



# **Growth and the three-dimensional poverty in Sub-Sahara Africa: does legislative democracy play a role?**

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## Abstract

*We examine the consequence of legislative competition on the long term impact of economic growth on the three-dimensional poverty – including revenue, education and health – in a panel of 32 sub-Sahara African countries. We built time series data as a measure of this poverty from the Human Development Index of the United Nations Development Programme. The importance of legislative competition is considered as reversely proportional to the number of seats occupied by the major political party as the Parliament. Results show that Ethiopia's growth reduces poverty thanks both to good government policies and legislative competition; while in the Congo Republic growth increases poverty because of inappropriate governance and anti-poor legislative democracy. Ethiopia's legislative institutions are then considered as a success-story, those of Congo Republic as a failure. We end the paper suggesting legislative institutional reforms capable of reinforcing the impact of global economic growth on poverty in these countries.*

## Keywords

Growth, three-dimensional poverty, legislative democracy, sub-Saharan Africa

## 1. Introduction

During the 40s, 50s and 60s, global economic growth was synonymous with development, under the assumption that *free market mechanisms ensure equitable distribution of the benefits of global economic growth*, so that they automatically trickle down to the poor. Of course Kuznets (1955) indicates that in its initial stages, growth increases inequality; but he also concludes that pursuing growth remains the solution in the long run. This consensus came at the end of the 60s, when it was realised that the rapid economic growth recorded during the previous three decades rather exacerbated poverty of the poorest in many countries, without hope for an automatic turning point. This is why at the very start of the 70s, *equitable growth strategies debates* were launched. The objective of economists participating at these debates was to find the best way of more equitably sharing the benefits of global economic growth. Four options emerged from the discussions: two extremist options, and two middle-ground.

The first of the middle-way options are referred to as *Growth With Redistribution Strategies (GWR)*. They recommend that development policy authorities should modify the patterns of economic growth, so that the benefits can reach the poorest: the World Employment Program (WEP) launched by the *International Labour Office (ILO)* at the early 70s is considered as one of these strategies. The WEP aimed to convince poor countries' governments to put employment at the core of economic policies. The 1990 call for *broad based growth*, by the World Bank is considered as another *GWR* strategy

and for more than a decade, economists are developing *pro-poor growth* research, in order to provide governments with *broad based growth policy instruments*.

The second category of intermediary options is composed of strategies referred to as *Essential Human Goods and Services (EHGS)* strategies and are promoted by the United Nations Organisation system. They recommend that when reshaping the patterns of growth, governments should provide the poor with better education and health services – a strategy which is adopted by both poor and advanced countries. Indeed, it is admitted, on the one hand, that *only earning revenue cannot help escape poverty*, and on the other hand that *even with a low revenue one can escape*, because poverty is a multidimensional phenomenon. Thus many countries managed to provide populations with good social services even though they have relatively low income per capita. Political competition, especially at the Parliament, is a determinant of the willingness of governments to increase social services expenditure as well as to work for pro-poor patterns of economic growth.

Growth can then reduce poverty in two different ways: either by increasing the income of the poor, or by rendering social and essential services more available and accessible to them. Existing works on pro-poor growth, which aim only at appreciating the impact of growth on an income poverty index, are thus incomplete; it is important to rather consider a multidimensional poverty indicator. Economists are aware of this, but they focus on economic aspect because they face difficulties constructing and handling a multidimensional poverty indicator (Kakwani and Pernia, 2000). Moreover these arithmetic works do not reveal the long term relations between growth and poverty. The very genuine impact of growth on poverty reduction would more likely come from an econometric analysis.

The objective of our research is to fill this gap and to go further. We estimate the long term impact of growth on multidimensional poverty in sub-Sahara African (SSA) countries, and analyse the way national political institutions in general – and legislative institutions in particular – influence this long term growth-multidimensional poverty relation. This report comprises seven sections: the first two that follow provide an assessment of the pro-poor and the multidimensional poverty literature; the third and fourth try to construct a three-dimensional poverty index and to build time series data for 32 SSA countries<sup>(1)</sup>; section 5 proposes time series econometric estimation of the impact

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<sup>1</sup> The 32 SSA countries concerned are: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo Republic, Côte-d'Ivoire, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambican Republic, Namibia, Niger, Nigeria, Senegal, South-Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe, Gabon, Ghana, Mauritania, and Democratic Republic of Congo.

of growth on poverty in these countries; section 6 estimates the impact of legislative institutions; and section 7 presents policy implications, and the last section concludes.

## 2. Brief assessment of the Pro-Poor Growth literature

### **2.1. Pro-poor growth: definition and measurement**

We distinguish strong pro-poor growth and weak pro-poor growth: weakly pro-poor if it increases the revenue of the poor and reduces the poverty index (Ravallion and Chen, 2003; Ravallion, 2004; DFID, 2004); strongly pro-poor if it reduces both the rate of poverty and income inequality (White and Anderson, 2001; Kakwani and Pernia, 2000). Instruments for the diagnostic of the weak version are developed by Kakwani (1993, 1997), Datt and Ravallion (1992) and Shorrocks (1999); and those for the strong version by Ravallion and Chen (2003). All these instruments are presented in the technical appendix 1. They share important shortcomings.

### **2.2. The major limits of existing Pro-Poor Growth studies**

#### *2.2.1. They don't examine the long term impact of growth on poverty*

These works tell us nothing about the long term impact of growth on poverty due to the scarcity of data. Each uses two databases on income distribution in the national economy, though the surveys necessary for the construction of such databases need important financial resources, so cannot be regularly conducted in developing countries. Cameroon for example, carried out only three national surveys in over 50 years: 1984, 1996 and 2001; Zambia has no more than three databases: 1991, 1996 and 1998. For this reason, all pro-poor growth papers are of arithmetic nature, non econometric research, and so are not able to reveal any long term tendency. They cannot help answer the question: *does economic growth, as experienced by SSA countries tend to improve living conditions of all?*

#### *2.2.2. They only consider economic aspect of poverty*

These works only consider income aspects while poverty is more and more commonly accepted as a multidimensional phenomenon. Kakwani and Pernia (2000) recognised that a growth that does not increase neither the average revenue of the poor nor their share of the national revenue would remain pro-poor if it makes it possible to improve health and education of the poor by rendering these services more accessible.

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### 3. Brief assessment of the multidimensional poverty literature

The first call for the multidimensional approach of poverty came from Atkinson and Bourguignon (1982); and has been followed during the second half of the 1990s. For a couple of years, economists have been developing works on multidimensional poverty – the theoretical framework of these works is presented in Technical Appendix 2 – though they face three important limits.

#### **3.1. The difficulty of constructing time series data for econometric analysis**

The most important limit of multidimensional poverty works is that they tell nothing on the long term relation between growth and poverty, because of the scarcity of data. They use databases on Living Condition Surveys of the populations, that can not be conducted annually.

#### **3.2. The subjectivity of researchers**

As empirical studies can show, the analysis of multidimensional poverty – as that of the income poverty – yields different results from one analyst to another. The reason is that at the beginning of these works, the constitution of the list of dimensions and variables of poverty is at the discretion of the researcher. This appears clear from the two studies carried out on Cameroon, presented in the technical appendix.

#### **3.3. A combination of very different indicators**

Another important theoretical limit of this research on multidimensional poverty is that it confusedly uses input and output indicators. The measure of multidimensional poverty obtained is consequently a hybrid index, that does not really make sense and thus, is not very useful. Output indicators describe the citizens' living conditions whereas input indicators tell us about the efforts of the government and the citizens themselves to improve these living conditions.

In order to take into consideration these shortcomings, we have selected a limited number of poverty dimensions and variables. These variables should be representative of output indicators only and must be selected so that the existence of the secondary database, in time series, is possible, so as to facilitate the construction of time series data of a multidimensional poverty measure. The construction of these time series data for our panel countries is the main concern of the next section.

## 4. Construction of a multidimensional poverty index time series from the Human Development Index (HDI) for SSA countries

We propose a three-dimensional poverty measure which integrates income, education and health. Income is the main economic dimension; education and health are the main non economic aspects.<sup>(2)</sup>

In the past, there has been one tentative construction of a three-dimensional development indicator based on these three variables: the Human Development Index (HDI) computed by the United Nations Development Programme (UNDP) since 1990. It is then tempting to consider the complementary to the unit of the HDI as a measure of three-dimensional poverty, but there is a serious obstacle.

### **4.1. Obstacle: the non comparability of the HDI**

#### *4.1.1. The non comparability through time of the HDI*

Saha (2005) showed that since 1990, variations of HDI for a single country through time can be caused by factors which have nothing to do with the existing conditions of citizens: methodological changes and modifications of limit values of variables. So there have been some nonsense variations of HDI for countries through time on the period 1990–2006. Consequently, if we consider the complementary to the unit of the HDI as a measure of multidimensional poverty, our poverty index will not be comparable through time. The HDI and the problem of its non comparability through time are largely presented in the technical appendix 3.

#### *4.1.2. The inappropriate solution adopted by UNDP*

To solve the problem, UNDP has adopted a solution that is still controversial: they proposed to keep constant the limit values of variables on the whole period through which we wish to compare HDI. These constant limit values should be determined using retrospective and prospective approaches: for example, if we want HDI to be comparable through the period 1960–2050, we should use a retrospective approach to fix the minimal value of variables at the one experienced by the less developed country in the past (1960–2007); and a prospective approach for the maximum, as the one the most developed country can realise during the next four decades (2008–2050).

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<sup>2</sup> The importance of education and health for human development has been theoretically demonstrated (Sen 1999, Bloom 2007). The East Asian Tigers' experience shows that strong education and health are important for economic growth (Asian Development Bank 1997, World Bank 1993). There are five of the eight Millennium Development Goals (MDG) that concern health and education.



The HDI\_1994 is computed using this method. The retrospectively determined minimal value is 25 years for life expectancy, 0 percent for adults' literacy rate, 0 years for the average duration of schooling; the prospectively determined maximum values are 85 years, 100 percent and 15 years. As GDP per capita is concerned, the minimum is PPA\$ 200, the maximum \$40,000 and the international poverty line is \$5,120. Some other important modifications occurred in 1995, 1998 and 1999 and spoiled the comparability of the index. UNDP is aware, and since 1997 publishes in every *Human Development Report (HDR)* national trends in human development. In 1997 for example, the trends contained HDI values for five non consecutive years: 1960, 1970, 1980, 1992 and 1994. They are constructed using the same methodology, but not the same limit values of variables. So along the trends HDIs should still be considered as non comparable. Constructing strictly comparable HDI trends requires that we also keep unchanged the methodology, or that we isolate the influence of external factors. We have chosen the second option.

#### 4.2. Construction of comparable multidimensional poverty index time series

Our method consists in building time series data of a Comparable HDI, noted C\_HDI, the complementary one to the unit of which will be considered as a relevant three-dimensional poverty indicator, named Human Poverty Index (HPI).

##### 4.2.1. The methodology: The problem

We consider the value of HDI for a country as a function of three factors: the living conditions of citizens ( $V_t$ ), the methodology ( $M_t$ ) and the limit values of variables ( $L_t$ ).

$$HDI_t = f(V_t, M_t, L_t) \quad (1)$$

Its variation from t-1 to t can then be written:

$$HDI_t - HDI_{t-1} = f(\Delta V_t, \Delta M_t, \Delta L_t) \quad (2)$$

We should compute a comparable value of HDI, noted C\_HDI<sub>t</sub>, that can be different from HDI<sub>t-1</sub> if and only if the living conditions have changed. For this let's break up the variation so as to determine the contribution of each variable. If CV<sub>t</sub> is the contribution of the evolution of living conditions, CM<sub>t</sub> that of methodological modifications and CL<sub>t</sub> that of the modifications of limit values of variables, we can write our C\_HDI<sub>t</sub> as:

$$C\_HDI_t = HDI_{t-1} + CV_t \quad (3)$$

If  $C\_HDI_t < HDI_{t-1}$ , the three-dimensional poverty has increased. In order to show exactly HDI variations, we have used the Shapley Value approach. The conceptual

framework of this approach is presented in the Technical Appendix n°1. Here we just present its adaptation.

#### 4.2.1.2. The adaptation of the Shapley Value approach

We have :

$$\Delta HDI_t = HDI_t - HDI_{t-1} = f(\Delta M_t, \Delta L_t, \Delta V_t). \quad (4)$$

In which  $\Delta M_t$  is the methodological modifications,  $\Delta L_t$  the modifications of the limit values of variables, and  $\Delta V_t$  the modifications of living conditions of citizens. In order to facilitate the application of the Shapley Value formula, we can construct the table below, with  $m = 3$  and  $m! = 6$ .

Table 1: Guideline for the application of the Shapley Value equation on the HDI variations

	S	s	Probability $\frac{s!(m-s-1)!}{m!}$	Marginal Contributions $V(S \cup \{k\}) - V(S)$
Methodological modifications ( $\Delta M_t$ )				
Number of factors in the coalition S without $\Delta M_t$	$S = \emptyset$	0	$\frac{2}{6}$	$V(\emptyset \cup \{\Delta M_t\}) - V(\emptyset)$
	$S = \{\Delta L_t\}$	1	$\frac{1}{6}$	$V(\{\Delta L_t\} \cup \{\Delta M_t\}) - V(\{\Delta L_t\})$
	$S = \{\Delta V_t\}$	1	$\frac{1}{6}$	$V(\{\Delta V_t\} \cup \{\Delta M_t\}) - V(\{\Delta V_t\})$
	$S = \{\Delta L_t, \Delta V_t\}$	2	$\frac{2}{6}$	$V(\{\Delta L_t, \Delta V_t\} \cup \{\Delta M_t\}) - V(\{\Delta L_t, \Delta V_t\})$
Changes in the limit values of var. ( $\Delta L_t$ )				
Number of factors in the coalition S without $\Delta L_t$	$S = \emptyset$	0	$\frac{2}{6}$	$V(\emptyset \cup \{\Delta L_t\}) - V(\emptyset)$
	$S = \{\Delta M_t\}$	1	$\frac{1}{6}$	$V(\{\Delta M_t\} \cup \{\Delta L_t\}) - V(\{\Delta M_t\})$
	$S = \{\Delta V_t\}$	1	$\frac{1}{6}$	$V(\{\Delta V_t\} \cup \{\Delta L_t\}) - V(\{\Delta V_t\})$
	$S = \{\Delta M_t, \Delta V_t\}$	2	$\frac{2}{6}$	$V(\{\Delta M_t, \Delta V_t\} \cup \{\Delta L_t\}) - V(\{\Delta M_t, \Delta V_t\})$
Changes in the living conditions ( $\Delta V_t$ )				
Number of factors in the coalition S without $\Delta V_t$	$S = \emptyset$	0	$\frac{2}{6}$	$V(\emptyset \cup \{\Delta V_t\}) - V(\emptyset)$
	$S = \{\Delta M_t\}$	1	$\frac{1}{6}$	$V(\{\Delta M_t\} \cup \{\Delta V_t\}) - V(\{\Delta M_t\})$
	$S = \{\Delta L_t\}$	1	$\frac{1}{6}$	$V(\{\Delta L_t\} \cup \{\Delta V_t\}) - V(\{\Delta L_t\})$
	$S = \{\Delta M_t, \Delta L_t\}$	2	$\frac{2}{6}$	$V(\{\Delta M_t, \Delta L_t\} \cup \{\Delta V_t\}) - V(\{\Delta M_t, \Delta L_t\})$

Source: Our work

$V(\emptyset)$  = HDI variation at year t if none of these factors had changed, that is, if the three factors had kept their level of year t-1.

$$V(\emptyset) = HDI_t(M_{t-1}, L_{t-1}, V_{t-1}) - HDI_{t-1}(M_{t-1}, L_{t-1}, V_{t-1}) = 0 \quad (5)$$

$V(\{\Delta M_t\})$  = HDI variation in year t if only the methodology had changed. So we can define the marginal contribution of  $\Delta M_t$  to a coalition of o factor:

$$V(\emptyset \cup \{\Delta M_t\}) = HDI_t(M_t, L_{t-1}, V_{t-1}) - HDI_{t-1}(M_{t-1}, L_{t-1}, V_{t-1}) \quad (6)$$

The Shapley Value for the methodology, i-e the marginal contribution of methodological modifications in HDI variation is given by:

$$\begin{aligned} CM_t &= \frac{2}{6} [V(\emptyset \cup \{\Delta M_t\}) - V(\emptyset)] \\ &+ \frac{1}{6} [V(\{\Delta L_t\} \cup \{\Delta M_t\}) - V(\{\Delta L_t\})] \\ &+ \frac{1}{6} [V(\{\Delta V_t\} \cup \{\Delta M_t\}) - V(\{\Delta V_t\})] \\ &+ \frac{2}{6} [V(\{\Delta L_t, \Delta V_t\} \cup \{\Delta M_t\}) - V(\{\Delta L_t, \Delta V_t\})] \\ &= \frac{2}{6} [HDI(M_t, L_{t-1}, V_{t-1}) - HDI(M_{t-1}, L_{t-1}, V_{t-1})] \\ &+ \frac{1}{6} [HDI(M_t, L_t, V_{t-1}) - HDI(M_{t-1}, L_t, V_{t-1})] \\ &+ \frac{1}{6} [HDI(M_t, L_{t-1}, V_t) - HDI(M_{t-1}, L_{t-1}, V_t)] \\ &+ \frac{2}{6} [HDI(M_t, L_t, V_t) - HDI(M_{t-1}, L_t, V_t)] \end{aligned} \quad (7)$$

The formulas giving the Shapley Value for limit values modifications ( $CL_t$ ) as well as that of changes in living conditions of citizens ( $CV_t$ ) can easily be derived.

#### 4.2.2. Illustration on the case of Cameroon

Below are results of the application on the case of Cameroon, as illustration.

Table 2: Shapley Value decomposition of Cameroon's HDI variations

Years	HDI <sub>t</sub>	HDI <sub>t</sub> -HDI <sub>t-1</sub>	Decomposition of Variations			
			CM <sub>t</sub>	CL <sub>t</sub>	CV <sub>t</sub>	Sum
1990	0.4762					
1991	0.3274	-0.14877	-0.13001	-0.01608	-0.00268	-0.14877
1992	0.3125	-0.01494	-0.001898	-0.02226	0.009214	-0.01494
1993	0.3095	-0.00301	-0.00021	0.00012	-0.00397	-0.00301
1994	0.4472	0.13766	-0.0347	0.0864	0.08590	0.13766
1995	0.5029	0.05578	0.04371	0.00193	0.01014	0.05578
1996	0.4813	-0.02165	0	-0.0137	-0.00795	-0.02165
1997	0.4675	-0.01375	0	-0.00219	-0.01156	-0.01375
1998	0.4802	0.01269	0	-0.00297	0.01566	0.01269
1999	0.4718	-0.00839	0.00044	0.00416	-0.01299	-0.00839
2000	0.5282	0.05639	0.03189	0	0.02450	0.05639
2001	0.5062	-0.02205	0	0	-0.02205	-0.02205
2002	0.5128	0.00664	0	0	0.00664	0.00664
2003	0.4989	-0.01387	0	0	-0.01387	-0.01387
2004	0.5009	0.00192	0	0	0.00192	0.00192
2005	0.497	-0.0039	0	0	-0.0039	-0.0039
2006	0.506	0.009	0	0	0.009	0.009

Source: The authors

For Cameroon, we have the following time series of the C\_HDI.

Table 3: The C\_HDI and the HPI for Cameroon from 1990 to 2006

Years	HDI <sub>t</sub>	C_IDH=HDI <sub>t</sub> +CV <sub>t</sub>	HPI = 1-(C_HDI)
1990	0.4762	0.4762	0.5237
1991	0.3274	0.4735	0.5265
1992	0.3125	0.4827	0.6634
1993	0.3095	0.4787	0.6914
1994	0.4472	0.5646	0.6046
1995	0.5029	0.5748	0.5427
1996	0.4813	0.5668	0.505
1997	0.4675	0.5553	0.5209
1998	0.4802	0.5709	0.5169
1999	0.4718	0.5579	0.5327
2000	0.5282	0.5824	0.5037
2001	0.5062	0.5604	0.4938
2002	0.5128	0.5670	0.4872
2003	0.4989	0.5532	0.5011
2004	0.5009	0.5551	0.4992
2005	0.497	0.497	0.503
2006	0.506	0.506	0.494

Source: The authors

From the C\_HDI, we get a three-dimensional poverty index as :  $HPI = 1 - (C\_HDI)$ . Thus in 1992,  $HPI = 1 - 0.4827 = 0.5173$ . This is the average three-dimensional poverty in the average citizen who, on average, experiences a 51.73% shortage in the three dimensions concerned. This can be generalised in order to obtain a three-dimensional poverty headcount index for the country. Thus in 1992, 51.73% of Cameroonians should be considered as poor. The higher the HPI, the deeper is the three-dimensional poverty in the country. These time series for all our 32 countries are presented in Appendix 1.

## 5. The long term impact of economic growth on three-dimensional poverty in SSA countries

Before all, it is worth notice that in *HDRs*, HDI are computed each year based on two year old data. The HDI published in 1990 is computed based on data of the year 1988, and that of 2006 on the basis of 2004. Time series data of HDI, C\_HDI and HPI, period 1990–2006, correspond to GDP per capita of the period 1990–2004. So in our estimation



countries from 1990 to 2006 can be explained by the equation. Two important conclusions can be drawn from this regression equation:

- The most significant independent variable is  $HPI_{t-1}$ . Its coefficient is positive and significant. This confirms the presence of the poverty trap across our panel countries. No victory against poverty in the region is then possible with that vicious circle unbroken. Some economists (Sachs et al., 2004; Collier, 2004) have already called for a *big push* without which this trap can not be broken.
- We should conclude that economic growth slightly increases poverty across these countries: so growth can be considered to be pro-poverty across these countries. These countries, globally considered, should then have been experiencing an impoverishing economic growth since 1988. There is a need for courageous anti-poverty economic growth policies if we want to stop this adverse tendency. However, optimal policy suggestions need a clear knowledge of the specific situation of each of these countries.

#### 5.2.2. The Fixed-Effects regression results

In order to appreciate the specific situation of each country, we have estimated our model using the Fixed Effects (FE) techniques and got results presented in details on table 4 annex 3. These results have permitted us to group countries into nine categories as in the following table:

Table 4: Classification of countries according to the impact of growth on poverty

	$\beta_2 < 0$ significant	$\beta_2 < 0$ non significant	$\beta_2 > 0$ significant	$\beta_2 > 0$ but non significant
$\beta_1 < 0$ and significant				
$\beta_1 < 0$ but non significant			(Category 7) Congo Rep., Mauritius	
$\beta_1 > 0$ and significant	(category 2) Ethiopia, Uganda	(category 4) Benin Burkina F. Lesotho, Malawi, Zimbabwe, Gabon, Tanzania, DR Congo	(category 9) Angola, Botswana, Chad	(Category 6) Burundi, Cameroon, Central African Republic, Kenya, Madagascar, Mali, Niger, Nigeria, Senegal, Togo
$\beta_1 > 0$ but non significant	(Category 1) Mozambique	(Category 3) Namibia, South Africa	(Category 8) Mauritania	(Category 5) Côte-d'Ivoire, Zambia, Ghana

Source: Our work



The best category is that of countries in which growth significantly reduces poverty while the poverty trap is not significant. This is the preferred group of countries, in which growth is a necessary and sufficient condition for poverty reduction. In this category we have only one country, the Mozambican Republic.

The second best category is that of countries in which growth significantly reduces poverty despite a significant poverty trap. Here, growth is the main instrument for any effective poverty reduction strategy, but we must pay enough attention to the poverty trap that should be broken before growth can reduce more rapidly the three-dimensional poverty. In this category we have two countries: Ethiopia and Uganda.

Countries of these first two categories can be considered to have pro-poor governments. Pro-poor government is the one that successfully translates global economic growth into three-dimensional poverty reduction. Such government is characterised by good governance (economic and social governance) and is the one that adopts pro-poor economic growth policies and/or invests seriously in social sectors for the benefit of the marginalised populations. However, in Uganda and Ethiopia, the efforts of government face some constraints that explain poverty trap. These constraints can be social rigidity, cultural backwardness factors or other institutional considerations.

The third best category is that of countries in which growth reduces, but not significantly, poverty and in which the poverty trap is not significant. In this category we have two countries: Namibia and South Africa.

The fourth best category is that of countries in which growth reduces poverty but not significantly and in which the poverty trap is significant. In this category we have eight countries: Benin, Burkina Faso, Malawi, Zimbabwe, Gabon, Lesotho, Tanzania and the DR Congo. The poverty trap is a serious concern in these countries, while growth is not an effective instrument for poverty reduction strategy. So these countries must first of all break the poverty trap, if not economic growth can not reduce poverty. Policies, other than economic ones, should be implemented, alongside an economic and financial big push. Institutional reform is one of these necessary non-economic policies.

The fifth best category is that of countries in which growth increases, but not significantly, poverty and in which poverty trap is not significant. Here we have three countries: Côte d'Ivoire, Zambia, Ghana.

The sixth best category is that of countries in which growth increases, but not significantly, poverty, while the poverty trap is serious. In this category we have ten countries: Burundi, Cameroon, Central African Republic, Kenya, Madagascar, Mali, Niger, Nigeria, Senegal and Togo. In these countries, anti-poverty growth policies should be more important and thorough than those needed in countries of the fifth best category above. Courageous institutional reforms are also needed to break out the poverty trap.

In the seventh category we have countries in which growth increases significantly the three-dimensional poverty but in which there is surprisingly no poverty trap. This is a controversial situation in which we find two countries: Congo Republic and Mauritius.

The eighth category comprises (Mauritania) in which growth significantly increases poverty, with no significant poverty trap. In this country, there is need for pro-poor growth policies as well as for redistributive policies. Patterns of growth should be adopted in order to facilitate the circulation of revenue, government should also invest enough in health and education of the poor to facilitate social participation in order to avoid exclusion from economic and social activities.

The least desirable category is that of countries in which growth increases poverty significantly with a significant poverty trap: Angola, Botswana and Chad. Globally, we can conclude that the poverty trap hypothesis is accepted in our panel countries. Only two countries don not experience any poverty trap: the Republic of Congo and the Mauritius. In 23 out of 32 countries, we should also conclude that growth is three-dimensional poverty neutral. Indeed, in thirteen countries (Burundi, Cameroon, Central African Republic, Côte-d'Ivoire, Kenya, Madagascar, Mali, Niger, Nigeria, Senegal, Togo, Ghana, Zambia), growth tends – but not significantly – to increase poverty. In the other countries, economic growth tends to reduce poverty though again, not significantly.

The poverty reduction impact of growth can depend on the nature of government. So in the three countries in which growth significantly reduces poverty (Ethiopia, Uganda and Mozambique), we consider that there is a strong pro-poor government. In ten other countries, in which growth reduces poverty but not significantly, we consider that there is a weak pro-poor government. In countries where growth significantly increases poverty, we consider that there is a strong anti-poor government. This kind of government is characterised by disconnection of objectives: members of government have objectives that completely differ from those of the populations. Some authors would have called it predator government (Azam and al., 1996); but in countries where growth does not significantly increase poverty, we consider we have weak anti-poor government.

Institutional reforms can help weak anti-poor governments to become pro-poor regimes. Our panel countries can then be classified as follow, according to the nature of government.

Table 5: Classification of Countries according to our governance criteria

	Strong Pro-Poor Governments	Weak Pro-Poor Governments	Strong Anti-Poor Governments	Weak Anti-Poor Governments
C <sup>tries</sup>	Ethiopia, Uganda Mozambique	Benin, Burkina Faso, D.R. Congo, Gabon, Lesotho, Malawi, Namibia, South Africa, Tanzania, Zimbabwe	Congo Rep., Mauritius, Angola, Botswana, Chad, Mauritania	Burundi, Cameroon, Central African Rep., Côte-d'Ivoire, Ghana, Kenya, Madagascar, Mali, Niger, Nigeria, Senegal, Togo, Zambia

Source: Results of the authors

## 6. The role played by SSA countries' legislative institutions

### 6.1. The problem and hypothesis

#### 6.1.1. The non linearity of the growth-poverty relation

The impact of GDP per capita on the three-dimensional poverty in sub-Saharan Africa, as it appears on the Fixed Effects (FE) estimation does not depend on the level of development of countries. Indeed, there are countries with relatively high GDP per capita in which growth tends to increase poverty, but there are also countries with very low GDP per capita in which growth tends to reduce poverty, as we can see in the table below. So we cannot say that the way out of poverty is through economic growth solely.

Table 6: The level of development of countries and the impact of growth

Countries	GDP per capita			
	1988	1995	2000	2004
Countries with relatively high GDP per capita in which growth tends to increase poverty				
Cameroon	765.76	524.95	587.37	611.15
Côte-d'Ivoire	742.47	644.68	669.66	638.76
Congo Rep.	1,142.9	971.93	934.11	940.1
Mauritius	2,291.2	3,050.5	3,726.9	3,973.55
Botswana	2,198.4	2,588.1	3,135	3,324.75
Countries with low GDP per capita in which growth tends to reduce poverty				
Ethiopia	99.58	90.19	101.52	105.12
Uganda	168.99	212.46	253.28	265.59
Mozambique	142.90	159.58	208.28	234.02
Malawi	142.25	153.08	165.52	157.68

Source of data on GDP per capita: WDI, 2005

The lesson from this is that in sub-Saharan Africa, the main problem is that of the effectiveness of development strategies, not that of the level of GDP per capita. Some countries, with relatively high GDP per capita, fail to adopt effective strategies that can reduce the most significantly three-dimensional poverty and reinforce growth. Some others, with relatively low GDP per capita, have adopted effective development strategies that improve health and education of citizens. Good education and good health reinforce each other and ameliorate human capital that reinforces growth (Bloom, 2007). The adoption and the effective implementation of such strategies by government depend on the nature of institutions, especially of political institutions, in the country. With good political institutions, governments will tend to become predator governments.

#### 6.1.2. *The potential role of legislative institutions: What are 'Political institutions'?*

In general, 'institutions are relatively enduring rules and organised practices that shape or constraint human behavior and are relatively resilient to the idiosyncratic preferences and expectations of individuals and changing circumstances' (March and Olsen, 2006:3). According to Leftwich (2006), institutions should simply be regarded as the set of those agreed and predictable rules that govern economic, political and cultural interactions among individuals and organisations of the same society.

Institutions can be formal or informal (Helmke and Levitsky, 2006). We can also distinguish economic, political, social and cultural institutions. Economic institutions are those 'rules of the game' that shape economic activities (North, 1990), they can reinforce

or slow down economic growth. Political institutions are those rules, written or not, which orientate political behaviour and determine decisions of governments. Development strategies of government then depend on the nature of political institutions. All these different categories of institutions interact with each other, and the interaction influences economic, political and developmental outcomes.

*The legislatives institutions and their impact on development strategies*

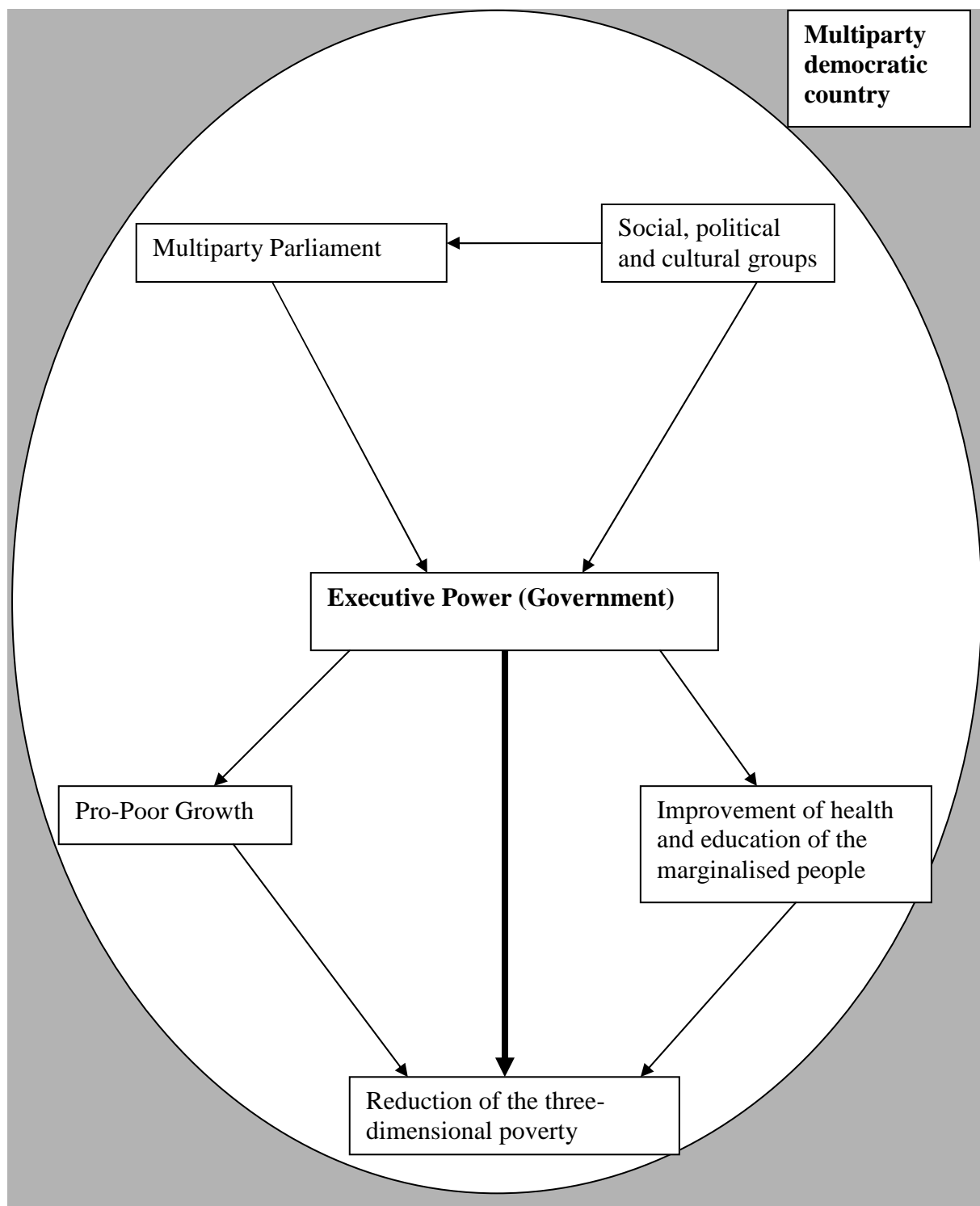
In this research we are concerned with the impact of legislative institutions on the determination of government to adopt pro-poor strategies and to implement them effectively, so consequently effecting the relationship between growth and the three-dimensional poverty in SSA countries. Indeed, above we have distinguished countries with pro-poor governments from countries with non pro-poor governments. Pro-poor governments are those who are supposed to have implemented effectively pro-poor economic growth policies and/or to have seriously invested in social sectors so as to improve health and education for the poor. For pro-poor government to emerge there should also be pro-poor political pressure, which can come from the parliament in a multipartite democratic system, or from other social pressure groups.

Indeed, in democratic political system, governments, in order to prepare for re-election, pay attention to the *alternative economic policies* proposed by the opposition parties. In a context of poverty and inequality, opposition parties, who want to win the executive power, propose *pro-poor economic growth alternative policies*. So the governments have to adopt pro-poor economic growth policies because of political competition. The confrontation between the economic policies of the government and the alternative ones from the opposition takes place particularly in parliament. The competition among parliamentarians is motivated by the fact that each of them wants to prepare for their re-election and to permit his political party to conquer or to keep, democratically, the executive power. The pro-poor patterns of growth that result from this confrontation ensure the circulation of revenue created by growth that can then trickle down to the poor.

However, even with pro-poor growth, there are some sections of the population that cannot take advantage in terms of individual revenue increase. For these marginalised people, the opposition parties propose important *redistributive alternative policies* and in reaction, the government increases social spending. So pro-poor governments are those who also use revenue created by economic growth to improve education and health of the marginalised populations, and thus reduce poverty.

These two characteristics of pro-poor governments are necessary for the reduction of our three-dimensional poverty. Parliamentary competition is supposed to facilitate the appearance of pro-poor governments and then to increase the impact of growth in terms of poverty reduction. Our hypothesis is that *countries in which growth reduces poverty are those in which there is high competition among parliamentarians of different political parties; and countries in which growth does not reduce poverty are supposed to be characterised by no (or low) competition parliament.* Our theoretical model can then be represented, schematically, as follows.

Figure 1: Theoretical model of the role of political institutions on the impact of growth on the three-dimensional poverty



Source: The authors

In a multipartite democratic country, there are social, political and cultural groups that pressure governments and parliaments for the improvement of living conditions of the populations. The multipartite parliament also pressures the government to improve the living conditions of their electorate. Under this pressure, governments tend to improve

health and education of marginalised people, and to implement pro-poor growth policies. Consequently, three-dimensional poverty is reduced.

In this research, we do not consider direct pressure from pressure groups: we only consider the pressure from the parliaments. The pressure from parliament is supposed to be important in the presence of competition among parliamentarians from different political parties. So countries in which growth significantly reduces poverty are supposed to experience high competition among parliamentarians of different political parties. In order to check all this, we should first construct a measure of parliamentary competition, and secondly integrate this in our econometric model.

## 6.2. Construction of a Legislative Competition Index (LCI) for SSA countries

In order to measure competition in parliament, we have built a Legislative Competition Index (LCI), with  $LCI_t$  = the proportion of parliamentary seats occupied by the major political party at period t.  $0 < LCI \leq 1$ . The lower is LCI the more important and severe is supposed to be the competition. We got primary data on the constitution of parliaments in our panel countries from the *African Elections Database website*: <http://africanelections.tripod.com/index.html>. This information is completed and confirmed during our visits at these countries' diplomatic representations in Cameroon. Below we describe, as illustration, the process of construction of the LCI for Cameroon.

### *Illustration on the case of Cameroon*

In Cameroon, the years 1990 and 1991 witnessed a one party National Assembly, so for these years  $LCI_t=1$ . The first multiparty legislative elections occurred in March 1992, at which Cameroon People's Democratic Movement (CPDM) party won 88 seats out of 180, the National Union for Democracy and Progress (UNDP) 68 seats, the Movement for the Defence of the Republic (MDR) 18 seats and the Union of Cameroonian Populations (UPC) 06 seats. The Parliament is then composed of five parties for a five year term during

$$\text{which } LCI = \frac{88}{180} = 0.48.$$

At the May 1997 legislative elections, six political parties entered the Assembly. The major and ruling political party, the CPDM, got 116 seats out of 180, the Social Democratic Front (SDF) 43 seats, the NUDP 13 seats, the Cameroon Democratic Union (CDU) 05 seats, the MDR 01 seat, and the UPC 01 seat. So for the period 1997-2001,

$$LCI = \frac{116}{180} = 0.644. \text{ After the June-September 2002 legislative elections, CPDM}$$



got 149 seats out of 180, the SDF 22 seats, the UDC 05, the UPC 03 and the UNDP 01 seat. So for the period 2002-2006, LCI=0.827. So throughout the period 1990-2006, the evolution of the LCI for Cameroon is the following:

Table 7: The evolution of LCI for Cameroon, 1990–2006

	1990	/91	/92	/93	/94	/95	/96	/97	/98	/99	/00	/01	/02	/03	/04	/05	/06
LCI	1	1	0.48	0.48	0.48	0.48	0.48	0.64	0.64	0.64	0.64	0.64	0.83	0.83	0.83	0.83	0.83

Source: Computed by the authors

This work has been done for all our 32 panel countries, and the results are presented in the appendix. We should observe that for a single country the value of LCI is constant throughout the parliamentary mandate which is for several countries four or five years long and from one term to another, for some countries, there is important changes in the value of LCI.

### 6.3. Evaluation of the role played by Legislative Competition

#### 6.3.1. The econometric model

So the following panel data econometric model is adopted.

$$HPI_{it} = \beta_1 HPI_{i,t-1} + \beta_2 GDP_{it} + \beta_3 LCI_{it} + \varepsilon_{it} \quad (16)$$

In which  $LCI_{it}$  represents the LCI for country  $i$  at year  $t$ , with  $i=0, 2, 3, \dots, 32$ . We are interested in the value of  $\beta_3$  and its impact on  $\beta_2$  for each country. If for a country  $i$   $\beta_3$  is positive and significant, it means that legislative competition by itself reduces poverty. If at the same time  $\beta_2$  decreases, in absolute term, or becomes less significant compared to its value in the previous Fixed Effects Estimation of equation (8), where it was negative, it means that for this country *growth reduces poverty thanks to legislative democracy*. Such a country will be considered to have *Pro-Poor Legislative Institutions*. If on the contrary  $\beta_3$  is negative and significant, it means that legislative competition by itself increases poverty. If at the same time  $\beta_2$  that was initially positive decreases (or even becomes negative) or becomes less significant, it means that in this country *growth increases poverty because of legislative competition*.

### 6.3.2. *The results*

The estimation of this model using the Fixed Effects techniques gives the results presented in the following table, compared to those of the Fixed Effect Estimation of equation (8).

Table 8: Results of the estimation of the influence of legislative competition on the impact of growth on the three-dimensional poverty

Countries	Equation (8)		Equation ( )			
	$\beta_2$	Prob( $\beta_2$ )	$\beta_2$	Prob( $\beta_2$ )	$\beta_3$	Prob( $\beta_3$ )
Angola	0.0003	0.0013	0.00029	0.0139	-0.0345	0.5855
Benin	-0.0006	0.4378	0.0018	0.078	-1.499	0.032**
Botswana	0.0001	0.0042	0.0001	0.009	-0.107	0.3068
Burkina F	-0.0019	0.1312	-0.0021	0.1513	-0.0402	0.4395
Burundi	0.0011	0.0619	0.00127	0.0382	0.0782	0.0238*
Cameroon	0.0003	0.1494	0.00087	0.0000	-0.3164	0.0000**
Central Af.	0.0015	0.2406	0.0011	0.5243	0.03316	0.8062
Chad	0.0022	0.0186	0.0024	0.0392	-0.0577	0.4364
Congo Rep.	0.0004	0.0155	0.00058	0.0000	-0.1976	0.0000**
Cots-d'Ivoire	0.0001	0.8319	-0.00026	0.5133	0.1580	0.0123*
Ethiopia	-0.0039	0.0006	-0.0046	0.0000	0.1735	0.0000*
Kenya	0.0016	0.133	0.0032	0.0008	-0.1125	0.2093
Lesotho	-0.0003	0.0569	-0.0004	0.0065	-0.0669	0.028**
Madagascar	0.0009	0.4201	0.0015	0.1826	-0.1239	0.3314
Malawi	-0.0016	0.4053	-0.0012	0.3766	0.1208	0.0926
Mali	0.00035	0.3926	-0.00025	0.7393	-0.0614	0.3362
Mauritius	0.00004	0.0036	0.00004	0.1357	0.0309	0.7278
Mozambique	-0.0012	0.0100	-0.0010	0.0015	0.0801	0.1149
Namibia	-0.0006	0.5985	-0.0003	0.8473	-0.3853	0.8366
Niger	0.0014	0.2804	0.0006	0.6114	0.0567	0.3276
Nigeria	0.0012	0.0624	0.0011	0.0812	-0.1717	0.3159
South-Africa	-0.00012	0.3777	-0.0001	0.3749	0.1671	0.4804
Senegal	0.00005	0.8942	-0.0001	0.7982	0.3375	0.4243
Tanzania	-0.0004	0.278	-0.0006	0.0459	0.3603	0.0000*
Togo	0.0011	0.1002	0.0013	0.0718	-0.0283	0.7020
Uganda	-0.0019	0.0000	-0.0018	0.0001	-0.031	0.3829
Zambia	0.0003	0.6317	0.00017	0.7959	0.0602	0.1758
Zimbabwe	-0.00000	0.983	-0.00012	0.5030	0.0623	0.2186
Gabon	-0.0001	0.0934	-0.00011	0.013	0.2239	0.042*
Ghana	0.0017	0.2643	0.0007	0.3923	-0.4479	0.0008**
Mauritania	0.0039	0.0056	0.004	0.0107	0.0414	0.3488
DR Congo	-0.0004	0.0758	-0.0007	0.0000	0.1330	0.0000*

Source: Our econometric results

\* affects the  $\beta_3$  positive and significant and \*\* those negative and significant, at 5%.

#### *One success story: the case of Ethiopia*

According to these results, we have six countries in which legislative competition reduces poverty by itself: Burundi, Côte-d'Ivoire, Ethiopia, Tanzania, Gabon and D.R. Congo. Ethiopia appears as the best success so we will present in detail.

In the case of Ethiopia, the regression coefficient of LCI is 0.1735, is highly significant. The introduction of political competition at the parliament, with the reduction of LCI, has reduced poverty. The consequence of the consideration of the LCI variable is that the regression coefficient of GDP changes from -0.0039 in equation 8) to -0.0046.

So knowing that the legislative competition has been improving the living conditions of the poor reinforces the specific impact of economic growth on poverty. Legislative competition is poverty reducer, even though it is less effective than global economic growth. The Ethiopian government is a pro-poor one, partly thanks to pro-poor legislative institutions. In order to accelerate poverty reduction, Ethiopia should reinforce economic growth, maintaining the actual legislative institutions, the main characteristics of which are highlighted below.

#### *History*

The country went through a multiparty transition from 1991 to 1995, after a civil One Party Regime (1987–1991). The first multiparty election for Ethiopia's constituent Assembly was held in June 1994. This Assembly adopted the constitution of the Federal Democratic Republic of Ethiopia in December 1994. The elections for Ethiopia's first popularly-chosen national parliament and regional legislatures were held in May and June 1995.

#### *Administrative organisation of Ethiopia*

Ethiopia is a Federal Parliamentary Republic, composed of 9 ethnically-based semi-autonomous administrative regions, known as *Awraja*<sup>4</sup>. Each of these awraja has the power to raise and spend its own revenues. Each Awraja is divided into sub-provinces, known as Woredas. Each *Awraja* has a legislative body, named the *Regional State Council*. The Regional State Council has 138 members in Addis Ababa administrative city; 87 seats in the State of Afar; 294 in the State of Amhara; 80 seats in the State of Benishangul/Gumaz; 53 in the State of Gambera People's; etc.

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<sup>4</sup> The ten Ethiopia's Awraja are : Addis Ababa\*; Afar; **Amhara**, Benishangul/Gumaz; **Dire Dawa**\*; **Gambela**; **Harar**; Oromia; **Somali**; Southern Nations, Nationalities, and Peoples Region; **Tigray**.

### *The Federal Legislative Power*

A legislative body, typically, is a democratically elected representative body which serves as a law maker and checks on the executive branch of a government. It can be a single house (unicameral) or two houses (bicameral), and in rare instances, more than two chambers. Each type has its advantages and disadvantages. Since the 1995 constitution, Ethiopia's legislative body is a bicameral one, with a *House of People's Representatives* and a *House of Federation (Senate)*. The *House of People's Representatives* is composed of 547 members, elected for a five-year term in single-seat constituencies. The *House of Federation* is composed of 110 members, one for each nationality, and one additional representative for each one million of its population, designated by the regional councils, which may elect them themselves or through popular elections.

### *The Executive Power*

The President of the Republic is elected by the *House of People's Representatives* for a six-year term. The Prime Minister is designated by the political party in power following legislative elections. A Council of Ministers as provided for in the December 1994 constitution is selected by the Prime Minister and approved by the House of People's Representatives.

### *The Judicial Power*

The basic functions of the judiciary are: the impartial application or administration of the law in a dispute; the promotion and observance of human rights; and the assurance that the people and the state live under the rule of law. To carry out these functions properly, the independence of the judiciary, and the qualifications and mode of selections of judges are important.

These requirements are fulfilled in Ethiopia where the president and vice president of the *Federal Supreme Court* are recommended by the Prime Minister and appointed by the House of People's Representatives. For other federal judges, the prime minister submits candidates selected by the Federal Judicial Administrative Council to the House of People's Representatives for appointment. This guarantees the independence of the justice, recognised by many organisations and countries.

### *The electoral organisation: high participation*

The first multiparty legislative election took place in 1994. It was the Constituent Assembly Election, won by the Ethiopian People's Revolutionary Democratic Front (EPRDF), 484 seats out of 547; the other parties won a total of 63 seats. This led to the first House of People's Representatives elections which took place in 1995 and was won

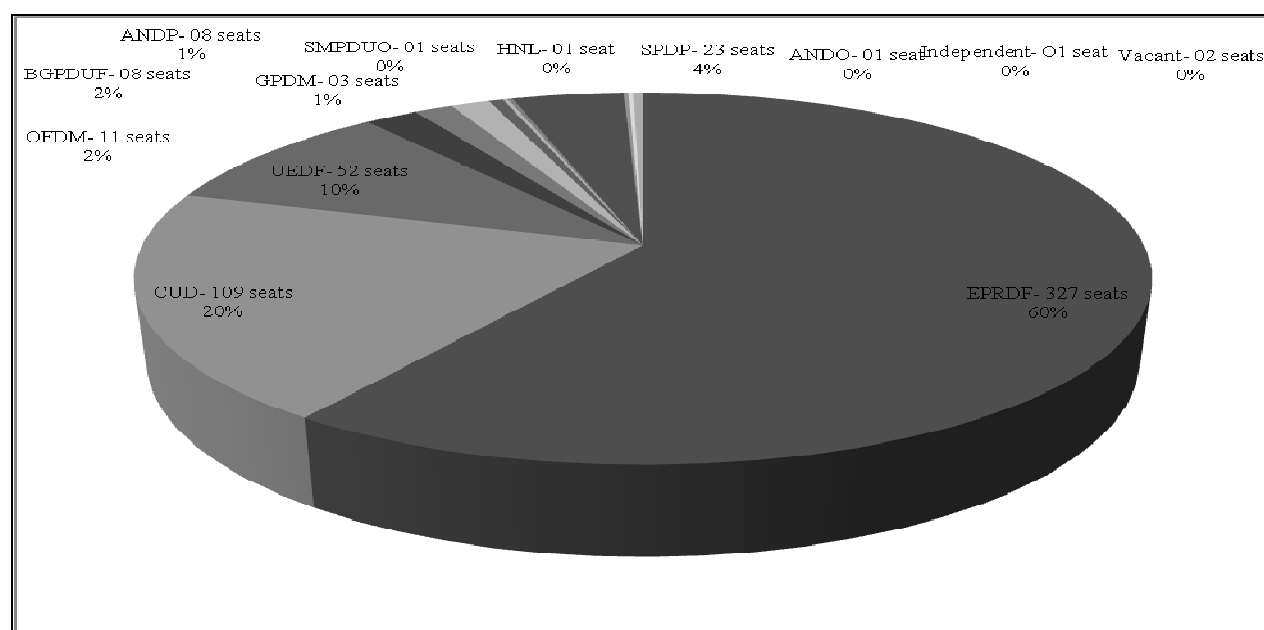
by the EPRDF, 483 seats out of 548. After a five year term, the legislative elections were once again organised in 2000 and 2005, resulting in the following constitution of the House of People's Representatives.

Table 9: The constitution of the Ethiopian House of People's Representatives after the 2000 legislative elections

Coalition/Parties	Number of seats (547)
Ethiopian People's Revolutionary Democratic Front (EPRDF)	481
<i>Oromo People's Democratic Organisation (OPDO)</i>	183
<i>Amhara National Democratic Movement (ANDM)</i>	146
<i>Southern Ethiopia People's Democratic Movement (SEPDM)</i>	112
<i>Tigary People's Liberation Front (TPLF)</i>	40
EPRDF-Affiliated Parties	17
Others Parties	18
Independents	13
Total	547

Source of primary data: *African Elections database*

Figure 2: The constitution of the Ethiopian House of People's Representatives after the 2005 legislative elections



Source of primary data: African Elections Database

The higher the electoral participation the better the results for the society. The electoral system in Ethiopia encourages popular participation. Indeed in Ethiopia, political participation is one of the highest in Sub-Saharan Africa, so the electoral system can be considered as one of the most appropriate. The May 2005 general election drew a record number of voters, with 90% of the electorate turning out to cast their vote.

*One failure case: the case of Congo Republic*

There are five countries in which legislative competition by itself has significantly increased poverty: Benin, Cameroon, Congo Republic, Lesotho and Ghana. Here, parliamentarians rule for their own material interest and for their respective political party's financial power, not for the benefits of populations. The authentic anti-poor legislative competition is that of Congo Republic.

Indeed, Congo went through multiparty transition from 1990 to 1992. A multiparty democracy has been practiced from 1993 to 1997, after which the country underwent a transitional period from 1997 to 2002, and came back to a multiparty democracy in 2002. As legislative institutions are concerned, Congo Republic is under a *bicameral parliament*. The Senate is composed of 66 members indirectly elected for six years. The National Assembly is composed of 137 members in 2007, directly elected for a five year term. The first multiparty legislative elections took place in 1992. The major party, the Pan-African Union for Social Democracy (UPADS), won 39 seats out of 125. After the presidential election won by Pascal LISSOUBA of the UPADS in 1992, the legislative elections were re-organised in 1993. This time the UPADS won 47 seats and formed a coalition with six other parties. The coalition totalled 65 members, the parliamentary majority. At the 2002 legislative elections, the Congolese Labour Party (PCT) of President Denise SASSOU-NGUESSO won 53 seats out of 137. More than six political parties won at least a seat of Parliamentarian. The PCT formed a coalition with the United Democratic Forces (FDU) who won 30 seats.

We can then see that Congo has experienced an *atomistic political competition* since 1990. No party has ever had the majority necessary for political stability without which it is difficult to develop pro-poor strategies. So the parliamentary competition has yielded negative results for the poor who pays for it.

## 7. Policy implications

### 7.1. The importance of Bicameral Parliaments

In five countries (Ethiopia, Burundi, Tanzania, Gabon and D.R. Congo), legislative institutions can be considered as pro-poor. One of the main characteristics of these pro-poor legislative institutions is that they have bicameral parliaments. The first chamber is the *House of Federation* in Ethiopia, where members are indirectly elected in Regional State Council; in Burundi there are 49 members of the Senate, 34 of whom are indirectly elected by Communal Councillors (two from each of them), three come from the ethnic Twa minority, three are former Presidents, eight are appointed in order to meet gender quotas.

The second chamber is the most popular one. In Ethiopia, the *House of People's Representatives* is composed of 547 members directly elected. In Burundi it is the *National Assembly* composed of 118 members, 100 are directly elected and 18 are co-opted in such a way that ethnic and gender quotas are met. In Gabon it is the *National Assembly* composed of 120 members of whom 111 are directly elected and 09 appointed by the President of the Republic.

### 7.2. The importance of equitable parliamentary representation

Pro-poor legislative institutions are those that permit all social groups of the population to be represented. In Ethiopia, Burundi and Gabon, the constitution of the parliament depends not only on the political parties' landscape, but all is put in place in order to integrate all groups of the population.

This is important because the legislature represents the people in law making. In Ethiopia, the *House of People's Representatives* is composed of 547 members, elected for a five-year term in single-seat constituencies; the *House of Federation* is composed of 110 members, one for each nationality and one additional representative for each one million of the population. Additional members are designated by the regional councils, which may elect them themselves or through popular elections. This ensures equitable representation in the Parliament.

The advantages of equitable parliamentary representation in Ethiopia are reinforced by the efficient administrative organisation of the country. Ethiopia is a Federal Parliamentary Republic, composed of 9 ethnically-based administrative regions known as *Awraja*. Each *Awraja* raises and spends its own revenues. Each *Awraja* is then divided into sub-provinces, known as *Woredas*. Each *Awraja* has a legislative body known as the



*Regional State Council*. Ethiopia is one of the African countries with better governance. This country has a credible electoral system and electoral organisation that explains the high rate of political participation among citizens. This is a success-story in the domain, with pro-poor legislative institutions, pro-poor administration and pro-poor interaction between the two organisations.

Burundi is another country with pro-poor legislative institutions. The National Assembly is composed of 118 members of whom 100 are elected by direct popular vote, 18 are co-opted to ensure that constitutionally mandated ethnic (60% Hutu–40% Tutsi and three Twa) and gender (at least 30% women) quotas are met. The Senate is composed of 49 members: 34 of them are indirectly elected by Communal Councillors, three members come from the ethnic Twa minority, four are former Presidents and eight are co-opted members appointed to ensure that gender (at least 30% should be women) quotas are met. This ensures equitable representation at the Parliament.

In Tanzania, with a unicameral parliament, laws also ensure that all social groups of the populations are represented at the National Assembly. The Assembly is composed of 323 members, 232 of whom are directly elected, 75 are reserved for women, five are directly elected by Zanzibar House of Representatives, ten are appointed by the President and one reserved for Attorney-General.

## 8. Concluding remarks

If poverty is accepted as a multidimensional phenomenon, economists should try to move from the *examination of the impact of growth on the revenue of the poor to the appreciation of the influence of growth on a multidimensional poverty measure*. Researchers were aware of this but they face difficulties in constructing and handling a multidimensional poverty index. One aspect of the contribution of our research has been to provide a three-dimensional poverty index.

Another important limit of the literature on *poverty and its relation with growth* as well as on pro-poor growth was their incapacity to reveal a long-term structural relation between growth and poverty. Indeed poverty and pro-poor growth works have up to now been arithmetic works, not econometric ones that are able to reveal structural tendencies. The absence of econometric works was due to the inexistence of time series data on economic measures of poverty. We have proposed a three-dimensional poverty index that gives the possibility of building time series data.

Panel data regression has indicated that on our 32 panel countries globally considered, growth increases poverty, it has also confirmed the presence of a three-dimensional poverty trap across the region. However, Fixed Effects estimation has shown that there are three countries (Ethiopia, Mozambique and Uganda) in which growth significantly reduces poverty, and six others in which growth significantly increases poverty (Congo Republic, Mauritius, Angola, Botswana, Chad and Mauritania). In the 23 other countries of our panel, growth can be considered as neutral vis-à-vis poverty.

Institutional economics literature indicates that political competition is an important factor that can determine governments to adopt and implement pro-poor growth policies and to increase social services spending in order to reduce poverty. In order to check this, we have built a Legislative Competition Index (LCI) measured by the proportion of parliamentary seats occupied by the major political party. An increase in this proportion means a reduction of legislative competition. Time series data for this has been constructed for each of our panel countries, from 1990 to 2006.

The LCI variable has then been introduced in the model. The Fixed Effects estimation shows that in one of the three countries with a significant poverty reduction impact of growth we should consider that legislative competition has played an important role. Indeed, for Ethiopia, the regression coefficient of LCI is positive and highly significant, indicating that as legislative competition increases (LCI decreases), the three-dimensional poverty decreases in the country. This specific impact of legislative competition considered and isolated, the poverty reduction impact of growth is reinforced. So there is significant synergy between pro-poor legislative institutions and pro-poor governance in Ethiopia. This country's legislative institutions then appear as a success story, and the other countries can benefit from its experience. The main characteristics of Ethiopia's legislative institutions have been highlighted.

On the other hand, in one out of the six countries in which growth significantly increases poverty, estimation shows that it is due to legislative competition. Indeed, for Congo Republic, the regression coefficient of LCI is negative and highly significant, indicating that when legislative competition is intensified, the three-dimensional poverty measure increases. This specific impact of legislative competition considered and isolated, the impact of growth slightly increases. This means that in Congo Republic the government and the parliament are anti-poor. This country then appears as the vicious case to avoid.

As final conclusion of this research, we suggest that in order to more effectively fight three-dimensional poverty using resources created by economic growth, Sub-Saharan

countries need to implement some legislative institutions reforms, with the Ethiopia as a success story and Congo Republic as a bad example.

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## Appendix I: Data

Table 1: Evolution of HPI for our 32 countries 1990-2006

	Angola	Benin	Botswana	Burkina-Faso	Burundi	Cameroon	C. Af. Rep.	Chad	Congo	Côte-d'Ivoire	Ethiopia	Kenya	Lesotho	Madagascar	Malawi
1990	0.6984	0.7774	0.2381	0.8485	0.7619	0.5237	0.7461	0.8452	0.6085	0.6092	0.7159	0.5236	0.4178	0.5624	0.747
1991	0.7251	0.7658	0.2679	0.8312	0.7321	0.5265	0.7218	0.8318	0.4925	0.5543	0.7508	0.4722	0.4232	0.5144	0.724
1992	0.811	0.873	0.1927	0.9196	0.8073	0.6634	0.8099	0.8917	0.6046	0.688	0.7948	0.606	0.5494	0.6423	0.812
1993	0.8582	0.8878	0.1657	0.9267	0.8343	0.6914	0.8419	0.9135	0.6293	0.7151	0.8282	0.6311	0.5697	0.6736	0.832
1994	0.843	0.8606	0.1735	0.9188	0.8265	0.6046	0.8561	0.9094	0.618	0.8095	0.8597	0.619	0.566	0.6688	0.852
1995	0.7394	0.7073	0.2494	0.7965	0.7506	0.5427	0.6772	0.7374	0.5097	0.6632	0.7857	0.5697	0.5687	0.5951	0.713
1996	0.7129	0.6628	0.2856	0.7714	0.7144	0.505	0.6389	0.7047	0.4664	0.6338	0.7613	0.5191	0.5305	0.6463	0.674
1997	0.664	0.6575	0.2476	0.7782	0.7524	0.5209	0.6447	0.7119	0.4976	0.6306	0.7562	0.5357	0.5418	0.6493	0.678
1998	0.6534	0.6188	0.2419	0.7803	0.7581	0.5169	0.652	0.6811	0.4775	0.6301	0.7478	0.535	0.5301	0.6511	0.664
1999	0.6782	0.6403	0.2394	0.7768	0.7606	0.5327	0.6849	0.6842	0.5224	0.6497	0.7652	0.5597	0.5062	0.6199	0.678
2000	0.6153	0.5809	0.2973	0.6972	0.7027	0.5037	0.6473	0.6561	0.5028	0.5826	0.7037	0.5251	0.4576	0.5249	0.595
2001	0.5776	0.5802	0.3096	0.68	0.6904	0.4938	0.6289	0.6415	0.498	0.5735	0.6786	0.4868	0.4583	0.5384	0.604
2002	0.5973	0.5794	0.3122	0.6741	0.6878	0.4872	0.6254	0.6355	0.4872	0.5718	0.6725	0.4876	0.4644	0.5316	0.601
2003	0.6223	0.5889	0.3368	0.6705	0.6632	0.5011	0.638	0.6244	0.4979	0.6032	0.6413	0.5113	0.4907	0.5316	0.612
2004	0.6193	0.5792	0.3388	0.6982	0.6612	0.4992	0.6385	0.6207	0.5063	0.6015	0.6418	0.5124	0.5069	0.5313	0.611
2005	0.555	0.569	0.435	0.683	0.622	0.503	0.645	0.659	0.488	0.58	0.633	0.526	0.503	0.501	0.596
2006	0.561	0.572	0.43	0.658	0.616	0.494	0.647	0.632	0.48	0.579	0.629	0.509	0.506	0.491	0.6

	Mali	Mauritius	Mozambique	Namibia	Niger	Nigeria	Senegal	S-Africa	Tanzania	Togo	Uganda	Zambia	Zimbabwe	Gabon	Ghana	Mauritania	D.R. C
1990	0.8555	0.2354	0.7626	0.5963	0.8867	0.6797	0.7225	0.2825	0.5847	0.6596	0.6425	0.5193	0.4272	0.5236	0.3631	0.2098	0.2909
1991	0.8436	0.0978	0.7325	0.4296	0.8452	0.6408	0.6792	0.2062	0.632	0.664	0.7021	0.5214	0.4397	0.6164	0.4193	0.2587	0.3475
1992	0.9215	0.1807	0.8316	0.6902	0.9194	0.7341	0.8012	0.3075	0.7042	0.7884	0.7846	0.6582	0.5787	0.5662	0.3294	0.1626	0.2926
1993	0.9193	0.202	0.8469	0.7122	0.9213	0.7532	0.8196	0.3278	0.7312	0.7829	0.8103	0.6875	0.6022	0.5205	0.3243	0.1491	0.2920
1994	0.9107	0.1983	0.8628	0.6397	0.9167	0.7415	0.7814	0.3563	0.7755	0.7735	0.8341	0.7364	0.5753	0.4578	0.3152	0.1431	0.2633
1995	0.7972	0.2108	0.7751	0.4668	0.812	0.6462	0.691	0.35	0.6646	0.65	0.7085	0.6141	0.5183	0.5467	0.4546	0.1847	0.3472
1996	0.7745	0.1514	0.7363	0.4036	0.7913	0.59	0.6592	0.3304	0.6332	0.6082	0.6687	0.5818	0.4536	0.5802	0.4798	0.3630	0.3736
1997	0.7712	0.1582	0.7515	0.426	0.7929	0.6062	0.6718	0.2796	0.642	0.6336	0.671	0.6303	0.4853	0.566	0.4697	0.3554	0.3815
1998	0.7633	0.1592	0.7175	0.3501	0.7915	0.6076	0.6549	0.278	0.6557	0.6181	0.6583	0.6214	0.4893	0.5727	0.4763	0.3625	0.3836
1999	0.6978	0.1707	0.7355	0.3495	0.7816	0.6179	0.6429	0.2376	0.6657	0.6125	0.6709	0.6483	0.5082	0.5407	0.4750	0.3771	0.4042
2000	0.6317	0.2612	0.6766	0.3656	0.7058	0.5677	0.5838	0.2926	0.6282	0.5208	0.6174	0.6092	0.4707	0.5866	0.5958	0.4527	0.4240
2001	0.6226	0.2358	0.6765	0.3993	0.7259	0.5444	0.5766	0.2977	0.5638	0.5101	0.5653	0.5726	0.4459	0.6168	0.5416	0.4375	0.4297
2002	0.614	0.2287	0.6779	0.3901	0.7229	0.5377	0.5689	0.3038	0.5605	0.5069	0.5567	0.5666	0.4492	0.6371	0.5478	0.4378	0.4468
2003	0.6627	0.2206	0.6442	0.3723	0.7084	0.5367	0.5704	0.3163	0.5994	0.4993	0.5103	0.6135	0.5043	0.6532	0.5675	0.4540	0.36264
2004	0.6743	0.2344	0.6453	0.3935	0.7085	0.5341	0.563	0.3345	0.5937	0.5049	0.5066	0.6113	0.5093	0.6485	0.5675	0.4645	0.36451
2005	0.667	0.209	0.621	0.373	0.719	0.547	0.542	0.342	0.582	0.488	0.492	0.606	0.495	0.6356	0.5207	0.4776	0.3856
2006	0.662	0.2	0.61	0.374	0.689	0.552	0.54	0.347	0.57	0.505	0.498	0.593	0.509	0.6336	0.5326	0.4867	0.3915

Source: Our construction, from the Human Development Index (HDI) of the United Nations Development Program (UNDP)



Table 2: The GDP per capita in our 32 Sub-Saharan African countries from 1988 to 2004 (in constant 2000 dollar)

	Angola	Benin	Botswana	Burkina F.	Burundi	Cameroon	C. A. Rep.	Chad	D.R.C	Congo R.	Côte-d'Ivoire	Ethiopia	Gabon	Ghana	Kenya	Lesotho
1988	908.61	318.76	2198.40	207.79	149.16	765.76	285.11	203.95	237.03	1142.90	742.47	99.58	3828.60	206.75	369.33	350.26
1989	893.97	299.91	2405.50	204.82	146.99	729.65	285.44	208.50	226.97	1134.50	737.96	95.72	4023.70	211.71	374.66	372.84
1990	878.10	299.87	2486.60	197.05	147.93	664.53	274.89	194.78	205.39	1108.60	704.97	94.67	4096.90	213.83	378.64	391.39
1991	836.88	304.40	2587.60	209.23	151.22	620.54	268.14	205.86	182.03	1098.50	681.71	84.90	4211.20	219.73	373.52	401.65
1992	754.92	305.91	2579.50	204.99	148.46	584.22	245.27	216.24	157.53	1090.80	657.82	74.74	3949.50	222.44	360.55	415.10
1993	552.32	307.34	2546.90	209.44	136.65	549.90	239.74	177.06	131.71	1045.20	635.58	87.10	3922.70	226.95	352.30	424.77
1994	556.12	311.51	2557.60	206.61	128.40	521.77	244.17	189.19	122.19	956.11	620.73	87.52	3939.60	227.79	352.26	434.71
1995	597.25	317.86	2588.10	211.07	116.53	524.97	253.26	184.83	118.69	971.93	644.68	90.19	4094.20	230.08	358.53	449.48
1996	646.57	327.16	2655.90	220.82	104.56	537.32	236.24	183.43	114.00	981.53	674.39	97.10	4188.20	234.10	364.18	489.48
1997	680.22	338.55	2766.70	226.79	102.82	550.93	242.71	185.44	105.05	944.74	693.39	99.73	4313.80	237.88	362.74	524.19
1998	708.56	344.92	2867.40	223.57	105.59	565.02	248.97	190.38	101.49	948.75	707.52	95.45	4293.80	243.53	359.87	494.99
1999	713.56	351.83	2962.30	232.80	102.53	576.39	253.77	183.49	95.87	891.31	701.22	98.14	3932.10	249.25	355.97	491.27
2000	715.17	362.40	3135.00	230.68	99.68	587.37	256.48	176.86	88.62	934.11	669.66	101.52	3920.30	254.05	347.40	492.73
2001	716.91	370.82	3260.40	238.40	100.93	605.34	256.88	188.62	84.28	938.84	655.95	107.99	3929.00	260.11	343.97	503.81
2002	803.02	383.14	3371.60	243.03	103.49	617.82	251.14	201.32	84.64	944.19	632.49	108.55	3842.90	267.02	340.89	518.20
2003	814.29	391.52	3532.00	252.88	100.33	634.06	229.17	217.78	86.74	943.26	596.94	102.42	3865.30	275.86	340.81	530.40
2004	762.35	376.97	3324.75	241.25	101.11	611.15	248.42	196.15	86.07	940.10	638.76	105.12	3889.38	264.26	343.27	511.29

	Malawi	Madagascar	Mali	Mauritania	Mauritius	Mozambique	Namibia	Niger	Nigeria	Senegal	South-Africa	Tanzania	Togo	Uganda	Zambia	Zimbabwe
1988	142.25	276.58	185.84	309.32	2291.20	142.90	1680.90	210.69	307.19	441.65	3126.70	255.85	313.88	168.99	419.77	570.16
1989	139.68	279.93	202.01	316.83	2401.50	151.13	1637.30	206.03	320.02	423.55	3130.90	257.32	317.77	173.01	403.12	580.25
1990	143.11	280.75	192.69	304.17	2522.00	151.46	1605.80	196.99	336.53	428.07	3058.00	267.03	309.89	176.84	388.95	601.79
1991	153.15	257.43	190.47	302.38	2643.70	155.92	1669.40	196.05	342.64	417.86	2965.10	264.19	300.82	179.77	377.54	618.19
1992	139.69	253.93	200.92	300.65	2748.60	140.66	1727.20	177.38	342.60	417.05	2841.80	257.63	282.37	179.64	360.80	548.82
1993	150.81	252.07	191.63	321.72	2868.70	149.69	1640.70	173.86	340.09	397.24	2816.80	252.90	234.38	188.65	375.31	542.31
1994	133.24	244.60	188.65	326.83	2955.20	156.58	1714.20	174.58	330.59	397.66	2846.40	249.29	263.47	195.23	334.53	580.31
1995	153.08	241.55	195.65	334.69	3050.50	159.19	1745.10	173.02	328.94	407.06	2872.30	250.76	277.79	212.46	317.61	570.13
1996	160.27	239.23	197.19	336.67	3174.70	166.18	1757.60	172.79	333.42	416.37	2930.00	254.95	294.57	225.91	332.06	617.14
1997	162.48	240.52	205.56	336.67	3320.50	180.19	1784.30	171.33	333.15	424.98	2939.60	256.92	327.12	231.24	335.53	621.49
1998	164.13	242.36	212.82	340.15	3483.20	198.94	1792.10	182.61	330.60	436.65	2892.90	259.71	309.24	236.03	322.30	627.08
1999	167.15	245.94	221.79	347.72	3622.00	209.81	1797.90	175.44	325.93	446.00	2881.30	262.40	305.59	247.50	322.67	610.63
2000	165.52	249.80	223.48	355.25	3726.90	208.28	1802.30	167.41	331.56	458.90	2909.60	269.45	291.34	253.28	327.51	569.51
2001	154.17	257.28	244.58	359.70	3933.50	230.40	1797.80	173.76	333.69	472.65	2933.50	280.00	284.72	261.16	337.19	513.46
2002	153.72	218.29	249.25	362.66	4072.70	242.53	1805.30	173.64	330.76	466.63	3002.30	294.03	290.28	271.36	342.47	479.16
2003	157.29	233.18	257.91	372.14	4161.10	254.87	1845.00	177.65	357.36	485.45	3025.70	308.70	291.86	276.54	354.45	559.97
2004	157.68	239.64	243.81	362.44	3973.55	234.02	1812.60	173.12	338.34	470.91	2967.78	288.05	289.55	265.59	340.41	530.52

Source: From the World Development Indicators (2005)

Table 3: Time series data of Legislative Competition Index (LCI) for our 32 Sub-Saharan African countries from 1990 to 2006

	Angola	Benin	Botswana	Burkina F	Burundi	Cameroon	Central A.Rep.	Chad	Congo	Côte-d'Iv	Ethiopia	Kenya	Lesotho	Madagascar	Malawi	Mali
1990	1	1	0.9117	0.4912	1	1	1	1	1	0.9314	1	1	1	0.8759	1	1
1991	1	0.1875	0.9117	0.4912	1	1	1	1	1	0.9314	1	1	1	0.8759	1	1
1992	0.5863	0.1875	0.9117	0.7289	1	0.4888	1	1	0.312	0.9314	1	1	1	0.8759	1	0.6552
1993	0.5863	0.1875	0.9117	0.7289	0.8024	0.4888	0.4	1	0.376	0.9314	1	0.56	1	0.3405	1	0.6552
1994	0.5863	0.1875	0.675	0.7289	0.8024	0.4888	0.4	1	0.376	0.9314	0.8848	0.56	1	0.3405	0.4745	0.6552
1995	0.5863	0.2530	0.675	0.7289	0.8024	0.4888	0.4	1	0.376	0.9314	0.8813	0.56	1	0.3405	0.4745	0.6552
1996	0.5863	0.2530	0.675	0.7289	1	0.4888	0.4	1	0.376	0.8457	0.8813	0.56	1	0.3405	0.4745	0.6552
1997	0.5863	0.2530	0.675	0.9099	1	0.6055	0.4	0.52	0.376	0.8457	0.8813	0.56	1	0.3405	0.4745	0.8707
1998	0.5863	0.2530	0.675	0.9099	1	0.6055	0.4312	0.52	0.376	0.8457	0.8813	0.5090	0.975	0.42	0.4745	0.8707
1999	0.5863	0.3253	0.825	0.9099	1	0.6055	0.4312	0.52	0.376	0.8457	0.8813	0.5090	0.975	0.42	0.4843	0.8707
2000	0.5863	0.3253	0.825	0.9099	1	0.6055	0.4312	0.52	0.376	0.4266	0.8793	0.5090	0.975	0.42	0.4843	0.8707
2001	0.5863	0.3253	0.825	0.9099	1	0.6055	0.4312	0.52	0.376	0.4266	0.8793	0.5090	0.975	0.42	0.4843	0.8707
2002	0.5863	0.3253	0.825	0.5135	1	0.8277	0.4312	0.52	0.3868	0.4266	0.8793	0.5090	0.6416	0.6437	0.4843	0.3129
2003	0.5863	0.3734	0.825	0.5135	1	0.8277	0.4312	0.7096	0.3868	0.4266	0.8793	0.3035	0.6416	0.6437	0.4843	0.3129
2004	0.5863	0.3734	0.7719	0.5135	1	0.8277	0.4312	0.7096	0.3868	0.4266	0.8793	0.3035	0.6416	0.6437	0.3056	0.3129
2005	0.5863	0.3734	0.7719	0.5135	0.5423	0.8277	0.4	0.7096	0.3868	0.4266	0.5978	0.3035	0.6416	0.6437	0.3056	0.3129
2006	0.5863	0.3734	0.7719	0.5135	0.5423	0.8277	0.4	0.7096	0.3868	0.4266	0.5978	0.3035	0.6416	0.6437	0.3056	0.3129

	Mauritius	Mozambique	Namibia	Niger	Nigeria	Senegal	S-Africa	Gabon	Ghana	Mauritania	D.R. C	Tanzania	Togo	Uganda	Zambia	Zimbabwe
1990	0.4429	1	0.5694	1	0.6703	0.8583	0.5787	0.525	1	1	1	1	1	0.5714	1	0.975
1991	0.4394	1	0.5694	1	0.6703	0.8583	0.5787	0.525	1	1	1	1	1	0.5714	0.8333	0.975
1992	0.4394	1	0.625	1	0.5365	0.8583	0.5787	0.525	0.945	0.8481	0.312	1	1	0.5714	0.8333	0.975
1993	0.4394	1	0.625	0.3494	0.5365	0.7	0.5787	0.525	0.945	0.8481	0.376	1	1	0.5714	0.8333	0.975
1994	0.4394	0.516	0.75	0.3494	0.5365	0.7	0.63	0.525	0.945	0.8481	0.376	1	0.4444	0.5714	0.8333	0.975
1995	0.4394	0.516	0.75	0.3494	0.5365	0.7	0.63	0.525	0.945	0.8481	0.376	0.7955	0.4444	0.5714	0.8333	0.9833
1996	0.5303	0.516	0.75	0.6747	0.5365	0.7	0.63	0.7083	0.665	0.8861	0.376	0.7955	0.4444	0.5652	0.8733	0.9833
1997	0.5303	0.516	0.75	0.6747	0.5365	0.7	0.63	0.7083	0.665	0.8861	0.376	0.7955	0.4444	0.5652	0.8733	0.9833
1998	0.5303	0.516	0.7708	0.6747	0.5365	0.6643	0.63	0.7083	0.665	0.8861	0.376	0.7955	0.4444	0.5652	0.8733	0.9833
1999	0.5303	0.532	0.7755	0.4578	0.5650	0.755	0.665	0.7083	0.665	0.8861	0.376	0.7955	0.9753	0.5652	0.8733	0.9833
2000	0.5303	0.532	0.7755	0.4578	0.5650	0.755	0.665	0.7083	0.495	0.8861	0.376	0.8746	0.9753	0.5652	0.8733	0.5167
2001	0.8286	0.532	0.7755	0.4578	0.5650	0.7417	0.665	0.7167	0.495	0.7901	0.376	0.8746	0.9753	1	0.46	0.5167
2002	0.8286	0.532	0.7755	0.4578	0.5650	0.7417	0.665	0.7167	0.495	0.7901	0.3869	0.8746	0.8889	1	0.46	0.5167
2003	0.8286	0.532	0.7755	0.4578	0.6375	0.7417	0.665	0.7167	0.495	0.7901	0.3869	0.8746	0.8889	1	0.46	0.5167
2004	0.8286	0.64	0.8061	0.4159	0.6375	0.7417	0.6975	0.7167	0.5565	0.7901	0.3869	0.8746	0.8889	1	0.46	0.5167
2005	0.8286	0.64	0.8061	0.4159	0.6375	0.7417	0.6975	0.7167	0.5565	0.7901	0.3869	0.8514	0.8889	1	0.46	0.65
2006	0.6	0.64	0.8061	0.4159	0.6375	0.7417	0.6975	0.6833	0.5565	0.1579	0.3869	0.8514	0.8889	0.6725	0.48	0.65

Source: Our construction, based on primary data from African Elections Database website

## Appendix II: Econometric results

### I. List of panel countries and their identifiers

1- Angola (ANG) ; 2- Benin (BEN) ; 3- Botswana (BTW); 4- Burkina Faso (BUF); 5- Burundi (BDI); 6- Cameroon (CMR); 7- Central African Republic (CAR); 8- Chad (TCH); 9- Congo Republic (CGO) ; 10- Côte-d'Ivoire (CIV) ; 11- Ethiopia (ETH) ; 12- Kenya (KNY) ; 13- Lesotho (LTO) ; 14- Madagascar (MGR) ; 15- Malawi (MLW) ; 16- Mali (MLI) ; 17- Mauritius (MRC) ; 18- Mozambican Republic (MZB) ; 19- Namibia (NBI) ; 20- Niger (NGR) ; 21- Nigeria (NIG) ; 22- Senegal (SNG) ; 23- South-Africa (SAF) ; 24- Tanzania (TAN) ; 25- Togo (TOG) ; 26- Uganda (UGA) ; 27- Zambia (ZAM) ; 28- Zimbabwe (ZBW), 29. Gabon (GAB); 30- Ghana (GHA); 31- Mauritania (MAU); 32- Democratic Republic of Congo (DRC)

II. Estimation of the equation  $HPI_{it} = \beta_0 + \beta_1 HPI_{i,t-v} + \beta_2 GDP_{it} + \varepsilon_{it}$

#### II.1. Cross-country estimation

Dependent Variable: HPI?				
Method: Pooled Least Squares				
Date: 10/31/08 Time: 06:35				
Sample(adjusted): 1991 2006				
Included observations: 16 after adjusting endpoints				
Total panel (balanced) observations 512				
White Heteroskedasticity-Consistent Standard Errors & Covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.046306	0.011057	4.187749	0.0000
HPI?(-1)	0.919728	0.017139	53.66181	0.0000
GDP?	-4.15E-06	2.43E-06	-1.707538	0.0883
R-squared	0.919239	Mean dependent var		0.577634
Adjusted R-squared	0.918922	S.D. dependent var		0.167499
S.E. of regression	0.047694	Sum squared resid		1.157827
F-statistic	2896.783	Durbin-Watson stat		1.943849
Prob(F-statistic)	0.000000			

Dependent Variable: HPI?

Method: GLS (Cross Section Weights)

Date: 06/15/08 Time: 10:42

Sample: 1991 2006

Included observations: 16

Total panel (balanced) observations 512

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HPI?(-1)	0.986388	0.003405	289.7005	0.0000
GDP?	3.70E-06	1.55E-06	2.392382	0.0171
Weighted Statistics				
R-squared	0.954765	Mean dependent var		0.620948
Adjusted R-squared	0.954677	S.D. dependent var		0.228704
S.E. of regression	0.048689	Sum squared resid		1.209040
F-statistic	10764.55	Durbin-Watson stat		1.953149
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.915638	Mean dependent var		0.577634
Adjusted R-squared	0.915472	S.D. dependent var		0.167499
S.E. of regression	0.048698	Sum squared resid		1.209458
Durbin-Watson stat	1.994774			

II.2. Fixed Effects estimation

Dependent Variable: HPI?

Method: GLS (Cross Section Weights)

Date: 06/15/08 Time: 10:46

Sample: 1991 2006

Included observations: 16

Total panel (balanced) observations 512

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_ANG--HPI_ANG(-1)	0.968869	0.080740	11.99993	0.0000
_BEN--HPI_BEN(-1)	0.741530	0.286936	2.584307	0.0101
_BTW--HPI_BTW(-1)	0.514424	0.168826	3.047061	0.0024
_BUF--HPI_BUF(-1)	0.608755	0.254496	2.392006	0.0171
_BUR--HPI_BUR(-1)	0.649498	0.183955	3.530746	0.0005
_CMR--HPI_CMR(-1)	0.726110	0.175607	4.134851	0.0000
_CAR--HPI_CAR(-1)	0.692239	0.302727	2.286680	0.0226
_CHA--HPI_CHA(-1)	0.816621	0.136455	5.984537	0.0000

_CGO--HPI_CGO(-1)	-	0.237470	-0.031826	0.9746
_CIV--HPI_CIV(-1)	0.007558	0.562054	0.397767	1.413024
_ETH--HPI_ETH(-1)	0.489879	0.180132	2.719551	0.1583
_KNY--HPI_KNY(-1)	0.476766	0.196501	2.426282	0.0068
_LTO--HPI_LTO(-1)	0.606074	0.157012	3.860058	0.0156
_MGR--HPI_MGR(-1)	0.751605	0.177527	4.233757	0.0001
_MLW--HPI_MLW(-1)	0.738862	0.264906	2.789153	0.0000
_MLI--HPI_MLI(-1)	0.971853	0.130614	7.440664	0.0055
_MRC--HPI_MRC(-1)	-	0.202460	-0.442735	0.0000
_MZB--HPI_MZB(-1)	0.089636	0.338237	0.267444	1.264701
_NBI--HPI_NBI(-1)	0.409445	0.640166	0.639591	0.2066
_NGR--HPI_NGR(-1)	0.779648	0.141755	5.499954	0.5227
_NIG--HPI_NIG(-1)	0.837519	0.118376	7.075087	0.0000
_SEN--HPI_SEN(-1)	0.917717	0.148247	6.190470	0.0000
_SAF--HPI_SAF(-1)	0.402307	0.221292	1.817990	0.0697
_TAN--HPI_TAN(-1)	0.663952	0.290363	2.286623	0.0227
_TOG--HPI_TOG(-1)	0.951748	0.081345	11.70013	0.0000
_UGA--HPI_UGA(-1)	0.374300	0.170874	2.190498	0.0290
_ZAM--HPI_ZAM(-1)	0.424639	0.333335	1.273909	0.2033
_ZBW--HPI_ZBW(-1)	0.508343	0.225848	2.250819	0.0248
_GAB--HPI_GAB(-1)	0.556737	0.200987	2.770012	0.0058
_GHA--HPI_GHA(-1)	0.459246	0.343700	1.336182	0.1821
_MAU--HPI_MAU(-1)	0.254357	0.291584	0.872328	0.3835
_DRC--HPI_DRC(-1)	0.436391	0.198997	2.192952	0.0288
_ANG--GDP_ANG	0.000278	8.58E-05	3.246364	0.0013
_BEN--GDP_BEN	-	0.000843	-0.776534	0.4378
_BTW--GDP_BTW	0.000655	0.000109	3.78E-05	2.875494
_BUF--GDP_BUF	-	0.001307	-1.511852	0.0042
_BUR--GDP_BUR	0.001975	0.001100	0.000588	1.871419
_CMR--GDP_CMR	0.000355	0.000246	1.443991	0.0619
_CAR--GDP_CAR	0.001526	0.001299	1.175009	0.1494
_CHA--GDP_CHA	0.002175	0.000921	2.362106	0.2406
_CGO--GDP_CGO	0.000459	0.000189	2.430149	0.0186
_CIV--GDP_CIV	0.000102	0.000481	0.212441	0.0155
_ETH--GDP_ETH	-	0.001128	-3.478510	0.8319
	0.003925			0.0006

_KNY--GDP_KNY	0.001539	0.001022	1.505081	0.1330
_LTO--GDP_LTO	-	0.000142	-1.908619	0.0569
	0.000271			
_MGR--GDP_MGR	0.000956	0.001185	0.806974	0.4201
_MLW--GDP_MLW	-	0.001995	-0.832997	0.4053
	0.001662			
_MLI--GDP_MLI	0.000354	0.000414	0.855663	0.3926
_MRC--GDP_MRC	4.57E-05	1.56E-05	2.929714	0.0036
_MZB--GDP_MZB	-	0.000484	-2.584657	0.0100
	0.001252			
_NBI--GDP_NBI	-	0.001260	-0.526867	0.5985
	0.000664			
_NGR--GDP_NGR	0.001392	0.001288	1.080713	0.2804
_NIG--GDP_NIG	0.001206	0.000646	1.867541	0.0624
_SEN--GDP_SEN	5.30E-05	0.000399	0.133069	0.8942
_SAF--GDP_SAF	-	0.000136	-0.883022	0.3777
	0.000120			
_TAN--GDP_TAN	-	0.000405	-1.086015	0.2780
	0.000440			
_TOG--GDP_TOG	0.001097	0.000666	1.647286	0.1002
_UGA--GDP_UGA	-	0.000408	-4.720266	0.0000
	0.001925			
_ZAM--GDP_ZAM	0.000301	0.000628	0.479594	0.6317
_ZBW--GDP_ZBW	-4.14E-06	0.000194	-0.021337	0.9830
_GAB--GDP_GAB	-	6.00E-05	-1.681283	0.0934
	0.000101			
_GHA--GDP_GHA	0.001746	0.001562	1.117554	0.2643
_MAU--GDP_MAU	0.003953	0.001421	2.781919	0.0056
_DRC--GDP_DRC	-	0.000237	-1.779650	0.0758
	0.000422			
Fixed Effects				
_ANG--C	-			
	0.189604			
_BEN--C	0.384382			
_BTW--C	-			
	0.166429			
_BUF--C	0.731291			
_BUR--C	0.117351			
_CMR--C	-			
	0.064684			
_CAR--C	-			
	0.177581			
_CHA--C	-			
	0.300118			
_CGO--C	0.066278			
_CIV--C	0.206438			
_ETH--C	0.744262			
_KNY--C	-			
	0.268093			
_LTO--C	0.330494			
_MGR--C	-			
	0.096484			
_MLW--C	0.425281			
_MLI--C	-			
	0.066483			
_MRC--C	0.062111			
_MZB--C	0.708097			

_NBI--C	1.416878		
_NGR--C	-		
	0.086142		
_NIG--C	-		
	0.311323		
_SEN--C	0.019646		
_SAF--C	0.538489		
_TAN--C	0.331152		
_TOG--C	-		
	0.300342		
_UGA--C	0.827644		
_ZAM--C	0.251974		
_ZBW--C	0.251847		
_GAB--C	0.669537		
_GHA--C	-		
	0.156538		
_MAU--C	-		
	1.065459		
_DRC--C	0.262818		
<hr/> <b>Weighted Statistics</b> <hr/>			
R-squared	0.962655	Mean dependent var	0.613739
Adjusted R-squared	0.954127	S.D. dependent var	0.210005
S.E. of regression	0.044979	Sum squared resid	0.841613
F-statistic	170.2129	Durbin-Watson stat	1.800526
Prob(F-statistic)	0.000000		
<hr/> <b>Unweighted Statistics</b> <hr/>			
R-squared	0.941296	Mean dependent var	0.577634
Adjusted R-squared	0.927890	S.D. dependent var	0.167499
S.E. of regression	0.044979	Sum squared resid	0.841613
Durbin-Watson stat	1.815050		

### III. Estimation of the equation

$$HPI_{it} = \beta_1 HPI_{i,t-1} + \beta_2 GDP_{it} + \beta_3 LCI_{it} + \varepsilon_{it}$$

#### III.1. Estimation Cross-Country

Dependent Variable: HPI?
Method: GLS (Cross Section Weights)
Date: 06/15/08 Time: 10:49
Sample: 1991 2006
Included observations: 16
Total panel (balanced) observations 512

White Heteroskedasticity-Consistent Standard Errors & Covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HPI?(-1)	0.952722	0.008919	106.8220	0.0000
GDP?	-2.40E-08	1.83E-06	-0.013074	0.9896
LCI?	0.035170	0.008481	4.147064	0.0000
Weighted Statistics				
R-squared	0.957210	Mean dependent var		0.622701
Adjusted R-squared	0.957042	S.D. dependent var		0.231154
S.E. of regression	0.047910	Sum squared resid		1.168331
F-statistic	5693.142	Durbin-Watson stat		1.959569
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.918469	Mean dependent var		0.577634
Adjusted R-squared	0.918148	S.D. dependent var		0.167499
S.E. of regression	0.047921	Sum squared resid		1.168875
Durbin-Watson stat	1.993421			

### III.2. Fixed Effects estimation

Dependent Variable: HPI?				
Method: GLS (Cross Section Weights)				
Date: 06/15/08 Time: 10:51				
Sample: 1991 2006				
Included observations: 16				
Total panel (balanced) observations 512				
White Heteroskedasticity-Consistent Standard Errors & Covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
_ANG--HPI_ANG(-1)	0.972949	0.088726	10.96581	0.0000
_BEN--HPI_BEN(-1)	0.508241	0.226606	2.242843	0.0254
_BTW--HPI_BTW(-1)	0.539737	0.167978	3.213141	0.0014
_BUF--HPI_BUF(-1)	0.609407	0.282673	2.155872	0.0316
_BUR--HPI_BUR(-1)	0.563204	0.185764	3.031831	0.0026
_CMR--HPI_CM(-1)	0.231389	0.097004	2.385354	0.0175



1)				
_CAR--HPI_CAR(-1)	0.691218	0.347484	1.989207	0.0473
_CHA--HPI_CHA(-1)	0.899984	0.107324	8.385685	0.0000
_CGO--HPI_CGO(-1)	0.092780	0.158114	0.586795	0.5576
_CIV--HPI_CIV(-1)	0.204419	0.326420	0.626245	0.5315
_ETH--HPI_ETH(-1)	0.242145	0.138008	1.754573	0.0800
_KNY--HPI_KNY(-1)	0.392690	0.201486	1.948967	0.0519
_LTO--HPI_LTO(-1)	0.675044	0.185818	3.632823	0.0003
_MGR--HPI_MGR(-1)	0.475475	0.299103	1.589668	0.1126
_MLW--HPI_MLW(-1)	0.600989	0.231676	2.594087	0.0098
_MLI--HPI_MLI(-1)	0.933965	0.139243	6.707449	0.0000
_MRC--HPI_MRC(-1)	-0.123997	0.226336	-0.547844	0.5841
_MZB--HPI_MZB(-1)	0.412251	0.193857	2.126570	0.0340
_NBI--HPI_NBI(-1)	0.409492	0.699928	0.585049	0.5588
_NGR--HPI_NGR(-1)	0.807669	0.150628	5.362004	0.0000
_NIG--HPI_NIG(-1)	0.783099	0.133407	5.869987	0.0000
_SEN--HPI_SEN(-1)	0.899919	0.191257	4.705278	0.0000
_SAF--HPI_SAF(-1)	0.353819	0.251640	1.406053	0.1604
_TAN--HPI_TAN(-1)	0.634110	0.136817	4.634726	0.0000
_TOG--HPI_TOG(-1)	0.936654	0.119923	7.810437	0.0000
_UGA--HPI_UGA(-1)	0.363326	0.192848	1.884005	0.0602
_ZAM--HPI_ZAM(-1)	0.370904	0.370070	1.002254	0.3168
_ZBW--HPI_ZBW(-1)	0.431509	0.271403	1.589917	0.1126
_GAB--HPI_GAB(-1)	0.344984	0.123154	2.801250	0.0053
_GHA--HPI_GHA(-1)	-0.217894	0.341739	-0.637604	0.5241
_MAU--HPI_MAU(-1)	0.270116	0.321077	0.841281	0.4006
_DRC--HPI_DRC(-1)	0.400510	0.174457	2.295752	0.0222
ANG--GDP_ANG	0.000293	0.000119	2.470521	0.0139
BEN--GDP_BEN	0.001879	0.001067	1.761888	0.0788
BTW--GDP_BTW	0.000106	4.05E-05	2.617155	0.0092

_BUF--GDP_BUF	- 0.002125	0.001479	-1.437398	0.1513
BUR--GDP_BUR	0.001275	0.000613	2.078644	0.0382
_CMR--GDP_CMR	0.000871	7.96E-05	10.93291	0.0000
_CAR--GDP_CAR	0.001173	0.001840	0.637196	0.5243
_CHA--GDP_CHA	0.002459	0.001189	2.068460	0.0392
_CGO--GDP_CGO	0.000584	6.83E-05	8.539219	0.0000
_CIV--GDP_CIV	- 0.000268	0.000410	-0.654237	0.5133
_ETH--GDP_ETH	- 0.004696	0.000926	-5.073078	0.0000
_KNY--GDP_KNY	0.003252	0.000963	3.376052	0.0008
_LTO--GDP_LTO	- 0.000414	0.000151	-2.735806	0.0065
MGR--GDP_MGR	0.001523	0.001141	1.334941	0.1826
_MLW--GDP_MLW	- 0.001251	0.001414	-0.885007	0.3766
_MLI--GDP_MLI	- 0.000252	0.000756	-0.332934	0.7393
MRC--GDP_MRC	3.92E-05	2.62E-05	1.494595	0.1357
_MZB--GDP_MZB	- 0.001032	0.000323	-3.198977	0.0015
_NBI--GDP_NBI	- 0.000346	0.001796	-0.192706	0.8473
_NGR--GDP_NGR	0.000639	0.001257	0.508501	0.6114
_NIG--GDP_NIG	0.001190	0.000681	1.747713	0.0812
_SEN--GDP_SEN	- 0.000134	0.000526	-0.255780	0.7982
_SAF--GDP_SAF	- 0.000115	0.000129	-0.888295	0.3749
_TAN--GDP_TAN	- 0.000609	0.000304	-2.001531	0.0459
_TOG--GDP_TOG	0.001311	0.000726	1.804906	0.0718
_UGA--GDP_UGA	- 0.001820	0.000465	-3.916730	0.0001
ZAM--GDP_ZAM	0.000168	0.000651	0.258824	0.7959
_ZBW--GDP_ZBW	- 0.000121	0.000181	-0.670327	0.5030
_GAB--GDP_GAB	- 0.000113	4.52E-05	-2.494062	0.0130
GHA--GDP_GHA	0.000715	0.000835	0.856320	0.3923
_MAU--GDP_MAU	0.004022	0.001570	2.562035	0.0107
_DRC--GDP_DRC	- 0.000698	9.87E-05	-7.070037	0.0000
_ANG--LCI_ANG	- 0.034571	0.063342	-0.545781	0.5855
_BEN--LCI_BEN	- 1.499856	0.697176	-2.151332	0.0320
_BTW--LCI_BTW	- 0.107026	0.104610	-1.023090	0.3068
_BUF--LCI_BUF	-	0.052047	-0.773733	0.4395

	0.040271			
_BUR--LCI_BUR	0.078250	0.034496	2.268391	0.0238
_CMR--LCI_CMR	-0.316467	0.028735	-11.01321	0.0000
_CAR--LCI_CAR	0.033164	0.135103	0.245472	0.8062
_CHA--LCI_CHA	-0.057701	0.074069	-0.779020	0.4364
_CGO--LCI_CGO	-0.197668	0.023877	-8.278701	0.0000
_CIV--LCI_CIV	0.158083	0.062875	2.514238	0.0123
_ETH--LCI_ETH	0.173573	0.029587	5.866527	0.0000
_KNY--LCI_KNY	-0.112481	0.089467	-1.257228	0.2093
_LTO--LCI_LTO	-0.066908	0.030413	-2.199980	0.0283
_MGR--LCI_MGR	-0.123948	0.127475	-0.972327	0.3314
_MLW--LCI_MLW	0.120804	0.071682	1.685283	0.0926
_MLI--LCI_MLI	-0.061460	0.063843	-0.962668	0.3362
_MRC--LCI_MRC	0.030936	0.088843	0.348212	0.7278
_MZB--LCI_MZB	0.080113	0.050717	1.579603	0.1149
_NBI--LCI_NBI	-0.385374	1.867030	-0.206410	0.8366
_NGR--LCI_NGR	0.056744	0.057897	0.980086	0.3276
_NIG--LCI_NIG	-0.171746	0.171048	-1.004080	0.3159
_SEN--LCI_SEN	0.337571	0.422086	0.799768	0.4243
_SAF--LCI_SAF	0.167185	0.236717	0.706266	0.4804
_TAN--LCI_TAN	0.360333	0.077451	4.652392	0.0000
_TOG--LCI_TOG	-0.028301	0.073911	-0.382906	0.7020
_UGA--LCI_UGA	-0.031332	0.035870	-0.873487	0.3829
_ZAM--LCI_ZAM	0.060202	0.044400	1.355913	0.1758
_ZBW--LCI_ZBW	0.062315	0.050585	1.231889	0.2186
_GAB--LCI_GAB	0.223933	0.109814	2.039209	0.0420
_GHA--LCI_GHA	-0.447988	0.133310	-3.360507	0.0008
_MAU--LCI_MAU	0.041396	0.044146	0.937706	0.3489
_DRC--LCI_DRC	0.133065	0.015566	8.548271	0.0000
Fixed Effects				
_ANG--C	-0.182216			
_BEN--C	0.116751			
_BTW--C	-0.081387			
_BUF--C	0.792383			
_BUR--C	0.088918			
_CMR--C	0.105952			

_CAR--C	- 0.103926			
_CHA--C	- 0.373261			
_CGO--C	- 0.028358			
_CIV--C	- 0.569621			
_ETH--C	- 0.849137			
_KNY--C	- 0.773908			
_LTO--C	- 0.421318			
_MGR--C	- 0.010585			
_MLW--C	- 0.391336			
_MLI--C	- 0.130920			
_MRC--C	- 0.071884			
_MZB--C	- 0.561999			
_NBI--C	- 1.148270			
_NGR--C	- 0.004152			
_NIG--C	- 0.173121			
_SEN--C	- 0.136813			
_SAF--C	- 0.429050			
_TAN--C	- 0.078921			
_TOG--C	- 0.331199			
_UGA--C	- 0.833553			
_ZAM--C	- 0.288613			
_ZBW--C	- 0.307615			
_GAB--C	- 0.694364			
_GHA--C	- 0.716573			
_MAU--C	- 1.127452			
_DRC--C	- 0.254918			
Weighted Statistics				
R-squared	0.971893	Mean dependent var		0.62584 6
Adjusted R- squared	0.962598	S.D. dependent var		0.22189 4
S.E. of regression	0.042914	Sum squared resid		0.70716 6
F-statistic	139.7709	Durbin-Watson stat		1.90586 4
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.950674	Mean dependent var		0.57763 4

Adjusted R-squared	0.934360	S.D. dependent var	0.167499
S.E. of regression	0.042914	Sum squared resid	0.707166
Durbin-Watson stat	1.916286		