Political Institutions and Human Development

Does Democracy Fulfill its 'Constructive' and 'Instrumental' Role?

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Abstract

Institutions are a major field of interest in the study of development processes. We contribute to this discussion concentrating our research on political institutions and their effect on the non-income dimensions of human development. First, we elaborate a theoretical argument why and under what conditions democracies compared to autocratic political systems might perform better with regards to the provision of public goods. Due to higher redistributive concerns matched to the needs of the population democracies should show a higher level of human development. In the following we analyze whether our theoretical expectations are supported by empirical facts. We perform a static panel analysis over the period of 1970 to 2003. The model confirms that living in a democratic system positively affects human development measured by life expectancy and literacy rates even controlling for GDP. By analyzing interaction effects we find that the performance of democracy is rather independent of the circumstances. However, democracy leads to more redistribution in favor of health provision in more unequal societies.

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1 Introduction

Since Sen (1983, 1988, 1991, 1999, 2000, 2003 etc.) we are aware that development is a very encompassing and broad concept. Development as a whole depends on each individual's capabilities. Capabilities define the freedoms to choose a valuable life in accordance with individual preferences. This approach inspired the emergence of the pluralist and integrative conception of "human development" and the operationalization in form of UNDP's Human Development Index. It is not only income but also health and education that enable people to shape their life in line with their desires. The aim of this paper is to discuss the contribution that can be made by political institutions to enhance human development.

Political institutions are an appealing topic of research as they organize social, economic and political life. Hence, it is not surprising to ask what kinds of institutions do this job best. From an ideological perspective democracy seems to be the right political system because at the end of the day the people are politically free and those who decide. Therefore democracy is also considered as an end of the development process and a piece of the puzzle of the more comprehensive picture of human development (Sen 1999a: 147-159, Sen 1999b, Sen 2000: 23). But whether democracy[1] has a positive impact on economic and human development is not a trivial question - neither from a theoretical nor from an empirical perspective. For this reason, it is worth to ask this question. Moreover, it seems to be a necessary question in the light of a, besides religious cleavages, world-wide separation into democracies and autocracies and observable autocratization tendencies.

[1] Democracy is conceived as a political system whose structures and procedures permit the rule of the people. Of importance are free and repeated elections, political competition, rule of law, political and civil liberties. These component parts frame public debate and deliberation that deal with the management of society.

Regarding theory, three major debates circle around the instrumental value of democracy for economic development:

First, there is the controversy about the contradictory effects of property rights protection and redistribution in a democracy on growth and well-being. There might be a trade-off between growth-enhancing property rights protection and equalizing, market-correcting redistribution. On the one hand, property rights protection is a necessary condition for an increase in the overall wealth of a nation (Acemoglu/Johnson/Robinson 2001, 2002). But whether all can benefit depends on redistribution as well. On the other hand, one can think of the probably adverse effects of redistribution on the savings rate, growth and the labour market and the related effects on the overall living standard of the population including non-income human development. Moreover, in democracy corporatism may lead to lock-in effects and decreasing reform capacity. This together with the fact that elites in democracies tend to produce inefficient policies supports positions like the Lee-Hypothesis[2] which state that autocratic regimes are the more efficient systems to tackle market failures, stimulate economic growth and as a consequence improve human development (Alesina/Rodrik 1994, Barro 1996, Acemoglu/Robinson 2008).

A second debate relates to causation. The causal direction is not clear: Is democracy cause or consequence of the development process? Third and linked to this second point are discussions that focus on factors that impede or foster democratic system to work well. It is not obvious under what conditions democracies will display a positive effect - if they are supposed to have one. Candidates of these enhancing or impeding factors are the level of economic development itself, inequality, country-specific and historical factors, education and social fragmentation (Lipset 1959, Barro 1999, Alesina/Baqir/Easterly 1999, Bourguignon/Verdier 2000, Acemoglu/Johnson/Robinson 2005, Alesina/Ferrara 2005, Acemoglu/Robinson/Yared 2007, Acemoglu/Johnson/Robinson/

[2] The hypothesis that authoritarian rule is beneficial to economic growth is named after the former president of Singapore Lee Kuan Yew (Sen 1999b: 5).

Yared 2008, Acemoglu/Robinson 2008, Miguel/Gugerty 2005, Keefer/Khemani 2005, Collier 2001: 137).

Research studies give no clear answer. Persson and Tabellini (2006) and Rodrik and Wacziarg (2005) show that for the case of economic growth the efficiency argument in favour of autocratic regimes does not withstand empirical investigations. Others, on the contrary, find a moderately negative or nonlinear relationship between democracy and growth (Barro 1996, Tavares/Wacziarg 2001, Minier 1998). When studies center on redistribution, i.e. the effect of political systems on income inequality or on the provision of public goods and the size of the public sector, the picture seems to be clearer (Boix 2001, Gradstein/Milanovic 2004, Persson 2002, Stasavage 2005, Persson/Roland/ Tabellini 2000). In general, they support the view that redistribution might be higher under a democratic regime. But if this is the case, the question still remains whether this redistribution is beneficial to economic and non-income human development.

For the non-income dimensions of human development there again is uncertainty about the effects of democracy. There are only a very few studies empirically investigating the links between political systems and measures for the non-income dimensions of human development. Whereas some find a positive relationship between democracy and human development (Besley/Kudamatsu 2006, Franco/Álvarez-Dardet/Ruiz 2004, Tsai 2006), others find less evidence for this influence (Ross 2006). These research efforts are either confined to the subsample of developing countries (Tsai 2006), to only one of the non-income dimensions of human development (Besley/Kudamatsu 2006, Franco/ Álvarez-Dardet/Ruiz 2004, Ross 2006) or to a cross-sectional focus leaving out developments over time (Tsai 2006, Franco/Álvarez-Dardet/Ruiz 2004). Moreover, the investigations, while having in mind conditions influencing democracy's performance, only include these requisites as simple controls in their regression models and not interacted with some institutional measure.

Our paper does not claim to answer all these questions, theoretically and empirically. What we want to do is to extend the latter strand of research in the following ways:

First, we theoretically discuss why we believe democracy has a positive impact on human development. Linked to this is the question whether democracies besides their intrinsic importance for the developmental process fulfill a constructive and instrumental role giving people the opportunity to express, to form and aggregate their preferences and thus to steer public action in an efficient and effective manner (Sen 1999: 157). Particularly, we base our argumentation on the redistributive side including public goods provision and not the property rights side of democracy. We argue that with respect to the quantitative as well as the qualitative dimension of redistribution and public goods provision democracy performs better than an otherwise equal autocracy; thereby we rely on implications of the median voter theory and arguments made by Sen. Although redistribution often is seen as a disturbing factor leading to inefficiencies we want to clarify why it is redistribution in democracies that makes a difference in non-income human development outcomes compared to autocratic regimes. We also empirically try to find evidence on whether living in a democratic or autocratic political system makes a difference for the level of education and health that we take as proxies for non-income human development, keeping in mind that questions of causality are hard to tackle.

Second, we theoretically identify and empirically investigate the prerequisites for the functioning of democracy with respect to the provision of public goods and services that foster human development.[3] This allows us to account for heterogeneity in human development over democratic regimes.

Third, we include the time dimension of the data and all countries on that data is available into our empirical analysis to fully exploit all the information which is available in the data.

[3] Consequently, we do not try to explain democratization but the dependence of democracy's performance upon other factors once it is in place.

In the next section 2, we want to clarify why redistribution is the major angle in investigating the relationship between political institutions and human development. Furthermore, we point out why there should be quantitatively more and qualitatively better redistribution in democracies. Then we discuss why this might only be true if certain other factors are present like a certain level of education, economic development, inequality or unity in the people. In section 3 we examine whether there is empirical evidence for this relationship. First, we estimate the distribution of life expectancy and literacy for selected years. Second, we perform a panel analysis of a more sophisticated model including interaction effects between democracy and the main determinants of its functioning.

Our results indicate that democracy is good for human development even controlling for the level of economic development. But, except from inequality, democracy's performance - in terms of an improvement in human development -, contrary to theoretical reasoning seems not to depend on the other factors that are highlighted by the literature. It is democracy itself - rather independent from the circumstances - which has a positive effect on human development. While this result is encouraging for low-income democracies, it also leaves some questions for future research.

2 The Political Economy of Democracy and Human Development

The following remarks serve to clarify the relationship between political institutions and human development. Recurrence on institutionalist theories provides a link from political institutions to the living standard of the population. This link is given by the policies an institutional system produces. Of major importance are redistributive policies. The median voter theory predicts that democratic systems are characterized

by a higher level of redistribution than autocracies. Consequently, the median voter theory gives insights into the quantitative dimension of redistribution. Arguments made by Amartya Sen permit to extend the median voter theory by stating that democratic institutions make redistribution more responsive to the needs of the society, i.e. that redistribution translates into a public spending for transfers, goods and services that increase the wealth of the society. Therefore, Sen's contribution captures the qualitative part of redistribution. To complete our theoretical discussion we address the issue that the fulfillment of the predictions made by the median voter theory and Sen depends on several requisites that influence democracy's performance.

2.1 How can political institutions influence human development?

Institutions attract a lot of attention in the mostly, interdisciplinary study of the differences in the wealth of nations. Questions range from institutional effects on the one-dimensional perspective of economic development to the multidimensional one of human development. However, there still seems to be a bias towards the economic side of the coin (Knack/Keefer 1995, Hall/Jones 1999, Acemoglu/Johnson/Robinson 2001, Acemoglu/Johnson/Robinson 2002, La Porta et al. 2004).[4] This reflects the probably justified preference for the economy as the major driver of the development process and the resulting focus on the property rights angle of institutions. We, on the contrary, want to complete this picture and center on the redistributive side of institutions and the non-monetary components of human development.

With regards to institutions, the existing literature leaves the impression that there is not enough precision about the term "institution" itself. There is a big use of per-

[4] A famous controversy in this context is the Geography vs. Institutions debate in the explanation and prediction of economic development.

formance indicators measuring how certain institutional systems function, e.g. when it comes to political stability or governance issues (Gradstein/Milanovic 2004: 516).[5] Such performance indicators then are often mixed up with public policies. But, the performance and the policies together are the outputs of underlying structures and procedures as well as contextual factors. These underlying (formal) structures and procedures can be subsumed under the heading political system. This is what we understand under political institutions.

According to the rational choice strand of the new institutionalism in political science or the field of new institutional economics and political economy, political institutions are the rules which govern the political game (e.g. Peters 1999, Hall/Taylor 1996, Persson/Tabellini 2000). They not only determine via electoral rules which actors and preferences can access the political arena and get heard. They also provide the means to aggregate those preferences by establishing procedures for decision-making and distributing political power, i.e. the right to decide (Persson 2002: 886). The common output of institutions and preferences are policies. Although actors and other environmental constellations may change over time, policies in general will reflect the political institutions that produced them (Persson/Tabellini 2006: 321, Peters 1999). We will distinguish between two types of policies that may be favorable to human development: policies for the protection of property rights and policies for redistribution. Policies for the protection of property rights encourage economic investment and contribute to economic development and economic growth (e.g. Acemoglu/Johnson/Robinson 2002). Growth is assumed, under certain conditions, to increase the welfare of the population by reducing poverty (Klasen 2004). Policies for redistribution have an equalizing impact on the distribution of wealth in a society. Especially through broad-based programs and the provision of public goods and services, market failures shall be compensated

[5] See for example the Worldwide Governance Indicators (Kaufmann/Krayy/Mastruzzi 2007).

and normative, social optima be arrived. The matching of society's and individual needs with an adequate redistribution scheme and an appropriate public provision of goods and services provides the link between political institutions and human development. That is what we mean by redistribution. Of course, one might argue, that there might be a trade-off between growth-enhancing property rights protection and equalizing, market-correcting redistribution. Nevertheless, the focus of this paper will be on policies with redistributing character which aim at better health and education for the population as a whole and especially for those groups - the poor - having otherwise disadvantaged access to these goods as they are not sufficiently provided by markets. If we assume that via these channels policies affect the level of human development, if we especially focus on redistributive policies and moreover, if policies mirror the political system in which society is steered according to certain political decisions, then the following question emerges: What political systems are more appropriate to produce market-correcting redistributive policies that likewise match the needs of the society and therefore advance human development?

The answer is democracy. Democracy is conceived as a political system whose structures and procedures permit the rule of the people. Of importance are free and repeated elections, political competition, rule of law, political and civil liberties. These component parts frame public debate and deliberation that deal with the management of society. Carrying forward our reasoning, democratic political systems are assumed to be the most appropriate systems to ensure a redistribution that fulfils societal demands.[6] Although redistribution from the rich to the poor and vice versa exists in both autocratic and democratic systems, the following theoretical arguments make us believe that redistribution from the rich to the poor is more pronounced and at a higher level

[6] Democracies are considered to perform best on both dimensions: property rights protection and redistribution. Whether the one or the other is more important depends on people's preferences and the formal and informal face of the considered democracy.

in democracies.[7] One of the most famous theoretical arguments is the model of Meltzer and Richard (1981). The median-voter hypothesis states that in democratic governments the median voter is the decisive voter. The more his income falls short of the average income of all voters, the higher the tax rate, i.e. redistribution he will decide. Therefore government spending should be larger and social services more extensive in democratic regimes - if the majority of the voting public lives at the bottom of the income distribution and only a small part enjoys richness (Keefer/Khemani 2005: 2). In contrast, in authoritarian systems the distribution of wealth does not play a decisive role. All or a substantial part of the electorate is excluded from the decision-making process, and this precisely to avoid the redistributive consequences of democracy. As a result the size of the public sector on average remains small (Boix 2001: 2), although there might be examples of autocracies with relatively large public sectors such as Cuba and Venezuela. As mentioned later, autocrats implement redistributive policies not because of institutional structures but either due to ideological reasons and/or only to the level that serves them to remain in power and to increase their own wealth.

The fact that there is more redistribution in democratic regimes does not mean that the redistribution is aligned with societal demands. That means voting alone does not help to solve the aggregation problem resulting from different individual preferences. Thus, a second question relating to the qualitative dimension of redistribution emerges: Why are democratic governments compared to autocratic ones more responsive to the needs of the citizenry? Talking with Sen (1999a: 157, 1999b), democracy - behind its "intrinsic" value - is of eminent importance for the process of development because of the "constructive" and "instrumental" role it plays in the formation and aggregation of values, needs and preferences and their translation into well-designed policies benefiting the society. Political and civil liberties - for example those relating to free speech,

[7] See for example Gradstein and Milanovic (2004) for an empirical study finding evidence for this linkage.

public debate and criticism, as constituent parts of a democratic regime - permit the formation of preferences and values as well as access to the relevant information. Consequently a better understanding of societal needs is possible. Democratic procedures then facilitate the transmission of these needs into the political arena where decision power is distributed amongst legitimate representatives of the society as a whole. The latter means that otherwise disadvantaged groups, whether they are minorities or only a broad mass of poor people in a developing country, get a voice and the opportunity to be heard and represented. In cases of direct democracy or democracy at the local level they even decide themselves.

But, in the "pursuit of political objectivity" and through the facilitation of "public reasoning", democracy not only helps to construct policies that are matched to the needs of the citizens (Sen 2004: 9). It is also instrumental and protective because control mechanisms like free and repeated, competitive elections and the compliance with the rule of law principle reduce discretionary and corrupt behavior of those representatives who hold political power. Democracy provides the incentives to create responsibility and accountability that induce political-administrative leaders to listen and to act on behalf of the society they represent (Sen 1999a: 147ff., Sen 1999b: 9f.). In an autocratic regime the usually small, ruling elite dictates the will of the people from above. This is frequently accompanied by the repression of the political opposition and the prohibition of free expression and opinion impeding the conceptualization of the volonté générale. The state apparatus is (mis-)used in favor of the welfare of the ruling elite. Political measures with redistributing character increasing the welfare of the bottom quintile of society are only implemented if they assure political power to the autocratic leaders and/or increase their welfare (Olson 1993, McGuire/Olson 1996). Responsiveness, representation, accountability and the selection of competent political and administrative staff thus are uncommon in autocratic regimes (Besley/Kudamatsu 2006:313f.). Sum-

marizing, whereas democracies quantitatively and qualitatively perform better than autocracies in terms of redistribution that in our terminology encompasses the public provision of goods and services, there is no clear relation between inequality and societal needs on the one hand and redistribution on the other in autocracies. In general this leads to a lower level of human development in autocratic systems.

2.2 What determines public service provision especially in democracies?

The formal existence of democracy does not guarantee that it functions in the idealized manner described above. Democratic regimes might display a lot of heterogeneity concerning the benefits for human development. This is the case when certain factors impede or enable that the relationships predicted by the median voter theory or Sen's theory can be observed. These factors then hamper or foster the performance of democracy with regards to the satisfaction of societal needs. Problems could arise if for certain reasons - located either at the agenda setting, the policy formulation, the implementation or evaluation phase - the allocation of public expenditures is inefficient.[8] What are the reasons for an ineffective allocation of public resources especially in democracies? Or more general, what are those factors that change the operation of a democratic regime either in a positive or in a negative direction?

Our approach to explain heterogeneity in democracies' performance follows the one from Keefer and Khemani (2005) and hence differs from other studies that focus on the pre-conditions for democracy or democratization (e.g. Lipset 1959, Glaeser/Ponzetto/ Shleifer 2007). We do not consider the question whether a country has to be prepared for democracy or whether it is democracy which lifts the country up to a certain level

[8] Because poor people are highly dependent on public action as they cannot invest their own (nonexistent) private resources, they suffer the most from ineffective government in terms of redistribution and service provision (Keefer/Khemani 2005: 1).

of development.[9] Following our theoretical reasoning, the necessary timing of the presence of the respective factors is treated here as simultaneous. Their interaction with democracy at one point in time influences the output, the policies in form of public goods' provision, and the outcome, the level of human development.

First, as redistribution and the provision of public goods depends upon the fact whether there is something to redistribute and to invest in public good the performance of democratic system will be the better the higher the level of economic development. So the positive effect of democracies on public goods provision will be intensifed by the level of economic development.

Second, imperfect information of the citizens may lead to insufficient participation that is necessary for public reasoning and 'qualified' needs' expression. As a result the quality of responsive government manifesting itself in policies that reflect society's demands and needs decreases. Moreover, accountability suffers from information constraints because voters cannot control politicians' behavior. Education[10] is one of the important factors[11] having the potential to alleviate the information problem. Education in this context is not taken as an intrinsic component of human development that we want to explain, but as a means to human development. It is not only in itself a precondition for a higher living standard because it positively affects earnings, health

[9] In contrast to Sen (1999: 4) we do not follow his statement "A country does not have to be deemed fit for democracy; rather, it has to become fit through democracy." It is certainly a question of point of view to answer this question in the one or the other direction.

[10] We leave out cultural factors here because they are hard to measure. Inglehart and Welzel (2005) emphasize people's values as equally important as socioeconomic resources and civil and political rights. According to them, culture provides the link between economic development and democratic freedom. Without certain values like "human autonomy" or "self-expression values", fostering a priority on self-made choices human development might not be possible (Inglehart/Welzel 2005: 286f). Moreover such values are dependent upon a certain level of socioeconomic development. We assume, although this is to be questioned, that the more education people have the more enlightened they are and the more freedom they demand to live the life they value.

[11] Other factors might be a well developed media sector and accountable and institutionalized parties that overtake political education tasks (see Keefer/Khemani 2005: 5-9). But it can easily be argued that without education a media sector will not develop because of missing demand (for the role of the media see Besley and Burgess (2002)). The same is supposed to hold for the institutionalization of parties and the accountability issues.

and so on. It is also found to be a requirement for democracies to develop and to persist. Moreover one can suppose that education leading to conscientious participation raises the quality of democracy. The latter may come to the fore in a more efficient and effective provision of public goods (Lipset 1959, Glaeser/Ponzetto/Shleifer 2007, Keefer/Khemani 2005: 5-9).

Social fragmentation can be another factor disturbing the functioning of a democratic system measured by the public goods it provides. Research has found that social fragmentation or more concretely ethnic diversity leads to collective action problems, increased patronage as well as clientelism and in the end to an under-provision of public goods (Alesina/Baqir/Easterly 1999, Alesina/Ferrara 2005, Miguel/Gugerty 2005). For democratic systems social fragmentation may pose problems because mechanisms to hold the government accountable and responsible are undermined. In socially heterogeneous settings, governments are rewarded on basis of identity and not governmental performance (Keefer/Khemani 2005: 10). Moreover social fragmentation leads to political fragmentation that from a certain threshold value can result in increasing co-operation problems (Collier 2001: 137).

The last factor that is the one in line with the quantity-redistribution argument is income inequality characterized by a distribution of income where the median income is a lot smaller than the average income.[12] Hence, the majority of people live at the lower bound of the distribution whereas only a few benefit from being rich. The reasoning behind the effects of inequality on human development can be twofold. First, such income inequality can induce inequalities in human development because in more unequal societies more people cannot afford to live a healthy life and to spend on education. This effect should even be higher in autocracies where service provision according to our

[12] The argument, that the median voter is farther away from the mean when a society is more unequal, is true for right-skewed distributions. This is usually the case for the national income distributions, which are quite close to log-normal distributions.

argumentation does not function well. Democratic political systems should compensate the negative effect of income inequality. The higher the income inequality is the larger is the distance of the median voter's income to the average income. Following the median voter hypothesis, more redistribution will be demanded. Thus, with higher income inequality the redistribution effect of democracy increases. Public service provision will be at a higher level that may result in better human development outcomes.

2.3 Summary and Working Hypotheses

Summarizing the theoretical arguments above, democratic regimes in comparison to autocratic ones are expected to lead to higher redistribution and thus higher public expenditures. Additionally, public spending priorities in democracies reflect the needs of the society more than in autocracies. Execution of public budgets will be in those sectors where public demand is most obvious. Moreover, democratic control mechanisms will assure the implementation of policies so that a high degree of compliance with laws, directives and orders is reached. Hence, public action can translate into the wished human development outcomes, for example a better health status of the population or a lower illiteracy rate. But the performance of democracies will vary according to the specific circumstances. We assume that the level of income, education, social fragmentation and the level of income inequality affect the level of the provision of public goods and human development in a democratic system. Therefore the following general hypotheses can be derived:

a) Democratic political systems will yield better results in human development than autocracies and this independently from the level of economic development.

b) The positive effect of democracies on public goods provision will be intensified by the level of economic development. When there is nothing to redistribute, public

goods provision will be disturbed.

c) Education has a positive effect on the performance of democracy. Therefore the positive effect of democracy on human development will be higher the higher the level of education in a society.

d) Social fragmentation lowers the positive impact of democracies on human development. The more socially diverse a country is the more difficult it is to provide broad-based services even in democracies.

e) The redistribution effect of democracy compensates the negative effect of income inequality on human development. Furthermore, the higher the level of inequality and the more right skewed the distribution of income is, the bigger is the positive effect of democracy on human development.

3 Empirical Links between Democracy and Human Development

Does our theoretical argumentation withstand empirical evidence? In the next paragraphs, we present the data and variables we use as well as our empirical analysis. We rely descriptive statistics like kernel density estimates and a more sophisticated panel analysis.

3.1 Empirical Implementation

To quantify human development we focus on the non-income components of UNDP's Human Development Index and consequently use UNDP's data on life expectancy and literacy. Life expectancy is measured in years and literacy is an index value ranging

from 0 to 100. We choose education and health as both are direct determinants of capabilities and influence the freedom to choose the kind of life one likes. Education as well as health raises productivity and the ability to convert income and resources into the favored way of life (Sen 2003: 55). The third dimension of human development, namely income, is not of interest for this paper, since there is much work on the relation between democracy and economic development already available. Our data on political institutions, especially democracy comes from the Polity IV Project of the Center for International Development and Conflict Management at the University of Maryland. This dataset includes the Polity2 score ranging from 10 (highly democratic) to -10 (highly autocratic), while a zero score indicates a state between autocracy and democracy which we consider as not democratic.[13] Following Besley and Kudamatsu (2006) we calculate the fraction of democratic years over the past five years as our measure for democracy. The consideration of a period of five years captures the effect of democratic experience and reduces the uncertainty concerning the length of the delay until a change in the political system affects human development.

Other variables that we expect to have an impact on human development or that describe possible conditions under which democracy affects human development are the following: GDP per capita PPP in constant prices[14] from the Penn World Tables 6.2; Gini coefficients[15] from the WIDER dataset with improvements in terms of comparability across countries and across time by Grün and Klasen (2008); a measure of ethnic

[13] According to the Polity2 measure, a system can be classified as democratic if three interdependent elements exists: 1) competitiveness of participation, institutions and procedures allow citizens to express their political preferences; 2) openness and competitiveness of executive recruitment and constraints on the chief executive, so that the executive power is institutionally constraint; 3) civil liberties. The last element as well as rule of law, system of checks and balances, freedom of the press etc. is not coded in the index as the latter are performance indicators of democratic regimes. Autocracies are defined vice versa. For more details see Marshall and Jaggers (2005: 13f.).

[14] US$, base year: 2000.

[15] Gini coefficients are not available for every year. We therefore use a simple moving average between available observations to complete the dataset.

fractionalization[16] as proxy for social fragmentation from Alesina et al. (2003) which is constant over time[17]. Since education is also a factor influencing the performance of democracy, literacy rates are also used as an explanatory variable in our panel analysis for life expectancy. As control variables we consider as most important whether a country experienced some conflict in the period under observation and whether the population suffers from HIV/AIDS. To measure war we take data from the UCDP/PRIO intrastate conflict onset dataset, 1946-2006. We choose the variable warinci2 that measures the incidence of intrastate war and is coded 1 in all country years with at least one active war.[18] For HIV/AIDS we take HIV/AIDS adult infections prevalence rates estimated by UNAIDS. Data coverage over time and countries leads us to the decision to create a variable that is one when a country has a prevalence rate over 10 per cent in the year 1999. Taking the availability of all variables as criteria, we decide to analyze the period from 1970 to 2003, though some of the variables are available for longer time spans.

Unfortunately, the available data on public expenditures were not sufficient for our purposes. Such data would have enriched our analysis as we could have examined the channels that democracy takes to affect human development. We suspect that democracy causes different priorities in public expenditures compared to autocracies. Therefore increases in public expenditures on health and education can be decomposed into two components: An increase due to higher total expenditures and an increase due to different priorities in government spending. While the first source is mainly driven

[16] The ethnic fractionalization measure renders the probability that two individuals selected at random from a population are members of different groups. It is calculated with data on language and race using the following formula $FRAC_j = 1 - \sum_{i=1}^{N} s_{ij}^2$, where s_{ij} is the proportion of group $i = 1, \ldots, N$ in country j going from complete homogeneity (an index of 0) to complete heterogeneity (in index of 1). For more details see Alesina et al. (2003: 159f.).

[17] According to Alesina et al. (2003: 160f) the assumption of stable group shares is not a problem, as examples of changes in ethnic fractionalization are rare. At least over the time-horizon of 20 to 30 years time persistence can be assumed.

[18] War is defined by more than 1000 battle deaths. As intrastate wars are more frequent than interstate wars we decide to take the intrastate war variable.

by economic growth, we expect democracy to be a main driver of the second source. As mentioned, we were unable to gather good data for relative government spending for the given period. Only for more recent years the Government Finance Statistics of the IMF include sufficient information on these issues.

Neither the public expenditures' path of causation nor the channel of private spending can be investigated here due to data restrictions. We presume that increases of private expenditures on health or education can be decomposed into increases of income and increases due to different priorities as well. There are different possible explanations for changes in priorities: It certainly plays a crucial role how much income remains after the satisfaction of basic requirements such as housing and nourishment. Moreover a high level of education might foster expenditures on health and education, and additionally the returns of health and education spending partly determine the level of the spending. Without sufficient expenditure data, we must rely on the use of proxies like income itself or literacy and on the theoretical argumentation that underpins our empirical analysis.

3.2 Descriptive statistics

First, it is worthwhile to take a look at the densities of life expectancy and literacy for democracies and autocracies separately (Figures 1 and 2). We use kernel density estimators for this purpose and apply boundary corrections at 0 and 100 in the case of the literacy rate and at the minimum and maximum values in the case of the life expectancy. While for democracies both for life expectancy and literacy the mass of the distribution tends to the right hand side, there seems to be a group of autocracies with a low level and another one with a high level of life expectancy and literacy each. The same pattern can be observed in Tables 7 to 14 in the appendix where we classified countries according to three categories: low, middle and high income; autocracy and

democracy; low, middle and high life expectancy or literacy rates.[19]. On average we observe that democracies have a higher life expectancy and a higher literacy rate than autocracies. Exceptions are democracies with low life expectancies. This is mainly due to the HIV/AIDS tragedy in big parts of Sub-Saharan Africa or to the fact that there are no economic means to provide public goods or to redistribute in such democratic countries. Considering the rich group of autocracies especially in 2000, it is striking that virtually all of them are oil states. This indicates, at least to some extent, that autocracies have problems to catch up with the top of the income distribution, as long as they do not control a large amount of such an important resource as oil. But what is more important for our study is the fact that although these countries show a high level of income whether caused by natural resources or not, they display lower life expectancies and literacy rates than their democratic counterparts.

3.3 Panel Analysis

In a simple model we try to explain life expectancy and literacy with our measure of democracy controlling for GDP and a set of dummies for global regions and time. GDP is lagged for one period to reduce the apparent problem of endogeneity. Additionally to the measures of democracy and economic development we include step by step the literacy rate as a proxy of the population's ability to articulate their needs in the political arena, to control politicians' activities and as a proxy of the people's priority for private spending on education and health. We as well lag literacy for one period to reduce endogeneity problems. We only include education and its interaction with democracy in the model with life expectancy as dependent variable. In line with our theoretical reasoning, we incorporate the Gini coefficient to measure the effect of income

[19] To define the groups of low, middle and high life expectancy or literacy rates we computed quantiles of life expectancy and literacy. The income groups are defined according to Holzmann, Vollmer and Weisbrod (2008).

inequality and ethnic fractionalization as a proxy for social fragmentation.

As pointed out all variables describe conditions, which hamper or foster the functioning of democracy in terms of addressing the needs of the population. Thus, we are interested in their interaction with democracy on the one hand. On the other hand, we want to know whether they have an effect on human development independently from the political system. Following Cronbach (1987)[20], we center the variables used for the modeling of the interaction terms to deal with problems of multicollinearity.

Furthermore, we add a set of dummies for global regions (leaving out Sub-Saharan African as reference category) and year dummies to all regression. The inclusion of period effects allows us to capture overall upward trends in literacy and life expectancy that for example could be explained by technological improvements in the health sector (Pritchett/Summers 1996: 846). Moreover, we control in both regression for war, because it destroys lives as well as infrastructure in the case of literacy. Additionally we control for HIV/AIDS in the life expectancy regressions. The dummy variable identifying the countries with high HIV/AIDS prevalence is interacted with the time dummies because HIV/AIDS was more of a problem for the more recent years in the sample compared to the earlier ones. The period under study is 1970 through 2003, and instead of annual data we use five year averages of the variables. Pre-estimation diagnostics indicate that heteroscedasticity and autocorrelation are important issues for our dataset and cause estimation problems. We therefore find the estimation of our model with a cross-sectional time-series FGLS regression with panel specific AR(1) to be the most appropriate, addressing both issues simultaneously.

In case of life expectancy we run separate regressions for non-OECD countries and the entire sample, however we will find similar results for both samples which also underpins their robustness. For literacy only the regression for the sub-sample of non-

[20] See also Jaccard et al. (1990).

OECD makes sense because firmly all OECD countries have a constant level of literacy of exactly 99 percent in the UNDP data. The results are presented in Tables 1 to 6.

Let us start the discussion of the results with our analysis for life expectancy, both for non-OECD countries and the complete sample. We start with a regression including democracy and a full set of dummies and then step by step include the other explanatory variables (Tables 1 and 3). The impact of democracy on life expectancy is positive and in all specifications highly significant. The HIV/AIDS dummy carries the expected negative sign for the more recent years 1990, 1995 and 2000. The positive sign of the time dummies captures the overall upward trend in the level of life expectancy. As expected, war has a negative and significant impact on life expectancy.

The results for our other main explanatory variables are as expected from the theoretical reasoning. GDP and education in all specifications have a positive and highly significant impact on life expectancy. Ethnic fractionalization in contrast is negatively linked to life expectancy. Although the latter result mainly confirms theoretical expectations it must be taken with caution because of the critical assumption of homogeneity over years. Inequality carries a negative coefficient, however it is not significant in the final specification with all control variables.

In Tables 2 and 4 we proceed with the final specification including all variables and step by step include the different interaction effects of the conditioning variables with democracy. What do the interaction effects tell us? Whereas inequality alone carries a negative sign, its interaction with democracy indicates that increases of life expectancy due to democracy are stronger in more unequal societies compared to more equal ones confirming in part the median voter hypothesis and the need for more redistribution in more unequal societies. The other interaction effects turn out to be statistically insignificant. This leads us to the conclusion that despite the fact that GDP per capita, education and ethnic fractionalization are important for human development, they do

not hamper or foster the ability of a democracy to increase life expectancy. Hence, it is democracy itself what is important and to a smaller extent the circumstances under which it occurs. This stands in contrast to what we would expect from theory, however it can be considered as good news for promoting democracy in poor, uneducated and diverse societies.

Table 5 and 6 show the results of the panel analysis for literacy. Overall, the picture is quite similar to the one for life expectancy. Both GDP and democracy are important determinants of literacy, while ethnic fractionalization has a negative impact. Inequality is not significant, the same is true for all interaction effects. While this again stands in contrast to the expectations from theory it again confirms, that also for our second dimension of human development it is democracy itself that is important.

4 Conclusion

We believe that our study has its associated merits explaining the linkage between democracy and human development. In the theoretical section we clarify the causal channels of democracy influencing human development. In contrast to earlier studies which have their focus on property rights we emphasize the importance of the redistributive effects and effects of public goods provision in democracy. The influence of democracy on human development is investigated descriptively and analytically, the statistical analysis includes both the cross-sectional and the time dimension. Extending the existing literature we not only measure the influence of democracy on human development, but we further theoretically and empirically identify conditions which are important for the functioning of democracy in terms of improving the level of human development. In particular, we find some evidence for the median voter theory.

Empirically, we have shown that there is a strong and robust link between democ-

racy and human development measured as life expectancy and literacy, even if one is controlling for the level of economic development and other important variables. We have constructed our model in such a way, that to the best of our knowledge we can be quite certain, that this is a causal relation and not just a spurious correlation. This result is rather robust no matter what specification we used.

Furthermore, we found empirical evidence for conditions and requirements that increase or decrease the impact of democracy on human development. In very unequal societies the median voter that is the decisive voter in democracies, is farther away from the mean income than in more equal societies, therefore inequality combined with democracy accelerates the redistributive effects of democracy. Redistribution in favor of the bottom part of the distribution increases average life expectancy and literacy, because the poor are in general farther away from the technological (or say medical) frontier of life expectancy and can thus obtain higher improvements than people closer to the frontier with the same amount of money. The interaction of democracy and its other presumed conditions of functioning turned out to be insignificant. One could therefore conclude that the functioning of democracy - in terms of non-income human development improvements - is independent of GDP per capita, ethnic fractionalization and even education. Nevertheless, these factors influence non-income human development levels directly.

The positive effect of education on life expectancy could be caused by priority changes in private spending, by more efficient private spending on education or by changes in private behavior. Social fragmentation, as proxied by ethnic fractionalization, and corresponding differences in preferences possibly split the population in subpopulations and could therefore weaken the power of each sub-group to articulate and to assert its needs. This is confirmed by our empirical findings. Ethnic fractionalization negatively affects life expectancy and literacy.

Controlling for economic development, we can be quite certain, that democracy has an impact on human development which goes beyond its linkage with economic development. However, we can be less certain, that the influence comes directly from a democratic system or whether it comes from other social and political factors which are very well proxied by democracy. In the background of democracy other factors might be at work as well. Future studies could incorporate social capital as well as the degree of decentralization of the political-administrative system. Moreover it would be interesting to investigate whether the distribution of our non-income dimensions of human development is more equal in democracies than in autocracies. In addition, it would certainly be useful and an improvement of our analysis to empirically identify and model the channels that democracy takes before it affects human development, for example via the public expenditures. Unfortunately, the data for this endeavor have not been available.

In the end, we can derive two conclusions from our analysis on the relationship between political institutions and human development. First, democracy is good for human development and this independently from its effect on economic development. This strengthens both the median voter theory and Sen's democracy argument. Hence, the main question whether democracy fulfils its "constructive" and "instrumental" role deserves an affirmative answer. Second, even if the picture here is more ambiguous, the positive impact of democracy on human development seems to be rather independent from the circumstances. However, democracy leads to more redistribution in favor of health provision in more unequal societies.

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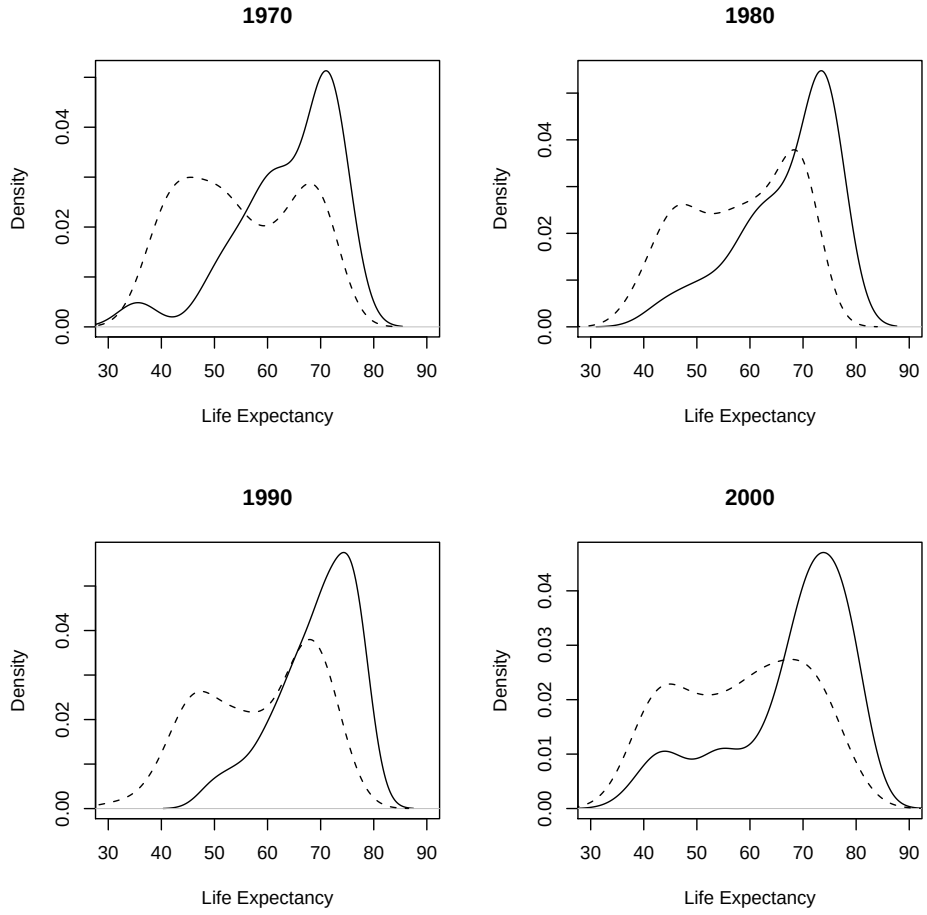

Figure 1: Kernel density estimates for life expectancy. Solid line: democratic countries. Dashed line: autocractic countries.

Solid line: Kernel density estimator for countries being democratic in the given year. Dashed line: Kernel density estimator for countries being autocratic in the given year. 1970: 41 democracies and 97 autocracies; 1980: 44 democracies and 107 autocracies; 1990: 67 democracies and 85 autocracies; 2000: 97 democracies and 58 autocracies.

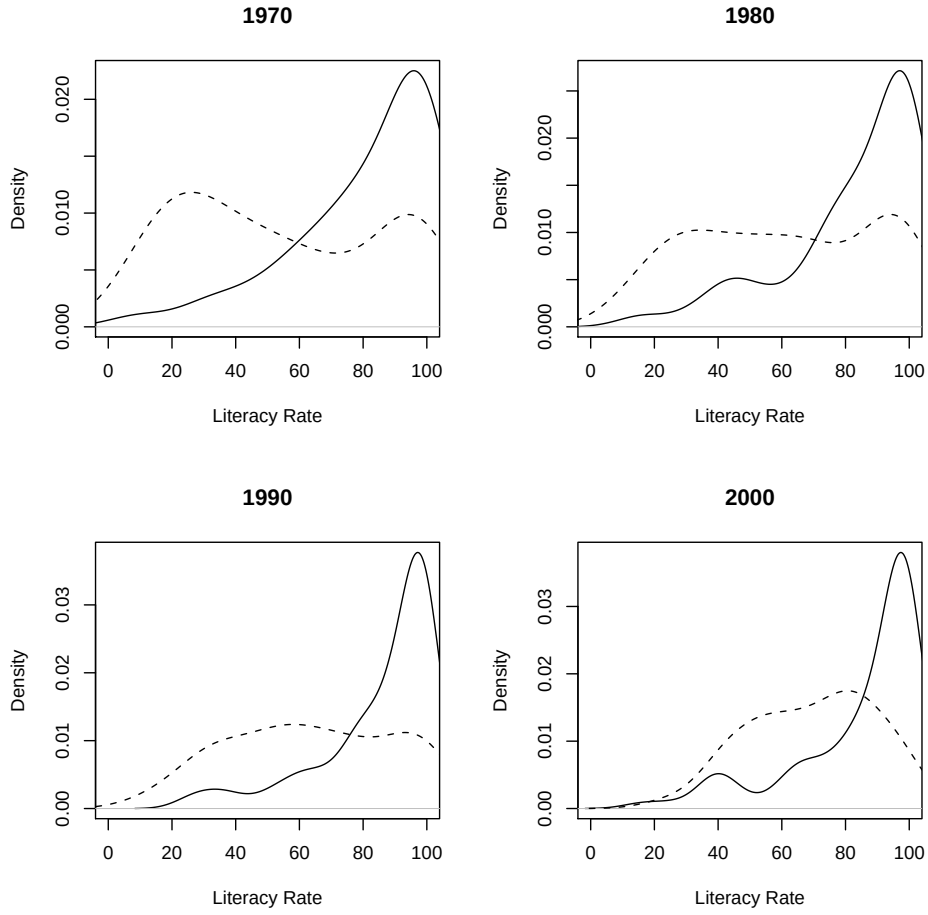

Figure 2: Kernel density estimates for literacy. Solid line: democratic countries. Dashed line: autocractic countries.

Solid line: Kernel density estimator for countries being democratic in the given year. Dashed line: Kernel density estimator for countries being autocratic in the given year. 1970: 23 democracies and 77 autocracies; 1980: 25 democracies and 87 autocracies; 1990: 44 democracies and 68 autocracies; 2000: 70 democracies and 45 autocracies.

	(I)	(II)	(III)	(IV)	(V)	(VI)
constant	44.931***	47.951***	48.765***	54.834***	48.984***	55.283***
	(0.270)	(0.294)	(0.360)	(0.294)	(0.302)	(0.380)
Democracy	1.996***	1.699***	1.443***	1.162***	1.949***	1.225***
	(0.225)	(0.207)	(0.163)	(0.158)	(0.241)	(0.174)
GDP p.c.		4.000***	4.711***	2.289***	4.962***	3.676***
		(0.133)	(0.179)	(0.153)	(0.231)	(0.237)
Gini			-5.223***			-0.203
			(0.799)			(1.074)
Literacy				0.220***		0.183***
				(0.008)		(0.009)
Fractionalization					-4.743***	-4.012***
					(0.505)	(0.884)
War	-2.548***	-0.743***	-0.651***	-0.750***	-0.460	-0.516**
	(0.213)	(0.209)	(0.173)	(0.154)	(0.231)	(0.178)
AIDS*1975	2.488***	2.024***	2.280***	0.248	1.955***	-0.675
	(0.270)	(0.332)	(0.382)	(0.732)	(0.382)	(0.699)
AIDS*1980	2.414***	1.890***	2.328***	-0.115	1.860***	-0.725
	(0.392)	(0.393)	(0.442)	(0.716)	(0.465)	(0.676)
AIDS*1985	2.010***	1.423***	2.077***	-1.121	1.510**	-0.996
	(0.470)	(0.424)	(0.466)	(0.720)	(0.500)	(0.672)
AIDS*1990	0.666	-0.217	0.609	-3.685***	-0.002	-3.066***
	(0.535)	(0.443)	(0.480)	(0.743)	(0.520)	(0.682)
AIDS*1995	-3.643***	-4.962***	-3.808***	-9.191***	-4.677***	-8.164***
	(0.595)	(0.465)	(0.497)	(0.791)	(0.541)	(0.716)
AIDS*2000	-9.046***	-10.658***	-10.023***	-15.486***	-10.370***	-14.902***
	(0.666)	(0.491)	(0.511)	(0.866)	(0.592)	(0.766)
Year 1980	2.295***	1.992***	1.885***	1.159***	1.790***	1.147***
	(0.150)	(0.139)	(0.172)	(0.104)	(0.167)	(0.116)
Year 1985	4.196***	4.181***	3.929***	2.418***	3.681***	2.385***
	(0.195)	(0.181)	(0.223)	(0.141)	(0.210)	(0.162)
Year 1990	5.438***	5.346***	5.233***	3.107***	4.842***	3.126***
	(0.226)	(0.209)	(0.253)	(0.168)	(0.239)	(0.198)
Year 1995	6.215***	6.192***	6.056***	3.431***	5.604***	3.414***
	(0.255)	(0.234)	(0.281)	(0.192)	(0.274)	(0.234)
Year 2000	7.140***	6.709***	6.740***	3.615***	6.104***	3.819***
	(0.270)	(0.240)	(0.282)	(0.201)	(0.309)	(0.272)
AIC	3020.288	2597.735	2116.471	1841.316	2306.006	1432.179
BIC	3108.371	2688.353	2207.582	1932.464	2397.846	1525.7
N	762	686	566	567	586	431

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level.
Standard errors are reported in brackets.

Table 1: Dependent variable: life expectancy. Sample: non-OECD countries. Regional dummies included.

	(I)	(II)	(III)	(IV)	(V)
constant	55.291***	55.130***	55.294***	55.505***	55.565***
	(0.384)	(0.365)	(0.380)	(0.392)	(0.394)
Democracy	1.188***	1.240***	1.189***	1.326***	1.332***
	(0.177)	(0.170)	(0.178)	(0.182)	(0.182)
GDP p.c.	3.763***	3.598***	3.683***	3.473***	3.426***
	(0.245)	(0.232)	(0.244)	(0.240)	(0.242)
Gini	-0.141	-0.373	-0.236	-0.120	-0.573
	(1.082)	(1.082)	(1.090)	(1.071)	(1.113)
Fractionalization	-3.934***	-4.062***	-4.097***	-4.465***	-4.604***
	(0.879)	(0.871)	(0.885)	(0.825)	(0.766)
Literacy	0.182***	0.181***	0.183***	0.185***	0.183***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)
War	-0.492**	-0.579***	-0.522**	-0.508**	-0.517**
	(0.179)	(0.168)	(0.176)	(0.180)	(0.169)
GDP*Democracy	-0.255				-0.389
	(0.197)				(0.302)
Gini*Democracy		4.794**			6.337**
		(1.861)			(1.975)
Literacy*Democracy			-0.005		0.002
			(0.007)		(0.010)
Fract.*Democracy				-0.881	-2.059
				(0.710)	(0.951)
AIDS*1975	-0.480	-0.543	-0.647	-0.783	-0.846
	(0.697)	(0.714)	(0.696)	(0.689)	(0.735)
AIDS*1980	-0.548	-0.508	-0.689	-0.909	-0.879
	(0.677)	(0.691)	(0.673)	(0.670)	(0.705)
AIDS*1985	-0.827	-0.882	-0.956	-1.274	-1.236
	(0.675)	(0.684)	(0.668)	(0.672)	(0.698)
AIDS*1990	-2.935***	-2.841***	-3.056***	-3.335***	-3.131***
	(0.684)	(0.690)	(0.675)	(0.691)	(0.706)
AIDS*1995	-8.126***	-8.107***	-8.186***	-8.439***	-8.454***
	(0.719)	(0.719)	(0.708)	(0.741)	(0.739)
AIDS*2000	-14.944***	-14.980***	-14.911***	-15.246***	-15.394***
	(0.776)	(0.773)	(0.755)	(0.813)	(0.804)
Year 1980	1.128***	1.100***	1.139***	1.168***	1.140***
	(0.117)	(0.118)	(0.119)	(0.116)	(0.119)
Year 1985	2.384***	2.353***	2.385***	2.407***	2.392***
	(0.162)	(0.163)	(0.163)	(0.162)	(0.164)
Year 1990	3.155***	3.167***	3.152***	3.108***	3.151***
	(0.199)	(0.196)	(0.200)	(0.198)	(0.199)
Year 1995	3.444***	3.433***	3.454***	3.376***	3.418***
	(0.235)	(0.231)	(0.235)	(0.235)	(0.235)
Year 2000	3.838***	3.873***	3.861***	3.819***	3.844***
	(0.272)	(0.269)	(0.272)	(0.273)	(0.275)
AIC	1434.673	1444.435	1433.425	1437.844	1453.905
BIC	1532.259	1542.022	1531.012	1535.431	1563.689
N	431	431	431	431	431

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 2: Dependent variable: life expectancy. Sample: non-OECD countries. Regional dummies included.

	(I)	(II)	(III)	(IV)	(V)	(VI)
constant	47.278***	51.303***	52.987***	59.131***	53.135***	60.123***
	(0.332)	(0.319)	(0.371)	(0.257)	(0.279)	(0.240)
Democracy	4.538***	1.649***	1.521***	1.182***	1.904***	1.048***
	(0.230)	(0.188)	(0.192)	(0.140)	(0.199)	(0.149)
GDP p.c.		4.817***	5.638***	2.991***	5.499***	3.738***
		(0.130)	(0.126)	(0.126)	(0.166)	(0.152)
Gini			-5.816***			-0.612
			(1.070)			(0.845)
Literacy				0.234***		0.204***
				(0.006)		(0.007)
Fractionalization					-4.632***	-3.326***
					(0.392)	(0.622)
War	-4.207***	-0.804***	-0.698***	-0.685***	-0.506*	-0.565***
	(0.258)	(0.214)	(0.181)	(0.150)	(0.224)	(0.162)
AIDS*1975	2.604***	1.471***	1.789***	-0.744	1.465***	-0.882
	(0.315)	(0.337)	(0.424)	(0.697)	(0.421)	(0.650)
AIDS*1980	3.143***	1.749***	2.334***	-0.921	1.695***	-0.796
	(0.431)	(0.388)	(0.512)	(0.671)	(0.486)	(0.625)
AIDS*1985	3.224***	1.863***	2.514***	-1.695	1.674**	-0.969
	(0.499)	(0.411)	(0.548)	(0.677)	(0.513)	(0.622)
AIDS*1990	2.212***	0.523	1.669**	-4.180***	0.371	-2.989***
	(0.557)	(0.425)	(0.572)	(0.703)	(0.528)	(0.636)
AIDS*1995	-2.448***	-4.051***	-2.776***	-9.757***	-4.308***	-8.349***
	(0.623)	(0.439)	(0.597)	(0.751)	(0.545)	(0.674)
AIDS*2000	-9.015***	-9.771***	-8.907***	-16.297***	-9.976***	-15.239***
	(0.711)	(0.470)	(0.629)	(0.831)	(0.587)	(0.731)
Year 1980	1.836***	1.357***	1.184***	0.861***	1.187***	0.894***
	(0.145)	(0.113)	(0.124)	(0.065)	(0.116)	(0.075)
Year 1985	3.228***	2.977***	2.622***	1.858***	2.667***	1.920***
	(0.188)	(0.147)	(0.159)	(0.084)	(0.150)	(0.101)
Year 1990	4.000***	3.857***	3.477***	2.411***	3.567***	2.485***
	(0.216)	(0.168)	(0.178)	(0.097)	(0.172)	(0.120)
Year 1995	4.171***	4.642***	4.302***	2.843***	4.394***	2.984***
	(0.238)	(0.183)	(0.191)	(0.107)	(0.195)	(0.138)
Year 2000	5.043***	5.106***	4.787***	3.118***	4.812***	3.429***
	(0.248)	(0.195)	(0.202)	(0.122)	(0.221)	(0.156)
AIC	3881.806	3111.627	2624.683	2105.085	2777.565	1671.098
BIC	3973.898	3206.836	2721.507	2201.22	2874.892	1771.566
N	941	863	743	719	761	583

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level.
Standard errors are reported in brackets.

Table 3: Dependent variable: life expectancy. Sample: all countries. Regional dummies included.

	(I)	(II)	(III)	(IV)	(V)
constant	60.217***	60.071***	60.195***	60.065***	60.279***
	(0.251)	(0.235)	(0.251)	(0.236)	(0.257)
Democracy	0.981***	0.985***	0.998***	1.063***	0.950***
	(0.152)	(0.142)	(0.150)	(0.151)	(0.154)
GPD p.c.	3.816***	3.772***	3.781***	3.757***	3.827***
	(0.163)	(0.151)	(0.159)	(0.154)	(0.163)
Gini	-0.597	-0.573	-0.555	-0.589	-0.719
	(0.851)	(0.807)	(0.863)	(0.843)	(0.847)
Fractionalization	-3.389***	-3.090***	-3.535***	-3.135***	-3.111***
	(0.625)	(0.528)	(0.625)	(0.622)	(0.557)
War	-0.559***	-0.496**	-0.558***	-0.567***	-0.454**
	(0.160)	(0.156)	(0.161)	(0.163)	(0.161)
Literacy	0.203***	0.203***	0.202***	0.204***	0.202***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
GDP*Democracy	-0.212				-0.091
	(0.149)				(0.267)
Gini*Democracy		5.213***			5.805***
		(1.343)			(1.496)
Literacy*Democracy			-0.007		-0.004
			(0.006)		(0.010)
Fract.*Democracy				-0.073	-1.004
				(0.501)	(0.705)
AIDS*1975	-0.828	-0.968	-0.989	-0.839	-0.785
	(0.646)	(0.670)	(0.657)	(0.658)	(0.704)
AIDS*1980	-0.744	-0.765	-0.872	-0.736	-0.613
	(0.621)	(0.643)	(0.628)	(0.631)	(0.673)
AIDS*1985	-0.899	-0.983	-1.022	-0.890	-0.823
	(0.620)	(0.636)	(0.623)	(0.627)	(0.666)
AIDS*1990	-2.917***	-2.797***	-3.021***	-2.895***	-2.607***
	(0.633)	(0.645)	(0.634)	(0.640)	(0.674)
AIDS*1995	-8.360***	-8.363***	-8.409***	-8.237***	-8.147***
	(0.667)	(0.668)	(0.668)	(0.679)	(0.695)
AIDS*2000	-15.304***	-15.370***	-15.277***	-15.123***	-15.199***
	(0.725)	(0.722)	(0.722)	(0.737)	(0.751)
Year 19980	0.884***	0.845***	0.885***	0.893***	0.848***
	(0.075)	(0.067)	(0.076)	(0.075)	(0.070)
Year 1985	1.918***	1.882***	1.918***	1.914***	1.876***
	(0.101)	(0.091)	(0.102)	(0.102)	(0.095)
Year 1990	2.506***	2.478***	2.500***	2.466***	2.440***
	(0.120)	(0.108)	(0.120)	(0.121)	(0.113)
Year 1995	3.008***	2.967***	3.009***	2.956***	2.915***
	(0.138)	(0.125)	(0.138)	(0.138)	(0.131)
Year 2000	3.450***	3.378***	3.461***	3.405***	3.338***
	(0.156)	(0.145)	(0.155)	(0.156)	(0.149)
AIC	1671.174	1656.900	1670.387	1673.902	1670.253
BIC	1776.01	1761.736	1775.223	1778.738	1788.194
N	583	583	583	583	583

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 4: Dependent variable: life expectancy. Sample: all countries. Regional dummies included.

	(I)	(II)	(III)	(IV)	(V)
constant	31.643***	42.315***	44.758***	43.105***	42.667***
	(0.915)	(1.004)	(0.964)	(0.833)	(0.937)
Democracy	1.271***	1.687***	1.509***	1.019**	1.321***
	(0.386)	(0.334)	(0.334)	(0.387)	(0.395)
GDP p.c.		9.420***	11.740***	9.786***	11.791***
		(0.358)	(0.468)	(0.530)	(0.555)
Gini			-2.320		-0.927
			(1.736)		(2.460)
Fractionalization				-15.246***	-14.030***
				(1.899)	(2.222)
War	-0.414	0.329	-0.234	0.499	0.433
	(0.399)	(0.319)	(0.323)	(0.379)	(0.402)
Year 1980	4.236***	3.331***	2.881***	3.006***	2.725***
	(0.240)	(0.262)	(0.279)	(0.277)	(0.285)
Year 1985	8.265***	7.505***	6.418***	6.697***	6.358***
	(0.322)	(0.344)	(0.364)	(0.367)	(0.384)
Year 1990	12.044***	10.909***	9.324***	9.864***	9.117***
	(0.386)	(0.407)	(0.428)	(0.435)	(0.462)
Year 1995	15.044***	13.763***	11.799***	12.755***	11.542***
	(0.451)	(0.470)	(0.502)	(0.507)	(0.546)
Year 2000	17.822***	16.007***	13.936***	15.244***	13.441***
	(0.499)	(0.499)	(0.512)	(0.575)	(0.598)
AIC	3404.857	3093.600	2576.279	2680.587	2360.993
BIC	3463.909	3155.795	2640.541	2745.071	2428.005
N	694	628	536	544	487

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 5: Dependent variable: literacy. Sample: non-OECD countries. Regional dummies included.

	(I)	(II)	(III)	(IV)
constant	44.742***	41.945***	42.436***	42.127***
	(0.984)	(1.033)	(0.918)	(0.966)
Democracy	1.536***	1.049	0.967	0.871
	(0.437)	(0.409)	(0.407)	(0.403)
GDP p.c.	13.192***	10.694***	11.446***	11.376***
	(0.552)	(0.574)	(0.550)	(0.537)
Gini	1.585	-1.647	-0.980	-2.026
	(2.724)	(2.467)	(2.481)	(2.432)
Fractionalization	-11.436***	-14.555***	-14.232***	-12.928***
	(2.299)	(2.379)	(2.159)	(2.239)
War	0.465	0.217	0.418	0.318
	(0.412)	(0.401)	(0.429)	(0.404)
GDP*Democracy	-0.695			-1.289
	(0.540)			(0.530)
Gini*Democracy		-4.891		-3.450
		(3.654)		(3.623)
Fract.*Democracy			2.973	0.728
			(1.644)	(1.905)
Year 1980	2.726***	2.910***	2.668***	2.737***
	(0.315)	(0.289)	(0.288)	(0.287)
Year 1985	6.405***	6.690***	6.333***	6.627***
	(0.423)	(0.388)	(0.388)	(0.386)
Year 1990	9.147***	9.535***	9.125***	9.498***
	(0.506)	(0.467)	(0.467)	(0.465)
Year 1995	11.262***	12.089***	11.511***	11.885***
	(0.592)	(0.549)	(0.546)	(0.543)
Year 2000	12.747***	14.122***	13.458***	13.837***
	(0.613)	(0.604)	(0.606)	(0.596)
AIC	2393.163	2347.701	2358.355	2359.821
BIC	2464.364	2418.901	2429.556	2439.398
N	487	487	487	487

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 6: Dependent variable: literacy. Sample: non-OECD countries. Regional dummies included.

A Appendix

	Low life expectancy Mean: 44.28; Min: 34.75; Max: 51.83; Obs: 48		**Middle life expectancy** Mean: 58.87; Min: 51.85; Max: 66.16; Obs 48		**High life expectancy** Mean: 70.33; Min: 66.28; Max: 74.43; Obs: 47	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Benin; Bhutan; Burkina Faso; Burundi; Cambodia; Central African Republic; Chad; Congo, Dem. Rep.; Equatorial Guinea; Ethiopia; Indonesia; Lao PDR; Lesotho; Madagascar; Malawi; Mali; Mauritania; Nepal; Niger; Nigeria; Pakistan; Rwanda; Senegal; Somalia; Sudan; Tanzania; Togo; Uganda; Zambia	The Gambia; Ghana; India; Sierra Leone	China; Congo, Rep.; Kenya; Korea, Dem. Rep.; Mongolia; Syrian Arab Republic	Botswana; Sri Lanka	-	Comoros; Guinea-Bissau; Maldives; Mozambique
Middle income	Afghanistan; Bolivia; Cameroon; Egypt. Arab Rep.; Guinea; Haiti; Liberia; Morocco; Swaziland	-	Algeria; Brazil; Dominican Republic; Ecuador; El Salvador; Honduras; Iraq; Jordan; Mexico; Panama; Paraguay; Peru; Tunisia	Colombia; Fiji; Guatemala; Korea, Rep.; Malaysia; Mauritius; Philippines; Thailand; Turkey; Zimbabwe	Cuba; Poland; Romania	Jamaica
High income	Gabon; Oman; Saudi Arabia	-	Iran, Islamic Rep.; Kuwait; Nicaragua	Chile; South Africa; Trinidad and Tobago; Venezuela, RB	Argentina; Greece; Hungary; Portugal; Singapore; Spain	Australia; Austria; Belgium; Canada; Costa Rica; Cyprus; Denmark; Finland; France; Ireland; Israel; Italy; Japan; Netherlands; New Zealand; Norway; Sweden; Switzerland; United Kingdom; United States; Uruguay

Table 7: Democracies and autocracies classified according to their levels of income and life expectancy, 1970

	Low life expectancy Mean: 47.88; Min: 37.59; Max: 56.29 Autocracies	Democracies	Middle life expectancy Mean: 62.63; Min: 56.43; Max: 68.60 Autocracies	Democracies	High life expectancy Mean: 71.96; Min: 68.94; Max: 76.25 Autocracies	Democracies
Low income	Afghanistan; Bangladesh; Benin; Bhutan; Burkina Faso; Burundi; Central African Republic; Chad; Comoros; Congo, Dem. Rep.; Congo, Rep.; Equatorial Guinea; Ethiopia; Guinea-Bissau; Indonesia; Lao PDR; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mozambique; Nepal; Niger; Pakistan; Rwanda; Senegal; Sierra Leone; Somalia; Sudan; Tanzania; Togo; Zambia	The Gambia; Ghana; India; Maldives; Nigeria; Uganda	China; Kenya; Korea, Dem. Rep.; Mongolia; Syrian Arab Republic	Sri Lanka	-	-
Middle income	Bolivia; Cameroon; Djibouti; Egypt. Arab Rep.; El Salvador; Guinea; Haiti; Swaziland	Papua New Guinea	Algeria; Brazil; Guatemala; Iran, Islamic Rep.; Iraq; Jordan; Korea, Rep.; Mexico; Morocco; Nicaragua; Paraguay; Philippines; Tunisia; Turkey	Botswana; Colombia; Dominican Republic; Ecuador; Fiji; Honduras; Malaysia; Mauritius; Peru; Solomon Islands; South Africa; Thailand; Zimbabwe	Chile; Cuba; Panama; Poland; Romania	Costa Rica; Jamaica
High income	Gabon	-	Bahrain; Oman; Qatar; Saudi Arabia; United Arab Emirates	Venezuela, RB	Argentina; Hungary; Kuwait; Singapore; Uruguay	Australia; Austria; Belgium; Brunei; Canada; Cyprus; Denmark; Finland; France; Greece; Ireland; Israel; Italy; Japan; Netherlands; New Zealand; Norway; Portugal; Spain; Sweden; Switzerland; Trinidad and Tobago; United Kingdom; United States

Table 8: Democracies and autocracies classified according to their levels of income and life expectancy, 1980

	Low life expectancy Mean: 48.71; Min: 37.54; Max: 61.31		**Middle life expectancy** Mean: 67.62; Min: 61.36; Max: 72.18		**High life expectancy** Mean: 76.24; Min: 72.45; Max: 81.23	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Afghanistan; Angola; Bhutan; Burkina Paso; Burundi; Chad; Congo, Dem. Rep.; Congo, Rep. Eritrea; The Gambia; Haiti; Kenya; Lao PDR; Liberia; Mauritania; Rwanda; Sierra Leone; Somalia; Sudan; Togo; Uganda; Yemen. Rep.	Benin; Cambodia; Central African Republic; Cote d'Ivoire; Ethiopia; Ghana; Guinea-Bissau; Lesotho; Madagascar; Malawi; Mali; Mozambique; Nepal; Niger; Nigeria; Senegal; Tanzania; Zambia	Korea, Dem. Rep.; Solomon Islands; Tajikistan; Vietnam	Bangladesh; Honduras; Moldova; Mongolia	Syrian Arab Republic	Serbia and Montenegro
Middle income	Cameroon; Equatorial Guinea; Guinea; Iraq; Pakistan; Swaziland; Zimbabwe	Botswana; Djibouti; Guyana; Namibia; Papua New Guinea; South Africa	Algeria; Azerbaijan; Belarus; China; Egypt. Arab Rep.; Jordan; Kazakhstan; Kyrgyz Republic; Morocco; Pakistan; Turkmenistan; Uzbekistan	Armenia; Bolivia; Brazil; Bulgaria; Colombia; Dominican Republic; El Salvador; Fiji; Georgia; Guatemala; Guyana; India; Indonesia; Iran, Islamic Rep.; Jamaica; Latvia; Lithuania; Nicaragua; Paraguay; Philippines; Romania; Russian Federation; Thailand Turkey; Ukraine	Cuba; Libya; Tunisia	Albania; Costa Rica; Croatia; Ecuador; Macedonia, FYR; Mexico; Panama; Poland; Slovak Republic; Sri Lanka; Venezuela, RB
High income	Gabon	-	Qatar; Saudi Arabia	Estonia; Hungary; Mauritius; Trinidad and Tobago	Bahrain; Kuwait; Oman; Singapore; United Arab Emirates	Argentina; Australia; Austria; Belgium; Canada; Chile; Cyprus; Czech Republic; Denmark; Finland; France; Germany; Greece; Ireland; Israel; Italy; Japan; Korea, Rep.; Malaysia; Netherlands; New Zealand; Norway; Portugal; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States; Uruguay

Table 9: Democracies and autocracies classified according to their levels of income and life expectancy, 1990

	Low life expectancy Mean: 48.71; Min: 37.54; Max: 61.31		Middle life expectancy Mean: 67.62; Min: 61.36; Max: 72.18		High life expectancy Mean: 76.24; Min: 72.45; Max: 81.23	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Afghanistan; Angola; Bhutan; Burkina Paso; Burundi; Chad; Congo, Dem. Rep.; Congo, Rep. Eritrea; The Gambia; Haiti; Kenya; Lao PDR; Liberia; Mauritania; Rwanda; Sierra Leone; Somalia; Sudan; Togo; Uganda; Yemen. Rep.	Benin; Cambodia; Central African Republic; Cote d'Ivoire; Ethiopia; Ghana; Guinea-Bissau; Lesotho; Madagascar; Malawi; Mali; Mozambique; Nepal; Niger; Nigeria; Senegal; Tanzania; Zambia	Korea, Dem. Rep.; Solomon Islands; Tajikistan; Vietnam	Bangladesh; Honduras; Moldova; Mongolia	Syrian Arab Republic	Serbia and Montenegro
Middle income	Cameroon; Equatorial Guinea; Guinea; Iraq; Pakistan; Swaziland; Zimbabwe	Botswana; Djibouti; Guyana; Namibia; Papua New Guinea; South Africa	Algeria; Azerbaijan; Belarus; China; Egypt. Arab Rep.; Jordan; Kazakhstan; Kyrgyz Republic; Morocco; Pakistan; Turkmenistan; Uzbekistan	Armenia; Bolivia; Brazil; Bulgaria; Colombia; Dominican Republic; El Salvador; Fiji; Georgia; Guatemala; Guyana; India; Indonesia; Iran, Islamic Rep.; Jamaica; Latvia; Lithuania; Nicaragua; Paraguay; Philippines; Romania; Russian Federation; Thailand Turkey; Ukraine	Cuba; Libya; Tunisia	Albania; Costa Rica; Croatia; Ecuador; Macedonia, FYR; Mexico; Panama; Poland; Slovak Republic; Sri Lanka; Venezuela, RB
High income	Gabon	-	Qatar; Saudi Arabia	Estonia; Hungary; Mauritius; Trinidad and Tobago	Bahrain; Kuwait; Oman; Singapore; United Arab Emirates	Argentina; Australia; Austria; Belgium; Canada; Chile; Cyprus; Czech Republic; Denmark; Finland; France; Germany; Greece; Ireland; Israel; Italy; Japan; Korea, Rep.; Malaysia; Netherlands; New Zealand; Norway; Portugal; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States; Uruguay

Table 10: Democracies and autocracies classified according to their levels of income and life expectancy, 2000

	Low literacy rate Mean: 21.30; Min: 5.75; Max: 35.36		**Middle literacy rate** Mean: 54.21; Min: 35.64; Max: 72.89		**High literacy rate** Mean: 89.07; Min: 73.21; Max: 99	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Benin; Burkina Faso; Burundi; Central African Republic; Chad; Congo, Dem. Rep.; Congo, Rep.; Ethiopia; Mali; Mauritania; Nepal; Niger; Nigeria; Pakistan; Rwanda; Senegal; Sudan; Togo	The Gambia; Ghana; India	Cambodia; China; Equatorial Guinea; Indonesia; Kenya; Lao PDR; Lesotho; Madagascar; Malawi; Syrian Arab Republic; Tanzania; Uganda; Zambia	Botswana	Mongolia	Sri Lanka
Middle income	Algeria; Cameroon; Egypt, Arab Rep.; Haiti; Iraq; Liberia; Morocco; Tunisia	-	Bolivia; Brazil; Dominican Republic; El Salvador; Honduras; Jordan; Peru; Swaziland	Guatemala; Jamaica; Malaysia; Mauritius; Zimbabwe	Cuba; Ecuador; Panama; Paraguay; Romania	Colombia; Fiji; Philippines; Thailand
High income	Iran, Islamic Rep.; Oman; Saudi Arabia	-	Kuwait; Nicaragua; Singapore	South Africa	Argentina	Chile; Costa Rica; Cyprus; Israel; Trinidad and Tobago; Uruguay; Venezuela, RB

Table 11: Democracies and autocracies classified according to their levels of income and literacy, 1970

	Low literacy rate Mean: 29.76; Min: 7.95; Max: 47.55		**Middle literacy rate** Mean: 63.11; Min: 48.18; Max: 76.27		**High literacy rate** Mean: 91.90; Min: 79.43; Max: 99	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Bangladesh; Benin; Burkina Faso; Burundi; Central African Republic; Chad; Congo, Dem. Rep.; Ethiopia; Guinea-Bissau; Liberia; Madagascar; Malawi; Mali; Mauritania; Mozambique; Nepal; Niger; Pakistan; Rwanda; Senegal; Sudan; Togo	The Gambia; Ghana; India; Nigeria; Uganda	China; Comoros; Congo, Rep.; Equatorial Guinea; Indonesia; Kenya; Lao, PDR; Lesotho; Syrian Arab Republic; Tanzania; Zambia	-	Mongolia	Sri Lanka
Middle income	Algeria; Cameroon; Djibouti; Egypt, Arab Rep.; Haiti; Iraq; Morocco; Tunisia	-	Bolivia; Brazil; El Salvador; Guatemala; Iran, Islamic Rep.; Jordan; Nicaragua; Swaziland	Botswana; Dominican Republic; Honduras; Jamaica; Malaysia; Mauritius; Papua New Guinea; South Africa; Zimbabwe	Chile; Cuba; Panama; Paraguay; Philippines; Romania	Colombia; Costa Rica; Ecuador; Fiji; Peru; Thailand
High income	Oman	-	Bahrain; Kuwait; Qatar; Saudi Arabia; United Arab Emirates	-	Argentina; Singapore; Uruguay	Cyprus; Israel; Trinidad and Tobago; Venezuela, RB

Table 12: Democracies and autocracies classified according to their levels of income and literacy, 1980

	Low literacy rate Mean: 39.57; Min: 11.40; Max: 57.88		**Middle literacy rate** Mean: 72.17; Min: 57.96; Max: 82.18		**High literacy rate** Mean: 94.530; Min: 85.47; Max: 99	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Bangladesh; Benin; Burkina Faso; Burundi; Central African Republic; Chad; Congo, Dem. Rep.; Ethiopia; Guinea-Bissau; Lao, PDR.; Liberia; Malawi; Mali; Mauritania; Mozambique; Niger; Nigeria; Rwanda; Senegal; Sudan; Togo; Uganda; Yemen, Rep.	Comoros; The Gambia; Haiti; India; Nepal	China; Equatorial Guinea; Kenya; Madagascar; Syrian Arab Republic; Tanzania; Zambia	*Cambodia* Ghana; Lesotho;	Vietnam	*Mongolia*
Middle income	Algeria; Cameroon; Djibouti; Egypt, Arab Rep.; Iraq; Morocco	Pakistan; Papua New Guinea	Congo, Rep.; Indonesia; Iran, Islamic Rep.; Jordan; Swaziland; Tunisia; Zimbabwe	Albania; Bolivia; Brazil; Botswana; Dominican Republic; El Salvador; Guatemala; Honduras; Jamaica; Malaysia; Namibia; Nicaragua; South Africa	Cuba; Uzbekistan	Argentina; Chile; Colombia; Costa Rica; Ecuador; Fiji; Panama; Paraguay; Peru; Philippines; Romania; Sri Lanka; Thailand; Uruguay; Venezuela, RB
High income	Oman	-	Bahrain; Qatar; Saudi Arabia; United Arab Emirates	Mauritius	Croatia; Estonia; Russian Federation; Singapore; Slovenia	Cyprus; Israel; Trinidad and Tobago

Table 13: Democracies and autocracies classified according to their levels of income and literacy, 1990

	Low literacy rate Mean: 49.74; Min: 15.96; Max: 67.03		**Middle literacy rate** Mean: 80.03; Min: 68.01; Max: 88.67		**High literacy rate** Mean: 96.27; Min: 89.81389; Max: 99	
	Autocracies	**Democracies**	**Autocracies**	**Democracies**	**Autocracies**	**Democracies**
Low income	Burkina Faso; Burundi; Chad; Comoros; Congo, Dem. Rep.; Eritrea; The Gambia; Haiti; Lao, PDR; Liberia; Mauritania; Mozambique; Rwanda; Sudan; Togo; Uganda; Yemen, Rep.	Bangladesh; Benin; Central African Republic; Ethiopia; Guinea-Bissau; Madagascar; Malawi; Mali; Mozambique; Nepal; Niger; Nigeria; Senegal	Congo, Rep.; Kenya; Syrian Arab Republic	Cambodia; Ghana; Honduras; Lesotho; Tanzania; Zambia	Tajikistan; Vietnam	Moldova; Mongolia
Middle income	Algeria; Egypt, Arab Rep.; Iraq; Morocco; Pakistan	Djibouti; India; Nicaragua; Papua New Guinea	Cameroon; China; Equatorial Guinea; Libya; Swaziland; Tunisia; Zimbabwe	Albania; Bolivia; Botswana; Brazil; Dominican Republic; El Salvador; Guatemala; Indonesia; Iran, Islamic Rep.; Jamaica; Namibia; South Africa	Belarus; Cuba; Jordan; Kazakhstan; Uzbekistan	Armenia; Bulgaria; Colombia; Costa Rica; Ecuador; Fiji; Guyana; Latvia; Lithuania; Panama; Paraguay; Philippines; Romania; Russian Federation; Sri Lanka; Thailand; Ukraine; Venezuela, RB
High income	-	-	Bahrain; Kuwait; Oman; Qatar; Saudi Arabia; United Arab Emirates	Malaysia; Mauritius	Gabon	Argentian; Chile; Cyprus; Estonia; Israel; Slovenia; Trinidad and Tobago; Uruguay

Table 14: Democracies and autocracies classified according to their levels of income and literacy, 2000