

Urbanization and Economic Growth in West Africa: A Panel Data Approach

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Introduction

Statistics have revealed that more people now live in cities than rural areas. Indeed, the world's population is currently 6.6 billion, according to a new UN report, '*State of the World Population: Unleashing the Potential of Urban Growth*', and slightly more than half of which live in urban areas, the majority of them in developing countries. Between now and 2050, the report says, world population will surge by more than 37 per cent – from 6.616 billion to 9.076 billion, with Asia and Africa leading the way. About three decades ago, the United Nations (UN) convened the Habitat I conference in Vancouver. In 1976, rapid urbanization and its impact were not very significant, especially given that one-third of humanity lived in urban areas while the world's population was primarily rural. However, since then there has been a considerable increase in the growth rate of cities and towns. In fact, thirty years after the Vancouver Conference, the proportion of people living in urban areas has risen by 50%. These current trends predict that the number of urban dwellers will keep rising, reaching almost 5 billion by 2030, and will continue to grow to 6 billion by 2050. By implication, between 2005 and 2030, the world's urban population is expected to grow at an average annual rate of 1.78 per cent, almost twice the growth rate of the world's total population, thus portending a grave danger for meeting the Millennium Development Goals.

The relationship between urbanization and economic growth has been a source of great perennial concern. At one extreme has been the view that greater urbanization inevitably leads to economic illness rather than economic growth. This is based on the argument that government policies which are often biased in favour of urban areas at the expense of rural areas have prompted rural-urban migration and thereby increased the size of urban regions. Though this may temporarily promote economic growth in poor countries, it will not bring about a long-term, equitable development possible only through aiding agriculture (Lipton, 1984). At the other end is

the perception that urbanization is a crucial component of the natural transition from a traditional (agrarian) society to a modern (industrial) nation (Bradshaw, 1987). By implication, any urbanization-induced development problem worth solving will be addressed more or less automatically as a consequence of economic growth. This debate is of considerable relevance to developing countries partly because urban trends reveal that between 1950 and 2000, the share of urban population in total increased by 124 per cent in developing nations, compared to 38 per cent in the industrialized world (UN, 2002). On the other hand, the gap in economic performance between the two regions continues to diverge or widen. This long-debated urbanization-growth issue has recently been again popularized by the World Bank in its 2000 World Development Report. The debate rages on also because of the insignificant empirical evidence on how urbanization impacts on economic growth, particularly in developing countries which do not have required data even though this situation has improved over time.

The broad objective of this paper is to analyze the relationship between urbanization and economic growth in West Africa. It builds on the seemingly sparse literature regarding the impact of urbanization on the economic development of West African countries. Specifically, using panel data covering the period 1950 – 2005, the paper investigates how urbanization has affected economic growth in a sample of West African countries. In effect, Section 2 describes the trend of urbanization in West Africa, and reviews some empirical literature on the relationship between urbanization and economic growth while the following section presents the theoretical framework. Section four specifies the analytical model while section five contains the empirical analysis, data sources and results. The final section provides the concluding remarks and policy recommendations.

Urbanization in West Africa and some empirical evidence

Urbanization is conceptualized as the increase in the percentage of a country's population living in cities. It is a development process of civilization in which the rural character of a town or an area is removed. Demographically, it denotes redistribution of populations from rural to urban settlements. Economic growth, on the other hand, connotes an increase in the value of goods and services produced in an economy over a well-defined period, conventionally measured as the percentage rate of increase in the real gross domestic product (GDP). In developed countries, urban areas generate over 80 per cent of national economic output, while in developing countries,

urban economic activity contributes considerably to national revenue to the tune of about 40 per cent of GDP. Wealthy world cities are increasingly operating like city-states and city-regions, independent of regional or national administration and offering the greatest potential for reducing poverty and providing numerous employment opportunities. Of relevance at this juncture is that in the developing world, there is an increasing trend towards the 'informalization' of the urban economy which is evident by the increasing shares of income earned in unregulated employment. In Latin America and the Caribbean, 7 out of 10 new jobs in urban areas are created in the informal sector. Women account for a disproportionately larger share of the informal labour force than men (around 60 per cent in the world; 84 per cent in Sub-Saharan Africa). While terrorism is one of the pressing concerns of cities in the developed world, most cities in developing countries are grappling with problems imposed by the insecurity and inequalities. The security of the urban poor is threatened by their health status, which also influences their ability to be productive. The HIV/AIDS pandemic has far reaching implications for urban security as it results in loss of household income, growth in the phenomenon of orphaned street children, and disintegration of the family unit (Odularu, 2006). Furthermore, though some developing economies have experienced increased growth, this has not generated prosperity for all, rather intra-city inequalities appear to have deepened and widened between the rich and the poor. Thus, a large proportion of urban dwellers seemingly suffers from extreme levels of deprivations that are worse than those experienced by the rural poor. The inequality in access to services such as housing, land, education, health and employment opportunities within cities have socio-economic, environmental and political repercussions, including rising violence, urban unrest, environmental degradation, and underemployment, which threaten to diminish the recorded gains in economic growth and poverty reduction.

These negative implications of urbanization have led to concerns about how to address them in both developed and least developed countries, more so that the degree of urbanization in a given country can vary independently of the absolute number of people living in cities. While underdeveloped countries have less urbanization than the advanced countries, there are more people living in cities, of at least 100, 000, of underdeveloped countries than in industrialized nations. This perspective links the increasing rate of urbanization to the rise of industrialization. According to the 2005 report of the United Nations World Urbanization Prospects, the 20th century was described as that century which has experienced greatly rapid urbanization of the world's population, noting that the global proportion of urban population rose unprecedented from 13 per cent (220m) in 1900, to 29 per cent (732m)

in 1950, to 49 per cent (3.2b) in 2005; forecasting a rise to 60 per cent (4.9b) by 2030. Furthermore, about 93 per cent of urban growth will occur in Asia and Africa, and to a lesser extent in Latin America and the Caribbean. By 2050, over 6 billion people, two thirds of humanity will be living in towns and cities.

Relating all this to West Africa, approximately 38 per cent of the population of Western Africa lives in urban areas at a par with average for Africa as a whole (UNEP, 2002 : 203). Cape Verde is the most urbanized country with 62 per cent of the population living in urban areas, and Burkina Faso the least, with just 18.5 per cent of its population in urban areas (UNEP, 2002 : 203). The predicted average rate of urbanization during 2000 – 2015 will range from about 5 per cent in Burkina Faso and Niger to 3 per cent in Cape Verde (UNEP, 2002 : 203). Thirty years ago, only one West African city (Lagos) had a population of more than 1 million. By 2000, cities with population exceeding 1 million included Ouagadougou (Burkina Faso), Abidjan (Cote d'Ivoire), Accra (Ghana), Conakry (Guinea), Bamako (Mali), Ibadan (Nigeria), Lagos (Nigeria), and Dakar (Senegal). Lagos, the largest city in Africa, and the sixth in the world, has an estimated current population of 13.4 million people, and this is expected to grow to more than 23 million by 2012 (UNEP, 2002 : 203). It is important to note that the growth of urban populations in West Africa can be explained by high overall population growth and migration. Migration, in turn is determined by a mixture of rural push and urban pull factors. The rural push variables include climatic variation, soil / vegetation degradation, diminishing agricultural yields, and excruciating food insecurity. On the other hand, the urban pull factors include the prevailing educational opportunities which are oriented towards training people in urban occupations, rather than to improving agriculture or animal husbandry in rural areas, improved quality of life, concentration of amenities (such as health care, educational and recreational facilities), minimum wage legislation, among others. Reports have revealed that the urban growth rates in West Africa exceed the capacities of municipalities to provide adequate housing and services such as water supply, sanitation, waste disposal, communications and transport infrastructure, health services and education. It is also pertinent to note that high unemployment in urban areas also contributes to widespread poverty, poor living conditions and other social problems. Thus, rapid urban growth which is complicated by poor urban planning and control of land use, lack of financial resources and inadequate investment in environmental management – has led to the proliferation of urban slums in West Africa. Although it is difficult to quantify the number of people living in slums, it has been reported that 42 per cent of the population in Liberia's capital, Monrovia, are squatters and, in Nouakchott (Mauritania),

approximately 12 per cent of the city's area is taken up with slums (UNEP, 2002 : 203). In Abidjan, Cote d'Ivoire, a number of schemes have been implemented to improve the living conditions of the 20 per cent of the population estimated to be living in slums. Also, since unplanned developments accounted for about 25 per cent of Senegal's urban areas in 1987, the Dalifort Settlement Upgrading Pilot Project was launched and aimed at assisting squatters improve their own living conditions, while adhering to environmentally sound practices.

In seeking econometric evidence for this paper, it appears only a few empirical works have attempted to analyze the nexus between urbanization and economic development. Moomaw and Shatter (1993) regressed different measures of urbanization and urban concentration on economic growth and found that metropolitan concentration has a positive effect while urban primacy, defined as concentration of urban population in the largest city, has a negative impact. McCoskey and Kao (1998), using panel co-integration techniques, established that the long-run effect of urbanization on growth cannot be rejected. Bradshaw (1987) addressed the theories of modernization, urban bias and economic dependency. Using a panel regression analysis to assess the validity of the three perspectives in sixty-one underdeveloped countries between 1960 and 1980, the result provides some support for each theory and also contradicts previous studies that do not consider several important variables. More recently, Henderson (2003) identified a non-monotonous impact of urban primacy on economic development, thus suggesting a broad range of values of optimal primacy levels, below which urban concentration fosters rather than inhibits economic development. Furthermore, Bertinelli and Strobl (2003) investigated how urban and urbanization affect economic growth in developing countries. The study uses semi-parametric estimation technique on a cross-country panel of 39 countries for the years 1960 – 1990. It discovers that a U-shaped relationship exists for urban concentration. This implies the presence of an urban-concentration trap where marginal increases in urban concentration would reduce growth for about a third of the collected sample. The study concludes that there appears to be no systematic relationship between urbanization and economic growth.

Theoretical Framework

The relationship between urbanization and economic development is explained by the theories of modernization, urban bias, and economic dependency.

These theories present different arguments but seemingly complementary interpretations of the correlation between urbanization and economic growth.

Modernization Theory

Urban expansion is a crucial stage in the natural transition from a traditional (agrarian) society to a modern (industrial) nation, according to the modernization theory, which also argues that strong urban economies are the backbone and motor of the wealth of nations (Jacob, 1984). In other words, as countries become more reliant on manufacturing and services and less on agriculture, urban areas are more likely to become crucial in fostering economic development. This is in line with the doctrine of classical economics that rural inhabitants are pulled to urban areas by high industrial wages, since industrialization (and manufacturing employment growth) remains a formidable engine of urbanization. This is further justified by the fact that people will migrate increasingly from rural to urban areas as long as their expected urban wages exceed their current rural wages. Thus, migrants take a temporary job in the informal sector while waiting for higher paying permanent employment in the formal sector. The classical economists also noted that urban growth positively enhances the total output of society and thus increases economic growth (Berliner, 1977).

The traditional view of economics is that labour mobility contributes significantly to the efficiency of resource allocation. By migration from regions of low marginal productivity and low wages to regions with higher marginal productivity and wages, mobile labour increases the total output of the society. Of two societies alike in all other respects, the one with the higher degree of mobility would enjoy the higher income. This implies that a nation must experience large-scale migration to urban areas before it can become a modern industrial society. In relation to this is the argument that developing countries' urban areas consists of modernizing institutions such as schools, factories and the mass media, all of which generate and transmit modern and globalized development ideas that foster economic prosperity.

Urban Bias Theory

Basically, the urban bias theorists (e.g. Lipton, 1984) argue that many underdeveloped nations implement investment, tax, pricing and other macroeconomic policies which favour urban areas at the expense of the rural areas due to the pressure being mounted on the government by various urban-based groups such as industrialists,

urban workers (labour union) and small-scale capitalists or entrepreneurs. Thus, since the state is not controlled by a single group, but by competing interests of various powerful urban-based groups that are interested in urban development, it is clear that government policy usually will favour some type of urban project over an agricultural project that would aid peasant farmers. Consequently, this will create a disparity between urban and rural areas with respect to consumption, wages, productivity and standard of living. Furthermore, according to the urban bias theory, urbanization promotes economic inefficiency and therefore impedes long-term economic development in developing countries. Thus, in contrast to modernization theory, the urban bias thesis asserts that rural dwellers should remain in agricultural activities instead of migrating to urban areas, where they will join the informal labour market or turn to crime, begging, or prostitution, making urbanization to be a sign of economic illness rather than development (Bradshaw, 1987). Another pertinent variant of the urban bias theory is related to the traditional debate on the nexus between urbanization and economic development in developing countries focused on whether urbanization was too high, thus subscribing to the over-urbanization hypothesis. This hypothesis argues that developing countries' rates of urbanization are higher than that of today's developed nations compared to when the latter were at the same stage of development in the 19th century and hence are above their optimum level (Bertinelli and Strobl, 2003).

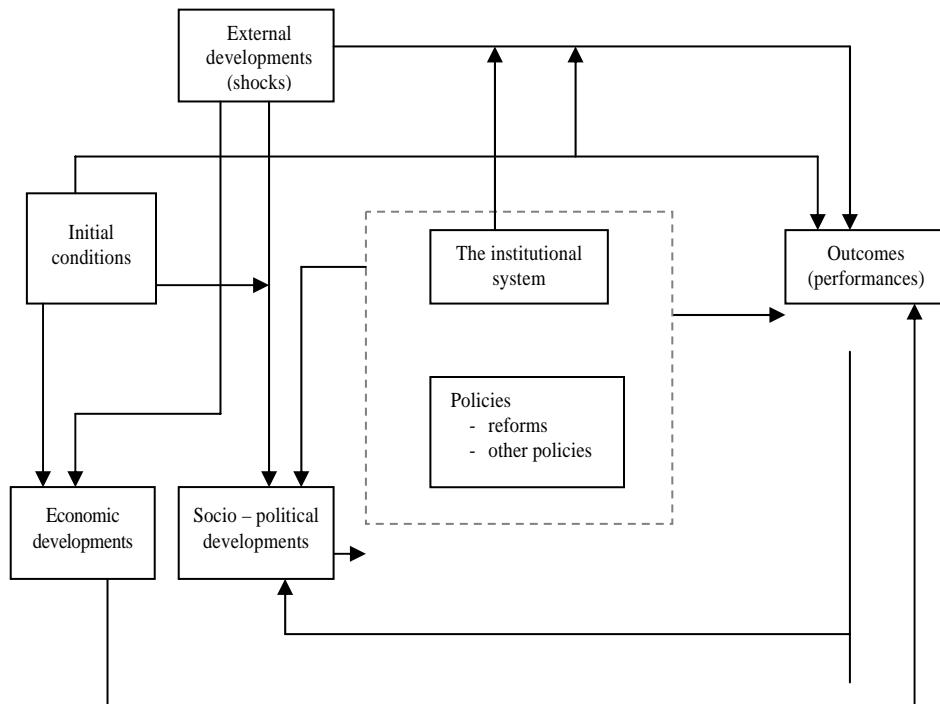
Economic Dependence and World-system Theory

Various studies have established a direct correlation between foreign investment and urbanization through the expansion of the service and informal sectors, which indirectly retards economic development (Bradshaw, 1985). For instance, foreign investment in large-scale agricultural production displaces peasant farmers and encourages rural-urban migration by enlarging the potential pool of urban workers. Attached to the economic dependence thesis is the 'bright lights' theory of urbanization which states that people in the rural areas are attracted to the excitement and supposed opportunity offered by the city. For instance, the inflow of foreign direct investment 'pushes' peasants to the city where they are unable to find high-paying employment opportunities. Furthermore, the dependency and world-system theory assert that countries that have a high concentration of agricultural exports should also experience urbanization since their farmers are vulnerable to low international prices for agricultural produce and unfavourable climatic conditions.

Analytical Framework, Model Specification and Methodology

Modeling output growth in developing economies is an interestingly complex task that requires more in-depth analysis of possible variables than a simple analysis of a growth equation, particularly when the central issue of the role of urbanization in economic growth is considered. In other words, urbanization as a factor needs to be considered along with such other factors as labour supply, capital, economic reform policies, foreign direct investment, socio-political conditions, and government spending, among others, which affect economic growth. Figure 4.1 presents a graphic overview of the analytical framework. The diagram reveals the complexity of the output growth in a typical economy. In other words, economic performance is affected by a number of variables, which then raises the problem of endogeneity. Being that as it may, the purpose of this section is to articulate a model and identify the variables that affect economic performance in West Africa with special focus on the role of urbanization.

Figure 1
The Relevant Variables in the Modelling of Output (in Developing Countries)



Source: Authors' formulation

Different authors have taken different approaches to modelling economic growth. Havrylyshyn (2001) focused on monetary stabilization and liberalization, but added structural reform. Staehr (2003) focused also on the sequencing and complementarities of reforms while Radulescu and Barlow (2002) examined the importance of vanishing effects of initial conditions. Campos (2000) also examined the effects of population growth and human capital. These numerous suggestions do not simplify the choice of variables to include in the model. The complexity of such a decision makes the general to specific modelling approach much more appealing. In view of the schema in the figure, and given that a simple growth model approach may not suffice, this paper specifies a general function to capture the multivariate nature of economic growth that accounts for initial conditions, structural changes, shocks, among others. Thus, we have

$$Y_{jt} = F(X_{jt}^{EC}, P_{jt-s}, I_{jt-s}, S_{j0}, Z_{jt}, \mu_t) \dots \quad (4.1)$$

Even though the general function model above is favoured, it is important to be specific about the functional form of Equation (4.1). Following Barro (1997, 2001), an explicit growth model which has been adapted for urbanization is specified as:

$$\begin{aligned} \text{PCGDPG}_{jt} = & \alpha_0 + \alpha_1 \log \text{PCGDP}_{jt} + \alpha_2 \log \text{PCGDP}^2_{jt} + \alpha_3 \text{SERATE}_{jt} + \alpha_4 \text{GCONGDP}_{jt} + \\ & \alpha_5 \text{RLI}_{jt} + \alpha_6 \text{OPEN}_{jt} + \alpha_7 \text{OPEN}^* \log \text{GDP}_{jt} + \alpha_8 \text{EXRATE}_{jt} + \alpha_9 \log \text{TF}_{jt} + \\ & \alpha_{10} \text{INV/GDP}_{jt} + \alpha_{11} \text{CURRACC}_{jt} + \alpha_{12} \log \text{URBPOPN}_{jt} + \mu_{jt} \dots \quad 4.1b \end{aligned}$$

Where PCGDPG is growth rate of per capita GDP, PCGDP is level of real per capita GDP, PCGDP² is square of real per capita GDP, SERATE is secondary education enrolment rate to measure human capital, GCONGDP is the ratio of government expenditure to GDP, RLI is rule of law index, OPEN is degree of openness measured as the ratio of total trade to GDP, OPEN*LogGDP is an interaction term of openness and the level of GDP, EXR is exchange rate, LogTF is total fertility rate, INV/GDP is investment GDP ratio, CURR is current account balance as a measure of external shock, URBPOPN is urban population computed as share of urban population in total; j, t and μ are as previously defined. The α is are the regression coefficients which have a priori

expectation regarding each of the explanatory variables namely, $\alpha_1, \alpha_3, \alpha_5, \alpha_6, \alpha_{10}, \alpha_{11}, \alpha_{12} > 0$; and $\alpha_2, \alpha_4, \alpha_7, \alpha_8, \alpha_9 < 0$. Equation 4.1b was estimated using pooled least squares method without and with cross section weights on panel data of six West African countries. Equation (4.1b) can be rewritten to reflect the panel or pooled regression equation for a panel of data:

$$\chi_{jt} = V_{jt}\beta + a_j + \mu_t \dots \quad (4.2)$$

For $j = 1, \dots, Z$ and $t = 2, \dots, T$. V_{jt} is a $1 \times K$ vector of the explanatory variables which in the case of panel data analysis, can vary over t and j ; a_j is unobservable heterogeneous country effects with variance σ_a^2 . This could be seen as unobservable country characteristics due to, for instance, national macroeconomic policy reforms, unique attractions and/or climate that are constant over time period and determine χ_{jt} ; while u_{jt} = stochastic error term with variance σ_u^2 and usual properties. Based on equation (4.2), the in-between estimator is OLS applied to the following equation:

$$\bar{\chi}_j = \alpha + \bar{V}_j\beta + a_j + U_j \dots \quad (4.3)$$

where $\bar{\chi}_j = \bar{I}^{-1} \sum_{t=1}^{\bar{I}} \chi_{jt}$. Let us note that the in-between estimators is not consistent because $E(\bar{V}_j a_j) \neq 0$. The fixed effects (or within) estimator is obtained by using OLS estimator:

$$(\chi_{jt} - \bar{\chi}_j) = (V_{jt} - \bar{V}_j)\beta + (\mu_{jt} - \mu_j) \dots \quad (4.4)$$

The random effects estimator is a weighted average of the estimates produced by the between estimator (4.3) and the within estimator (4.4):

$$(\chi_{jt} - \theta \bar{\chi}_j) = (1 - \theta) \alpha + (V_{jt} - \theta \bar{V}_j)\beta + (1 - \theta)a_j + (\mu_{jt} - \theta \bar{\mu}_j) \dots \quad (4.5)$$

Where

$$\hat{\theta}_j = 1 - \sqrt{\frac{\hat{\sigma}_u^2}{T_j \hat{\sigma}_u^2}}$$

Data Sources, Estimation and Analysis of Results

The regression analysis was performed on a data set of 6 West African countries namely, The Gambia, Ghana, Guinea, Nigeria, Senegal, and Sierra Leone, that spanned over 55 years (1950 – 2005) at 5-year interval (also see Barro, 2001). By implication, the number of years is 12 per country. The data on real gross domestic product per capita, openness, and exchange rate were collected from the Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania. The urban population data were collected from the United Nations Population Division while the current account balance data were obtained from the IMF World Economic Outlook (WEO).

The estimation procedure takes a general to specific approach whereby all variables except rule of law index and total fertility dropped for lack of appropriate data were included in the initial regression and parsimony achieved. The regressions followed the procedures for both fixed and random effects panel estimation, the parsimonious version of both of which is reported in Table 1 which indicates that the fixed effect model provides the more robust results that were subsequently interpreted. Panel estimation which makes use of pooled least squares is adopted to deal with the combination of time series and cross section data which are used in cases when there are not enough time series for a particular country or where there are few time series data but significant number of cross section samples or vice versa. In our case we obtained data on the relevant variables from six countries over 12 years. For estimation purpose these data were stacked on top of each other to generate a total of 72 (6 x 12) sample points. During estimation, samples which have empty cells are dropped which explains

the number of observation of 39. The independent variables in the robust estimation are the urbanization variable for urban population, openness, exchange rate and current account balance. The value of the adjusted R^2 around 0.55, the F-statistic for model test is 6.16, and the DW statistic for serial autocorrelation is 2.39, all implying that the model appears to fit the data quite well. All the variables have the expected positive signs. In the random effect model, all the diagnostic tests are inferior to those of the fixed effects version.

Table 1: Panel Regression Results of Economic growth and Urbanisation

Variable	Fixed effects			Random effects		
	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.
LURBPOPN	0.1223 (0.04849)	2.521	0.0164	0.07866 (0.03514)	2.239	0.0252
LOPEN	0.21827 (0.08758)	2.492	0.0176	0.19177 (0.08594)	2.231	0.0257
EXRATE	0.00006317 (0.00003618)	1.746	0.0896	0.000069513 (0.00035182)	1.976	0.0482
CURRACC	0.000035207 (0.00013775)	0.256	0.7998	-0.000012629 (0.00013106)	0.096	0.9232
CONSTANT	-	-	-	5.547 (0.5364)	10.342	0.0000
Adjusted R-square = 0.55, F (9,29) = 6.16, Durbin Watson = 2.397			Adjusted R-square = 0.21, F (9,29) = 2.32, Durbin Watson = 0.977			

Note: Standard errors are in parenthesis.

All the explanatory variables in the fixed effect model except the current account variable are significant at 10 per cent. In other words, the sign and magnitude of the urban population, openness, and exchange rate variables are within the expected range and conform to *a priori* expectation of positive signs in the model which is consistent with the neoclassical modernisation theory. From this empirical result, the role of urbanization in fostering economic development in West Africa cannot be overemphasised. Indeed, the urbanisation variable is statistically significant at 5 per cent level, with the existence of the positive relationship being an indication of the

possibility that some urban development policies may have been used as a strategy to support economic growth policies. This is exemplified by the deliberate creation of industrial parks, industrial estates, factory clusters and central business districts (CBDs) in urban centres and their fringes. Since the empirical analysis shows that urban population exerts a significantly positive influence on economic performance, this suggests that urbanisation-led growth is a feasible strategy for West Africa, and further lends credence to the existing findings in the literature in this regard.

Concluding Remarks

This paper examined the impact of urbanization on economic performance in West Africa, using pooled data on six West African countries from 1950 to 2005 at five-year intervals. The modernisation theory which emphasises the role of urbanization in economic growth was tested by adapting and estimating a growth model using pooled least squares approach and deploying the random and fixed effects dimensions of panel estimation. The findings indicate that, urbanization contributes positively to economic performance in West Africa and as such it represents a crucial component for the performance of West African emerging economies. While the paper shows that urbanization does matter in West Africa, this may have been induced by the fact that the urban centres in these economies are their commercial nerve centres which contribute to their prosperity and thus makes the regression result not too surprising. Whereas the result suggests that, the role of urbanization cannot be overemphasised, the sustainable management of urbanization in order to reap maximum benefits is of topical relevance to West Africa's macroeconomic performance. This finding generally upholds the theoretical assertion of positive relationship between economic performance and urbanization, openness, exchange rate, and current account balance. Specifically, both urbanization and openness were found to stimulate economic growth in West Africa. Thus, policy measures that enhance the growth of urban areas over time and promote open trade have the potential of significantly stimulating economic growth in West Africa. In other words, economic performance in West Africa can be enhanced through sound urban development policies that support economic openness with greater emphasis on liberalisation policy since the region stands to gain from this policy stance.

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Appendix I
Data and Data Sources

Year	RGDP per capita(\$)	Urban pop('000)	Openness (%)	Exch. Rate(US\$=1)	Cur. a/c(bal)
Gambia					
1950		30		1.78	
1955		35		1.78	
1960	205.5	43	126.96	1.79	
1965	254.37	59	128.12	1.79	
1970	325.82	91	129.61	2.08	
1975	387.03	136	115.20	1.81	
1980	602.11	185	156.11	1.72	-0.117
1985	656.57	255	74.65	3.89	-0.006
1990	753.4	358	87.69	7.88	-8.000
1995	982.24	489	124.98	9.55	-0.016
2000	953.86	646	93.23	12.79	-0.013
2005	1,000.20	818	96.61	30.03	-0.060
Ghana					
1950		807.42		0.71	
1955	349.27	1,166.25	490.59	0.71	
1960	409.89	1,660.36	781.41	0.71	
1965	397.56	2,136.81	986.45	0.71	
1970	515.50	2,627.11	197.02	1.02	
1975	620.25	3,106.62	136.10	1.15	
1980	896.88	3,553.68	93.92	2.75	0.029
1985	869.00	4,434.59	55.50	54.37	-0.161
1990	1,053.11	5,686.34	64.33	326.33	-0.218
1995	1,249.68	7,190.57	81.54	1,200.43	-0.154
2000	1,392.2	8,865.12	95.86	5,455.06	-0.419
2005	1,712.68	10,771.70	90.98	9,004.63	-0.822
Guinea					
1950		175.47		17.49	
1955		239.48		17.50	
1960	555.77	327.39	58.97	24.69	
1965	592.34	447.07	49.10	24.69	
1970	612.98	611.04	62.81	24.69	
1975	874.81	780.78	62.81	20.67	
1980	1,329.38	1,084.28	62.81	18.97	0.054
1985	1,416.68	1,384.40	62.81	24.33	-0.041
1990	1,951.86	1,689.24	55.36	660.17	-0.266
1995	2,047.43	2,160.29	46.94	991.41	-0.272
2000	2,546.12	2,542.93	52.32	1,746.87	-0.200
2005	3,188.78	2,970.99	45.64	2,225.03	-0.161

Year	RGDP per capita(\$)	Urban pop('000)	Openness (%)	Exch. Rate(US\$=1)	Cur. a/c(bal)
Nigeria					
1950	128.98	3,939.36	7.19	0.714	
1955	167.40	5,071.90	8.92	0.714	
1960	235.95	7,031.10	8.74	0.714	
1965	234.78	9,331.76	12.82	0.714	
1970	286.38	11,505.50	16.16	0.714	
1975	477.69	14,312.10	22.44	0.616	
1980	591.71	19,116.50	41.47	0.547	5.520
1985	668.98	25,050.60	22.67	0.894	-0.210
1990	965.47	33,058.90	23.91	8.038	2.477
1995	873.47	43,059.00	88.52	21.89	-1.483
2000	1,073.93	54,775.30	77.46	101.69	5.353
2005	1,312.61	68,133.60	92.39	132.89	12.331
Senegal					
1950		474		174.84	
1955		617		174.98	
1960	458.83	806	60.86	245.19	
1965	461.03	1,051	75.24	245.06	
1970	484.87	1,372	78.93	276.40	
1975	653.29	1,773	76.42	214.31	
1980	881.96	2,132	78.25	211.28	-0.432
1985	1,176.22	2,580	74.08	449.26	-0.272
1990	1,441.70	3,107	78.96	272.26	-0.444
1995	1,393.66	3,629	77.53	499.14	-0.235
2000	1,571.37	4,203	69.25	711.97	-0.308
2005	1,949.40	4,844	110.76	528.28	-0.694
Sierra Leone					
1950		144		0.71	
1955		194		0.71	
1960		261		0.71	
1965		351		0.71	
1970	335.58	473	31.00	0.83	
1975	443.22	624	30.65	0.90	
1980	574.01	775	34.02	1.04	-0.165
1985	873.66	964	37.17	5.09	-0.054
1990	899.75	1,228	25.40	151.44	-0.106
1995	879.62	1,385	16.68	755.21	-0.082
2000	683.73	1,669	36.93	2,092.13	-0.096
2005	630.43	2,247	28.43	2,701.3	-0.086

Sources:

1. Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.
2. UNITED NATIONS POPULATION DIVISION. <http://esa.un.org/unpp/p2k0data.asp>
3. IMF World Economic Outlook (WEO): www.imf.org/external/pubs/ft/weo/2005/01/index.htm

Appendix II
Panel Regression Result

FIXED EFFECTS

Dep. var. = LPCGDP	Mean=	6.937021027	, S.D.=	.4540941434	
Model size: Observations =	39,	Parameters =	10,	Deg.Fr.=	29
Residuals: Sum of squares=	2.690482709	, Std.Dev.=			.30459
Fit: R-squared=	.656636	Adjusted R-squared =			.55007
Model test: F[9, 29] =	6.16,	Prob value =			.00008
Diagnostic: Log-L =	-3.1987	Restricted(b=0) Log-L =			-24.0435
LogAmemiyaPrCrt.=	-2.149,	Akaike Info. Crt.=			.677
Estd. Autocorrelation of e(i,t)		.482100			
+-----+-----+-----+-----+-----+-----+					
Variable	Coefficient	Standard Error	t-ratio	P[T >t]	Mean of X
+-----+-----+-----+-----+-----+-----+					
LURBPOPN	.1222552297	.48492027E-01	2.521	.0164	5.5726208
LOPEN	.2182721515	.8757773E-01	2.492	.0176	4.6852399
EXRATE	.6317341728E-04	.36182847E-04	1.746	.0896	586.54269
CURRACC	.3520753863E-04	.13775194E-03	.256	.7998	233.87172

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

RANDOM EFFECTS

Estimates: Var[e]	=	.953759D-01			
Var[u]	=	.630810D+00			
Sum of Squares		.676486D+01			
R-squared		.207387D+00			
+-----+-----+-----+-----+-----+					
Variable	Coefficient	Standard Error	b/St.Er. P[Z >z]	Mean of X	
+-----+-----+-----+-----+-----+					
LURBPOPN	.7866936239E-01	.35141732E-01	2.239	.0252	5.5726208
LOPEN	.1917773667	.85947719E-01	2.231	.0257	4.6852399
EXRATE	.6951343846E-04	.35182588E-04	1.976	.0482	586.54269
CURRACC	-.1262952769E-04	.13106438E-03	-.096	.9232	233.87172
Constant	5.547724184	.53640971	10.342	.0000	

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)