

Democracy and Human Development Nexus: The African Experience

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Using data from 46 African countries over the period from 1990 to 2012, the present study examines three principal issues. First, the study examines whether human development is affected by the level or the stock of democracy in these countries; and whether the affect varies over time. Second, the study investigates whether a country's level of development and education level foster or impede the impact of democracy on human development. Third, the study examines whether a democratic regime helps to further improve the health of its population via redistribution mechanisms. The results of the Arellano-Bond (A-B) GMM technique show that democracy, irrespective of the measurement employed, has a positive impact on human development in both the long run and the short run (i.e., infant mortality rate and life expectancy). The results also show that human development is independent of the country's level of development and the education level of its population. Additionally, democratic regimes tend to devote a considerable portion of government resources to the health sector, which is likely to be reflected in further improvements in the well-being of a population via redistribution mechanisms. The results seem to contain good news for African countries that inherited bad political institutions or systems from the earlier or colonial regimes. This is because the results tell us that African countries may still have the ability to improve their population's health, even with their contemporary status of political institutions.

1. Introduction

Since the end of 1990s, most African countries have experienced a wave of democratization (Kudamatsu 2012). The discussion among political scientists pertaining to African countries focuses upon the causes of

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democratization; and whether new democracies in the region will be strengthened. Unfortunately, very few studies examine whether such political changes affect the lives of people on the continent. Improvements among political institutions do not always imply that similar improvements will occur in relation to the standard of living because no consensus exists in regards to whether democracy enhances economic development (Przeworski et al. 2000; Kurzman et al. 2002).

In contrast, consensus does exist for the notion that democracy improves human development (Lipset 1959; Boix 2001; Lenski 1966; Muller 1988; Dreze and Sen 1989; Lake and Baum 2001; Ghobarah et al. 2004; Brown and Hunter 2004; Ghobarah et al. 2004; Kudamatsu 2006; Brown and Mobarak 2009). The logic of the argument is based upon the idea that widespread participation in government empowers ordinary citizens, including the very poor, and should therefore lead governments to be more accountable to the population governed (Vollmer and Ziegler 2009; Gerring et al. 2012). For a long period, most political economists believed that democracy was one of the efficient channels to improve human development (UNDP 2002-2206; Gerring et al. 2012). Nevertheless, the view has been strongly challenged in recent years. Several studies maintain that no positive correlation exists between regime type and different measures of human development; or that these relationships are not particularly robust (Gauri and Khaleghian 2002; McGuire 2004; Shandra et al. 2004; Ross 2006). Surprisingly, such studies claim that even under the auspices of authoritarian rule, the level of human development remained high in some countries (i.e., East Asian countries). In contrast, some democratic societies in developing countries witnessed widespread of poverty and income inequality (i.e., India).

Gerring et al. (2012) criticize the extant studies concerning the democracy–human development nexus, claiming that such studies are based upon the fundamental assumption that a proximal relationship exists between the two variables. Subsequently, Gerring et al. (2012) introduce the possibility that the developmental effects of democracy might be long-term and characterized by a distal rather than proximal causal relationship due to the fact that new democracies and old democracies vary. While new democracies are prone to a host of problems associated with regime transition, older democracies are more institutionalized and generally enjoy higher-quality governance

(Kapstein and Converse 2008; Keefer 2006). To support the argument, Gerring et al. (2012) examine samples from 159 countries (developed and developing countries) over the period of 1960 to 2000. The results demonstrate that a country's contemporary level of democracy has only a weak association with the improvement of human development, while a country's historical experience with democracy has a strong and robust influence on human development.

Using data from 46 African countries for the period 1990-2012, the present study examines three principal issues. First, the study examines whether human development is affected by the level or the stock of democracy in these countries; and whether the affect varies over time. Second, the study investigates whether a country's level of development; and whether education level fosters or impedes the impact of democracy on human development. Third, the study examines whether a democratic regime leads to further improvements in the health of its population via redistribution mechanisms. The results of the Arellano-Bond GMM (A-B GMM) technique show that democracy, irrespective of the measurement employed, has a positive impact on human development in both the long run and the short run (i.e., infant mortality rate, and life expectancy). The results also show that the positive impact of democracy, irrespective of the measurement employed, on human development is independent of a country's level of development and the education level of its population. Additionally, democratic regimes through tend to devote a considerable portion of a government resources to the health sector via redistribution mechanisms, which is likely to be reflected in further improvements in the well-being of a population.

The remainder of the paper is organized as follows. Section 2 provides an overview of the causal pathways through which democracy can influence human development. Section 3 presents the data and methodology employed in the present study to perform the empirical estimation. Section 4 analyses the econometric results and discuss the findings. Section 5 summarizes the study and presents the conclusions of the present paper.

2. Democracy and Human Development

Three principal theories highlight the importance of political institutions in increasing the living standards of citizens. Two of the theories are associated with Sen (1981, 1999), whose works concerning the causes of famine extend to addressing the causes of poverty more generally (Rose 2006). The first theory argues that democracies, through the electoral processes, allow the poor to penalize governments that allow famines to occur and result in political leaders actively attempting to avoid famines (Rose 2006: 23). The second argument put forward by Sen is democracies are better than non-democracies in facilitating the transmission of information from poor and distant areas to the central government due to the freedom of the press (Ross 2006). A third theory suggests that a democratic regime tends to help the poor more than non-democracies by creating more public goods and improving the quality of the redistribution of income because the electoral processes present in democracies force politicians to spend government revenues on government services, while autocratic governments face no such constraints (Deacon 2003; Lake and Baum 2001; McGuire and Olson 1996; Niskanen 1997). In other words, democratic governments have a wider range of supporters to satisfy, which encourages democratic regimes to produce public goods instead of private ones (Bueno de Mesquita et al. 2003; Ghorbarah et al. 2004).

The focus of the present study is to examine policies with redistributive characteristics that are intended to promote better health for the population as a whole. In accordance with the third theory, democratic regimes can affect human development through policies on the protection of property rights and redistribution (e.g., Acemoglu and Robinson 2005; Boix 2003; Bueno de Mesquita et al. 2003; Ghorbarah et al. 2004; McGuire and Olson 1996; Meltzer and Richard 1981; Niskanen 1997)³. Nonetheless, matching societal and individual needs with a sufficient redistribution system and suitable public provision of goods and services provides a more direct link between political institutions and human development than property rights protection

³ Vollmer and Ziegler (2009) discuss the possibility of trade-offs between policies for the protection of property rights and/or policies for redistribution. 'Redistribution' refers to the effect of political systems on income inequality or on the provision of public goods; and the size of the public sector (see Boix 2001; Gradstein and Milanovic 2004; Persson et al. 2002, Stasavage 2005a; Persson and Tabellini. 2000).

(Vollmer and Ziegler 2009). Policies for redistribution have an equalizing influence on the distribution of wealth in a society. Such policies are particularly suitable in conjunction with broad-based programs and the provision of public goods and services, in which redistribution policies can offset market failures and normative social optimum levels can be achieved. The redistribution of wealth from the rich to the poor, and vice versa, exists in both autocratic and democratic systems. However, Meltzer and Richard (1981) argue that income redistribution from the rich to the poor is more pronounced and at a higher level in democracies (Avelino et al. 2005; Brown and Hunter 2004; Gerring et al. 2005; Kaufman and Segura-Ubiergo 2001; McGuire 2006; Stasavage 2005a; Tavares and Wacziarg 2001; Gradstein and Milanovic 2004).

According to the model by Meltzer and Richard (1981), the median voter in a democratic government is the decisive voter. The more the income of the median voter falls short of the average income of all voters, the higher the tax rate becomes due to their pressure for redistribution. Consequently, if the majority of the voting public lives at the bottom of the income distribution and only a small part enjoys or controls the wealth, government spending will increase and social services will become more extensive in democratic regimes (Keefer and Khemani 2005). In contrast, the distribution of wealth does not play a decisive role in authoritarian systems. All or a considerable part of the electorate is left out of the decision-making process, so as to avoid the redistributive consequences of democracy. As a result, the magnitude of the public sector on average remains small (Boix 2001).⁴ Autocrats do not implement redistributive policies because of institutional structures, but due to ideological causes; or only to levels that assist them to remain in power and to increase their personal wealth (Vollmer and Ziegler 2009).

However, even in democratic governments, voting alone does not help to overcome aggregation problems stemming from the vast differences in individual preferences. The existence of vast differences in individual preferences raises the issue of whether democratic regimes are more responsive to the needs of citizens when compared against citizens of

⁴ Examples of autocracies with relatively large public sectors include Cuba and Venezuela (Gerring et al. 2012).

autocratic regimes. According to Sen (1999a, 1999b), democracy, alongside its intrinsic value, is of distinguished importance for the development process because of the constructive and instrumental role it plays in the construction and aggregation of values, needs and preferences, and their translation into well-planned policies to benefit the society. For instance, the expansion of civil liberties that constitute parts of a democratic regime is likely to facilitate the formation of preferences and values, as well as access to appropriate information. Accordingly, democratic mechanisms will then enable the transmission of the needs of the citizens into the political arena where decision-making power is distributed among the legitimate representatives of the society as a whole (Vollmer and Ziegler 2009).

Nevertheless, the existence of a democratic regime does not indicate an efficient redistribution or allocation of public goods and services to satisfy the societal needs (Vollmer and Ziegler 2009). Some factors can either hamper or foster the performance of democracy in relation to the satisfaction of societal needs.⁵ For instance, the term 'redistribution' implies the presence of resources to be distributed in the form of public goods. The interaction between such factors and democracy at one point of time influences the output (i.e., policies through the provision of public goods) and the outcome (i.e., the level of human development). The positive effect of democracies on the provision of public goods and, thereby, human development is likely to be strengthened by the level of economic development, as argued by the third theory presented above. In addition, the inadequacy of the information available to the voters may lead to insufficient participation, which is essential for the expression of public opinion and social needs. Consequently, the quality of responsiveness of a government results in a decrease in the unaddressed needs and demands of the society. Moreover, since accountability suffers due to information restrictions, voters are unable to control the behavior of politicians (Vollmer and Ziegler 2009). Education is one of the key factors with the potential to eliminate or minimize problems associated with restricted information. Education, in

⁵ Many factors (e.g., cultural; ethnic fragmentation; media; the degree of income distribution) are likely to hamper or foster the performance of democracy concerning human development (Vollmer and Ziegler 2009). However, the present study focuses on factors that represent the level of development and education because data or proxies for other factors are not available for many countries in Africa and/or over a long period of historical time.

the present context, is not an intrinsic component of human development, but a means to human development (Vollmer and Ziegler 2009). Although, education alone may influence the quality of the democracy, the former may also influence the latter in terms of a more efficient and effective provision of public goods (Lipset 1959; Glaeser et al. 2007; Keefer and Khemani 2005).

Few studies empirically investigate the links between political systems and measures for non-income dimensions of human development.⁶ While some studies find a positive relationship between democracy and human development (e.g., Besley and Kudamatsu 2006; Franco et al. 2004; Tsai 2006; Vollmer and Ziegler 2009), others studies find less evidence supporting the existence of a positive relationship between democracy and human development (Gauri and Khaleghian 2002; McGuire 2004; Shandra et al. 2004; Ross 2006). The existence of the divergent results regarding the relationship between democracy and human development has been attributed, for instance, to the fact that while democracies spend more money on education and health than non-democracies, the benefits of such spending are primarily enjoyed by middle and upper income groups (Ross 2006). The research efforts referred to thus far are either limited to the sub-sample of developing countries (e.g., Tsai 2006; Vollmer and Ziegler 2009); to only one of the non-income dimensions of human development (e.g., Besley and Kudamatsu 2006; Franco et al. 2004; Ross 2006; Gerring et al. 2012); or to a cross-sectional focus leaving out developments over time (e.g., Tsai 2006; Franco et al. 2004). Moreover, the investigations, while having in mind potential conditions that influence the performance of a democracy, only include selected factors as control variables in the regression models employed in the respective models. In relation to the African continent, and to the best of the knowledge of the authors, no studies employ panel-time series data for a large number of countries and employ A-B GMM methods to evaluate the effect of democracy (not the outcomes of the democracy) at current level or stock on non-income dimensions of human development. Nonetheless, with growing

⁶ Numerous studies examine human development and utilize proxies used to measure institutional qualities. Due to the number of such studies, the findings of all relevant studies cannot be summarized here. Therefore, the present study focuses upon political institutions (i.e., democratic and non-democratic) and their relationship with human development.

importance of the human development issues (e.g., the United Nations Millennium Development Goals (MDGs) emphasize human development), few studies examine certain proxies that represent the quality of the governance and its effect on the human development.

Several studies examine issues concerning democracy and human rights in Africa. For instance, Baliaoune-Lutz and Boko (2012) examine the possibility that trade openness (i.e., openness) serves as a conduit through which political institutions, such as political rights, civil liberties and the rule of law (i.e., the outcomes of democracy), affect human development (i.e., life expectancy and literacy rates) through trade (i.e., openness). The study examined of a large group of African countries during the period of 1975 to 2001 and finds that trade and institutions exert little influence on human development in the form of literacy. Additionally, the study finds that income is the primary determinant of human development when measured according to literacy and life expectancy rates.

Similarly, using retrospective fertility surveys conducted in 28 African countries, Kudamatsu (2012) examine whether democracy helps babies survive in sub-Saharan Africa.⁷ The study compares the survival of infants born to the same mother before and after democratization to disentangle the effect of democracy from that of changes in population characteristics. The study finds that the infant mortality fell by 1.2 percentage points, which is roughly 12% of the sample mean, after democratization during the post-Cold War period. Nevertheless, due to the lack of appropriate data, the author fails to provide conclusive evidence concerning the mechanism through which democratization reduces infant mortality.

The present study seeks to fill the gap in extant empirical literature concerning the influence of democracy on non-income dimensions of human development, particularly in relation to the African continent, by incorporating the theoretical explanations of Vollmer and Ziegler (2009) and Gerring et al. (2012). First, although Vollmer and Ziegler (2009)

⁷ In the study, democracy refers to a country satisfying the following two conditions: (1) the chief executive of the government has been elected as a result of multiparty elections with universal suffrage, without subsequently banning opposition parties; and (2) a new chief executive assumes office by winning multiparty elections.

make reasonable theoretical justifications concerning the inclusion of several other factors in the analysis (i.e., education, distribution of income, ethnic fermentation), the study ignores the possibility that the relationship between democracy and human development may be a historical phenomenon, as suggested by Gerring et al.(2012). In contrast, while Gerring et al. (2012) examine the relationship between both the level and stock of democracy on human development, the incorporation of the selected variables (i.e., urbanization and instability) occurs without any clear theoretical justification. However, while Vollmer and Ziegler (2009) advocate the incorporation of variables that represent government expenditure on education and health in the process of investigating the impact of democracy on human development (i.e., to capture the redistribution mechanism of the democracy), the authors fail to capture such effect due to the lack of sufficient data on such expenditures. Second, Vollmer and Ziegler (2009) examine the possibility that the effect of democracy on human development may depend on a country's level of development or the education level of its population, but Gerring et al. (2012) ignore this possibility altogether.

Most importantly, common problems exist in these two studies that may affect the outcomes or at least make the robustness of the analyses questionable. First, in both of the studies, the data is analyzed using a fixed effect approach, which is widely criticized due to its inability to resolve issues arising due to endogeneity and the omitted variables problems (Balioune-Lutza and Bokoc 2012). Second, both studies employ only one measure for human development and the results may not be sufficiently robust when an alternative measure for human development is introduced. The robustness of the results is of particular importance since some extant studies indicate that the relationship between democracy and human development is not robust (e.g., Gauri and Khaleghian 2002; McGuire 2004; Shandra et al. 2004; Ross 2006), as mentioned earlier.

In the present study, the combination of the theoretical framework by Vollmer and Ziegler (2009) and Gerring et al. (2012), in conjunction with employment of a more appropriate estimation method (i.e., A-B GMM), are likely to be sufficiently superior to overcome the aforementioned shortcomings in previous studies. Most importantly, the comments of Vollmer and Ziegler (2009) are addressed in the present study and government expenditures on health variables are considered in

the analysis of the present study, which enables the examination of the impact of democracy on human development through redistribution mechanisms. Additionally, to ensure robustness, two measures of human development are employed: life expectancy and infant mortality rates. In the present study, the selection of both African countries and the period after 1990 is justifiable and is expected to have greater policy implications. As mentioned previously, the countries of the continent experienced remarkable improvement in their political institutions after 1990 (i.e., after the cold war). Nevertheless, no existing study addresses whether the level of human development in countries on the continent is affected by the contemporary status of political institutions; or whether the countries of the continent require a longer period of time for the current political institutions to have a measurable effect on the well-being of their populations. Extant studies propose that democracy and authoritarianism construct deep legacies, extending back several decades, perhaps even centuries (Collier and Collier 1991; Hite and Cesarini 2004). Further, in the framework of democratic regimes, whether the strength of the impact of such regimes on human development depends on a country's level of development and the education level of its population is examined.

In regards to policy implications, if the results show that the contemporary status of democracy exerts a significant influence over human development, the finding will imply that the current efforts to improve political institutions in the African region will manifest in similar improvements in human development. Additionally, the results also imply that new emerging countries in Africa, such as Southern Sudan, are able to improve the well-being of their populations by improving their political institutions. However, if the results show that human development on the African continent is more greatly affected by the accumulation effect of democracy, the finding will imply that countries with a bad historical record regarding the quality of their political institutions will suffer more as a result of improving the welfare of the population. Furthermore, if the results show that the impact of democracy on human development is independent of a country's level of development, the finding will imply that it is possible for poor and democratic governments on the African continent to continue to enhance the well-being of their populations. Otherwise, the current efforts to improve political institutions on the African continent must be

undertaken in conjunction with economic reform to ensure better human development for the populations affected.

3. Variables, Data and Methodology

3.1 Variables and Data

Following Vollmer and Ziegler (2009) and Gerring et al. (2012), the present study employs Polity 2 as indicators for the degree of democratization of the institutions in each country. Polity 2 measures the extent to which democratic or authoritarian political systems are institutionalized in a given country by taking into account how the executive is selected, the degree of checks on executive power, and the form of political competition. The Polity 2 score ranges from 10 (highly democratic) to minus 10 (highly autocratic), while a zero score indicates a state between autocracy and democracy.

The data are gathered from the Polity IV data set (Marshall and Jaggers 2013). For the democracy level, the score a country receives on the Polity 2 for a given year is utilized. For the stock of democracy, the approach of Gerring et al. (2012) is followed and the sum of each country's score from 1990 to the 2012 is computed while applying a 1% annual depreciation rate. The manner in which the stock of democracy is computed allows for the years that are more distant to be weighted less than recent years while allowing for a country's regime stock to be analyzed over a period of two decades. The expectation is that the causal effect of democracy, like other capital stocks, depreciates over time (Gerring et al. 2012).

For non-income dimensions of human development, infant mortality rate (per 1000) and life expectancy at birth (in years) are employed as common and conventional measure. Other variables that are expected to influence human development and to describe the possible conditions under which democracy affects human development include GDP per capita (measure in US\$ 2005) as the proxy for level of economic development. Since education is also a factor that influences the performance of democracy, primary education enrolments are also used as an explanatory variable in the panel analysis (Vollmer and Ziegler 2009). To examine the possibility that democratic regimes can affect human development through the provision of public goods (i.e., the

redistribution mechanism), government expenditure on health is incorporated in the analysis. Ranis et al. (2000) states that three important ratios should be considered when linking government expenditure to human development: the proportion of GDP spending by various levels of government; the proportion of government expenditure devoted to human development investments; and the proportion of spending on human development that is allocated according to priorities. The 1991 Human Development Report (HDR) suggests that good human development can be achieved when government expenditure accounts for approximately 25% of the GDP, of which 40% (or more) is allocated to social spending and more than 50% of this is spent on social priorities (UNDP 1991). Generally, increases in public expenditures for health 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 primarily driven by economic growth, democratic regimes are expected to be the main driver of the second source (Vollmer and Ziegler 2009). Thus, in the present study, such expenditures are measured as the proportion of total government expenditure (see Table 1 for more details). Data for the present study are gathered from 46 African countries over the period of 1990 to 2012 (the list of countries is reported in Table A1 in the Appendix). Data concerning human development measurements, education, health expenditure and per capita GDP are obtained from the World Bank Development Indicator Database (WBDI). According to Gerring et al. (2012), data from the WBDI is more reliable because it has broader country coverage and is less vulnerable to sample biases. A few missing data for some right-hand side variables are estimated using both straight-line interpolation and extrapolation methods. Table 1 shows the main descriptive statistics of the data. Meanwhile, Table 2 shows the statistically significant, but relatively weak, correlations between the democracy level and the stock of democracy; and the remaining variables. Per capita GDP is the only factor that is relatively significant and has a high correlation with the human development variables.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln GDP	1046	6.54	1.10	3.913	9.57
Infant mortality rate (ln)	1058	4.18	0.58	2.42	5.11
Life expectancy at birth(ln)	1058	4	0.163	3.29	4.326
Democracy, Level	989	0.44	5.55	-9	10
Democracy, Stock	989	-0.77	16.30	-90	80
Primary education	1014	93.67	26.06	21.72	172.77
Government expenditure on Health	1058	8.062	3.974	3.7	25.4

Source: Author's calculation

Table 2: Pairwise Correlations

Variable	Democracy, Level	Democracy, Stock	Infant mortality rate(ln)	Life expectancy at birth(ln)	Ln GDP	Government expenditure on Health	Primary education
Democracy, Level	1.00						
Democracy, Stock	0.66 [0.000]	1.000					
Infant mortality rate (ln)	-0.14 [0.000]	-0.27 [0.000]	1.000				
Life expectancy at birth(ln)	0.05 [0.14]	0.16 [0.000]	-0.84 [0.000]	1.000			
Ln GDP	0.13 [0.000]	0.18 [0.000]	-0.74 [0.000]	0.58 [0.000]	1.000		
Government expenditure on Health	0.07 [0.03]	0.03 [0.36]	-0.02 [0.47]	0.02 [0.37]	-0.06 [0.035]	1.000	
Primary education	0.20 [0.000]	0.15 [0.000]	-0.37 [0.000]	0.34 [0.000]	0.39 [0.000]	-0.05 [0.12]	1.000

Note: P-values in parentheses

Source: Author's calculation

3.2 Methodology

The panel-data models are estimated using the A-B GMM technique developed by Arellano and Bond (1991). The A-B GMM methodology is used to address the possible endogeneity of the right-hand side

variables (i.e., per capita income, education, health expenditure and democracy), whilst life expectancy and infant mortality rate are used as separate dependent variables (Baliamoune-Lutza and Bokoc 2012). The model is written as follows:

$$y_{it} = \alpha y_{i,t-1} + \beta X_{i,t-1} + \gamma z_{it} + v_i + \epsilon_{it} \quad (1)$$

where, y_{it} represents human development variables in country i at time t ; X_{it} is a vector of predetermined and endogenous variables; z_{it} is a vector of exogenous variables; and α , β and γ are parameters to be estimated. The term v_i , which represents country specific random effects, is assumed to be independent and identically distributed (iid) over the countries; and ϵ_{it} represents iid disturbances. Terms v_i and are assumed to be independent over all time periods and for each country i .

The A-B GMM method is derived from instrumental variables principles and provides convergent estimators. The A-B GMM also resolves the problem of correlation between the lagged dependent variable y_{t-1} and the error term ϵ_{it} , as well as between explanatory variables X_{it} and/or z_{it} ; and the unobserved country specific term v_i . The GMM procedure is based upon a set of orthogonality conditions, which may arise between the error terms and a set of instrumental variables. According to this principle, the GMM estimator must be able to minimize the empirical counterpart of these conditions to zero. The most efficient estimator is obtained when the model in Equation 1 is transformed into a difference equation as follows (Hansen and Tarp 2001; Naceur and Ghazouani 2007):

$$(y_{it} - y_{it-1}) = (\beta X_{it} - \beta X_{i,t-1}) + (\gamma z_{it} - \gamma z_{i,t-1}) + (\epsilon_{it} - \epsilon_{i,t-1}) \quad (2)$$

In this specification, the country specific effect is excluded, but a new kind of bias arises since $(y_{it-1} - y_{it-2})$ is correlated with the transformed error term $(\epsilon_{it} - \epsilon_{i,t-1})$. Recall that the vector $(\beta X_{it} - \beta X_{i,t-1})$ contains the components $(y_{it-1} - y_{it-2})$. Hence, Arellano and Bond (1991) propose the following moment conditions:

$$E(X_{it-s}(\epsilon_{it} - \epsilon_{i,t-1})) = 0, \text{ for } s \geq 2; \quad t = 3, \dots \dots T_i \quad (3)$$

$$E(Z_{it-s}(\epsilon_{it} - \epsilon_{i,t-1})) = 0, \text{ for } s \geq 2; \quad t = 3, \dots \dots T_i \quad (4)$$

With these conditions in mind, the so-called difference estimator is provided after running two steps. In the first run, the error terms are assumed to be independent and homoscedastic across countries and over time. In the second run, the residuals retained at this step serve to construct a consistent estimate for the variance–covariance matrix. Thus, the difference estimator is asymptotically more efficient than the first step estimator. Alongside the estimation procedure, Arellano and Bond (1991) construct a test to determine whether second-order correlations exist among the error terms of the first-difference equation provided by Equation 2. The importance of the test is due to the fact that the consistency of the GMM estimator depends on the assumption that $E(\varepsilon_{it} - \varepsilon_{it-2}) = 0$. The appropriate statistic of the test is asymptotically standard normal under the null hypothesis and is defined as follows:

$$N = \frac{\Delta \hat{\varepsilon}_{-2} \Delta \hat{\varepsilon}^*}{\sqrt{\Delta \hat{\varepsilon}}} \quad (5)$$

where, $\hat{\varepsilon}_{-2}$ is the vector of residuals lagged twice; and $\hat{\varepsilon}^*$ is a vector of trimmed $\hat{\varepsilon}$ to match $\hat{\varepsilon}_{-2}$. A Hansen specification test, which is a test of over-identifying restrictions, is also conducted. Under the null hypothesis, the Hansen statistic is asymptotically distributed as χ^2 with $p-k$ degrees of freedom and is written as follows:

$$\Delta \hat{\varepsilon} W \left(\sum_{i=1}^n w_i \Delta \hat{\varepsilon}_i \Delta \hat{\varepsilon}_i w_i \right)^{-1} w \Delta \hat{\varepsilon} \quad (6)$$

where, W is the chosen matrix of instruments; p indicates the number of columns in W ; and k the number of parameters to be estimated. The Hansen test is used to verify independence between the instruments and the error term. The null hypothesis, in this case, is that the instruments and the error term are independent. The Difference-Hansen test is used to verify that the error term is not serially correlated as assumed. Under the null hypothesis, there is no second-order serial correlation. Thus, a failure to reject the null hypothesis for both tests indicates that the instruments are valid. Both the Hansen and Difference-Hansen tests are distributed as χ^2 under the null hypothesis (Naceur and Ghazouani 2007).

Firstly, separate examinations of the impacts of democracy level and stock on each of the human development variables are examined.

Thereafter, the impacts of the democracy level and the stock of democracy on each of the human development variables are examined to determine whether either democracy level or stock of democracy are dependent or affected by a given country's level of development; the education level of its population; and the provision of health services. To do so, an interaction term is created between the democracy level and the stock of democracy; and the right hand side variables (i.e., per capita GDP, primary education and government expenditure on health). The introduction of the interaction term may lead to multi-collinearity, as it is likely to be strongly correlated with the original variables used to construct the interaction terms (Darlington 1990; Azman et al. 2010). In order to resolve this problem, the interaction term is orthogonalized using the two-step procedures suggested by Burill (2007). First, the interaction term between each pair of variables, (e.g., democratic level and per capita GDP) are regressed on the democratic level and per capita GDP. Second, the residuals from each regression in the first step are used to represent the interaction term (Azman et al. 2010).

4. Estimation Results and Discussion

Before the results are interpreted, it is important to note that the results of both the Hansen test for over-identifying restrictions and the test for serial correlation of the residuals (i.e. AR [1] and AR [2]) result in the rejection of the assumption of inconsistency of the GMM estimator. In addition, the difference-in-Hansen test of exogeneity results indicate that any correlation between the endogenous variables and the unobserved (fixed) effect is constant over time, which implies that the hypothesis that the additional subset of instruments used in the GMM estimates is exogenous cannot be rejected. Thus, the conclusion is drawn that the results are safe from any statistical problem that may influence the outcomes of the study. Additionally, the study employs data for a large number of African countries that differ in terms of economic structure and level of development. Thus, it is likely that outlier values exist in the data. The data are checked for the presence of outlier values and the model is re-analyzed. Since the quantity of the outlier value in the data is very limited, the results, with and without these values, are identical.

Table 3 reports the results of the impacts of democracy level and the stock of democracy on the human development variables without an interaction term. For the variables of interest, the results show that the

short run effect, together with the autoregressive coefficient, implies that a ten percent increase in a country's democracy level will lower the infant mortality rate by approximately 0.013 percent in the short run and by approximately 0.1 percent in the long run.⁸ Similarly, a 10 percent increase in a country's stock of democracy will lower the infant mortality rate by approximately 0.004 percent in the short run and by approximately 0.13 percent in the long run.

Meanwhile, for the second human development measurement (i.e., life expectancy), the results shows that a ten percent increase in a country's level of democracy will increase the life expectancy at birth by approximately 0.005 percent in the short run and by approximately 0.03 percent in the long run. Clearly, the magnitude of the impact of democracy on human development is relatively large when democracy is measured according to democracy level and human development is measured by infant mortality rate. In addition, the magnitude of the impact of the democracy, irrespective of the measurement employed, on human development is relatively large in the long run compared to short run. The finding implies that, over time, political reform in African countries will likely result in improvements in health of their populations.

Interestingly, the magnitude of the democracy coefficients in the short run is, to a certain extent, identical to that obtained by Gerring et al. (2012), but a slight difference exists. Gerring et al. (2012) detect an insignificant impact for democracy level on infant mortality rate, but the finding is statistically significant in the case of stock of democracy. This may be due to the difference in the period; the difference in the other variables that are included in the analysis; or due to the difference in the method of estimation. Nevertheless, the results appear to contain good news for African countries that inherited bad institutional systems from earlier regimes and for newly independent countries (e.g., South Sudan). The results indicate that African countries have the ability to improve the well-being of their populations, even with the contemporary status of their respective political institutions. This finding is consistent with recent empirical studies generally (e.g., Gerring et al. 2012; Vollmer and

⁸ The long run coefficient is given by the coefficient of the democracy $/(1 -$ the coefficient of the lag dependent variable) (see Felbermayr et al. 2011).

Ziegler 2009), particularly in relation to African countries (Baliamoune-Lutz and Boko 2012; Kudamatsu (2012).

Table 3: The impact of democracy on human development (without interaction terms)

Explanatory variables	Dependent variable Ln/ Infant mortality rate		Dependent variable Ln/ Life expectancy at birth	
Lag Dependent variable	0.97*** [0.1375]	0.97*** [0.03]	0.83*** [0.05]	0.79*** [0.05]
Ln GDP	-0.042 [0.041]	-0.043 [0.041]	0.006 [0.007]	0.002 [0.0004]
Primary education	-0.0003*** [0.00011]	-0.0005*** [0.0001]	0.0004*** [0.0001]	0.0004*** [0.0001]
Government expenditure on Health	-0.003*** [0.001]	-0.001*** [0.0003]	0.0005 [0.0004]	0.002 [0.0015]
Democracy , Level	-0.0013*** [0.0004]	-	0.0005** [0.0002]	-
Democracy / Stock	-	-0.0004*** [0.0002]	-	0.0004 [0.0002]
AR(1)	-0.81	-0.79	1.41	1.33
AR(2)	-1.01	-1.00	1.25	0.89
Hansen test	32.86	32.39	33.38	15.80
Hansen test excluding group	27.44	26.81	25.85	13.16
Difference-in-Hansen tests of exogeneity of instrument	5.42	5.58	7.53	2.64
Wald test, chi ² (probability)	0.000	0.000	0.000	0.000
Number of observation	883	883	883	883

Note: Robust Standard errors in parentheses. *** denotes significance at the 1% level.

The results also indicate that education has a statistically significant positive impact on population health, but the impact is marginal. Several empirical studies document the importance of education in relation to health performance; and identify various channels through which education can affect health (e.g., Arendt 2005; Grossman 2005; Cutler and Lleras-Muney 2010). For instance, parental education, particularly the education level of the mother, affects the health of the offspring. The education level of the mother is more significant than that of the father in regards to the health of the child, but both have a positive and

significant effect. The difference results from the fact that mothers are more involved with children's health than fathers (Grossman 2006). Nevertheless, compared to other regions, the African continent still has the lowest literacy rates in the world. For instance, the WBDI database shows that in 2011, the rate of the literacy among adult people in Africa was about 59% compared to 98%, 94% and 75% for Europe; East Asia and Pacific; and the world, respectively. Since the expansion of education is necessary for health improvement, further efforts should be devoted to the improving education levels of populations on the continent.

The results also detect the positive influence of government expenditure on health and infant mortality rates. Because the data on this variable (health expenditure) include information on aid and assistance from abroad that is mainly focused on child and maternal health, its effect on the overall mortality rate (i.e., life expectancy) appears to be statistically insignificant.⁹ However, generally, the results concerning the positive influence of government expenditure on health and the outcome of such expenditures is consistent with the human development approach, which advocates the significant role of a government in advancing the health of its population through expenditure mechanisms (Haq 2000). The finding is also consistent with others empirical studies that determine the existence of a positive relationship (Anand and Ravallion 1993; Hojman 1996; Bidani and Ravallion 1997). However, a number of studies find that health expenditure by the government contributes very little or is statistically insignificant to health status (Mingat and Tan 1992, 1998; Filmer and Pritchett 1999; McGuire 2004). Table 1 demonstrates that African countries, on average, devote 8% of total government expenditures to the health sector, but this ratio is very small compared to other regions. For instance, each of the European and OECD regions devoted more than 16% of the total government expenditure to the health sector in 2011 (i.e., double that of African countries). Since the results indicate the importance of such expenditures on the health of the population, devoting more resources to the health sectors of African countries will likely result in further improvements in the health of the populations of African countries.

⁹ See the definition of the health expenditure in the World Bank Development Indicator.

Columns 1, 2, 4 and 5 in Table 4 show the results concerning the possibility that a country's level of development and the education level of its population are likely to foster or distract the impact of the contemporary status of democracy on each of the human development variables. Columns 3 and 6 in Table 4 represent the impact of the contemporary status of democracy on each of the human development variables through the redistribution mechanism (i.e., provision of more health services). The results show that the impact of the contemporary status of democracy on human development variables is independent of the country's level of development and the education level of its population. The conclusion drawn is despite the fact that GDP per capita and education are essential for human development, they do not distract or foster the ability of democracy to promote the health of a population. Hence, the results prove that it is democracy itself that is imperative for the human well-being.

This finding is indistinguishable from the findings of Vollmer and Ziegler (2009), who conclude that the impact of democracy on human development (i.e., life expectancy) is independent of the country's level of development (i.e. per capita GDP) and the education level of the population (i.e., literacy rate). In contrast, as expected, democratic regimes tend to devote more resources to the health sector, which is reflected in further improvements in the health of the population, particularly the health of children. This finding is consistent with the theoretical prediction (i.e., the third theory) concerning the impact of democracy on human development. According to the theory, democracies are forced by electoral processes to spend their revenues on government services, while autocratic governments face no such constraints (Deacon 2003; Lake and Baum 2001; McGuire and Olson 1996; Niskanen 1997).

Table 4: The impact of contemporary status of democracy on human development (with interaction terms)

Explanatory variables	Dependent variable Ln/ Infant mortality rate			Dependent variable Ln/ Life expectancy at birth		
	1	2	3	4	5	6
Lag Dependent variable,	0.96*** [0.03]	0.96*** [0.03]	0.95*** [0.03]	0.75 [0.07]	0.75 [0.07]	0.75 [0.07]
Ln GDP	-0.05 [0.04]	-0.05 [0.04]	-0.05 [0.04]	0.02 [0.02]	0.02 [0.014]	0.02 [0.01]
Primary education	-0.001*** [0.0003]	-0.001*** [0.0003]	-0.001*** [0.0002]	0.0005*** [0.0001]	0.0004*** [0.0001]	0.0005*** [0.0001]
Government expenditure on Health	-0.001*** [0.0001]	-0.001*** [0.0001]	-0.001*** [0.0001]	0.0004 [0.0004]	0.0004 [0.004]	0.0004 [0.0004]
Democracy, Level	-0.0004* [0.0002]	-0.001** [0.0003]	-0.001*** [0.0003]	0.0013** [0.001]	0.0009** [0.0004]	0.001** [0.0003]
Democracy, Level × Ln GDP	0.0004 [0.0003]	-	-	0.0007 [0.0005]	-	-
Democracy, Level × Primary education	-	0.0002 [0.0006]	-	-	0.00001 [0.00001]	-
Democracy, Level × Government expenditure on Health	-	-	- 0.0001*** [0.00004]	-	-	-0.00001 [0.00007]
AR(1)	-0.75	-0.75	-0.78	1.58	1.52	1.60
AR(2)	-0.99	-0.99	-0.99	1.53	1.50	4.50
Hansen test	32.66	33.40	33.39	36.77	37.44	37.83
Hansen test excluding group	25.33	25.33	27.58	28.47	29.71	28.86
Difference-in-Hansen tests of exogeneity of instrument	7.33	8.06	5.81	8.31	7.73	8.97
Wald test, χ^2 (probability)	0.000	0.000	0.000	0.000	0.000	0.000
Number of observation	883	883	883	883	883	883

Note: Robust Standard errors in parentheses. *** denotes significance at the 1% level.

Alternatively, democratic governments have a wider range of supporters to appease, which encourages them to produce public goods instead of private ones (Bueno de Mesquita et al. 2003; Ghorbarah et al. 2004). Stasavage (2005a) analysis data for 44 African states and detects strong evidence that democracy has increased government spending on education, and a series of studies of Latin America finds that democracy is robustly linked to higher spending on health, education, and social security (Avelino, Brown, and Hunter 2005; Brown and Hunter 2004; Kaufman and Segura-Ubiergo 2001).

The results of Table 4 are identical to the results obtained when democracy level is substituted with the stock of democracy, as shown in Table 5. The results imply that even if a country lacks an appropriate stock of political institutions, any attempt to improve the contemporary status of such institutions will be reflected in a significant improvement in the population's health, similar to a country that inherited a good stock of political institutions. Thus, the claim that the relative failure of most African countries to achieve the MDGs due to bad political institutions inherited from former regimes is inaccurate (UNDP, 2002-2006). This is because the contemporary status of a country, and/or even its stock of democracy, is able to generate improvements for the population of that country.

In order to check for robustness, the relationship between democracy and human development is re-examined using different proxies,¹⁰ as discussed above. Literacy rate is utilized instead of primary education and the overall results remain the same. Nevertheless, when the model is estimated using fixed and random effect approaches, the results are slightly different because the fixed and random effect techniques are not able to capture endogeneity and omitted variables problems (Balioune-Lutza and Bokoc 2012).

¹⁰ The results are not reported, but available upon request.

Table 5: The impact of stock of democracy on human development (with interaction terms)

Explanatory variables	Dependent variable Ln/ Infant mortality rate			Dependent variable Ln/ Life expectancy at birth		
	1	2	3	4	5	6
Lag Dependent variable	0.96 [0.03]	0.95 [0.03]	0.95 [0.03]	0.84 [0.04]	0.81 [0.05]	0.79 [0.06]
Ln GDP	-0.05 [0.04]	-0.05 [0.04]	-0.05 [0.04]	0.001 [0.009]	0.001 [0.009]	0.004 [0.009]
Primary education	-0.001*** [0.0002]	-0.001*** [0.0003]	-0.0003** [0.0002]	0.0004*** [0.0001]	0.0004*** [0.0001]	0.004*** [0.0001]
Government expenditure on Health	-0.001*** [0.0001]	-0.001*** [0.0001]	-0.001*** [0.0001]	0.002 [0.001]	0.002 [0.001]	0.002 [0.002]
Democracy, Stock	-0.0003 [0.0001]	-0.0004** [0.0002]	-0.0004** [0.0002]	0.0004 [0.0003]	0.0004 [0.0003]	0.0004 [0.0003]
Democracy, stock × Ln GDP	0.0003 [0.0002]	-	-	-	-	-
Democracy, stock × Primary education	-	0.0002 [0.004]	-	-	0.0003 [0.0003]	-
Democracy, stock × Government expenditure on Health	-	-	- 0.0001*** [0.00004]	-	-	0.0001 [0.0001]
AR(1)	-0.72	-0.73	-0.97	1.33	1.35	1.36
AR(2)	-0.99	-0.99	-0.99	0.97	0.91	0.80
Hansen test	32.77	33.06	33.50	18.12	16.11	17.01
Hansen test excluding group	25.42	25.98	27.19	15.63	13.03	13.65
Difference-in- Hansen tests of exogeneity of instrument	7.35	7.08	6.31	4.12	3.10	3.36
Wald test, χ^2 (probability)	0.000	0.000	0.000	0.000	0.000	0.000
Number of observation	883	883	883	883	883	883

Note: Robust Standard errors in parentheses. *** denotes significance at the 1% level.

5. Conclusion

Using data from 46 African countries for the period of 1990 to 2012, the present study examines three principal issues. First, the study examines whether human development is affected by the contemporary status or the stock of the democracy in the countries; and whether the effect varies over time. Second, in the context of democratic regimes, the study investigates whether the strength of the impact of such regimes on human development depends on a country's level of development and the education level of its population. Third, the study determines whether democratic regimes, through their redistribution mechanisms, help to further improve the well-being of the population.

The results of the A-B GMM technique show that democracy level or stock of democracy has a positive influence on human development in terms of infant mortality rate and life expectancy. The results also show that this impact is independent of the country's level of development and the education level of the population. In addition, democratic regimes tend to devote a considerable proportion of government resources to the health sector through redistribution mechanisms, which is likely to be reflected by further improvements in the well-being of the population. The findings are robust, since the results are similar even when an alternative proxy and different estimation methods are employed.

The finding implies that, over time, political reform in African countries will likely result in further improvements in the well-being of the population. In general, the results seem to contain good news for African countries that inherited bad political institutions or systems. The results indicate that the African countries can improve the well-being of their populations irrespective of the current status of their political institutions. The result also implies that even poor countries and countries with low levels of literacy can achieve better human development if the country have higher levels of democracy or are governed by a democratic regime.

Nevertheless, because of data limitations, the present study is unable to consider the impact of democracy, irrespective of how it is measured, on human development due to inequalities in the distribution of income, assets and human capital between populations (i.e., the median voter theory). This is imperative since the unequal distribution of physical

capital and human resources between populations, which are a common feature amongst the African countries, may affect the strength of the impact of democracy on human development (Vollmer and Ziegler 2009). Thus, future studies in this area should incorporate the degree of such distribution in attempt to provide more light on this issue. Moreover, the influence of the ethnic fragmentation, which is also another common feature in the African region, on the strength of the impact of democracy on human development should be investigated. According to Vollmer and Ziegler (2009), under specific circumstances, ethnic fragmentation and the heterogeneity of the societies in a country may influence the relationship between political institutions and human development.

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Appendix 1: List of the countries

Algeria	Gabon	Niger
Angola	Gambia, The	Nigeria
Benin	Guinea	Rwanda
Botswana	Guinea-Bissau	Senegal
Burkina Faso	Kenya	Seychelles
Burundi	Lesotho	Sierra Leone
Cameroon	Liberia	South Africa
Cape Verde	Libya	Sudan
Central African Republic	Madagascar	Tanzania
Chad	Malawi	Togo
Comoros	Mali	Tunisia
Congo, Dem. Rep.	Mauritania	Uganda
Congo, Rep.	Mauritius	Zambia
Cote d'Ivoire	Morocco	Zimbabwe
Egypt, Arab Rep.	Mozambique	
Ethiopia	Namibia	