ON THE PERPETUATION OF THE SITUATION OF ECONOMIC AND SOCIAL UNDERDEVELOPMENT IN AFRICA

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ABSTRACT

Why do the majority of African countries fail to take the steps that would lead them towards greater development? The aim of this work is to determine the factors affecting development, not only the economic ones, which play a central role in economic literature, but also social. To do so we have used a wide sample of countries and have estimated a panel data for 171 countries of those that have been members of the United Nations (UN) for a period of 16 years (from 1995 to 2010 inclusive). Our results lead us to conclude that monetary instability and the colonial past of these countries have had a negative impact on their level of human development. However, improvements in the efficiency of governmental policy and instruments, investment in greater democracy, greater stability and less corruption, have, in all cases, a positive effect on human development in these countries.

KEY WORDS

Human development, institutionalism, poverty, inequality, GDP, Africa.

JEL CODES

I1, I2, I3, O1

1. INTRODUCTION

Is there a universal remedy for underdevelopment? Williamson (1990) proposed a series of measures for countries in this situation in what was known as the "Washington Consensus". The results in the case of African countries, however, were not as expected, given that the whole of Africa registered negative growth rates in the nineties. This being so, we ask two questions, firstly: what measures should African countries adopt in order to escape underdevelopment? And secondly: why do African countries continue to suffer from the situation of underdevelopment which separates them more and more from the levels of economic and social wellbeing found in developed countries? The aim of this study is to contribute to clarifying these and other questions. To do so we have used a panel data for 171 countries belonging to the United Nations (UN) for a period of 16 years (from 1995 to 2010 inclusive) and we have jointly estimated a range of variables, including economic, geographic, historic, religious, environmental, demographic, social and institutional, in order to be able to evaluate the influence of each of them. To do so we have estimated the same data panel model for 52 African countries with the intention of analysing the differences presented by that continent in its process of development. Unlike other empirical analyses made of the determining factors of economic growth, this study uses four dependant variables (the human development index, the GDP per capita, life expectancy and literacy rate) which allow us to asses not only the economic, but also the social aspect of development.

Amongst the results obtained we can single out, in first place, that economic development should not be confused with human development, given that a higher per capita income does not guarantee greater social wellbeing. On the other hand governmental policies and instruments need to be made more efficient. This does not imply greater spending but better organization. Finally, the institutional analysis shows that more investment is needed to enhance democracy, increase political stability and reduce corruption. The analysis of the particular case of African countries shows that acute monetary and political instability, a colonial past and acute deficiencies in physical and institutional infrastructures are the fundamental reasons for the situation of underdevelopment suffered by the majority of these countries.

This study is structured as follows: after this introduction, in section 2 the literature on empirical analysis of the determinants of economic growth is revised. In section 3 a data table model is applied to 171 member countries of the United Nations and the 52 african countries to determine the different variables that affect human development and, finally, in section 4 we present our conclusions.

2. HUMAN DEVELOPMENT AND ITS CONDITIONING FACTORS

Although studies of economic growth have tended to focus on factors such as the investment in physical capital (neo-classical model based on the Solow model), population growth, human capital or research and development (endogenous development), recent studies (new geography and human development) emphasize the heterogeneity of growth and suggest that the effects of policies and institutions vary systematically between one country and another depending on historical, political and structural conditions (Rodrik, 2007, Hausman et al, 2008; Sachs, 2012). Theoretical developments have been accompanied by a growing number of empirical studies. Initially research centered on the question of economic convergence or divergence, as this provided a test for the validity of the two main theories of growth (neo-classical and endogenous growth theories). Finally, the focus has shifted towards finding the factors that determine economic growth. Seminal studies in this field were made by Kormendi and Meguire (1985), Grier and Tullock (1989), and, above all, Barro (1991). This second wave of empirical studies has been aided, on the one hand, by the spectacular development of indicators, above all qualitative, that has led to larger and richer databases, and on the other, by more advanced statistical and econometric techniques (above all cross sectional data and panels data) which allow the identification of the determinants of economic growth with greater precision and confidence.

Within this new current of studies, in the last few years a great part of research has placed an emphasis on studying the reasons for the differences between countries in terms of certain non economic factors that play a crucial role in economic results (Arvanitidis et al, 2007), As such the new institutional economics has brought to the forefront the important function of institutions (Mathews, 1986, North, 1990, Shirley,

2005) and economic sociology has underlined the importance of socio-cultural factors (Granovetter 1985, Knack and Keefer, 1997). Political science has centered its explanations on political factors (Lipset, 1959, Brunetti, 1997) whilst others emphasize the role played by geography and demography (Brander and Dowrick, 1994, Kalemli-Ozcan, 2002, Gallup et al, 1999). Within the new institutional economics the empirical evidence stressing institutional quality above growth has reached the following classification for different institutional dimensions[1]: civil liberties, political rights, economic freedom, corruption, social capital, political instability and institutional infrastructure.

Economic freedom has been the institutional characteristic with the highest level of consensus amongst researchers, showing a significant and favourable impact on economic growth and individual income (De Vanssa and Spindler, 1994; Gwartney et al, 1999; Cole, 2003; Pattanik and Nayak, 2014). Some also find that such impact is superior to that brought about by civil liberties and political rights (Hanke and Walters, 1997, Gwartney et al, 1999, Stroup, 2007), and depends on the level of development of a country (Islam, 1996).

On the other hand, the institutional aspects that have caused the greatest discrepancies have been those of democracy and political rights. As such we find works that consider democracy as an obstruction to economic growth (Bhagwati, 1966, Huntington, 1968, Olson, 1982) whilst others find that democracy has a beneficial global effect on economic development (Scully, 1988, Gwartney et al, 1999, Rigobon and Rodrik, 2005) which also promotes a more equitable distribution of wealth (Hanke and Walters, 1997) and protects growing economies from negative external shocks (Rodrik, 1999). Others, nevertheless, find that said relationship is neither significant nor robust (Barro and Sala i Martin, 1995, De Haan and Siermann, 1995, Alesina et al, 1996, Ali and Crain, 2002).

With regard to civil liberties it is generally observed that the estimated effect on growth is positive (Kormendi and Mequire, 1985, Scully, 1988, Barro 1996) if not always significant or robust (Barro and Sala i Martin, 1995, Ali and Crain, 2002).

[1] In a study carried out by Aixalá and Fabro, (2007), they presented a revision of the literature using these indicators to investigate the relationship between institutions and economic growth.

Likewise, Zeaiter et al. (2015) hold that it is very important to enhance political rights and civil liberties to promote economic development.

With regard to the variables of corruption and political instability, the theoretical literature accentuates the pernicious effects that corruption has on economic growth as it discourages private investment (Mauro, 1995, Del Monte and Papagni, 2001), affects government spending by reducing the amount destined to education (Mauro, 1997), reduces the effectiveness of spending on public investments (Del Monte and Papagni, 2001; Shera et al., 2014), limits the development of small and medium sized businesses (Tanzi and Davoodi, 2002) and hinders innovation (Varsekelis, 2006). Political instability creates uncertainty and threatens property rights, acting thus as a disincentive to investment (Rodrik, 1991; Alesini and Perotti, 1994; Pearson and Tabellini, 1994), and promotes unproductive activity such as rent seeking and corruption (Murphy et al, 1993, Schleifer and Vishny, 1993). Furthermore, it is associated with slower growth and lower levels of investment (Barro, 1991, Alesina et al, 1996, Easterly and Levine, 1997, Fosu, 2001, Aisen and Veiga, 2013). These results are especially relevant for developing countries, most of which have high levels of corruption and political instability.

With regard to social capital, analysis indicates it to have a positive relation with economic growth (Coleman, 1990, Putnam, 1993, Boix and Posner, 1996 or Kenworthy, 1997, amongst others).

Finally, those studies that have used aggregate institutional variables coincide in indicating that these have a significant impact on economic growth (Knack, 1991, Kaufmann et al, 1999, Easterly and Levine, 2003). Some authors suggest that this effect is produced both by a greater effectiveness in allocating resources (Olson et al, 2000) as well as through higher investment levels in physical capital (Faruk et al, 2006) and human capital (Hall and Jones 1999). Furthermore, such infrastructure protects growth from external negative shocks (Rodrik, 1999) and reduces growth volatility (IMF, 2003).

Apart from institutional factors there are diverse socio-cultural factors that can affect growth (Granato et al, 1996, Inglehart and Baker, 2000, Landes, 2000, Zak and Knack, 2001, Barro and McCleary, 2003). Amongst such factors, trust is the most

important. Trust within the economy creates greater incentive for investment in innovation, the accumulation of physical capital and in human resources, all of which lead to economic growth (Knack and Keefer, 1997; Pinotti, 2012; Alesina et al., 2013; Gorodnichenko and Roland., 2013a, 2013b).

The relation between political factors and economic performance was first examined by Lipset (1959), provoking a number of further studies that concluded that the political environment played an important role in economic growth (Kormendi and Meguire, 1985, Scully, 1988, Grier and Tullock, 1989, Brunetti, 1997, Lensink et al 1999, Lensink, 2001). Researchers often evaluate the political environment via variables such as political stability and the level of democracy. The basic argument is that political stability reduces uncertainty, promotes investment and, finally, leads to economic growth.

The important role played by geography in economic growth has been recognized for some time now. Nevertheless, it is not until recently that geographic factors have been modeled and formalized (Gallup et al, 1999). Researchers have used numerous variables, such as latitude, the proportion of land in proximity to the coast, average temperatures and rainfall, soil quality and the ecology of diseases (Hall and Jones, 1999, Easterly and Levine, 2003, Rodrik et al, 2004). There has been a series of recent empirical studies (Sachs and Warner, 1997, Bloom and Sachs, 1998, Masters and McMillan, 2001, Armstrong and Read, 2004) which affirm that natural resources, climate, topography and coastal proximity all have a direct impact on economic growth, affecting productivity, economic structure, transport costs and competitiveness. Nevertheless, others (for example, Easterly and Levine, 2003, Rodrik et al, 2004) arrive at the conclusion that geographical effects are dominated by the institutional framework.

The relation between demographic and economic growth has attracted a lot of interest in recent years. Amongst the most frequently used variables in these studies we find: demographic growth, population density, population composition and migration. These seem to play a predominant role in economic growth (Kormendi and Meguire, 1985, Kelley and Schmidt, 1995, 2000, Barro, 1997, Bloom and Williamson, 1998). It is found that high population growth has a negative effect on economic growth, given that it influences investment, the behavior of savings and the quality of human capital.

Population density, on the other hand, has a positive relation with economic growth as a result of greater specialization and diffusion of knowledge. Nevertheless, other studies find no significant results between economic growth and demographic tendencies (Grier and Tullock, 1989, Pritchett, 2001).

Once presented a summary of the empirical evidence on the impact of the different types of determinants (economic and non economic) on growth, the need arises to indicate with clarity the contribution that each determinant has in a country's economic and social development, so that greater importance and attention can be given to those that have more significant weight. As such this present work aims to contribute to the study of the behavior of the determining factors that influence human development, taking as its base the already established theoretical and empirical knowledge, and introducing institutional, geographic, historical and demographic factors alongside with purely economic ones.

3. MODEL

We use a linear model in this study in order to explain economic and social development via a heterogeneous set of determinants that includes economic, social, geographic and demographic variables, as well as others that reflect physical infrastructures and institutional variables. We measure the development through four variables: Human Development Index (HDI), GDP per capita, life expectancy at birth and literacy rate. In fact, the HDI is made up of the other three used variables, and our intention is to analyze which is the effect of the independent variables on the HDI and each of its components. The sample used introduces novelties owing to its width of scope, given that we have analysed the cases of 171 countries, that is to say, 89% of the member states of the United Nations: countries that offer an adequate vision of the differences existing with regard to economic and social development, dictatorial regimes, democratic, communist and capitalist systems, distinct historical processes, and geographic, demographic and social differences. In this case we have used a more reduced model, comprising 52 African countries, to analyse the specific aspects influencing to human development on that continent.

The time period under study has a limited availability of information, fundamentally for the institutional variables. Even so we have been able to generate a data panel model for a period of 16 years, from 1995 to 2010. In this sense, the use of a panel data to study institutional determinants is a novelty given that the majority of empirical studies use cross sectional data, as institutional indices are of relatively recent creation, and it has been impossible up to now to have a series of more than 10 years available for some of these figures. In this way we have been able to analyse 2,736 observations for each variable used.

a. Data

The variables we have used are given below in table 1:

(TABLE 1)

b. The model

We have estimated a linear model using the estimator Panel Corrected Standard Error (PCSE). At the moment of choosing this estimator a series of tests were made to determine which were most efficient with respect to the variables used. In the first place the Lagrange multiplier test for random effects was used. The value for chi squared ($\chi 2$) led to a rejection of the null hypothesis, making it preferable to use Ordinary Least Squares (OLS) with grouped random effects in the regression, that is to say, the usual OLS estimator. In second place we made a similar test to determine if the estimator of fixed effects was also greater than the grouped model. The F test for the significance of fixed effects showed that, effectively, it was preferable to use the estimator of fixed effects. In third place the Hausman test was used to decide between random and fixed effects. The value of ($\chi 2$) obtained allowed us to reject the null hypothesis, that is to say, the difference between the coefficients of random and fixed effects is systemic, making it convenient to use fixed effects. In fourth place the Wooldridge test was made. This demonstrated that the model showed a problem of autocorrelation. Finally the modified Wald test showed that the model was also heteroscedastic. To resolve this the two best

estimators are Feasible Generalised Least Squares (FGLS) and PCSE. Nevertheless, Beck and Katz (1995) demonstrated that the standard errors of PCSE are more precise than those of MCGF. Furthermore these authors showed that when N>T (as is the case where N=171 and T= 16) MCGF should not be used. As such we decided to use PCSE as estimator for our model.

A panel data was used, allowing us to jointly estimate all the economic, institutional, social, geographic, demographic, historical and religious variables, as well as those that describe infrastructures. This was used instead of cross-sectional analysis, even though the latter is more commonly used by researchers using institutional variables, due to the previously mentioned problem of availability of data. This allows to the researcher work with a great number of data, increasing the degrees of freedom and reducing the colinearity between the explanatory variables. But mainly, the panel allows to analyze an important number of issues that cannot be studied with cross section or time series (Hsiao, 1986).

In this sense, our paper contributes a novel in the analysis of the determinants of the development using institutional variables, since almost all the articles mentioned here use cross section models (only the work of Papagni, (2001) uses a panel data although applied to 20 Italian regions). In addition, our sample surpasses to a great extent to the employees by the rest of authors, since we used a sample of 171 countries and the rest of works uses samples with less than120 countries.

We have made 4 different estimates according to:

- *The sample used.* Once again we apply the model to two sample groups, that is, to the 171 UN member countries and to the 52 African countries. By doing this we can compare and analyse the differences between development in Africa and the rest of the world.
- *The two groups of institutional variables used.* On the one hand we used the indices of civil liberties and political rights of Freedom House and the Corruption Perception Index of Transparency International. On the other hand we have used aggregate indicators of governability produced by the World Bank. In this way we can test if our model is robust and if the effects of institutional variables differ substantially from each other depending on who produces the indicators.

As such we have estimated the following models:

$$DEVELOPMENT_{it} = \alpha + \beta_1 Y_{it} + \beta_2 XCHANGE_{it} + \beta_3 INFLATION_{it} + \beta_4 INVESTMENT_{it} + \beta_5 UNEMPLOYMENT_{it} + \beta_6 FISCAL_{it} + \beta_7 ODA_{it} + \beta_8 OPENNESS_{it} + \beta_9 BOP_{it} + \beta_{10} RER_{it} + \gamma_1 GINI_{it} + \gamma_2 POVERTY_{it} + \gamma_3 PSE_{it} + \gamma_4 ATSCHOOL_{it} + \gamma_5 UNIVERSITY_{it} + \gamma_6 PSH_{it} + \gamma_7 MORTALITY_{it} + \gamma_8 R+D_{it} + \gamma_9 DEMGROW_{it} + \gamma_{10} URBANPOP_{it} + \gamma_{11} WOMEN_{it} + \gamma_{12} CO2_{it} + \gamma_{13} OPEC_{it} + \gamma_{14} EU_{it} + \gamma_{15} ISLAND_{it} + \gamma_{16} COLONY_{it} + \gamma_{17} UDCSA95_{it} + \gamma_{18} UDCSEA95_{it} + \gamma_{19} UDCLAP95_{it} + \gamma_{20} CATHOLIC_{it} + \lambda_1 WATER_{it} + \lambda_2 RENEWABLE_{it} + \lambda_3 AERO_{it} + \lambda_4 ROAD_{it} + \lambda_5 TRAIN_{it} + \lambda_6 MARITIME_{it} + \lambda_7 MOBILE_{it} + \lambda_8 INTERNET_{it} + \theta_1 GI_{it} + \theta_2 ELI_{it} + \theta_3 CLI_{it} + \theta_4 PRI_{it} + \theta_5 CPI_{it} + \eta_i + \delta_t + \mu_{it} \quad (1)$$

$$DEVELOPMENT_{it} = \alpha + \beta_1 Y_{it} + \beta_2 XCHANGE_{it} + \beta_3 INFLATION_{it} + \beta_4 INVESTMENT_{it} + \beta_5 UNEMPLOYMENT_{it} + \beta_6 PFISCAL_{it} + \beta_7 OAD_{it} + \beta_8 OPENNESS_{it} + \beta_9 BOP_{it} + \beta_{10} RER_{it} + \gamma_1 GINI_{it} + \gamma_2 POVERTY_{it} + \gamma_3 PSE_{it} + \gamma_4 ATSCHOOL_{it} + \gamma_5 UNIVERSITY_{it} + \gamma_6 PSH_{it} + \gamma_7 MORTALITY_{it} + \gamma_8 R+D_{it} + \gamma_9 DEMGROW_{it} + \gamma_{10} URBANPOP_{it} + \gamma_{11} WOMEN_{it} + \gamma_{12} CO2_{it} + \gamma_{13} OPEC_{it} + \gamma_{14} EU_{it} + \gamma_{15} ISLAND_{it} + \gamma_{16} COLONY_{it} + \gamma_{17} UDCSA95_{it} + \gamma_{18} UDCSEA95_{it} + \gamma_{19} UDCLAP95_{it} + \gamma_{20} CATHOLIC_{it} + \lambda_1 WATER_{it} + \lambda_2 RENEWABLE_{it} + \lambda_3 AERO_{it} + \lambda_4 ROAD_{it} + \lambda_5 TRAIN_{it} + \lambda_6 MARITIME_{it} + \lambda_7 MOBILE_{it} + \lambda_8 INTERNET_{it} + \theta_1 GI_{it} + \theta_2 ELI_{it} + \theta_3 VAI_{it} + \theta_4 CCI_{it} + \theta_5 GEI_{it} + \theta_6 QRI_{it} + \theta_7 RLI_{it} + \theta_8 PSI_{it} + \eta_i + \delta_t + \mu_{it} \quad (2)$$

Where:

DEVELOPMENT measures the level of development reached for the country in question using four variables: the Human Development Index, the GDP per capita, life expectancy and the level of literacy. *Y* is the Lagged GDP per capita, for one year, measured via the GDP. *XCHANGE* measures the exchange rate, shown as the value of the national currency against the dollar. *INFLATION* is the rate of inflation. *INVESTMENT* gives the percentage of brute investment against the GDP. *UNEMPLOYMENT* is the level of unemployment. *FISCAL* is fiscal pressure. *ODA* is official aid given to development. *OPENNESS* is the level of openness to trade, that is: imports plus exports measured against the GDP. *BOP* is the state of the balance of

payments. *RER* gives the real exchange rate. *GINI* is the Gini index. *POVERTY* is the percentage of the population that lives with less than two dollars a day. *PSE* measures the percentage of public spending on education over the GDP. *ATSCHOOL* gives the average length of school attendance. *UNIVERSITY* gives the proportion of students matriculated in universities. *PSH* measures public spending on heath over the total GDP. *MORTALITY* is the infant mortality rate. *R+D* is the level of spending on research and development. *DEMGROW* is the rate of demographic growth. *URBANPOP* gives the percentage of population living in cities. *WOMEN* gives the proportion of women working in non agricultural sectors divided by the total employment in these sectors. *CO2* gives carbon dioxide emissions per capita measured in metric tons. *OPEC* is a dummy variable that takes the value 1 if the country belongs to OPEC. *EU* is a dummy variable that takes the value 1 if the country is a member of the European Union. *ISLAND* is a dummy variable that takes the value 1 if the country is an island. *COLONY* is a dummy variable that takes the value 1 if the country was a European colony during some part of the 20^{th} century. *UDCSA95* is a dummy variable that takes the value 1 if the country was underdeveloped in 1995 and is in the region of Sub-Saharan Africa. *UDCSEA95* is a dummy variable that takes the value 1 if the country was underdeveloped in 1995 and is in the region of south-east Asia. *UDCLAP95* is a dummy variable that takes the value 1 if the country was underdeveloped in 1995 and is in the region of Latin America and the Pacific. *CATHOLIC* is a dummy variable that takes the value 1 if Catholicism is the majority religion in the country in question. *WATER* measures the percentage of the population with improved access to water supply. *RENEWABLE* gives hydroelectric production over the total production of electricity. *AERO* measures the number of passengers travelling by aeroplane. *ROAD* gives the percentage of surfaced roadways. *TRAIN* gives the total length of railways in kilometers. *MARITIME* measures, via the Maritime Connectivity Index, how each country is connected to world shipping networks. *MOBILE* gives the number of contracts held for cell phones. *INTERNET* gives the proportion of internet users. *GI* is the globalization index. *ELI* is the economic freedom index. *CLI* is the civil liberties index. *PRI* is the political rights index. *CPI* is the corruption perception index. *VAI* is the voice and accountability index. *CCI* is the corruption control index. *GEI* is the governmental effectiveness index. *QRI* is the quality of regulation index. *RLI* is the rule of law index. *PSI* is the political stability index. The variable η_i gives non observed individual effects

specific to each country but constant in time and δ_t measures non observed temporal effects that are variable in time but identical to all countries.

c. Results

After estimating these models using PCSE and analysing the global significance of the models used we obtained the following results. Table 2 shows the results obtained in the estimate of the model applied to the entire sample. Which are the factors that determine development at global level? The results show that the lagged per capita GDP has a positive effect on economic development. Nevertheless, the results are not conclusive for the other three dependant variables, given that the sign of the estimated coefficient depends on the model used. As such, we realized that economic development is not directly linked to human development, given that those countries with a higher per capita income are not those that register a higher level of human development.

Something similar happens with the exchange rate, though in this case the level of significance is less. Even so, the depreciation of the national currency has a positive effect on the level of health and education in the country, and is insignificant for human development and per capita income. With regard to the rate of inflation, its value is hardly significant. It only has a significant, negative, effect on economic development in countries registering higher price rise rates.

The estimated coefficient for the investment variable also shows no conclusive result, given that it is hardly significant and, furthermore, its level of significance and its sign changes according to the model estimated. Even so, we can confirm that as the level of investment rises with regard to the GDP there is an increase in economic development, even though there is no effect on human development, which is probably because private investment is not directed at increasing the social wellbeing of the population.

With regard to the unemployment rate, the regressor obtained is highly significant, with no significant changes with regard to the model used. As such we can affirm that unemployment has a negative impact on both economic and human development, as well as on the health of a country's citizens. Nevertheless, this variable has a positive effect on education, as many of the unemployed see education as a means of finding new employment.

The impact of actions taken in the public sector leads to contradictory results. Whilst fiscal pressure improves all the components of human development (economic development, health and education), public spending does not have the same effect. In this sense, we consider that public spending is not generally directed to social ends, and is probably also not used effectively. As we see in table 2, although public spending impacts positively on the level of education, the length of time that students spend attending school is more important.

The result obtained for Official Development Assistance is highly surprising, as both the negative value of the sign and its significance suggest that this type of aid impacts negatively on the very objective that it is aiming to achieve, that is: to increase the level of development in those countries that receive it. The sign of the variable openness to trade sugests that it is an obstacle to development. This result agrees with that obtained by Anyanwu (2014) who holds that while Africa is almost twice as open as China, openness does not positively and signifcantly affect Africa´s development. With regard to the balance of payments, we observe that competitive countries with a surplus in trade relations in goods and services are those that register a higher level of human and economic development. Nevertheless, contrary to what might be supposed a priori, the real exchange rate impacts negatively on development, from which we can conclude that it is not so important that the price of a country's exports improve in relation to its imports, but rather that the country is sufficiently competitive to sell more goods and services to the external world than it buys from it.

Inequality in the distribution of wealth, as measured by the Gini index shows that this is a hindrance for human development. That is to say that in those countries where wealth is distributed less equally there is greater difficulty to register higher levels of human development. Nevertheless, inequality is beneficial for economic development.

As such it is important that each country should have it very clear what its objectives are, as if the objective is a development that is not only economic but also social then that country must take action against economic inequality and ensure that wealth is more equally shared. With regard to the poverty variable, the negative sign and significance of the estimator allows us to conclude that poverty is adverse to development in all its aspects. Furthermore, in the estimation made for the African countries the sign does not vary, indicating that to diminish the percentage of poor, living on less than two dollars a day, should be one of the main aims of the political economy of these countries.

As we have commented previously, the level of education, given approximately by the time spent in school attendance, has a positive and significant effect on human, economic and educational development. Similarly, but with a lower level of significance, university matriculations also have a positive effect on the educational level. On the other hand, the standard of the health service, as approximated by the infant mortality rate, impacts negatively and significantly on development, which implies that improving health services and, consequently, lowering the infant mortality rate, would lead to greater human and economic development. With regard to spending, both public and private, in research and development (R+D), the result obtained is surprising, given that whilst human development, health and education all improve in those countries that dedicate more resources to research, this does not translate into a higher per capita income. This shows the importance of knowledge transference from those active in research to the productive sector.

With regard to demographic growth, the negative sign of the estimated coefficient allows us to conclude that those countries with higher rates of demographic growth have lower levels of development, though this is only significant in the case of human development and the level of education. No conclusive result is found for the effect of urbanization on development. The value of the regressor found for this variable is not significant. With regard to the incorporation of women into the labor market, we see that this has had a positive impact on human development, but this is not reflected in improved levels of health and education.

In this study of determining factors in human development we have introduced pollution, measured in terms of CO2 emission per capita. The result obtained indicates that this type of pollution is not an obstacle to human development. Even so, pollution has a negative effect on a country's state of health and those countries that pollute more have lower life expectancy levels.

With regard to the geographic variables, the case of those countries belonging to OPEC shows that this has no significant effect on development. We can affirm a priori that being one of the main producers of a resource as valuable as petrol provides no advantage in obtaining higher levels of development. With regard to the status of being an island, it seems that this fact acts as a stimulus to find solutions to overcome this supposed geographic obstacle, and this translates into greater human development.

With regard to the effect of the important historical factor of having been a colony of a European country in relatively recent times (20th century), the results of our estimation show that whilst this fact has not impeded these countries from increasing their per capita income, it has, nevertheless had a negative effect on other aspects of human development such as health and education. Those countries that were European colonies and have gained independence in the twentieth century show lower levels of literacy and life expectancy. In addition, the analysis of underdevelopment by regions, shows that it is "better" to have been underdeveloped in south-east Asia than in Sub-Saharan Africa or Latin America. Those countries that in 1995 were considered underdeveloped in south-east Asia have benefited by the spectacular development of some of their neighbours, whilst the countries in the other two regions have not had the benefit of nearby countries whose influence could help them towards greater economic and social development. With respect to the impact of religious factors, the value of the factor for Catholic religion is positive and significant, allowing us to conclude that the social work done by this religion has been positive for those countries where the majority professes this faith, showing higher levels of human development.

The estimation of those variables describing the state of a country's physical infrastructure yields no conclusive results. In the majority of cases the value of the regressor is not significant and we can offer no general conclusion on the impact of such infrastructures on development. Even so, the estimations show that improved access to

water sources is an incentive to human development, fundamentally in the aspect of health. On the other hand, the renewable use of energies stimulates the economic development. With regard to transport infrastructures, the results show that roads are the most important. A good network of surfaced roads has a positive effect on human development. On the other hand, the results for new technologies show no improvement in development, possibly because in less developed countries access to these technologies is not extended across all social levels. The negative sign for the Globalization Index shows that globalization does not lead to greater human development. Nevertheless, the positive indicator of the Economic Freedom index estimator suggests that there is a positive relation between this factor and human development, thus the protection of property rights, lower levels of corruption and strong fiscal policy have a positive effect on human development. This result agrees with those obtained by De Vansaay and Spindler (1994), Gwartney et al (1999) and Cole (2003). With regard to the Civil Liberties Index a positive coefficient is obtained. As this indicator is defined in such a way that those countries with greater civil liberties have a lower index, we can affirm that greater freedom of religion, press and association do not imply greater levels of development. The estimated coefficient for the GDP per capita institutional variable is not significant, and this agrees with the findings of Barro and Sala i Martin (1995) and Ali and Crain (2002). On the other hand, the negative sign estimated for the Political Rights Index allows us to affirm that democracy stimulate the human development, given that those countries where there are free and impartial elections and a plurality of political parties are the ones that show higher levels of development, as indicated by the work of Scully (1988), Gwartney et al (1999) and Rigobon and Rodrick (2005).

With regard to the Corruption Perception Index, the positive sign of this estimator shows that there is a positive relation between this indicator and development. As this indicator is defined in such a way that the higher its value the lower is a country's level of perceived corruption, we can conclude that corruption has a negative effect on human development. This result confirms the conclusions of Mauro (1995) and Del Monte and Papagini (2001).

With regard to the impact on development of the indices measuring institutional infrastructure elaborated by the World Bank, we find that their significance is low. Even

so, we see that the Voice and Accountability Index has a positive effect on economic development and health, indicating that democracy improves the economic development of a country. In the same way, the positive sign for the Government Effectiveness Index suggests that a higher quality of public administration and services has a positive impact on human development. As such, it is not so important that a country spends more or less, as mentioned previously, but that its spending is aimed at improving the quality of social welfare and public services.

Similarly, we find that political instability is an obstacle to development. On the other hand, the negative sign on the Corruption Control Index, though this only affects the per capita income, shows that corruption favours economic but not human development. This is not in contradiction with our earlier comments on the Corruption Perception Index, as, according to that indicator, human development advances when corruption is lower, whilst the indicator elaborated by the World Bank suggests that economic development is greater when corruption is higher.

(Table 2)

In table 3 we have made an *estimate for African countries*, and we have compared them with the results obtained in table 2 and table 4 (estimation for all the countries except Africa). Amongst the differences observed, *inflation* stands out for its negative effect on human development. As such, for African countries that have suffered periods of hyperinflation, this is evidently a problem for human development which the governments of these countries need to tackle. Elsewhere we see that even though these countries are net receivers of official aid to development, this is not transformed into greater development.

Contrary to what is seen on a global scale (including and excluding the African countries), *inequality in the distribution of wealth* has a positive effect on both economic and social development. Nevertheless, poverty remains one of the main

obstacles to development in these countries. The problem for these countries is that many of them are extremely poor, whilst those with more resources that have experienced some improvement in social welfare tend to have their wealth concentrated in the hands of small minorities.

Once again, we see that an improvement in the *quality of public services* is essential for the development of these countries. Elsewhere, we see that African countries *belonging OPEC members,* and, as such, obtain vast resources from their oil fields, have been unable to turn this into higher levels of development. This result agrees with that obtained by Yelwa et al. (2014).

Though it has no impact on human development, the *colonisation* of this continent by European countries has been very negative for the economic development of the colonised countries, contrary to what is seen on a global scale. The majority of the countries with worse rates of literacy and life expectancy is concentrated in this region, and so the European colonization not only did not make improve the social situation of these countries, but also has supposed an obstacle to the economic growth. In addition, they have been unable to escape the situation of underdevelopment in which they found themselves in 1995 and this is yet another obstacle for development in the region.

(Table 3 and Table 4)

For these countries it is necessary that they invest in improving *transport infrastructures,* as both air and road transport have a positive effect on human development.

With regard to the effect of institutions on development, we see that the impact of democracy varies with the extent to which it is practised. We find that, whilst the negative sign on the index of political rights implies that a greater degree of democracy stimulates the development in these countries, the negative sign on the index of voice and accountability indicates the contrary. As such we can come to no clear conclusion. Even so, we must remember that we are dealing with a part of the world where there is an abundance of non-democratic regimes. As such, it seems reasonable to suppose that the democratisation of these countries would lead to a higher level of development. It

also has to be taken into account that these countries are characterised by a high level of political instability which has a braking effect on their development. The positive sign of the estimated coefficient for the index of political stability clearly indicates this as is seen in the rest of the world. Whatever the case, these results demonstrate the variations produced by institutions in these countries depending on their historical, political and structural conditions, as indicated by Rodrick (2007) and Hausman et al (2008).

4. CONCLUSIONS

The aim of this study is to extend the analysis of the factors that have a bearing on economic and social development on the African continent and compare them with the factors determining human development worldwide.

The first conclusion we reach is that economic development must not be confused with human development. Furthermore, we see that greater economic development does not imply greater human development. The factors that affect human development do not usually affect economic development in the same way. It is not sufficient to merely increase the GDP per capita, social conditions and the wellbeing of the population also have to be improved.

The effectiveness of governmental policies and instruments also has to be improved. In this sense, we have seen that it is not sufficient to simply spend more on health and education. The nature of such spending has to be improved in such a way that greater spending results in a higher quality of services in the educational and health systems. Such improvements should also be made generally in all public services and public administration. Elsewhere we see that spending on R+D has to be promoted and its results made available to, and incorporated into, the productive sector. Similarly, we see that aid to development has to be rethought as it is not achieving its aims and is having no positive impact on human development in those countries that receive it.

Inequality in the distribution of wealth is another obstacle to development, although poverty is the main problem that affects both rich and poor countries. The greater the percentage of poor people in the population leads to lower development in the country

in question. As such, one of the main aims in political economy and in aid to underdeveloped countries should be the reduction of poverty.

Many countries, particularly the developing and less developed, have had to base their strategy of economic development on opening up their economies and increasing their dependence on the external sector. This, however, has had no impact on the level of human development. Similarly, globalization has generally had a negative effect on the development of countries. If we also take into account that in order to increase development it is necessary to have a surplus in the balance of payments, we can see that it is difficult for countries to achieve greater human development via the external sector. To do so such countries must improve their competitiveness in external markets.

Demographic growth and an increase of the population in urban areas has not led to any increase in human development. The creation of mega-cities with more the 10 million inhabitants where extreme wealth and poverty live side by side has led to a deterioration of social wellbeing for those that live there. The birth rate must also be controlled, especially in African countries where the greatest problems of famine occur. The incorporation of women into the workplace has improved the level of human development, especially in those countries where there is still resistance to women working in non agricultural productive sectors.

With regard to the environmental variable used, the per capita emission of CO2, the result obtained raises the question of whether we have to pay the price of higher pollution in order to achieve greater human and economic development. The answer is probably unclear, as we have seen that investment in renewable and less contaminating forms of energy has improved development in many of the countries under analysis. In this sense, infrastructures also play an important part in development. Investment in improving the water supply, airport infrastructures, road, rail and maritime networks could all improve a country's level of development. This is even more necessary in those countries that are initially underdeveloped, since in this situation is very difficult to initiate positive change.

Finally, the role played by institutions is very important for human development, and democracy plays a large part in this. Those countries that wish to increase their

level of development must first increase their level of democracy. Corruption, on the other hand, has a negative impact on human development, and, as such, an effective fight against corruption should be a prime aim of a country's political economy. Periods of political instability, from which both underdeveloped and developing countries have frequently suffered, has also been a big obstacle to development in these countries. As such, it is necessary to invest in democracy, political stability and the reduction of corruption.

With regard to the particular nature of the development process in Africa, these countries are subject to monetary, political and social instability and this is a severe handicap for them if they wish to escape the situation of underdevelopment that they have suffered for a long time now. This is not helped by the fact that the majority of these countries were once European colonies, nor by deficiencies in the physical and institutional infrastructure that is typically characteristic of these countries.

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TABLE 1. TAXONOMY OF MODELED VARIABLES

NATURE	DENOMINATION	DESCRIPTION
Economic	**GDP per capita**	Measured in US dollars. A *proxy* variable for a country´s economic development. The per capita GDP is one of the variables used as dependant variable. Source: *Governments Finance Statistics*, IMF.
	Lagged GDP per capita	This variable allows us to create a dynamic model. Source: *Governments Finance Statistics*, IMF.
	Exchange rate	Measures the rate of exchange of the national currency against the dollar. Source: *International Financial Statistics,* IMF.
	Inflation	Measured by the annual growth of the Consumer Price Index. Source: *International Financial Statistics,* IMF.
	Openness	Defined as the importance of exports plus imports relative to the GDP. Source: *Center for International Comparisons of Production, Income and Prices,* University of Pennsylvania.
	Investment	Measures brute investment against the GDP. Source: *Center for International Comparisons of Production, Income and Prices,* University of Pennsylvania.
	Official Development Assistance	We use the net official aid for development per capita, comprising concessionary loans (net or repayments of the original) and donations made by official organizations. Source: *World Development Indicators,* World Bank.
	Fiscal Pressure	Defined as imposed payments (taxes and Social Security contributions) relative to the GDP. Source: *Eurostat* and *Governments Finance Statistics,* IMF.
	Public Spending	Defined as all non financial spending made in the public sector relative to the GDP. Source: *Governments Finance Statistics,* IMF.
	Balance of Payments	Defined as the difference between incomes form the exportation of goods and services and spending on exportations of the same, measured in terms of the GDP. Source: *World Economic Outlook Database,* IMF.
	Unemployment rate	Reflects the proportion of unemployed relative to the working population. Source: *World Development Indicators,* World Bank.

	Real exchange rate	Calculated as the percentage ratio between the price of exports and the price of imports. This variable is expressed in base 100, taking the year 2000 as reference point. Source: *World Development Indicators*, World Bank.
Social, Geographic, Historical and Demographic	**Human Development Index**	Dependant variable used to measure economic and social development. Calculated in function of three variables: GDP per capita, life expectancy and the literacy rate. Source: *Human Development Report*, UNDP.
	Life expectancy at birth	Dependant variable used as a proxy variable for the level of health care. Source: *Human Development Report*, UNDP.
	Distribution of wealth	We have used the Gini index to measure inequalities in the distribution of wealth. This indicator varies between 0 and 1. When its value is closer to 1, greater is the inequality in distribution. Source: *Eurostat* y *World Development Indicators*, World Bank.
	Poverty	Percentage of the population that live with less than two dollars a day. Source: *World Development Indicators*, World Bank.
	Public Spending on Education	Percentage representing state spending on education against the GDP. Source: *World Development Indicators*, World Bank.
	Literacy rate	Measured as the percentage of people of 15 years and over that can read and write. This rate is used as a dependant variable, given that it is a proxy variable for the level of education. Source: *World Development Indicators*, World Bank.
	Average school life	Number of years spent at school. Proxy variable for the quality of education, given that a person who spends more years studying usually reaches a higher educational level. Source: *Human Development Report*, UNDP.
	University inscription	Measured as the proportion of those in attendance at university against the total population. Source: *World Development Indicators*, World Bank.
	Public Spending on Health	Percentage representing state spending on health against the GDP. Source: *World Development Indicators*, World Bank.
	Infant mortality	Measure of the probability that 1 in a 1000 new born children will die before reaching five. The infant mortality rate is used here as a proxy variable for the quality of the health service. Source: *World Development Indicators*, World Bank.
	Spending on R+D	Percentage representing both private and public spending on research and development against the GDP. Source: *World Development Indicators*, World Bank.

	Demographic growth rate	Annual rate of population growth. Source: *World Economic Outlook Database,* IMF.
	Urban population	Reflects the percentage of the population that live for at least half of the year in areas defined as urban, relative to the total population. Source: *World Development Indicators,* World Bank
	Women in work	Defined as the proportion of women employed in non agricultural sectors against the total of employees in such sectors. Source: *World Development Indicators*, World Bank.
	CO2 emission	Measured in metric tons per inhabitant, this variable allows us to evaluate the relation between the environment and human development. Source: *World Development Indicators*, World Bank.
	OPEC countries	Dummy variable that takes the value of 1 if the country belongs to the Organization of Oil Exporting Countries and 0 if not. This variable allows us to analyse how the availability of this important resource influences economic and social development.
	EU countries	Dummy variable that takes the value of 1 if the country belongs to the European Union and 0 if not. This variable allows us to evaluate if this integration process has favoured the development of member states.
	Island countries	Dummy variable that takes the value of 1 if the country is an island and 0 if not. This variable allows us to analyse if islands have advantages or hindrances with regard to development.
	Colonies	Dummy variable that takes the value of 1 if the country was a European colony in the 20th century and 0 if not. This variable allows us to evaluate if European colonialism is a determining factor in the underdevelopment of these countries.
	UDC 1995	Dummy variable that takes the value of 1 if the country was classified as underdeveloped in 1995 by the UNDP in function of the human development index, and 0 if not. Using this variable we can analyse if a county´s point of departure is an insurmountable obstacle to development. This variable, taken for all the countries of the world, is divided into three regions: **UDC in Sub-Saharan Africa, UDC in south-east Asia and UDC in Latin America and the Pacific**. This allows us to assess which regions have more difficulties in escaping underdevelopment.
	Catholic religion	Dummy variable that takes the value of 1 if the majority in the country professes the Catholic faith and 0 if not. This variable allows us to analyse if Catholicism has favoured human development or not.
Infrastructures	**Water**	A measure of the percentage of the population with reasonable access to adequate water from improved supplies. Source: *World Development Indicators*, World Bank.

	Renewable energy	Defined as the production of hydro-electricity against the total of electricity produced. Source: *World Development Indicators*, World Bank.
	Air transport infrastructure	Measured via the total of passengers using air transport. Source: *World Development Indicators*, World Bank.
	Road transport infrastructure	Defined as the percentage of surfaced roadways against the total of roadways. Source: *World Development Indicators*, World Bank.
	Rail transport infrastructure	Defined via the total length of railway in kilometers. Source: *World Development Indicators*, World Bank.
	Maritime transport infrastructure	Measured via the Maritime Connectivity Index that details how each country is connected to world shipping networks. This indicator is elaborated by the United Nations Conference on Trade and Development (UNCTAD) based on five components of the maritime transport sector: • The number of vessels. • Container transport capacity. • Maximum vessel size. • Number of services. • Number of businesses that use container vessels in the country's ports. Source: *World Development Indicators*, World Bank.
	Mobile phones	Measured via the total number of mobile phone contracts. Source: *World Development Indicators*, World Bank.
	Internet	The percentage of Internet users against the total population. Source: *World Development Indicators*, World Bank.
Institutional	**Civil Liberties**	*Civil Liberties Index*: index elaborated by the NGO *Freedom House* which includes evaluations of religious freedom and freedom of the press, Rule of Law, human and economic rights and rights of association. This index is frequently used in empirical studies.
	Political Rights	*Political Rights Index:* index elaborated by the NGO *Freedom House* which includes evaluations of free and impartial elections, plurality of political parties, significant opposition, military regimes and self determination for minority groups. This index has a high level of use in empirical studies[2].

[2]Both indices are often used together (civil and political) as an indicator of democracy or political freedom. Nevertheless, as Aixalá and Fabro (2007) pointed out, both variables should be used separately as they refer to distinct concepts and, as such, have different implications for the distribution of wealth.

	Economic Freedom	*Economic Freedom Index:* index elaborated by the *Research Institute Heritage Foundation/Wall Street Journal* which includes evaluations of trade policies, Government tariffs, Government intervention in the economy, monetary policy, flow of capital and foreign investment, foreign activity, financial activity, price and wage control, property rights and black market activity and regulation.
	Corruption	*Corruption Perception Index:* index elaborated by the NGO *Transparency International* which includes the impressions of businessmen, academics and analyst about the degree of corruption of politicians and public servants. This is the most widely used index of those given, including evaluations of 150 countries.
	Voice and Accountability	Index belonging to the *Aggregate Governance Indicators* which measures the degree to which a country's citizens can take part in the election of their government plus freedom of speech, freedom of association and freedom of the press. Source: World Bank.
	Political Stability	Index belonging to the *Aggregate Governance Indicators* which quantifies the perception of the probability that a government can become unstable or be overthrown by unconstitutional or violent means, including terrorist acts. Source: World Bank.
	Government Effectiveness	Index belonging to the *Aggregate Governance Indicators* which measures the quality of public services and administration, and the degree to which they are independent from political pressure, the quality of formulation and execution of policies and the credibility of a government's commitment to said policies. Source: World Bank.
	Regulatory Quality	Index belonging to the *Aggregate Governance Indicators* which measures the capacity of a government to formulate and apply adequate policies and regulations that permit the development of the private sector. Source: World Bank.
	Rule of Law	Index belonging to the *Aggregate Governance Indicators* which measures the degree to which people trust and obey the civil law, in particular the quality and execution of contracts, the police and the courts, including the possibility that these commit misdemeanors and acts of violence. Source: World Bank.
	Corruption Control	Index belonging to the *Aggregate Governance Indicators* which measures the misuse of power by the public sector for private gain, including small and wide scale corruption and state control by minorities. Source: World Bank.

	Globalization	Indicator elaborated by the Swiss Economic Institute KOF, which measures the global connectivity, integration and interdependence of countries in cultural, ecological, economic, political, social and technological spheres. Source: KOF, ETH Zurich.

Source: Compiled by Authors.

TABLE 2. RESULTS OF ESTIMATIONS FOR MODELS 1 AND 2 (WORLD)

	MODEL 1 (V. INSTITUTIONALS I)				MODEL 2 (V. INSTITUTIONALS II)			
	HDI	**GDPPC**	**LE**	**LIT**	**HDI**	**GDPPC**	**LE**	**LIT**
Constant	0.58*** (2.76)	15.20** (1.65)	8.75*** (6.21)	5.40*** (5.20)	0.60*** (2.52)	-7.25 (-0.86)	7.82*** (5.96)	6.39*** (5.79)
Lagged GDP per capita	-0.00003*** (-15.23)	0.99*** (94.37)	-0.007*** (-6.05)	-0.0005*** (-12.08)	-0.00002*** (-8.03)	0.95*** (37.99)	-0.0007*** (-5.95)	-0.0003*** (-11.18)
Exchange rate	0.000004*** (4.43)	0.02 (0.43)	0.0002*** (4.28)	0.002*** (10.12)	0.000009 (0.52)	0.002 (0.05)	0.0004*** (4.52)	0.002*** (7.28)
Inflation rate	0.000008 (0.01)	-0.42** (-2.10)	0.001*** (2.60)	0.00002 (0.02)	0.000001 (1.05)	-0.19 (-1.16)	0.001** (1.89)	0.0008 (0.95)
Investment	-0.0003** (-2.17)	0.90** (1.88)	-0.03*** (-4.80)	-0.09*** (-4.73)	0.00008 (0.50)	1.38** (2.04)	-0.01* (-1.48)	-0.06*** (-3.28)
Unemployment rate	-0.001*** (-7.41)	-3.95*** (-5.12)	-0.32*** (-26.55)	0.07** (2.18)	-0.001*** (-4.75)	-6.34*** (-5.90)	-0.35*** (-18.91)	0.09*** (2.07)
Fiscal pressure	-0.0002* (-1.84)	1.42*** (2.60)	-0.05*** (-6.35)	0.08*** (3.65)	0.00005 (0.30)	2.86*** (3.43)	-0.02** (-1.90)	0.06*** (2.51)
Official Development Assistance	-0.0007*** (-6.31)	0.92** (1.89)	0.07*** (9.69)	-0.05*** (-2.68)	-0.0004*** (-3.77)	0.68* (1.60)	0.06*** (7.15)	-0.006 (-0.35)
Openness to trade	-0.0002*** (-10.35)	-0.21 (-0.20)	-0.01*** (-7.24)	0.01*** (3.40)	-0.0002*** (-5.99)	-0.21 (-1.07)	-0.009*** (-5.04)	0.01** (2.24)
Balance of payments	0.0008*** (7.81)	1.51*** (3.72)	-0.02*** (-2.80)	0.12*** (7.12)	0.0005*** (4.83)	2.19*** (3.20)	-0.01** (-1.90)	0.08*** (5.29)
Real exchange rate	-0.0002*** (-5.13)	-0.77*** (-3.59)	-0.007*** (-2.67)	-0.02*** (-2.93)	-0.0002*** (-4.40)	-0.86*** (-3.57)	-0.006** (-2.07)	-0.02*** (-2.94)
Distribution of wealth (Gini Index)	-0.0002* (-1.56)	2.04*** (3.14)	-0.05*** (-5.18)	0.11*** (4.13)	-0.0002* (-1.48)	1.68*** (2.94)	-0.02** (-2.08)	0.01 (0.66)
Poverty	-0.002***	-1.86***	-0.09***	-0.17***	-0.001***	-1.60***	-0.08***	-0.09***

	(-22.18)	(-3.69)	(-12.95)	(-8.55)	(-10.53)	(-3.88)	(-10.20)	(-6.44)
Public spending on education	-0.004*** (-6.36)	-0.68*** (-2.48)	-0.31*** (-7.54)	0.49*** (4.33)	-0.002*** (-2.63)	-0.52* (-1.60)	-0.13*** (-2.79)	0.25*** (2.77)
Average school life	0.01*** (23.38)	-0.87 (-0.31)	-0.28*** (-7.29)	2.57*** (23.25)	0.02*** (16.50)	-0.15 (-0.04)	-0.09** (-1.97)	2.64*** (18.87)
University Matriculations	0.0001* (1.45)	0.11 (0.31)	0.02*** (3.61)	0.01 (0.87)	0.0001 (1.01)	0.98 (0.18)	0.10*** (4.28)	0.009 (0.76)
Public spending on health	0.0009* (1.54)	0.53** (2.13)	0.15*** (4.07)	1.29 (12.90)	-0.002** (-1.66)	1.03*** (3.16)	0.15*** (2.86)	0.89*** (6.82)
Infant mortality rate	-0.0009*** (-10.84)	0.99*** (2.61)	-0.20*** (-36.65)	-0.13*** (-9.05)	-0.0006*** (-6.95)	0.99*** (3.70)	-0.12*** (-22.51)	-0.05*** (-3.95)
Spending on R+D	0.02*** (8.36)	-0.50*** (-5.75)	0.32*** (2.48)	1.97*** (5.30)	0.02*** (10.84)	-0.53*** (-2.87)	0.21** (1.92)	2.46*** (7.54)
Demographic growth	-0.005*** (-4.75)	0.50 (1.12)	0.15** (2.26)	-0.71*** (-3.71)	-0.007*** (-5.62)	-0.84 (-0.07)	0.007 (0.09)	-1.00*** (-5.58)
Urban population	-0.0006*** (-8.41)	-0.58** (-1.82)	-0.02*** (-3.46)	-0.12*** (-9.51)	0.0002* (1.59)	-0.42 (-0.10)	-0.005 (-0.77)	-0.02* (-1.30)
Women in work	0.0006*** (4.46)	0.38 (0.70)	-0.09*** (-11.28)	0.13*** (5.92)	0.0009*** (5.60)	-0.48 (-0.80)	-0.04*** (-4.93)	0.12*** (5.07)
CO2 emission	0.001*** (5.58)	0.58*** (7.51)	-0.06*** (-5.44)	0.20*** (6.67)	0.002*** (6.25)	0.91*** (2.87)	-0.03** (-2.32)	0.28*** (6.66)
OPEC countries	0.01*** (2.65)	-0.17 (-0.99)	-0.54** (-2.25)	3.92*** (5.86)	0.02*** (3.07)	-0.23 (-1.02)	-0.02 (-0.05)	4.12*** (3.96)
EU countries	0.01*** (3.62)	3.56** (2.14)	0.11 (0.49)	1.41** (2.19)	0.01*** (2.37)	0.90*** (2.59)	-0.29 (-1.19)	-0.38 (-0.56)
Island countries	0.02*** (7.28)	-1.29 (-1.26)	0.43*** (2.82)	3.69*** (9.10)	0.02*** (5.60)	0.82 (0.41)	1.73*** (8.04)	3.43*** (5.05)
European Colonies in the 20th Century	-0.003 (-1.09)	0.14* (1.43)	-0.90*** (-5.93)	-0.84** (-2.09)	-0.01*** (-2.98)	0.25** (1.91)	-1.63*** (-6.80)	-2.16*** (-2.96)

Underdeveloped countries in Sub-Saharan Africa in 1995	-0.01*** (-3.79)	-0.22 (-0.16)	-0.61*** (-2.88)	-2.24*** (-3.96)	-0.04*** (-6.51)	-0.006 (-0.00)	-2.81*** (-7.23)	-7.49*** (-6.38)
Underdeveloped countries in south-east Asia in 1995	0.02*** (3.23)	0.14 (0.42)	1.14*** (2.39)	0.78 (0.61)	0.007 (0.50)	1.59 (0.87)	-0.06 (-0.09)	-0.93 (-0.47)
Underdeveloped countries in Latin America and the Pacific in 1995	-0.09*** (-8.37)	0.22 (0.48)	-0.67 (-1.01)	-1.27*** (-7.03)	-0.10*** (-5.78)	-0.77 (-0.30)	-3.18*** (-2.74)	-13.26*** (-4.65)
Catholic religion	0.02*** (9.99)	1.64 (0.19)	0.27** (2.12)	3.13*** (9.04)	0.02*** (5.76)	0.95 (0.07)	0.73*** (3.53)	2.98*** (5.18)
Access to water	0.001*** (8.34)	-0.57 (-0.81)	0.05*** (5.05)	0.13*** (5.10)	0.0004*** (3.54)	-0.38 (-1.09)	0.03*** (4.47)	0.03** (1.92)
Renewable energy	0.0001*** (4.77)	0.20* (1.51)	0.007*** (3.03)	0.02*** (3.11)	0.0001** (1.87)	0.62*** (2.50)	-0.01*** (-3.18)	0.003 (0.47)
Air transport Infrastructures	0.0000004* (1.49)	-0.0002** (-2.06)	0.0004** (2.24)	-0.000001*** (-2.53)	0.00000004 (1.16)	-0.00004 (-0.55)	0.000008 (0.47)	-0.00000006 (-1.19)
Road transport Infrastructures	0.0001*** (3.60)	0.11 (0.69)	0.02*** (8.81)	-0.01 (-0.18)	0.0003*** (6.36)	-0.34 (-0.12)	0.02*** (7.70)	0.02*** (3.48)
Rail transport Infrastructures	-0.0000001* (-1.49)	0.001 (0.27)	-0.003*** (-6.04)	0.00007*** (4.98)	0.00000002 (0.20)	-0.003 (-0.68)	-0.0002*** (-4.43)	0.00005*** (3.93)
Maritime transport Infrastructures	0.0002*** (2.73)	0.34 (0.88)	0.03*** (6.60)	0.008 (0.55)	0.0001 (1.02)	0.65 (1.13)	0.04*** (8.96)	0.01 (1.15)
Mobile phone contracts	-0.00001*** (-4.18)	0.00005 (0.24)	-0.00007 (-0.30)	-0.000002*** (-2.26)	-0.00001*** (-2.83)	-0.00005 (-0.44)	0.000002 (1.10)	-0.000001*** (-2.50)
Internet users	-0.0007*** (-10.31)	1.47*** (4.37)	0.03*** (7.44)	-0.12*** (-9.01)	-0.001*** (-11.71)	2.21*** (3.35)	0.02*** (5.84)	-0.13*** (-10.57)

Globalization Index	-0.0008*** (-6.85)	0.27 (0.57)	-0.04*** (-5.56)	-0.08*** (-4.36)	-0.0008*** (-4.42)	0.68 (1.01)	0.001 (0.16)	-0.07*** (-2.71)
Economic Freedom Index	0.0005*** (4.18)	-0.12*** (-2.35)	0.009 (1.03)	0.04** (1.68)	0.0008*** (4.02)	0.80 (1.11)	0.007 (0.74)	0.07*** (2.82)
Civil Liberty Index	0.01*** (10.17)	-0.19 (-0.32)	0.62*** (7.09)	2.22*** (9.63)				
Political Rights Index	-0.008*** (-8.00)	-0.55* (-1.28)	-0.62*** (-9.65)	-0.52*** (-3.10)				
Corruption Perception Index	0.01*** (13.35)	-0.43 (-0.11)	-0.12** (-1.85)	1.03*** (5.89)				
Voice and Accountability Index					-0.003 (-1.01)	1.60* (1.51)	0.24* (1.62)	-1.33*** (-3.22)
Corruption Control Index					0.004 (1.27)	-0.43*** (-2.52)	-0.11 (-0.56)	0.02 (0.04)
Government Effectiveness Index					0.01*** (3.88)	0.72 (0.04)	-0.17 (-0.91)	1.23*** (2.56)
Regulatory Quality Index					0.003 (0.95)	0.84 (0.53)	-0.11 (-0.77)	0.05 (0.14)
Rule of Law Index					0.003 (0.82)	-0.43*** (-2.67)	0.50** (2.28)	0.46 (0.82)
Political Stability Index					0.008*** (3.74)	0.30*** (3.49)	-0.23** (-1.99)	1.00*** (3.34)

Nº of observations	**2736**	**2736**	**2736**	**2736**	**2736**	**2736**	**2736**	**2736**
R^2	**0.96**	**0.98**	**0.95**	**0.90**	**0.92**	**0.96**	**0.96**	**0.88**

* Significant to 10%. ** Significant to 5%. *** Significant to 1%.

TABLE 3. RESULTS OF ESTIMATIONS FOR MODELS 1 AND 2 (AFRICA)

	MODEL 1 (V. INSTITUTIONALS I)				MODEL 2 (V. INSTITUTIONALS II)			
	HDI	**GDPPC**	**LE**	**LIT**	**HDI**	**GDPPC**	**LE**	**LIT**
Constant	0.54*** (2.75)	28.62 (0.04)	8.80*** (9.81)	4.53*** (5.58)	0.64*** (6.87)	-6.19 (-0.96)	8.28*** (3.07)	5.69*** (7.70)
Lagged GDP per capita	-0.00001*** (-10.85)	0.91*** (30.88)	-0.004*** (-5.16)	-0.0007*** (-2.72)	-0.00001*** (-10.43)	0.90*** (31.03)	-0.0003*** (-4.80)	-0.0007*** (-2.65)
Exchange rate	0.000004*** (3.21)	0.02 (0.70)	0.000009 (-0.90)	0.001*** (4.52)	0.000004*** (2.95)	0.03 (01.06)	-0.0007 (-0.78)	0.001*** (4.85)
Inflation rate	-0.00001** (-2.06)	-0.11* (-1.54)	0.002*** (2.57)	-0.003*** (-2.37)	-0.00002** (-2.09)	-0.05 (-0.74)	0.002*** (2.79)	-0.003*** (-2.39)
Investment	-0.001*** (-6.20)	0.77* (1.63)	0.01 (0.86)	-0.21*** (-4.05)	-0.001*** (-5.85)	0.25 (0.57)	0.007 (0.42)	-0.27*** (-5.06)
Unemployment rate	-0.002*** (-6.04)	-0.79 (-1.23)	-0.46*** (-16.67)	0.20*** (2.65)	-0.002*** (-6.17)	-0.66 (-1.03)	-0.45*** (-16.02)	0.21*** (2.81)
Fiscal pressure	-0.0003* (-1.32)	-0.30 (-0.64)	0.03** (1.64)	0.009 (0.17)	-0.0002 (-0.93)	-0.13 (-0.27)	0.04*** (2.33)	0.05 (0.89)
Official Development Assistance	-0.0007*** (-4.13)	1.04 (0.36)	0.09*** (6.71)	0.02 (0.65)	-0.0008*** (-4.46)	0.32 (0.11)	0.09*** (6.69)	0.02 (0.59)
Openness to trade	-0.00005 (-0.86)	0.86 (0.81)	-0.01*** (-3.91)	0.01* (1.29)	-0.00004 (-0.73)	0.41 (0.39)	-0.02*** (-4.01)	0.02* (1.31)
Balance of payments	0.0004** (2.23)	1.53*** (5.73)	-0.01 (-1.01)	0.05* (1.48)	0.0003** (1.78)	1.35*** (5.27)	-0.01 (-1.15)	0.02 (0.56)
Real exchange rate	-0.0002*** (-4.02)	-0.32*** (-2.72)	0.004 (0.99)	-0.04*** (-3.68)	-0.0002*** (-3.47)	-0.31*** (-2.66)	0.004 (1.14)	-0.04*** (-3.22)
Distribution of wealth (Gini Index)	0.001*** (2.58)	1.23*** (2.57)	-0.06*** (-2.61)	0.38*** (5.41)	0.0008** (2.16)	1.55*** (3.23)	-0.04** (-1.79)	0.40*** (5.80)

Poverty	-0.003*** (-13.54)	-0.86*** (-2.51)	-0.13*** (-12.95)	-0.20*** (-4.54)	-0.003*** (-16.18)	-0.68** (-1.91)	-0.12*** (-8.84)	-0.18*** (-4.66)
Public spending on education	-0.005*** (-3.88)	-0.30* (-1.57)	-0.32*** (-3.80)	0.17 (0.70)	-0.003*** (-2.64)	-0.19* (-0.98)	-0.32*** (-3.75)	0.02 (0.10)
Average school life	0.02*** (13.17)	2.50 (1.05)	-0.93*** (-11.37)	4.11*** (15.83)	0.02*** (12.31)	1.59 (0.68)	-0.95*** (-11.55)	4.13*** (15.73)
University Matriculations	0.00009 (0.45)	-0.36 (-1.14)	0.05*** (4.13)	-0.04 (-1.10)	0.00003 (0.14)	-0.28 (-0.90)	0.05*** (4.19)	-0.05 (-1.20)
Public spending on health	-0.006*** (-5.08)	-0.35 (-0.16)	0.06 (0.75)	0.71*** (2.92)	-0.006*** (-5.04)	-0.20 (-0.95)	0.03 (0.42)	0.52** (2.14)
Infant mortality rate	0.0001 (0.80)	3.16* (1.34)	-0.16*** (-17.93)	-0.03 (-1.13)	0.00009 (0.77)	0.22 (0.97)	-0.17*** (-19.67)	-0.01 (-0.62)
Spending on R+D	0.09*** (14.03)	-0.87 (-0.80)	0.69* (1.62)	9.57*** (6.98)	0.10*** (15.23)	1.52 (0.15)	0.86** (2.01)	11.04*** (8.09)
Demographic growth	-0.001 (-0.41)	-0.42 (-1.22)	0.05 (0.32)	-1.29*** (-3.02)	-0.003** (-1.35)	-0.43* (-1.28)	0.12 (0.73)	-1.58*** (-3.60)
Urban population	-0.001*** (-8.38)	-0.20 (-0.85)	0.004 (0.41)	-0.16*** (-5.13)	-0.001*** (-7.63)	-0.33* (-1.43)	0.002 (0.23)	-0.14*** (-4.43)
Women in work	0.002*** (6.53)	0.42 (0.93)	-0.02 (-0.88)	0.18*** (3.09)	0.002*** (6.12)	0.47 (1.05)	-0.006 (-0.31)	0.14*** (2.39)
CO2 emission	0.008*** (5.90)	1.15*** (4.58)	0.02 (0.28)	0.31 (1.15)	0.01*** (7.37)	1.15*** (4.62)	0.02 (0.25)	0.49** (1.80)
OPEC countries	-0.005 (-0.79)	-1.91* (-1.62)	-1.07** (-2.23)	4.66*** (3.44)	-0.008 (-1.10)	-1.67* (-1.37)	-1.15*** (-2.37)	5.22*** (3.76)
Island countries	-0.002 (-0.26)	-1.49 (-0.11)	-0.10 (-0.21)	7.58*** (5.12)	-0.001 (-0.13)	-1.37 (-0.10)	0.25 (0.47)	7.35*** (4.80)
European Colonies in the 20th Century	0.007 (0.74)	-3.35** (-2.24)	0.40 (0.60)	-0.76 (-0.42)	-0.0005 (-0.06)	-3.45*** (-2.37)	0.61 (0.92)	-1.13 (-0.62)
Underdeveloped countries in 1995	-0.03*** (-5.62)	2.12** (2.16)	-0.47 (-1.20)	-4.32*** (-3.97)	-0.03*** (-5.32)	1.45* (1.46)	-0.33 (-0.85)	-4.36*** (-3.88)

Catholic religion	0.03*** (5.61)	2.40*** (2.92)	-0.85*** (-2.47)	4.68*** (4.87)	0.03*** (5.18)	2.34*** (2.79)	-1.12*** (-3.19)	4.41*** (4.45)
Access to water	0.0003** (1.65)	0.71 (0.20)	0.04*** (2.82)	0.03 (0.87)	0.0001 (0.49)	0.16 (0.47)	0.05*** (3.11)	0.02 (0.40)
Renewable energy	-0.0001* (-1.47)	0.14 (1.25)	-0.08* (-1.51)	-0.02* (-1.31)	-0.0004 (-0.53)	0.14 (1.25)	-0.01** (-2.09)	-0.01 (-1.08)
Air transport Infrastructures	0.000004*** (2.59)	0.000003 (0.70)	0.00006 (0.52)	-0.000001*** (-2.66)	0.000006*** (3.48)	0.000005* (1.30)	0.00009 (0.72)	-0.000006** (-1.70)
Road transport Infrastructures	0.001*** (9.31)	0.80 (0.49)	0.05*** (5.86)	0.03* (1.40)	0.001*** (9.51)	0.42 (0.26)	0.05*** (6.22)	0.04** (1.77)
Rail transport Infrastructures	-0.000004** (-1.64)	-0.004 (-0.87)	-0.005*** (-3.54)	0.0001*** (2.92)	-0.00006*** (-2.66)	-0.006 (-1.14)	-0.0005*** (-3.52)	0.0001** (2.29)
Maritime transport Infrastructures	-0.001*** (-4.36)	-0.90* (-1.34)	0.11*** (5.73)	-0.12** (-1.76)	-0.001*** (-4.06)	-0.81 (-1.23)	0.11*** (5.36)	-0.10* (-1.45)
Mobile phone contracts	-0.00006** (-2.28)	-0.00001 (-0.16)	-0.0003* (-1.62)	-0.000001** (-2.17)	-0.00007*** (-2.64)	-0.000009 (-0.01)	-0.0004** (-2.08)	-0.000002*** (-2.40)
Internet users	-0.001*** (-4.11)	0.70 (0.67)	0.03 (1.08)	-0.19** (-2.05)	-0.002*** (-4.61)	0.64 (0.62)	0.02 (0.86)	-0.22*** (-2.43)
Globalization Index	-0.00004 (-0.14)	0.26 (0.57)	-0.08*** (-4.37)	-0.13*** (-2.48)	-0.0004* (-1.44)	0.34 (0.71)	-0.06*** (-3.10)	-0.19*** (-3.50)
Economic Freedom Index	0.001*** (3.77)	0.68* (1.63)	0.02 (0.84)	0.05 (1.02)	0.001*** (3.57)	1.23*** (2.79)	0.01 (0.78)	0.05 (1.02)
Civil Liberty Index	0.02*** (6.44)	1.69 (0.37)	0.26* (1.47)	3.01*** (5.90)				
Political Rights Index	-0.008*** (-4.50)	-0.23 (-0.07)	-0.23** (-1.78)	-0.98*** (-2.69)				
Corruption Perception Index	0.01*** (12.75)	-0.81** (-1.85)	-0.53*** (-3.31)	0.46 (0.97)				
Voice and Accountability Index					-0.01*** (-2.45)	-0.69 (-0.96)	0.24 (0.83)	-3.38*** (-4.04)

Corruption Control Index					-0.02*** (-2.65)	-0.30*** (-3.06)	0.29 (0.63)	-4.40*** (-3.83)
Government Effectiveness Index					0.02*** (3.22)	0.77 (0.69)	-0.86* (-1.63)	3.20** (2.25)
Regulatory Quality Index					0.002 (0.36)	-0.13** (-1.79)	-0.15 (-0.38)	-1.25 (-1.27)
Rule of Law Index					0.004 (0.45)	-0.13 (-1.19)	-0.55 (-0.94)	3.81*** (2.48)
Political Stability Index					0.003 (0.77)	0.26*** (4.73)	-0.33* (-1.47)	0.68*** (7.70)

Nº of observations	**832**	**832**	**832**	**832**	**832**	**832**	**832**	**832**
R^2	**0.95**	**0.98**	**0.95**	**0.85**	**0.94**	**0.93**	**0.95**	**0.85**

* Significant to 10%. ** Significant to 5%. *** Significant to 1%.

TABLE 4. RESULTS OF ESTIMATIONS FOR MODELS 1 AND 2 (WORLD EXCEPT AFRICA)

	MODEL 1 (V. INSTITUTIONALS I)				MODEL 2 (V. INSTITUTIONALS II)			
	HDI	**GDPPC**	**LE**	**LIT**	**HDI**	**GDPPC**	**LE**	**LIT**
Constant	0.53*** (12.17)	45.54*** (2.80)	6.99*** (41.79)	5.89*** (9.95)	0.64*** (15.35)	24.09 (1.48)	7.03*** (4.36)	7.31*** (12.56)
Lagged GDP per capita	-0.00002*** (-5.45)	0.95*** (26.61)	0.0009*** (0.81)	-0.0005*** (-12.15)	-0.00001*** (-4.43)	0.97*** (27.74)	0.0001 (1.04)	-0.0004*** (-10.84)
Exchange rate	0.000005 (1.06)	-0.008 (-0.10)	0.0004** (2.47)	0.002*** (4.68)	0.000002 (0.51)	-0.03 (-0.39)	0.0003** (2.31)	0.002*** (3.89)
Inflation rate	0.00003* (1.67)	-0.96* (-1.55)	-0.0004 (-0.74)	0.004** (2.14)	0.000004** (2.34)	-0.80 (-1.29)	-0.0003 (-0.60)	0.005** (2.56)
Investment	0.0001 (0.49)	-0.87 (-0.77)	-0.01* (-1.73)	-0.06** (-2.07)	0.0001 (0.57)	-1.52 (-0.14)	-0.01* (-1.78)	-0.05** (-2.00)
Unemployment rate	-0.0005 (-1.21)	-1.24*** (-5.91)	-0.05*** (-3.19)	0.0005 (0.01)	-0.0005 (-1.38)	-13.19*** (-6.71)	-0.05*** (-3.03)	-0.002 (-0.004)
Fiscal pressure	-0.00004 (-0.19)	4.16*** (2.89)	-0.01 (-1.09)	0.02 (0.57)	-0.0002 (-0.78)	4.73*** (3.32)	-0.01 (-1.07)	0.01 (0.43)
Official Development Assistance	-0.001** (-2.05)	3.42** (2.49)	-0.02 (-0.95)	-0.19** (-2.40)	-0.001** (-2.29)	3.29** (2.37)	-0.02 (-0.90)	-0.21*** (-2.82)
Openness to trade	-0.0002*** (-4.85)	-3.04 (-0.99)	-0.008*** (-4.49)	0.009 (1.38)	-0.0002*** (-4.99)	-3.37 (-1.04)	-0.008*** (-4.58)	0.009 (1.35)
Balance of payments	0.0009*** (4.69)	1.52 (1.25)	0.008 (1.01)	0.12*** (5.40)	0.0008*** (4.13)	1.33*** (1.09)	0.005 (0.65)	0.11*** (4.56)
Real exchange rate	-0.00007 (-0.07)	-0.83 (-1.45)	-0.004 (-1.00)	0.02 (1.34)	-0.0005 (-0.50)	-0.68 (-1.17)	-0.004 (-1.21)	0.02 (1.03)
Distribution of wealth (Gini Index)	-0.0003* (-1.49)	3.91*** (3.78)	-0.007 (-0.82)	-0.03 (-1.01)	-0.00003 (-1.25)	3.18*** (3.19)	-0.005 (-0.54)	-0.02 (-0.89)
Poverty	-0.001*** (-6.95)	-3.22*** (-4.10)	-0.04*** (-5.42)	-0.13*** (-5.45)	-0.001*** (-6.31)	-3.33*** (-4.36)	-0.04*** (-5.20)	-0.11*** (-4.58)

Public spending on education	-0.0003 (-0.25)	-1.51** (-2.44)	-0.07* (-1.69)	0.03** (2.31)	-0.0007 (-0.66)	-1.15* (-1.82)	-0.08* (-1.92)	0.04*** (2.59)
Average school life	0.01*** (9.83)	-2.29 (-0.44)	0.05 (0.94)	1.64*** (9.74)	0.01*** (9.04)	-3.65 (-0.72)	0.03 (0.66)	1.47*** (8.94)
University Matriculations	0.0002 (1.12)	-0.20 (-0.28)	0.005 (1.40)	0.01 (0.92)	0.00006 (0.62)	-0.06 (-0.01)	0.005 (1.27)	0.003 (0.26)
Public spending on health	0.002* (1.44)	3.84 (0.54)	0.17*** (3.19)	1.47*** (8.42)	0.001 (1.16)	6.42 (0.92)	0.17*** (3.16)	1.43*** (8.25)
Infant mortality rate	-0.001*** (-6.70)	1.52*** (2.63)	-0.09*** (-10.81)	-0.13*** (-5.23)	-0.001*** (-6.85)	1.19** (1.99)	-0.09*** (-11.12)	-0.13*** (-5.09)
Spending on R+D	0.02*** (4.83)	-0.85*** (-3.47)	0.04 (0.50)	0.79** (2.46)	0.01*** (4.65)	-7.14*** (-3.10)	0.03 (0.31)	0.90*** (2.68)
Demographic growth	-0.007*** (-3.52)	-3.75** (-2.12)	-0.007 (-0.10)	-0.67** (-2.46)	-0.009*** (-4.19)	-3.77 (-2.13)	-0.03 (-0.42)	-0.80*** (-2.79)
Urban population	-0.00005 (-0.37)	-0.55 (-0.82)	0.01* (1.52)	-0.07*** (-3.85)	0.0002 (1.13)	-0.36 (-0.54)	0.01* (1.76)	-0.05** (-2.41)
Women in work	-0.0001 (-0.60)	-0.84 (-0.95)	-0.02* (-1.53)	0.10** (2.34)	-0.0001 (-0.43)	-0.96 (-0.99)	-0.01 (-1.26)	0.10** (2.34)
CO2 emission	0.002*** (4.40)	1.22*** (3.98)	-0.02* (-1.63)	0.27*** (4.77)	0.002*** (4.44)	1.19*** (3.96)	-0.02 (-1.57)	0.27*** (4.65)
OPEC countries	-0.0009 (-0.09)	5.30 (1.34)	-0.19 (-0.49)	1.39 (1.06)	0.01 (1.09)	3.90 (0.93)	-0.15 (-0.39)	2.63** (2.04)
EU countries	0.02*** (3.36)	2.35 (0.70)	0.09 (0.49)	1.20* (1.87)	0.01*** (2.75)	3.31 (0.98)	0.05 (0.79)	0.71 (1.10)
Island countries	0.03*** (5.59)	-1.94 (-0.64)	1.26*** (5.06)	2.72*** (3.96)	0.02*** (4.48)	-4.71 (-0.16)	1.19*** (4.80)	2.22*** (3.22)
European Colonies in the 20th Century	-0.01* (-1.73)	6.85*** (2.86)	0.32 (0.98)	-2.12* (-1.93)	-0.01** (-1.98)	7.53*** (3.11)	0.33 (1.03)	-2.20** (-1.98)
Underdeveloped countries in south-east	0.01 (0.49)	6.66* (1.54)	-0.24** (-2.04)	-1.80 (-0.47)	0.01 (0.36)	5.68 (1.36)	-2.55** (-2.28)	-1.82 (-0.46)

Asia in 1995								
Underdeveloped countries in Latin America and the Pacific in 1995	-0.09*** (-8.37)	0.22 (0.48)	-0.67 (-1.01)	-1.27*** (-7.03)	-0.10*** (-5.78)	-0.77 (-0.30)	-3.18*** (-2.74)	-13.26*** (-4.65)
Catholic religion	0.01** (2.44)	2.64 (1.33)	0.75*** (3.74)	0.43 (0.72)	0.008** (2.00)	2.34 (1.15)	0.81*** (4.10)	-0.07*** (-0.12)
Access to water	0.001*** (3.92)	-2.08** (-2.26)	0.02** (1.95)	0.08** (2.13)	0.001*** (3.58)	-1.61* (-1.76)	0.02* (1.78)	0.07* (1.68)
Renewable energy	0.0002*** (3.53)	0.58 (1.49)	0.006** (2.16)	0.03*** (3.63)	0.0002*** (3.44)	0.72* (1.83)	0.006* (2.03)	0.03 (0.47)
Air transport Infrastructures	0.0000006* (1.49)	-0.0002 (-1.11)	0.0002* (1.48)	0.000004 (0.79)	0.0000007* (1.92)	-0.00002 (-0.88)	0.000003 (1.62)	0.00000004 (0.83)
Road transport Infrastructures	0.0002*** (2.79)	0.29 (0.69)	0.009*** (3.88)	0.01* (1.52)	0.0001** (2.33)	0.15 (0.37)	0.009*** (3.75)	0.01 (1.47)
Rail transport Infrastructures	-0.0000001 (-0.07)	0.00008 (0.13)	-0.002*** (-3.73)	0.00002 (1.31)	-0.0000009 (-0.78)	-0.001 (-0.17)	-0.0002*** (-4.11)	0.00001 (1.01)
Maritime transport Infrastructures	0.0002** (2.31)	0.31 (0.45)	0.02*** (5.05)	0.02* (1.84)	0.0003*** (2.87)	0.44 (0.64)	0.02*** (5.07)	0.03** (2.18)
Mobile phone contracts	-0.00003*** (-3.59)	-0.00007 (-0.24)	0.00002 (0.80)	-0.000002*** (-2.78)	-0.00003*** (-3.72)	-0.00002 (-0.79)	0.000002 (0.87)	-0.000002*** (-2.72)
Internet users	-0.001*** (-11.06)	2.34*** (3.07)	0.03*** (7.95)	-0.14*** (-11.21)	-0.001*** (-12.85)	2.28*** (3.01)	0.03*** (7.69)	-0.15*** (-12.01)
Globalization Index	-0.0005** (-2.09)	-0.37 (-0.33)	0.02** (2.35)	-0.03 (-0.85)	-0.0007*** (-3.14)	0.43 (0.04)	0.02** (2.13)	-0.04 (-1.30)
Economic Freedom Index	0.0008*** (2.98)	-1.85 (-1.46)	0.002 (0.22)	0.01*** (3.05)	0.0003 (1.26)	-0.99 (-0.07)	0.003 (0.28)	0.06* (1.70)
Civil Liberty Index	0.01*** (4.80)	-6.03 (-0.56)	0.15 (1.49)	2.01*** (6.18)				
Political Rights Index	-0.009***	-8.29	-0.20***	-0.72***				

	(-4.62)	(-1.07)	(-2.59)	(-2.79)				
Corruption Perception Index	0.009*** (6.53)	1.43 (1.16)	0.06 (1.22)	0.95*** (5.23)				
Voice and Accountability Index					0.0002 (0.05)	3.05* (1.71)	0.11 (0.63)	-1.64*** (-2.94)
Corruption Control Index					0.004 (0.82)	-4.85 (-1.57)	-0.14 (-0.68)	0.03 (0.04)
Government Effectiveness Index					0.01*** (2.75)	1.45 (0.42)	0.28 (1.49)	1.12 (1.57)
Regulatory Quality Index					0.003 (0.77)	1.40 (0.51)	-0.22* (-1.75)	0.83 (1.54)
Rule of Law Index					0.007 (1.03)	-3.64 (-1.25)	0.34 (1.31)	0.63 (0.71)
Political Stability Index					0.008** (2.52)	-0.65*** (-0.42)	-0.06** (-0.43)	0.96** (2.19)
Nº of observations	**1904**	**1904**	**1904**	**1904**	**1904**	**1904**	**1904**	**1904**
R^2	**0.94**	**0.97**	**0.99**	**0.94**	**0.94**	**0.97**	**0.99**	**0.94**

* Significant to 10%. ** Significant to 5%. *** Significant to 1%.