Construction and Economic Growth in Developing Countries of Africa: Evidence from Data of the Last Thirty Years

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Abstract

The role of construction in economic growth and development has been addressed by various writers and international bodies, many of whom have focused in developing countries. The main aspect derived from a seminal work in this field (Bon, 1992) is that there is a changing development pattern of the construction industry based on the stage of development of a country's economy. That is in the early stages of the economic development, the share of construction in gross domestic product (GDP) increases but ultimately decreases in industrially advanced countries. That finding was consistent with the classical approach in growth theory in which physical capital formation is the main engine of economic growth and development. Using most recent data spanning the last thirty years or so drawn from the United Nations (Yearbook of National Account Statistics: Main Aggregates and Detailed Tables) and World Bank publications (World Development Report and Africa Development Indicators), the results of the study corroborate, in the main, the assumptions of a previous work that posit that in the developing countries of Africa, the positive relationship between construction and the national economy concerns only a downturn economy, and an in an economic upward trend the pattern of the construction sector (measured as a share of value added in national output) tends to follow *pari passu* that of the rest of the economy.

Keywords: Africa, construction sector, developing countries, economic growth

1. Introduction

Development is the most important challenge facing human race (World Bank, 1991). Development and economic development are relatively recent pursuits of many writers from various research centres worldwide as well as international organisations. The majority of the international bodies to promote development, such as national development banks, The World Bank Group and agencies of the United Nations Organisation, all have been established since World War II. Since then economic policies urged on developing countries have produced significant progresses in many parts of Asia and Latin America. Regarding Sub-Saharan Africa, Lopes (1998) pointed out "most of the countries are not just standing still: for the last fifteen years they have been moving dramatically backwards". Although some successes have been noticeable in a significant number of countries, it is still the development pattern of the majority of Sub-Saharan African countries (see Fig.1).

Historically, the construction industry has been linked with the process of industrialisation and development. Railways systems and canals played an important role in the connection of different regions of Europe, North America and in some parts of Latin America (Rostow, 1963). Transport infrastructures facilitated trade and co-operation between countries and also the diffusion of technical innovations from the most advanced to the less advanced areas of the globe. The construction industry played a key role in the reconstruction of the war-ravaged Europe. The heavy programme of construction of improvement of housing and social infrastructure, beside its contribution to the national output, was also a reflex of a better re-distributive economic policy in Europe post World War II.

With regard to the relationship between construction and economic growth, Turin (1973) and Wells (1986), using cross-country comparisons, both found an association between construction investment and economic growth. That finding was consistent with the classical approach in growth theory in which physical capital formation is the main engine of economic growth and development. Bon (1992), in a longitudinal study covering the period 1970-1985, and in a worldwide perspective, presented an inverse U shape pattern of the development of the construction industry where in the latest stages of economic development, construction output tends to decrease not only relatively bur also absolutely.

In the aftermath of the 1979-980 oil-shock and the international financial crisis that followed in 1981, most of Sub- Saharan African countries experienced until the late 1990s a decreasing growth in per capita national income, despite heavy investment in construction and other physical capital over the preceding decade. Following the *Structural Adjustment Programme for Africa* that started in the mid-1980s, World Bank (1994) took the view that rather the quantity of infrastructures the main concern in developing countries should be the improvement of the quality of infrastructures. Thus, it is reasonable to argue that this would be achieved through an adequate maintenance of existing infrastructure stocks and by prioritising investments that modernise production and enhance international competitiveness. Lopes (1998), discussed the role of construction in economic development of countries in Sub-Saharan Africa. The development patterns of construction and related sectors were modelled based upon data from the period 1980-1993 and a sample of 15 countries comprising two different patterns of growth in that period. It was argued that construction

and the national output grow at the same rate only in a declining economy, and that in a growing economy, the volume of construction, typically, should not grow faster than the rest of the economy

The remaining of this paper presents the statistical sources and the indicators of the economic activity chosen for the analysis. Secondly, it presents data on the measures of national output and of the construction industry in the developing countries of Sub-Saharan Africa. Next, it analyses the pattern of development of construction investment in two groups of countries in that region according to their stage of economic development: Low Income Countries (LICs) and Middle Income Countries (MICs). A concluding remark finalizes the analysis.

2. Statistical sources and methodology of data collection

The main statistical sources used in this analysis are the 1998 edition of the *Yearbook of National Account Statistics: Main Aggregates and Detailed Tables* from the United Nations, *Africa Development Indicators 2008-2009* and *World Development Report 2010* from the World Bank. The internet site of the UN statistical office presents data on gross domestic product (GDP) and its components both in the expenditure and production approaches. This publication presents various sets of economic series detailing the evolution of GDP and its components in different statistical formats over the long period 1970-2006, both in the world, world regions and countries: at current prices in national currencies; constant 1990 prices in national currencies; current prices in US dollars; constant 1990 prices in US dollars: The indicators of economic activity analysed are: GDP and construction value added (CVA). Unfortunately, data on gross fixed capital formation in construction (GFCFC) are not provided in the UN publication. Thus, CVA is used as a proxy for analysing the evolution pattern of construction investment across the Sub-Saharan African region. As construction value added is roughly a half of GFCFC, it appears reasonable that CVA can be used as a surrogate measure of construction investment. In order to facilitate international comparison as well as for aggregation purposes, constant 1990 prices in US dollars are used: With respect to the investigation of the relationship between the construction sector and economic development according to a country's (group of countries) stage of economic development, gross national income (GNI) per capita for the bench mark year 2008 has been chosen. This is provided by World Bank (2009). *The World Development Report 2010* presents the following definitions. Income Group: The economies are divided according to 2008 GNI per capita. The groups are: low income countries (LICs), US$ 975 or less; lower- middle- income (LMICs), US$ 976-3,855; upper-middle-income (UMICs), US$ 3,856 - 11,905; and high income countries (HICs), US$ 11,906 or more. Data on the evolution of economic and development indicators in the period 1980-2006 stem from the *Africa Development Indicators 2008-2009*.

3. Data

As referred earlier, the indicator used as a proxy for construction investment is construction value added. CVA is calculated the same way as in any other sector, but includes only the activities of the construction activity proper. For example, it excludes the building materials industry which is accounted in the manufacturing sector. The main indicator of economic activity used in this study is

GNI per capita. It adjusts the growth in the economy with the growth in population, thus it is a better economic indicator of welfare.

Using data adapted from the *UN Yearbook of National Accounts Statistics* (United Nations, 2008 internet edition), data are presented for the share of construction in gross domestic product (at constant1990 US$) for the period 1980-2006. GNI per capita is presented for the year 2008. The evolution of basic indicators both of Sub-Saharan Africa as a whole as well as excluding two important economic players of that region (South Africa and Nigeria) are presented for the period 1980-2006.

Cross-matching sources, data is available for 45 countries and these can be split into two groups according to the level of GNI per capita in 2008. Tables 2 and 3 and Figs. 1 and 2 illustrate these two groups: Group I - low income countries (LICs); Group II- middle income countries (MICs). Thus Group II comprises both LMICs and UMICs, and only Equatorial Guinea could, in theory, be considered a HIC.

Table 1: Gross Domestic Product in Sub-Saharan Africa in 1980-2006, real

	Constant prices (2000$)				*Average annual growth (%)*		
	1980	*1990*	*2000*	*2006*	*1980- 1989*	*1990- 1999*	*2000- 2006*
SSA	*593*	*532*	*508*	*580*	*-1.0*	*-0.6*	*2.2*
SSA exclud. South Africa	*371*	*339*	*332*	*368*	*-0.9*	*-0.3*	*2.6*
SSA exclud. South Africa and Nigeria	*348*	*331*	*323*	*379*	*-0.3*	*-0.2*	*2.3*

Table 2: GNI per capita and Share of CVA in GDP (%) for Selected Years (Group I)

Countries	*GNI per capita current US$ (2008)*	*CVA/GDP (1980)*	*CVA/GDP (1990)*	*CVA/GDP (2000)*	*CVA/GDP (2006)*
Benin	*690*	*3.65*	*3.11*	*3.56*	*3.91*
Burkina Faso	*480*	*2.90*	*4.67*	*5.05*	*5.49*
Burundi	*140*	*3.29*	*3.35*	*4.37*	*3.11*
C. African Rep.	*410*	*1.77*	*2.81*	*2.57*	*2.97*
Chad	*530*	*1.02*	*1.69*	*1.32*	*1.31*
Comoros	*374*	*9.39*	*3.17*	*5.38*	*6.01*
Congo, D. Rep.	*150*	*3.65*	*5.00*	*3.27*	*4.24*

Gambia, The	*390*	*4.86*	*4.51*	*4.05*	*4.77*
Ghana	*670*	*3.30*	*3.30*	*3.48*	*3.56*
Guinea	*390*	*10.23*	*10.20*	*11.49*	*12.41*
Guinea-Bissau	*250*	*13.71*	*9.99*	*6.76*	*10.63*
Kenya	*750*	*3.74*	*2.92*	*2.66*	*2.53*
Liberia	*170*	*3.89*	*3.33*	*2.07*	*3.45*
Madagascar	*410*	*1.69*	*1.11*	*1.45*	*2.83*
Malawi	*290*	*6.81*	*4.96*	*3.84*	*5.10*
Mali	*580*	*2.00*	*2.91*	*5.14*	*4.92*
Madagascar	*410*	*1.69*	*1.11*	*1.45*	*2.83*
Mauritania	*840*	*3.42*	*4.78*	*6.27*	*8.95*
Mozambique	*370*	*9.65*	*5.19*	*8.40*	*7.37*
Niger	*330*	*2.63*	*2.45*	*2.30*	*2.55*
Rwanda	*410*	*6.82*	*6.78*	*7.97*	*9.18*
Senegal	*970*	*2.82*	*3.29*	*3.94*	*5.13*
Sierra Leone	*320*	*3.31*	*2.12*	*2.07*	*3.96*
Tanzania	*430*	*3.57*	*4.76*	*6.84*	*7.81*
Togo	*400*	*5.84*	*5.14*	*4.44*	*5.20*
Uganda	*420*	*3.51*	*4,84*	*6.39*	*7.58*
Zambia	*950*	*2.71*	*2.56*	*2.15*	*3.40*
Zimbabwe	*340*	*3.88*	*2.86*	*2.22*	*0.86*

Table 3: GNI per capita and Share of CVA in GDP (%) for Selected Years (Group II)

Countries	*GNI per capita current US$ (2008)*	*CVA/GDP (1980)*	*CVA/GDP (1990)*	*CVA/GDP (2000)*	*CVA/GDP (2006)*
Angola	*3, 450*	*4.64*	*2.92*	*2.73*	*3.45*
Botswana	*6,470*	*9.11*	*7.28*	*5.88*	*5.13*
Cameron	*1,150*	*6.92*	*4.59*	*3.57*	*3.58*
Cape Verde	*3,130*	*10.39*	*11.92*	*8.47*	*8.76*
Congo, Rep.	*1,970*	*7.23*	*2.99*	*4.44*	*5.01*
Cote d'Ivoire	*980*	*3.63*	*1.79*	*4.04*	*3.29*
Djibouti	*1,130*	*4.19*	*9.62*	*5.89*	*6.84*

Equatorial Guinea	*14,980*	*7.25*	*4.51*	*3.05*	*3.38*
Gabon	*7,240*	*5.70*	*6.71*	*6.37*	*6.54*
Lesotho	*1,080*	*9.63*	*14.69*	*13.84*	*12.45*
Mauritius	*6,400*	*5.74*	*5.62*	*5.88*	*5.96*
Namibia	*4,200*	*6.51*	*2.30*	*2.33*	*3.20*
Nigeria	*1,160*	*3.90*	*1.69*	*2.14*	*2.40*
Seychelles	*10,290*	*9.26*	*4.79*	*8.51*	*9.14*
S. Africa	*5,820*	*3.82*	*2.98*	*2.29*	*2.62*
Sudan	*1,130*	*5.56*	*6.04*	*5.01*	*5.00*
Swaziland	*2,520*	*5.84*	*2.49*	*6.39*	*6.70*

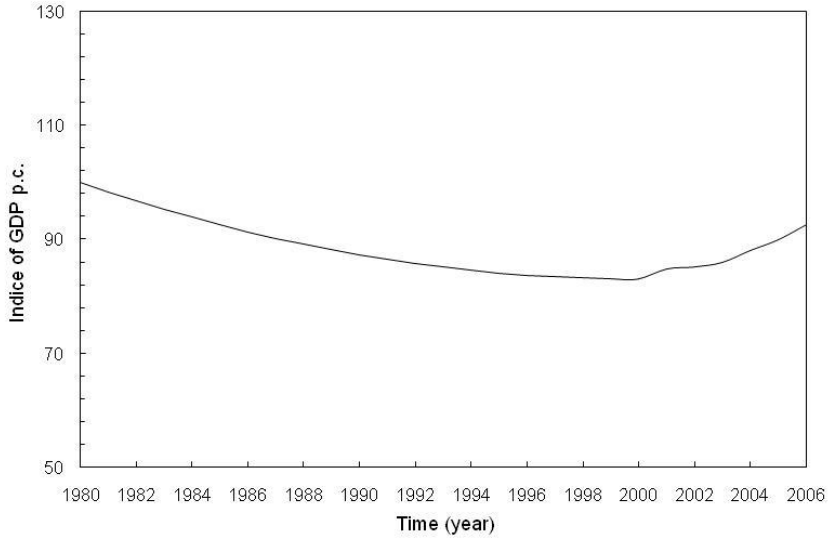

Figure 1: Indices of GNI per capita in Group I (mean average; 1980= 100)

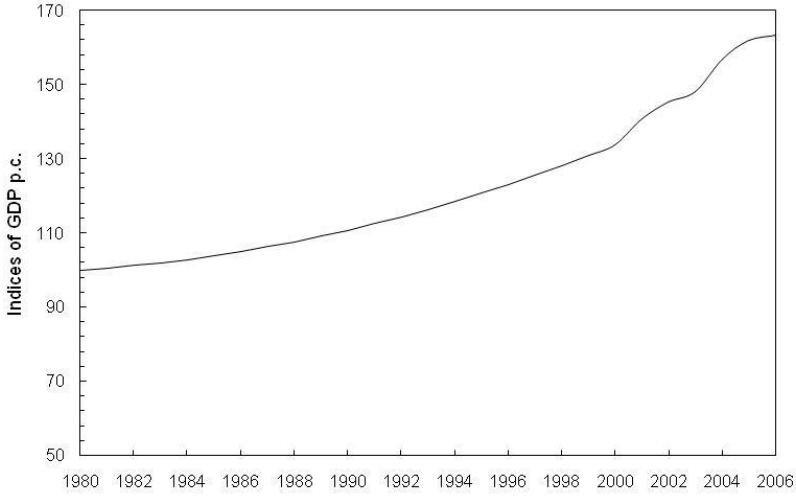

Figure 2: Indices of GNI per capita in Group II (mean average; 1980= 100)

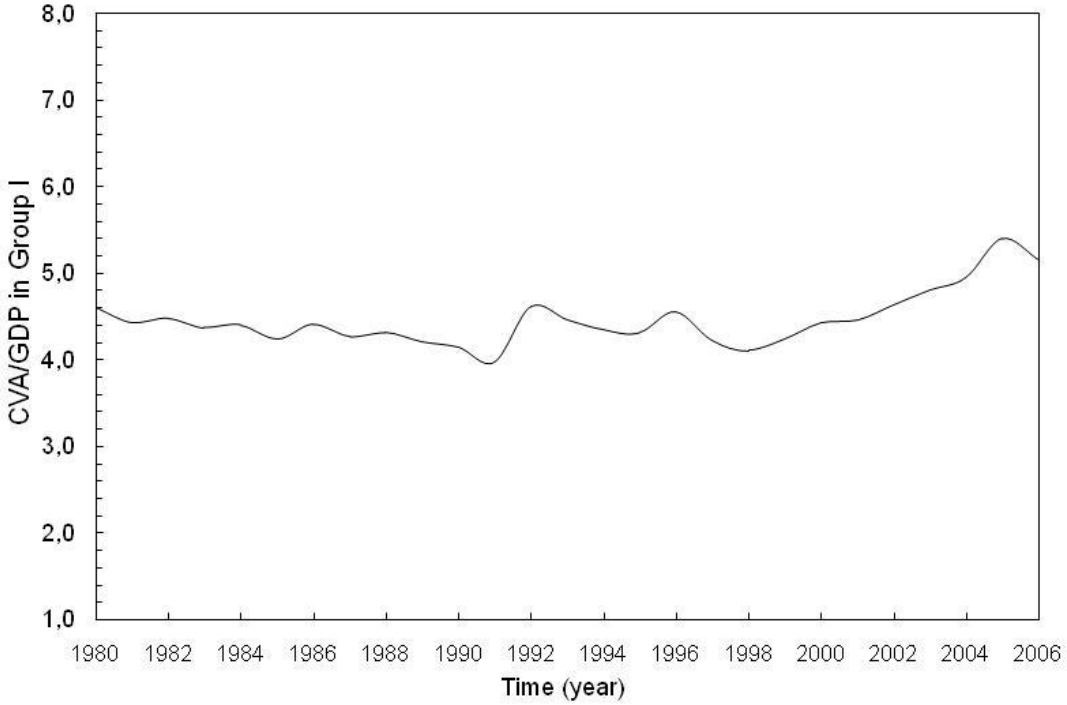

Figure 3: Evolution of the Share of CVA in GDP (%) in Group I (mean average)

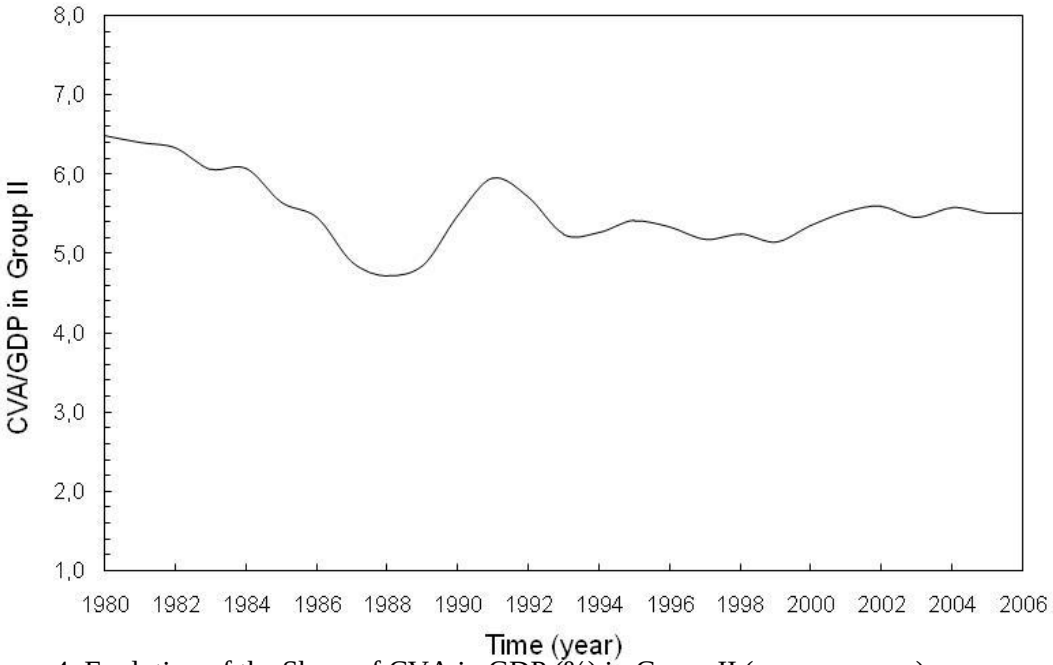

Figure 4: Evolution of the Share of CVA in GDP (%) in Group II (mean average)

4. Analysis

Table 1 shows the evolution of GDP per capita in Sub-Saharan Africa as well as that of Sub-Saharan Africa excluding South Africa and Sub-Saharan Africa excluding South Africa and Nigeria. The division shown in Table 1 is a reflexion of the clout those two countries represent for the Sub-Saharan African economy: The former because is by far the most populous country in the region and the latter for its unmatched industrial structure and technological development that makes it the economic pole of Sub-Saharan Africa. It can be seen that both the region and its subdivisions, in terms of GDP per capita, experienced a decreasing growth in the period 1980-2000 and a reasonable upturn in the period from 2000 onwards. This is in line with the evolution illustrated in Fig. 1. The low income countries (LCIs), as a group, experienced a dramatic decreasing growth in the period 1980-2000 and a rate of growth (annual average) of almost 2% in the period 200-2006. The striking aspect worthy of note concerning Group 1 is illustrated in Fig.1: GNI per capita in the LCIs in 2006 (group average) was lower than that in 1980. On the other hand, the countries comprising Group II (MICs) grew slightly in the period 1980-2000 (annual growth rate of about 1%) and notched up a spectacular rate of growth (more than 4% in terms of annual average) in the period 2000-2006. As illustrated in Fig. 2, GNI per capita in Group II in 2006 was about 1.65 times as that of 1980.

Now looking at the relationship between the construction sector and the national economy, it is shown from Tables 1 and 2 and also Figs 1 to 4 that the evolution pattern of the share of CVA in GDP in the developing countries of Africa is markedly different according to the stage of economic development. The share of CVA in GDP in the low income countries (Group I), despite differences across countries as well as taking into account annual fluctuations, varied, in general, from 4% to 5% of GDP .as is illustrated in Fig.3. In terms of the evolution in the period, the share of that indicator was in line with the development pattern of GNI per capita: decreased in the period 1980-1990, remained practically stagnant in the period 1990-2000 and grew reasonably in the period 2000-2006. It is worth of noting that in the late years of the period, the share of CVA in GDP was higher than that of the early years of the same period. That is, in the first stages of economic development, and in an increasing growth pattern, the construction industry tends to grow faster than national output. Conversely, in an economic downturn, the industry tends to decrease not only absolutely but also relatively. Regarding the middle income countries (Group II), Table 3 and Fig.4 show that the share of CVA in GDP varied, in general, from 5.0 % to 6.5% in the period 1980-2006, also disregarding differences across countries as well as annual fluctuations. Figs 2 and 4 also show that a small increase in GNI per capita corresponded to a fairly significant decrease in the share of CVA in GDP in the period 1980- mid 1990s. From then onwards, the share of construction in GDP remained practically stagnant at around 5.5% of GDP. The pattern experienced by the MICs is worthy of note: despite a significant increase in national income per capita, particularly in 2000-2006, the share of CVA in GDP in the late years of the period did not reach the value accounted in the beginning of the period. These results presented here seem to corroborate those of a previous work concerning the developing

countries of Africa (Lopes 1998) that found that the association between the construction sector and the general economy is consistent only with a declining economy.

5. Concluding Remarks

The picture that emerges from the analysis suggests that the share of construction in gross output tends to increase with the level of per capita income in the first stages of economic development. When countries reach a certain level of economic development, the construction output will grow slower than national output in the latest stages of their recovery. That is, it decreases relatively but not absolutely. Thus, it is reasonable to assume that when a certain level is achieved (say the share of CVA in GDP at around 5% - 6% - it depends upon the year taken as base and the currency used) and countries enter into a period of sustained economic growth and development, the construction output tends to grow, in general, with the same rate of growth as that of the general economy.

References

Bon, R. (1992), The Future of International Construction: Secular Patterns of Growth and Decline, *Habitat International*, **16** (3), 119- 28

Lopes, J. (1998), The Construction Industry and Macroeconomy in Sub-Saharan Africa post 1970, *Construction Management & Economics*, Vol. 16, 637-649, R E & FN SPON

Rostow, W.W, (1963), The Leading Sectors and the Take off, pp 1-21 in W.W. Rostow, ed, *The Economics of Take-off into Sustained Growth*, Proceedings of the Conference Held by the International Economic Association, The Macmillan Press

Turin, D. A. (1973), *The Construction Industry: Its Economic Significance and its Role in Development*, UCERG, London

United Nations (2008), *Yearbook of National Accounts Statistics*: *Main Aggregates and Detailed Tables,* Statistical Office, DESA, New York Publishing Division

Wells, J. (1987), *The Construction Industry in Developing Countries: Alternative Strategies for Development*, Croom Helm Ltd, London

World Bank (1994), *Adjustment in Africa: Results and the Road Ahead*, IBRD, Oxford University Press.

World Bank (2008), *Africa Development Indicators 2008-2009*, IBRD, Oxford University Press.

World Bank (2009), *World Development Repor*t 2010, IBRD, Oxford University Press.