |
| Democratic Regime | | 0.3326$^{\#}$ | |
| *Deviance (d.f.=2)* | | *28.4359* | |
| | | | |
| Polity Indicator (base: Rather Autocratic Regime) | | - | |
| Rather Democratic Regime | | | 0.4343$^{\#}$ |
| Democratic Regime | | | 0.0610 |
| *Deviance (d.f.=2)* | | | *17.3135* |
| | | | |
| Interactions with Regime Stability since 1950 | | | |
| Transition x Regime Stability | | 0.0046 | - |
| Democratic Regime x Regime Stability | | 0.0070$^{*}$ | - |
| Rather Democratic Regime x Regime Stability | | - | 0.0089$^{\sim}$ |
| Democratic Regime x Regime Stability | | - | 0.0093$^{\#}$ |
| *Deviance (d.f.=2)* | | *6.0555* | *11.7929* |
| | | | |
| Controls | | | |
| Percent population 15 to 24 years old | | 3.0874$^{\#}$ | 3.1266$^{\#}$ |
| Prosperity | | -0.0605$^{\#}$ | -0.0447* |
| *Deviance (d.f.=2)* | | *31.0076* | *25.7742* |
| East Europe | | 1.3850$^{\#}$ | 1.3951$^{\#}$ |
| Latin America/ Caribbean | | 0.9004$^{**}$ | 1.0345$^{\#}$ |
| U.S. | | 1.7555$^{\#}$ | 1.8118$^{\#}$ |
| *Deviance (d.f.=3)* | | *41.1151* | *49.7794* |
| | | | |
| *Total Deviance for all estimated parameters (d.f.)* | *6.8203 (1)* | *156.1102 (10)* | *151.0956 (10)* |
| | | | |
| Intercept | 0.7879$^{\#}$ | -0.1624 | -0.0075 |

Note: Models are based on 1,827 observations.

d.f.=degrees of freedom.

$^{\#}$ p-value<0.005, $^{**}$ 0.005<=p-value<0.01, $^{*}$ 0.01<=p-value<0.05, $^{\sim}$0.05<=p-value<0.10.

Table 3: Estimated multilevel effects of composite democracy indicators on the natural logarithm of national homicide rates during the second half of the 20th century across the world (continued).

| | Baseline Model | Democracy | Polity |
|---|---|---|---|
| | Estimated Random Variances-Covariances | | |
| *Random Variances-Covariances between Countries* | | | |
| $\sigma^2_0$ (S.E.) | 1.2535 (0.2692) | 0.5660 (0.1413) | 0.6964 (0.1837) |
| $\sigma_{0\,time}$ (S.E.) | -0.0048 (0.0033) | -0.0018 (0.0012) | -0.0017 (0.0010) |
| $\sigma^2_{time}$ (S.E.) | 0.0003 (0.0001) | 0.0001 (0.0000) | 0.0001 (0.0000) |
| *Deviance (d.f.=2)* | *16.9360* | *12.1104* | *10.5895* |
| $\sigma_{0\,transition}$ (S.E.) | - | -0.1616 (0.0698) | - |
| $\sigma_{time\,transition}$ (S.E.) | - | 0.0052 (0.0016) | - |
| $\sigma^2_{transition}$ (S.E.) | - | 0.2497 (0.0873) | - |
| *Deviance (d.f.=3)* | | *12.3213* | |
| $\sigma_{0\,democratic\,regime}$ (S.E.) | - | -0.1923 (0.0828) | - |
| $\sigma^2_{democratic\,regime}$ (S.E.) | - | 0.0867 (0.0563) | - |
| *Deviance (d.f.=2)* | | *5.6693* | |
| $\sigma_{0\,rather\,democratic\,regime}$ (S.E.) | - | - | -0.1179 (0.0601) |
| $\sigma^2_{rather\,democratic\,regime}$ (S.E.) | - | - | 0.1597 (0.0680) |
| *Deviance (d.f.=2)* | | | *6.1315* |
| $\sigma_{0\,democratic\,regime}$ (S.E.) | - | - | -0.4395 (0.1601) |
| $\sigma^2_{democratic\,regime}$ (S.E.) | - | - | 0.4027 (0.1786) |
| *Deviance (d.f.=2)* | | | *7.7119* |
| *Total Deviance for between countries variance-covariance matrix (d.f.)* | *38.5370 (3)* | *38.1471 (8)* | *39.8276 (7)* |
| *Random Variances-Covariances between Years* | | | |
| $\sigma^2_0$ (S.E.) | 0.1838 (0.0094) | 0.1709 (0.0088) | 0.1685 (0.0089) |
| $\sigma_{0\,time}$ (S.E.) | -0.0024 (0.0003) | -0.0021 (0.0003) | -0.0020 (0.0003) |
| $\sigma^2_{time}$ (S.E.) | 0.0002 (0.0001) | 0.0002 (0.0000) | 0.0002 (0.0001) |
| *Deviance (d.f.=2)* | *52.0273* | *47.5252* | *47.7633* |
| *Total Deviance for between years variance-covariance matrix (d.f.=3)* | *869.9456* | *861.8876* | *858.4745* |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.

Table 4: Estimated multilevel effects of individual democracy indicators on the natural logarithm of national homicide rates during the second half of the 20$^{th}$ century across the world [1].

| | Competitive-ness of Participation | Executive Recruitment Competition | Executive Constraints |
|---|---|---|---|
| | Estimated Coefficients | | |
| Time (centred) | 0.0090$^{\#}$ | 0.0083$^{\#}$ | 0.0063$^{*}$ |
| | | | |
| Competitiveness of Participation | | | |
| (base: Unreg./ Suppr./ Restr. Transitional) | | - | - |
| Factional/ Transitional | 0.5450$^{\#}$ | | |
| Competitive | 0.3126$^{\#}$ | | |
| *Deviance (d.f.=2)* | *31.5000* | | |
| | | | |
| Executive Recruitment Competition | | | |
| (base: Unregulated/ Selection) | - | | - |
| Dual/Transitional | | 0.1996$^{*}$ | |
| Election | | 0.3582$^{\#}$ | |
| *Deviance (d.f.=2)* | | *13.0564* | |
| | | | |
| Executive Constraints | | | |
| (base: Unlimited Authority) | - | - | |
| Intermediate categories | | | 0.1020 |
| Executive Parity or Subordination | | | 0.4479$^{\#}$ |
| *Deviance (d.f.=2)* | | | *35.6429* |
| | | | |
| Controls | | | |
| Percent population 15 to 24 years old | 3.4667$^{\#}$ | 3.4412$^{\#}$ | 3.3666$^{\#}$ |
| Prosperity | -0.0806$^{\#}$ | -0.0823$^{\#}$ | -0.0875$^{\#}$ |
| *Deviance (d.f.=2)* | *42.7411* | *43.3872* | *41.5016* |
| East Europe | 1.4765$^{\#}$ | 1.5434$^{\#}$ | 1.7065$^{\#}$ |
| Latin America/ Caribbean | 0.6079$^{\sim}$ | 0.6414$^{\sim}$ | 0.7629$^{*}$ |
| U.S. | 1.7949$^{**}$ | 1.7239$^{\#}$ | 1.6946$^{*}$ |
| *Deviance (d.f.=3)* | *29.6649* | *66.7984* | *34.3770* |
| | | | |
| *Total Deviance for all estimated parameters (d.f.)* | *156.3229 (8)* | *145.8184 (8)* | *146.1843 (8)* |
| | | | |
| Intercept | 0.0386 | 0.0449 | -0.0597 |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.
$^{\#}$ p-value<0.005, $^{**}$ 0.005<=p-value<0.01, $^{*}$ 0.01<=p-value<0.05, $^{\sim}$ 0.0552=p-value<0.10.

Table 4: Estimated effects of individual democracy indicators on the natural logarithm of national homicide rates during the second half of the 20$^{th}$ century across the world [1] (continued).

| | Competitive-ness of Participation | Executive Recruitment Competition | Executive Constraints |
|---|---|---|---|
| Estimated Variances-Covariances | | | |
| *Random Variances-Covariances between Countries* | | | |
| $\sigma_0^2$ (S.E.) | 0.4519 (0.1007) | 0.6533 (0.1858) | 0.4787 (0.1059) |
| $\sigma_{0\,time}$ (S.E.) | -0.0019 (0.0015) | -0.0010 (0.0013) | 0.0005 (0.0018) |
| $\sigma^2_{time}$ (S.E.) | 0.0001 (0.0000) | 0.0001 (0.0000) | 0.0002 (0.0001) |
| *Deviance (d.f.=2)* | *13.3663* | *12.6237* | *15.9954* |
| $\sigma_{0\,factional/\,transitional}$ (S.E.) | -0.1663 (0.0800) | - | - |
| $\sigma_{time\,factional/\,transitional}$ (S.E.) | 0.0048 (0.0017) | - | - |
| $\sigma^2_{factional/\,transitional}$ (S.E.) | 0.2433 (0.0928) | - | - |
| *Deviance (d.f.=3)* | *9.3407* | | |
| $\sigma_{0\,election}$ (S.E.) | - | -0.2577 (0.1140) | - |
| $\sigma^2_{election}$ (S.E.) | - | 0.2043 (0.0858) | - |
| *Deviance (d.f.=2)* | | *6.0473* | |
| $\sigma_{0\,intermediate}$ (S.E.) | - | - | -0.0442 (0.0438) |
| $\sigma_{time\,intermediate}$ (S.E.) | - | - | -0.0026 (0.0011) |
| $\sigma^2_{intermediate}$ (S.E.) | - | - | 0.0327 (0.0250) |
| *Deviance (d.f.=3)* | | | *6.6149* |
| *Total Deviance for between countries variance-covariance matrix (d.f.)* | *37.9671 (6)* | *38.9347 (5)* | *37.8991 (6)* |
| *Random Variances-Covariances between Years* | | | |
| $\sigma_0^2$ (S.E.) | 0.1735 (0.0089) | 0.1717 (0.0089) | 0.1771 (0.0091) |
| $\sigma_{0\,time}$ (S.E.) | -0.0022 (0.0003) | -0.0022 (0.0003) | -0.0022 (0.0003) |
| $\sigma^2_{time}$ (S.E.) | 0.0002 (0.0000) | 0.0002 (0.0000) | 0.0002 (0.0000) |
| *Deviance (d.f.=2)* | *49.1819* | *50.3286* | *50.1897* |
| *Total Deviance for between years variance-covariance matrix (d.f.=3)* | *864.3272* | *862.9291* | *864.2292* |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.

Table 5: Estimated multilevel effects of individual democracy indicators on the natural logarithm of national homicide rates during the second half of the 20th century across the world [2].

| | Regulation of Participation | Openness of Executive Recruitment |
|---|---|---|
| Estimated Coefficients | | |
| Time (centred) | 0.0058[*] | 0.0077[**] |
| | | |
| Regulation of Participation (base: Multiple Identity) | | - |
| Sectarian/ Restricted | -0.2052[*] | |
| Regulated | -0.1680[~] | |
| *Deviance (d.f.=2)* | *5.7912* | |
| | | |
| Openness of Executive Recruitment (base: Unregulated) | - | |
| Open | | 0.2393[#] |
| *Deviance (d.f.=1)* | | *12.7609* |
| | | |
| Controls | | |
| Percent population 15 to 24 years old | 3.1457[#] | 3.3305[#] |
| Prosperity | -0.0504[#] | -0.0755[#] |
| *Deviance (d.f.=2)* | *28.3866* | *37.2637* |
| East Europe | 1.1878[#] | 1.3388[#] |
| Latin America/ Caribbean | 1.0140[#] | 0.8388[*] |
| U.S. | 1.8457[#] | 1.7657[**] |
| *Deviance (d.f.=3)* | *47.7239* | *29.5360* |
| | | |
| *Total Deviance for all estimated parameters (d.f.)* | *128.8822 (8)* | *132.9383 (7)* |
| | | |
| Intercept | 0.4685[#] | 0.0603 |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.
[#] p-value<0.005, [**] 0.005<=p-value<0.01, [*] 0.01<=p-value<0.05, [~] 0.0554=p-value<0.10.

Table 5: Estimated effects of individual democracy indicators on the natural logarithm of national homicide rates during the second half of the 20th century across the world [2] (continued).

| | Regulation of Participation | Openness of Executive Recruitment |
|---|---|---|
| Estimated Variances-Covariances | | |
| *Random Variances-Covariances between Countries* | | |
| $\sigma_0^2$ (S.E.) | 0.5716 (0.1456) | 0.4075 (0.0885) |
| $\sigma_{0\,time}$ (S.E.) | 0.0013 (0.0025) | 0.0012 (0.0019) |
| $\sigma_{time}^2$ (S.E.) | 0.0003 (0.0001) | 0.0003 (0.0001) |
| *Deviance (d.f.=2)* | *15.8721* | *16.9621* |
| $\sigma_{0\,sectarian/\,restricted}$ (S.E.) | -0.0301 (0.0498) | - |
| $\sigma_{sectarian/\,restricted}^2$ (S.E.) | 0.1070 (0.0557) | - |
| *Deviance (d.f.=2)* | *4.0496* | |
| $\sigma_{0\,regulated}$ (S.E.) | -0.2198 (0.0865) | - |
| $\sigma_{time\,regulated}$ (S.E.) | -0.0047 (0.0020) | - |
| $\sigma_{regulated}^2$ (S.E.) | 0.1368 (0.0646) | - |
| *Deviance (d.f.=3)* | *15.0607* | |
| *Total Deviance for between countries variance-covariance matrix (d.f.)* | *41.2650 (8)* | *38.1819 (3)* |
| | | |
| *Random Variances-Covariances between Years* | | |
| $\sigma_0^2$ (S.E.) | 0.1771 (0.0091) | 0.1840 (0.0093) |
| $\sigma_{0\,time}$ (S.E.) | -0.0023 (0.0003) | -0.0024 (0.0003) |
| $\sigma_{time}^2$ (S.E.) | 0.0002 (0.0000) | 0.0002 (0.0000) |
| *Deviance (d.f.=2)* | *52.0416* | *52.0698* |
| | | |
| *Total Deviance for between years variance-covariance matrix (d.f.=3)* | *860.4821* | *870.1646* |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.

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[1] Skewness of the distribution of *ln*(homicide rate) is considerably lower (0.34) than that of the original distribution of homicide rates (5.21). Similarly taking the natural logarithms of the raw homicide rates decreased kurtosis from 39.75 to 3.03. Thus the distribution of the transformed series, i.e. *ln*(homicide rate), approaches the Gaussian.

[2] Four data points, which denote foreign occupation of the respective country, have been subsumed in the 'rather autocratic regime' reference group.

[3] Principal components analysis is standard remedie for the problem of highly collinear regressors (Green 1997).

[4] Data from the Sinai campaign (1956, 1957) for Israel are excluded due to missing observations of youth population proportion.

[5] The modelling results including the dummy variables of "historic events" are available to interested readers upon request.

[6] Alternatively this method is called 'hierarchical linear model approach to repeated measures' (Snijders and Bosker 1999, page 166). The main advantage of the multilevel approach (as opposed, for instance, to panel data analysis) is that it can deal with unbalanced or incomplete data structures (Snijders and Bosker 1999).

[7] Random variance of the intercept at a higher level of aggregation, region (classified as north-west Europe, south-west Europe, east Europe, north America, Latin America & the Caribbean, Asia, Oceania, Israel, and Mauritius), was statistically non significant according to Deviance test with one degree of freedom. These results are available to interested readers upon request.

[8] The p-values for the Wald tests or *Devince* for random parameters have been corrected to account for one-tail tests (Snijders and Bosker, 1999, page 90). Random effects, which jointly showed p-value greater than 0.10, were removed from the models and less complex variation was fitted, for instance, constraining any non-significant covariance to zero except the intercept covariance, which has been kept regardless its statistical significance (Snijders and Bosker 1999). If the joint $X^2$ distribution had a p-value equal to or less than 0.10 the variance and all covariance terms of the random effect have been kept in the final models.

[9] A quadratic term of time, i.e. $(t-t_0)^2$, was also fitted but showed no statistically significant fixed or random effects.

[10] The regional dummy variables of East Europe and Latin America /Caribbean do not affect the slope of the relationship between homicide rates and democracy only its position. In other words interaction effects between each of these dummy variables and each democracy indicator, which were fitted in a preliminary analysis, were essentially zero. Similarly income inequality was not found to interact with democracy in affecting homicide rates.

[11] Indeed the effect of Estonia on homicide growth rates was found to be 2.26 in an estimated model, which differed from the one presented here by including a dummy variable for this country rather than the entire East Europe.

[12] Ninety-four (94) country-year points (i.e. 5.1% of the total sample) are classified into "rather autocratic regime" of the polity indicator whereas they belong to the middle category of transition of the composite democracy indicator. By contrast "rather

autocratic regime" excludes 13 (0.7%) country-year data points, which are classified into autocratic regime of the democracy indicator.

[13] In a preliminary model with only fixed effects of the composite polity indicator the estimated democracy effect was 0.3951 and highly significant (standard deviation 0.067). Allowing for random variation showed that the effect of democracy compared to rather autocratic regime is highly inconsistent between countries.

Table 1: Homicide rates per country and range of years

| Countries | Years | Frst | Last | Mean | Stdev | Min | Max |
|---|---|---|---|---|---|---|---|
| Australia | 50 | '50 | '99 | 1.70 | 0.26 | 1.04 | 2.39 |
| Austria | 51 | '50 | '00 | 1.23 | 0.23 | 0.84 | 1.77 |
| Belgium | 43 | '54 | '96 | 1.19 | 0.46 | 0.57 | 2.15 |
| Bulgaria | 41 | '60 | '00 | 2.95 | 0.99 | 0.80 | 5.07 |
| Canada | 49 | '50 | '98 | 1.80 | 0.52 | 0.99 | 2.70 |
| Chile | 44 | '54 | '99 | 3.32 | 1.23 | 1.75 | 6.60 |
| Colombia | 28 | '51 | '94 | 37.36 | 22.15 | 14.45 | 89.50 |
| Costa Rica | 46 | '55 | '00 | 4.28 | 1.15 | 2.39 | 8.35 |
| Czechosl.CzechR | 48 | '53 | '00 | 1.35 | 0.32 | 0.88 | 2.27 |
| Denmark | 49 | '50 | '98 | 0.89 | 0.32 | 0.39 | 1.45 |
| Dominican Rep. | 25 | '56 | '85 | 5.05 | 1.64 | 2.08 | 9.38 |
| El Salvador | 24 | '50 | '93 | 33.86 | 6.63 | 24.31 | 51.53 |
| Estonia | 8 | '91 | '98 | 20.11 | 5.44 | 10.79 | 28.22 |
| Finland | 51 | '50 | '00 | 2.81 | 0.43 | 1.82 | 3.63 |
| France | 44 | '50 | '99 | 0.95 | 0.16 | 0.70 | 1.32 |
| Germany | 50 | '50 | '99 | 1.12 | 0.13 | 0.86 | 1.39 |
| Greece | 43 | '56 | '98 | 1.06 | 0.43 | 0.51 | 2.74 |
| Hungary | 45 | '55 | '00 | 2.54 | 0.70 | 1.56 | 4.09 |
| Iceland | 48 | '50 | '97 | 0.79 | 0.76 | 0.00 | 3.31 |
| Ireland | 50 | '50 | '99 | 0.60 | 0.32 | 0.18 | 2.00 |
| Israel | 40 | '54 | '98 | 1.27 | 0.60 | 0.12 | 2.43 |
| Italy | 50 | '50 | '99 | 1.49 | 0.45 | 0.81 | 2.84 |
| Japan | 50 | '50 | '99 | 1.28 | 0.55 | 0.55 | 2.37 |
| Luxemburg | 33 | '67 | '00 | 1.36 | 0.72 | 0.25 | 2.91 |
| Mauritius | 33 | '68 | '00 | 2.05 | 1.05 | 0.61 | 6.10 |
| Mexico | 39 | '58 | '00 | 18.88 | 4.97 | 9.78 | 32.28 |
| Netherlands | 50 | '50 | '99 | 0.74 | 0.34 | 0.21 | 1.36 |
| New Zealand | 50 | '50 | '99 | 1.28 | 0.54 | 0.00 | 2.40 |
| Norway | 50 | '50 | '99 | 0.78 | 0.34 | 0.26 | 1.56 |
| Panama | 34 | '54 | '87 | 4.14 | 1.63 | 1.73 | 7.24 |
| Paraguay | 18 | '69 | '87 | 11.71 | 3.56 | 6.54 | 16.60 |
| Philippines | 20 | '57 | '81 | 6.20 | 5.59 | 0.38 | 17.40 |
| Poland | 41 | '55 | '00 | 1.55 | 0.65 | 0.83 | 2.94 |
| Portugal | 48 | '50 | '00 | 1.29 | 0.29 | 0.73 | 1.88 |
| Singapore | 42 | '59 | '00 | 1.76 | 0.53 | 0.57 | 3.02 |
| Spain | 49 | '50 | '99 | 0.62 | 0.34 | 0.06 | 1.18 |
| Sweden | 50 | '50 | '99 | 1.01 | 0.28 | 0.56 | 1.50 |
| Switzerland | 50 | '50 | '99 | 1.04 | 0.38 | 0.54 | 2.84 |
| Thailand | 33 | '55 | '94 | 15.39 | 5.73 | 6.71 | 28.77 |
| Trinidad&Tobago | 30 | '62 | '94 | 6.09 | 2.30 | 2.10 | 11.43 |
| United Kingdom | 51 | '50 | '00 | 0.84 | 0.25 | 0.51 | 1.52 |
| United States | 50 | '50 | '99 | 7.51 | 2.12 | 4.50 | 10.55 |
| Uruguay | 32 | '55 | '90 | 3.81 | 1.00 | 1.99 | 5.68 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Venezuela | 47 | '50 | '00 | 9.75 | 3.62 | 5.02 | 26.35 |
| All Countries | 51 | '50 | '00 | 3.91 | 7.40 | 0.00 | 89.50 |

Table 2: Description of Democracy Indicators and Controls

| Composite Democracy Variable [a] | % |
|---|---|
| Autocratic Regime (base) | 17.1 |
| Transition (in between values) | 24.1 |
| Fully Democratic Regime | 58.8 |
| **Composite Polity Variable (=Democracy-Autocracy) [a]** | |
| Rather Autocratic Regime (base, incl. Foreign Occ.) | 21.7 |
| Rather Democratic Regime | 19.7 |
| Fully Democratic Regime | 58.8 |
| **Competitiveness of Participation [a]** | |
| Unregulated/Suppressed/Restricted Transitional (base) | 19.7 |
| Factional/Transitional | 16.5 |
| Competitive | 63.8 |
| **Executive Recruitment Competition [a]** | |
| Unregulated/Selection (base) | 20.2 |
| Dual/Transitional | 5.6 |
| Election | 74.2 |
| **Executive Constraints [a]** | |
| Unlimited authority (base) | 7.8 |
| Intermediate categories | 25.8 |
| Executive parity or Subordination | 66.4 |
| **Regulation of Participation [a]** | |
| Multiple identity (base) | 12.1 |
| Sectarian or restricted | 24.0 |
| Regulated | 63.9 |
| **Openness of Executive Recruitment [a]** | |
| Unregulated (base) | 5.0 |
| Open | 95.0 |
| **CONTROL VARIABLES** | |
| East Europe | 10.0 |
| Latin America/ Caribbean | 20.1 |
| U.S. | 2.7 |

| | Mean | StdD. | Min/Max |
|---|---|---|---|
| Ln{GDP per capita (mean per country)} [e] | 8.39 | 0.63 | 6.60/ 9.52 |
| Gini coefficient (mean per country) [c] | 35.56 | 8.03 | 22.25/ 55.28 |
| Prosperity (country level) [d] | 0.00 | 7.85 | -18.61/ 12.54 |
| Percent population 15 to 24 years old [b] | 0.16 | 0.03 | 0.11/ 0.24 |
| Years (since 1950) of Regime Stability [a] | 19.19 | 14.19 | 0/ 51 |

[d] Composite variable calculated as {*0.926[Ln(GDP per capita)- Gini]*} at centred values.

[a] Gurr data set, www.cidcm.umd.edu; [b] WHO; [c] Deininger, Klaus & Squire, Lyn. 1999. The World Bank Group. Professor Tryggvi Thor Herbertsson: Gini coefficients for Iceland;

[e] OECD, www.oecd.org.

Table 3: Estimated multilevel effects of composite democracy indicators on national homicide rates (ln) during the second half of the 20th century.

| | Baseline | Democracy | Polity |
|---|---|---|---|
| | Estimated Coefficients | | |
| Time (centred) | **0.0075#** | 0.0041** | 0.0015 |
| | | | |
| Democracy Indicator (base: Autocratic Regime) | | | |
| Transition | | **0.6063#** | |
| Democratic Regime | | **0.3326#** | |
| *Deviance (d.f.=2)* | | *28.4359* | |
| | | | |
| Polity Indicator (base: Rather Autocratic Regime) | | | |
| Rather Democratic Regime | | | **0.4343#** |
| Democratic Regime | | | **0.0610** |
| *Deviance (d.f.=2)* | | | *17.3135* |
| | | | |
| Interactions with Regime Stability since 1950 | | | |
| Transition x Regime Stability | | 0.0046 | |
| Democratic Regime x Regime Stability | | **0.0070*** | |
| Rather Democratic Regime x Regime Stability | | | 0.0089~ |
| Democratic Regime x Regime Stability | | | **0.0093#** |
| *Deviance (d.f.=2)* | | *6.0555* | *11.7929* |
| | | | |
| Controls | | | |
| Percent population 15 to 24 years old | | 3.0874# | 3.1266# |
| Prosperity | | -0.0605# | -0.0447* |
| *Deviance (d.f.=2)* | | *31.0076* | *25.7742* |
| East Europe | | 1.3850# | 1.3951# |
| Latin America/ Caribbean | | 0.9004** | 1.0345# |
| U.S. | | 1.7555# | 1.8118# |
| *Deviance (d.f.=3)* | | *41.1151* | *49.7794* |
| | | | |
| *Total Deviance for all estimated parameters (d.f.)* | *6.8203 (1)* | *156.1102 (10)* | *151.0956 (10)* |
| | | | |
| Intercept | 0.7879# | -0.1624 | -0.0075 |

Note: Models are based on 1,827 observations; d.f.=degrees of freedom.
# p-value<0.005, ** 0.005<=p-value<0.01, * 0.01<=p-value<0.05, ~0.05<=p-value<0.10.

Table 3: Estimated multilevel effects of composite democracy indicators on national homicide rates (ln) during the second half of the 20th century (ctnd).

| | Baseline | Democracy | Polity |
|---|---|---|---|
| | *Estimated Random Variances-Covariances* | | |
| *Random Variances-Covariances between Countries* | | | |
| $\sigma^2_{0}$ (S.E.) | 1.2535 (0.2692) | 0.5660 (0.1413) | 0.6964 (0.1837) |
| $\sigma_{0\,time}$ (S.E.) | -0.0048 (0.0033) | -0.0018 (0.0012) | -0.0017 (0.0010) |
| $\sigma^2_{time}$ (S.E.) | 0.0003 (0.0001) | 0.0001 (0.0000) | 0.0001 (0.0000) |
| *Deviance (d.f.=2)* | *16.9360* | *12.1104* | *10.5895* |
| $\sigma_{0\,transition}$ (S.E.) | | **-0.1616 (0.0698)** | |
| $\sigma_{time\,transition}$ (S.E.) | | **0.0052 (0.0016)** | |
| $\sigma^2_{transition}$ (S.E.) | | **0.2497 (0.0873)** | |
| *Deviance (d.f.=3)* | | *12.3213* | |
| $\sigma_{0\,democratic\,regime}$ (S.E.) | | **-0.1923 (0.0828)** | |
| $\sigma^2_{democratic\,regime}$ (S.E.) | | **0.0867 (0.0563)** | |
| *Deviance (d.f.=2)* | | *5.6693* | |
| $\sigma_{0\,rather\,democratic\,regime}$ (S.E.) | | | **-0.1179 (0.0601)** |
| $\sigma^2_{rather\,democratic\,regime}$ (S.E.) | | | **0.1597 (0.0680)** |
| *Deviance (d.f.=2)* | | | *6.1315* |
| $\sigma_{0\,democratic\,regime}$ (S.E.) | | | **-0.4395 (0.1601)** |
| $\sigma^2_{democratic\,regime}$ (S.E.) | | | **0.4027 (0.1786)** |
| *Deviance (d.f.=2)* | | | *7.7119* |
| *Total Deviance for between countries variance-covariance matrix (d.f.)* | *38.5370 (3)* | *38.1471 (8)* | *39.8276 (7)* |
| *Random Variances-Covariances between Years* | | | |
| $\sigma^2_{0}$ (S.E.) | 0.1838 (0.0094) | 0.1709 (0.0088) | 0.1685 (0.0089) |
| $\sigma_{0\,time}$ (S.E.) | -0.0024 (0.0003) | -0.0021 (0.0003) | -0.0020 (0.0003) |
| $\sigma^2_{time}$ (S.E.) | 0.0002 (0.0001) | 0.0002 (0.0000) | 0.0002 (0.0001) |
| *Deviance (d.f.=2)* | *52.0273* | *47.5252* | *47.7633* |
| *Total Deviance for between years variance-covariance matrix (d.f.=3)* | *869.9456* | *861.8876* | *858.4745* |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.

Table 4: Estimated multilevel effects of individual democracy indicators on national homicide rates (ln) during the second half of the 20th century [1].

| | Competitive-ness of Participat-ion | Executive Recruitment Competition | Executive Constraints |
|---|---|---|---|
| **Estimated Coefficients** | | | |
| Time (centred) | 0.0090[#] | 0.0083[#] | 0.0063[*] |
| | | | |
| **Competitiveness of Participation (base: Unreg./ Suppr./ Restr. Transitional)** | | | |
| Factional/ Transitional | **0.5450[#]** | | |
| Competitive | **0.3126[#]** | | |
| *Deviance (d.f.=2)* | *31.5000* | | |
| | | | |
| **Executive Recruitment Competition (base: Unregulated/ Selection)** | | | |
| Dual/Transitional | | **0.1996[*]** | |
| Election | | **0.3582[#]** | |
| *Deviance (d.f.=2)* | | *13.0564* | |
| | | | |
| **Executive Constraints (base: Unlimited Authority)** | | | |
| Intermediate categories | | | 0.1020 |
| Executive Parity or Subordination | | | **0.4479[#]** |
| *Deviance (d.f.=2)* | | | *35.6429* |
| | | | |
| **Controls** | | | |
| Percent population 15 to 24 yrs | 3.4667[#] | 3.4412[#] | 3.3666[#] |
| Prosperity | -0.0806[#] | -0.0823[#] | -0.0875[#] |
| *Deviance (d.f.=2)* | *42.7411* | *43.3872* | *41.5016* |
| East Europe | 1.4765[#] | 1.5434[#] | 1.7065[#] |
| Latin America/ Caribbean | 0.6079[~] | 0.6414[~] | 0.7629[*] |
| U.S. | 1.7949[**] | 1.7239[#] | 1.6946[*] |
| *Deviance (d.f.=3)* | *29.6649* | *66.7984* | *34.3770* |
| | | | |
| *Total Deviance for all estimated parameters (d.f.=8)* | *156.3229* | *145.8184* | *146.1843* |
| | | | |
| Intercept | 0.0386 | 0.0449 | -0.0597 |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.
[#] p-value<0.005, [**] 0.005<=p-value<0.01, [*] 0.01<=p-value<0.05, [~] 0.056=p-value<0.10.

Table 4: Estimated effects of individual democracy indicators on national homicide rates (ln) during the second half of the 20th century [1] (ctnd).

| | Competitive-ness of Participation | Executive Recruitment Competition | Executive Constraints |
|---|---|---|---|
| **Estimated Variances-Covariances** | | | |
| *Random Variances-Covariances between Countries* | | | |
| $\sigma_0^2$ (S.E.) | 0.4519 (0.1007) | 0.6533 (0.1858) | 0.4787 (0.1059) |
| $\sigma_{0\ time}$ (S.E.) | -0.0019 (0.0015) | -0.0010 (0.0013) | 0.0005 (0.0018) |
| $\sigma^2_{time}$ (S.E.) | 0.0001 (0.0000) | 0.0001 (0.0000) | 0.0002 (0.0001) |
| *Deviance (d.f.=2)* | *13.3663* | *12.6237* | *15.9954* |
| $\sigma_{0\ factional/\ transitional}$ (S.E.) | **-0.1663 (0.0800)** | | |
| $\sigma_{time\ factional/\ transitional}$ (S.E.) | **0.0048 (0.0017)** | | |
| $\sigma^2_{factional/\ transitional}$ (S.E.) | **0.2433 (0.0928)** | | |
| *Deviance (d.f.=3)* | *9.3407* | | |
| $\sigma_{0\ election}$ (S.E.) | | **-0.2577 (0.1140)** | |
| $\sigma^2_{election}$ (S.E.) | | **0.2043 (0.0858)** | |
| *Deviance (d.f.=2)* | | *6.0473* | |
| $\sigma_{0\ intermediate}$ (S.E.) | | | -0.0442 (0.0438) |
| $\sigma_{time\ intermediate}$ (S.E.) | | | **-0.0026 (0.0011)** |
| $\sigma^2_{intermediate}$ (S.E.) | | | **0.0327 (0.0250)** |
| *Deviance (d.f.=3)* | | | *6.6149* |
| *Total Deviance for between countries variance-covariance matrix (d.f.)* | *37.9671 (6)* | *38.9347 (5)* | *37.8991 (6)* |
| *Random Variances-Covariances between Years* | | | |
| $\sigma_0^2$ (S.E.) | 0.1735 (0.0089) | 0.1717 (0.0089) | 0.1771 (0.0091) |
| $\sigma_{0\ time}$ (S.E.) | -0.0022 (0.0003) | -0.0022 (0.0003) | -0.0022 (0.0003) |
| $\sigma^2_{time}$ (S.E.) | 0.0002 (0.0000) | 0.0002 (0.0000) | 0.0002 (0.0000) |
| *Deviance (d.f.=2)* | *49.1819* | *50.3286* | *50.1897* |
| *Total Deviance for between years variance-covariance matrix (d.f.=3)* | *864.3272* | *862.9291* | *864.2292* |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.

Table 5: Estimated multilevel effects of individual democracy indicators on the natural logarithm of national homicide rates during the second half of the 20th century across the world [2].

| | Regulation of Participation | Openness of Executive Recruitment |
|---|---|---|
| **Estimated Coefficients** | | |
| Time (centred) | 0.0058* | 0.0077** |
| | | |
| Regulation of Participation (base: Multiple Identity) | | |
| Sectarian/ Restricted | **-0.2052***| |
| Regulated | **-0.1680˜** | |
| *Deviance (d.f.=2)* | *5.7912* | |
| | | |
| Openness of Executive Recruitment (base: Unregulated) | | |
| Open | | **0.2393#** |
| *Deviance (d.f.=1)* | | *12.7609* |
| | | |
| Controls | | |
| Percent population 15 to 24 years old | 3.1457# | 3.3305# |
| Prosperity | -0.0504# | -0.0755# |
| *Deviance (d.f.=2)* | *28.3866* | *37.2637* |
| East Europe | 1.1878# | 1.3388# |
| Latin America/ Caribbean | 1.0140# | 0.8388* |
| U.S. | 1.8457# | 1.7657** |
| *Deviance (d.f.=3)* | *47.7239* | *29.5360* |
| | | |
| *Total Deviance for all estimated parameters (d.f.)* | *128.8822 (8)* | *132.9383 (7)* |
| | | |
| Intercept | 0.4685# | 0.0603 |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.
# p-value<0.005, ** 0.005<=p-value<0.01, * 0.01<=p-value<0.05, ˜ 0.058=p-value<0.10.

Table 5: Estimated effects of individual democracy indicators on the natural logarithm of national homicide rates during the second half of the 20th century across the world [2] (continued).

| | Competitive-ness of Participation | Executive Recruitment Competition |
|---|---|---|
| Estimated Variances-Covariances | | |
| *Random Variances-Covariances between Countries* | | |
| $\sigma_0^2$ (S.E.) | 0.5716 (0.1456) | 0.4075 (0.0885) |
| $\sigma_{0\text{ time}}$ (S.E.) | 0.0013 (0.0025) | 0.0012 (0.0019) |
| $\sigma^2_{\text{ time}}$ (S.E.) | 0.0003 (0.0001) | 0.0003 (0.0001) |
| *Deviance (d.f.=2)* | *15.8721* | *16.9621* |
| $\sigma_{0\text{ sectarian/ restricted}}$ (S.E.) | -0.0301 (0.0498) | |
| $\sigma^2_{\text{ sectarian/ restricted}}$ (S.E.) | **0.1070 (0.0557)** | |
| *Deviance (d.f.=2)* | *4.0496* | |
| $\sigma_{0\text{ regulated}}$ (S.E.) | -0.2198 (0.0865) | |
| $\sigma_{\text{time regulated}}$ (S.E.) | **-0.0047 (0.0020)** | |
| $\sigma^2_{\text{ regulated}}$ (S.E.) | **0.1368 (0.0646)** | |
| *Deviance (d.f.=3)* | *15.0607* | |
| *Total Deviance for between countries variance-covariance matrix (d.f.)* | *41.2650 (8)* | *38.1819 (3)* |
| | | |
| *Random Variances-Covariances between Years* | | |
| $\sigma_0^2$ (S.E.) | 0.1771 (0.0091) | 0.1840 (0.0093) |
| $\sigma_{0\text{ time}}$ (S.E.) | -0.0023 (0.0003) | -0.0024 (0.0003) |
| $\sigma^2_{\text{ time}}$ (S.E.) | 0.0002 (0.0000) | 0.0002 (0.0000) |
| *Deviance (d.f.=2)* | *52.0416* | *52.0698* |
| | | |
| *Total Deviance for between years variance-covariance matrix (d.f.=3)* | *860.4821* | *870.1646* |

Note: Models are based on 1,827 observations.
d.f.=degrees of freedom.