URBANIZATION AND DEVELOPMENT: EVIDENCE FROM LESS DEVELOPED ECONOMIES

By

Francis Adu Amankwa-Poku

THESIS

Submitted to

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Abstract

Urbanization is determined by a number of factors, and this study employs statistical techniques to confirm that economic development is not a significant factor for Less Developed Regions. Using cross-country data and employing econometric techniques, this study examines the relationship between urbanization and development proxies - Human Development Index (HDI), GDP per capita (PCGDP) and GDP growth rate (GDPr). The paper found that both HDI and GDP growth has a positive, statistically significant impact on urbanization in Developed Regions (DR). However, the evidence suggests that urbanization in Less Developed Region (LDR) is not caused by development. Comparing the results of the DR to those of the LDR suggests that the latter does not comply with Modernization theory of Urbanization, which claims that urbanization is determined by development. Other factors, such as urban-biased development policies, rural unrest, non-economic and socio-cultural, appear to be responsible for the high rate of urbanization in the LDR.

Urbanization also brings about adverse consequences for development. Policies that have been adopted in many countries suggest that urban development alone cannot handle the adverse effects of urbanization. Instead, complementing urban development with rural development appears to give better results in most countries. At the same time, LDR policy makers must recognize that, as they pursue their development agenda, other socio-cultural factor, such as discrimination against rural folks as well as rural and tribal unrest, must be given attention. It is also important to anticipate and integrate urbanization into the national development plan in other to minimize the adverse effects of rural-urban migration.

The resulting parameters estimates (p-values in parenthesis) from the robust OLS for the development proxies for the LDR are as follows; -4.7E-05 (0.857), 0.03696 (0.155) and -3.9695

(0.203) for PCGDP, GDPr and HDI respectively. Whiles for the DR they are 8.59E-06 (0.324), 0.04629 (0.093) and 3.8523 (0.023) for PCGDP, GDPr and HDI respectively. At 10% significant level, it can be concluded that unlike the DR, development does not determine urbanization in LDR. The continuous influx of rural population into the urban centres at any level of development in the LDR has compounded the problems hindering the quest for sustainable development in the region since the urban centres have not been able to contain the extra population. Policy-makers in LDR must therefore be aware and develop strategies to cater for the non-development factors such as cultural and social factors which push rural folks to the urban centres.

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1. Introduction and background

High population density coupled with an ever-expanding network of markets and people has become a global phenomenon. United Nation of West Africa estimates that, as of 2007, world urbanization rate – the proportion of world population living in urban areas – is 50 percent. Although less developed countries still has relatively few inhabitants living in urban, the pace at which rural folks move to the urban areas is tremendous. It has been estimated that if the current urbanization trend continues, two third of all Africans would be living in cities by the year 2020[1]. In the rest of this thesis, urbanization refers to the movement of rural folks to urban areas, while economic development is captured by three variables, namely per capita gross domestic product (PCGDP), Human Development Index (HDI), and percentage growth of gross domestic product of a country.

The particular region of interest for this thesis is the world's less developed regions (LDR). This study adopts the World Banks classifications of economic development as the criteria for LDR and Developed Regions (DR). Countries with per capita GNI less than $3,855 are the LDR, while those above $3,855 are the DR.[2] United Nations Department of Economic and Social Affairs/Population Division stipulated that by 1950, the urban population was already 50 percent

[1] Urbanization and insecurity in West Africa- UNOWA issue paper October 2007.

[2] http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20420458~menuPK:64133156~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html

in the more developed regions while in the less developed regions the 50 percent mark will be reached around 2019. Between 1975 and 2007, the UN estimated the average annual rate of growth in urbanization for more developed regions to be 0.81, while that of less developed regions to be 3.35. Today, DR have reached a stage associated with comparatively higher urban population but lower rate of urbanization. By contrast, the urban population is relatively low in Less Developed Regions (LDR) while the rate of urbanization is relatively high.

The LDR's high rates of urbanization have raised a lot of concerns. Depending on how well a country manages its rate of urbanization, the impact on the economy can differ in significant ways. The effects of urbanization can be seen in two ways: as a either a catalyst or hindrance for economic development. As a catalyst for development, urbanization provides opportunities for industrial agglomeration, a source of labor pool and also an avenue for competition, innovations, and corporation, which promotes long-term growth. There is also an element of positive externalities, such as knowledge spillover within clusters of the urban areas, which also promotes long-term growth. The resulting efficiency gains and innovations lead to employment generation and higher income in the region, which in turn will likely attract further rural-urban migration.

Additionally, urbanization allows less-developed areas to rapidly develop, first to small towns, and then to cities. These cities are complimented with high populations and population growth rates, and new economic and political structures emerge. The successful sectors within the city will attract extra investment, and therefore create increased demand for labor, and quick migration to the city as a further means of urban growth. With a relatively higher expected income, higher opportunities and better quality of life, nevertheless, cities may turn out to be a

major attractor for poor rural folks. Other researchers believe that urbanization is an inevitable process of development of a country and therefore as a country develops, urban population also moves in the same direction.

But there are others who believe that rather than acting as a catalyst, urbanization actually hinders development because it leads to severe congestion, increase in slums dwellers, poverty, environmental degradation, and insecurity in urban areas. According to the report of UN-HABITAT/DFID Nairobi (2002), urbanized areas has encouraged land, water, and air pollution, and it has harbored growing slum populations in and around many major cities, especially in Less Developed Countries. It also stipulates that more than 1 billion people, of the total global population, lived in areas classified as slums in 2005. Slum dwellers and quarters as a percentage of the urban population were estimated to be 79% in Addis Ababa, 67% in Calcutta and 60% in Bogota[3]. These slums and their associated activities have posed a big challenge to urban policymakers.

These competing views highlight the fact that urbanization is a confluence of many factors that often yield diametrically opposite results. These entangling and opposing views of urbanization have engendered competing paradigms on how urbanization relates to development. It does not help that different researchers employ different methodology and data, resulting in contradictory conclusion. Researchers like Chenery and Syrquin (1979), Kuznetts (1966), Kaldor (1975) view

[3] Population crises committee, World Population Growth and Global security, Report No. 13 (Washington, D.C. Population Crises Committee, 1983), p.2; Daniel Litvin, "Dirt poor: A survey of development and the environment," Economist, March 21, 1998. P.8

urbanization as an inevitable process associated with economic development[4]. They claim development is a gradual process and it involves a structural change in the economy. They associate this structural change to the fact that as a country develops the country move from the dependence on agriculture to manufacturing and service. The shift from the concentration on the agriculture to the manufacturing and service implies that factors of production will also move in the same direction geographically.

At the same time, manufacturing and service are not land intensive like agriculture. As a result, agricultural activities are concentrated in rural areas where land is in abundant, while non land-intensive sectors cluster in urban areas. It has been established that gains from scale economies are generated when manufacturing and service sectors share a common location. The gains from agglomeration – the co-location of economic activities – re-enforce the self fulfilling prophecy and therefore aggravate the rate of urbanization. Workers thus move to urban areas as the economy shifts from agricultural dependence to manufacturing- and service-oriented activities.

Ledent (1982) argues that different urbanization level reflects differing degrees of economic development. Thus, higher urban population implies higher development. His implicit assumption was the dual sector nature of a developing economy. Consequently, in Ledent's view urbanization is merely an inevitable process experienced by all nations in their transition from an agrarian to an industrial society.

However, some researchers proclaim that when it comes to urbanization in developing countries,

[4] Min Zhoa and Ying Zhang, 2008. Development and Urbanization: a revisit of Chenery-Syrquin's patterns of development

the causes might go beyond economic issues to include social, cultural, people's expectations, and government policies that systematically channel scarce national resources to metropolitan areas. Some researches attribute urbanization to social and cultural factor rather than economic incentives and lower standard of living in Less Developed Regions. According to Becker and Morrison (1988), the *pull* factors that traditionally thought to attract rural folk to urban areas, such as higher expected earnings, are not the main determinant. Rather, the factors that *push* rural folk to the urban areas matters greatly in the determinant of urbanization in Less Developed countries. However, the issue of economic incentive cannot be totally ignored when it comes to urbanization in general.

Another issue which needs to be addressed is the simultaneous relationship between urbanization and economic development. Like the classic chicken or egg question, urbanization has been perceived to be associated with economic growth but it is not clear which one comes first. There is no doubt that urbanization promotes clustering and agglomeration of industries, which leads to employment generation, higher output and income. At the same time however, the quest for higher output and income also attract people to establish themselves close to one another, which encourage higher urbanization. It must be noted that the movement of people from the rural area to the urban area per se does not necessarily promotes economic growth. The movement should be accompanied by industrialization and the rising importance of knowledge-oriented economic activities to induce growth in the urban areas.

Urbanization and economic development is therefore a complex, non-linear process. In order to make the study manageable it narrows down on the subjects covered. First of all, this study

admits the potentially simultaneous relationship between urbanization and development. Nonetheless, the study focuses only on the impact of economic development on urbanization, and does not consider the feedbacks from urbanization on development. The study also acknowledges several development factors which are directly and indirectly responsible for the rate of urbanization. To keep the analysis tractable, the study shall concentrate only on GDP per capita, GDP growth rate and Human Development Index as the development proxies. Using empirical methods, the study seeks to confirm or not whether development determines urbanization in LDR in the same way it does in the DR. Finally, based on other countries' experience in managing the adverse effects of urbanization, the paper proposes remedial policies.

The issue of development and urbanization is of much interest because LDR continue to seek and implement development program to enhance their standard of living. More often than not, LDR policymakers and advisors neglect the effects of development policy on rural-urban migration, which usually contributed to growing slums and shantytowns, urban unemployment, skyrocketing housing prices, and congestions. Table 1 below, which is drawn from 'INTA 689: International Economic Development' gives a percentage of the urban population that live in slums of select LDR. The high rates of slum dwelling are likely to impart adverse impact on economic development.

Table 1

SLUM DWELLERS AND SQUATTERS AS A PERCENTAGE OF THE URBAN POPULATION

City	Slum dwellers as a % of the population
Middle East and Africa	
Addis Ababa, Ethiopia	79
Casablanca, Morocco	70
Ankara, Turkey	60
Cairo, Egypt	60
Dar es Salaam, Tanzania	53
Asia	
Calcutta, India	67
Karachi, Pakistan	44
Manila, Philippines	35
Jakarta, Indonesia	26
Latin America	
Bogota, Colombia	60
Mexico City, Mexico	46
Caracas, Venezuela	54
Rio de Janeiro, Brazil	20

Source: Population crises committee, World Population Growth and Global security, Report No. 13 (Washington, D.C. Population Crises Committee, 1983), p.2; Daniel Litvin, "Dirt poor: A survey of development and the environment," Economist, March 21, 1998. P.8

Beside the high rates of slums and other negative consequences typically found in less developed regions, the rates of urbanization across region are worth highlighting. Table 2 (below), drawn from the 'World urbanization Prospect: The 2007 Revision,' breaks down the total, urban, and rural population for selected periods for both developed and less developed regions.

Table 2

TOTAL URBAN AND RURAL POPULATIONS BY DEVELOPMENT GROUP

	Population (billion)				Average annual rate of change (%)		
	1950	1975	2007	2025	1950-75	1975-07	'07-25
Urban Population							
World	0.74	1.52	3.29	4.58	2.89	2.42	1.84
D R	0.43	0.7	0.91	0.99	1.98	0.81	0.49
L D R	0.31	0.82	2.38	5.33	3.88	3.35	2.27
Rural Population							
World	1.8	2.56	3.38	3.43	1.41	0.87	0.08
D R	0.39	0.35	0.31	0.26	-0.44	-0.32	-0.94
L D R	1.41	2.21	3.06	3.16	1.8	1.02	0.17
Total Population							
World	2.54	4.08	6.67	8.01	1.9	1.54	1.02
D R	0.81	1.05	1.22	1.26	1.01	0.48	0.16
L D R	1.72	3.03	5.45	6.75	2.26	1.84	1.19

Source: World Urbanization Prospects: The 2007 Revision

Table 3

PERCENTAGE URBAN BY DEVELOPMENT GROUP

	Percentage urban				Rate of urbanization (%)		
	1950	1975	2007	2025	1950-75	1975-07	'07-25
Urban Population							
World	29.1	37.3	49.4	57.2	0.99	0.88	0.82
D R	52.5	67	74.4	79	0.97	0.33	0.33
L D R	18	27	43.8	53.2	1.62	1.51	1.08

Source: World Urbanization Prospects: The 2007 Revision

The data in table 3 shows a persistent increase of the total urban population. In recent years and future projection, the increase in the total urban population is mainly driven by less developed regions. It has been projected that the proportion of urban to total population will increase from 44% in 2007 to 67% in 2050 in the LDR[5]. This high rate and projected rate of urbanization vis-a-vis the low rate of development among the LDR should be of much concern. This is because; the rate of urbanization in the LDR is higher than the rate of development in the LDR's urban area. The provision of infrastructure, social amenities and utilities service does not meet the population growth in the urban area and this has been attributed to the insecurity, pollution,

[5] World Urbanization Prospects: the 2007 Revision

chaos, and higher real-estate prices in the urban areas in LDR.

Less developed countries continue to pursue development policies aimed to achieve higher growth, but usually fail to anticipate the negative effects of urban population increases. Additionally, provision of basic services in LDR's urban areas is typically not adequate to accommodate the high influx of people from the rural areas to the urban areas. The primary purpose of this research is to provide a systematic analysis of whether development has an impact on urbanization in LDR. The study employs quantitative analysis to estimate and test the maintained hypothesis of no relationship between urbanization and economic development in LDR. Urbanization will be treated as the dependent variable, and a number of variables representing the extent of economic development will be the independent variable. It will go on further to compare the responsiveness of urbanization to development in LDR with that of the developed country in order to evaluate whether systematic differences exist. Further, the paper will delve into why there are such differences in their responsiveness. The paper will conclude with policy recommendations on handling, anticipation and limiting of the negative aspects of urbanization and also on how to handle the overpopulated urban areas in most of the LDR.

The plan is as follows. The next chapter reviews the literatures on similar topics, theories and related matters. The third chapter concentrates on the all the data involved in the empirical study. Chapter four details the statistical methodology engaged in the analysis. The interpretation and analysis of the results are catered for in chapter five. The research paper ends with discussion and policy recommendations in chapter six.

2. Literature review

Numerous ideas, theories, views and series of research have attempted to establish the connections between urbanization, growth and development. Some papers have backed their arguments with theories and quantitative analysis while others use qualitative methods. It should be mentioned here that the methodology, the region of interest and data used by some of these articles defer from one another thereby resulting in either contradictory or complementary conclusion as highlighted in the subsequent paragraphs.

Fay and Opal (1999) used African countries as their region of interest. Their main claim was that while sustainable development is typically accompanied by urbanization since people relocate based on economic incentives and opportunities, African countries are different. Their mission was to find out why African countries seemingly continue to urbanize even *without* sustainable growth. Fay and Opal used cross-country macro data to investigate the determinant of urbanization over the last 40 years. Urban population share in the total population was used as the urbanization variable and GDP per capita as the measure of sustainable development. They concluded that African's urbanization does not respond to economic development. Additionally, even if there is negative growth rate, people continue to move to the urban areas rather than the returning or remaining in the rural areas. Moreover, countries with fewer civil and political crises show a weaker relationship between urbanization and sustainable development.

Fay and Opal were content that Africa's urbanization experience is different from that in other

continents, and so Africa's urbanization processes have been either distorted or it does not always respond to economic growth. They claim the differences in urbanization level can be predicted by income structure, education, rural urban wage differentials, ethnic tension and civil disturbances in Africa. They acknowledged, however, the difficulty in obtaining accurate data for their analysis for less developed countries and cited that even distinguishing between rural and urban as well as between formal and informal for the analysis was a tedious task.

The next article this paper reviewed is Ambe Njoh (2003). This paper identified three theories of urbanization was identified namely modernization, urban biased and dependency. Modernization was explained to be the process where the agrarian economy gives way to the modern or industrialized one. Believers of Modernization perceive urbanization as a natural process (Bradshaw and Noonan, 1997). From this point of view, urbanization has a positive effect on the economy and therefore should be encouraged since urbanization promotes agglomeration, competition and efficiency.

According to Ambe J. Njoh (2003), strongly opposing this view is the urban bias theorists which includes Dumont and Mottin, 1983; Lipton, 1977; and Stren, 1975. He claims that, they declared that urbanization is not a natural process but it is the effect of government policies that steadily use the national resource to develop the urban areas and neglecting the rural areas. The urban-biased development makes the urban areas very attractive and therefore serves as a *pulling* factor for the rural folks to the urban areas. The urban theorists claim that investing in the urban area will only result in a *short-term* economic development and not sustainable, long-term economic growth, except when the investment is towards agriculture. According to Ambe J. Njoh, the

Dependency theorists base their argument on the effect of urbanization on the availability of vital resources such as land in the rural area for farmers. They claim that urbanization may dispose rural folks of their resources therefore forcing them to move to cities.

Ambe J. Njoh's empirical study uses Human Development Index (HDI) as the measure of development and the proportion of a country's population living in urban areas as the measure of urbanization. Since HDI includes health, knowledge and a decent standard of living, Njoh claimed that HDI constitutes a vast improvement of the traditional indicators such as GNP and GDP. His main finding is that urbanization and development are positively linked for the case of sub-Saharan regions.

Zhao and Zhang (2008) shed some light on similar issues that my study here would like to address. Zhao and Zhang started their analysis by first explaining why labor moves to the urban sector based on Kuznets (1966), which identified the shift of resources from the agricultural sector to the industry as the vital feature of economic development. The authors again reiterated that urbanization might appear as the net result of a causative chain of events. The events begin with the shift in demand from agricultural commodities to industrial ones, and change in trade followed by industrialization. This is then followed by the movement of people from the rural areas to seek employment in the urban areas where industrialization takes place.

The demand shift is based on the proposition that income elasticity of demand for industrial goods is higher than that for agriculture. As a result of higher income elasticity, the demand side reinforces the industrial growth (Kuznets 1973). Subsequent productivity increases and

competitive pricing force the prices of industrial goods to decline relative to agricultural goods. The fallen prices then augment the demand for industrial goods, which in turn shift production factors from agriculture to industry (Chenery and Syrquin). As Engel's Law states, as income increases the fraction of expenditure on basic necessities likely falls, which implies that industrialization must take place to accommodate the rising demand for industrial products (Chenery and Syrquin 1979). In short, development is the changes in the economic structures that move resources, including labor from agriculture to the industrial sector. Since agricultural activities locate in rural areas while industrial activities in urban areas, workers will find their way to urban areas where there were ample employment and income avenues (Syrquin 1986).

Like Njoh, Zhao and Zhang also found a positive relationship between urbanization and development. Using selected cross-country data in 1999 from a reported by the World Bank (2001), Min Zhao and Ying Zhang re-estimated the stylized facts of the Chenery-Syrquin equation form of the relationships between urbanization and per capita GDP. Their model was specified as:

$$Urb = \beta_0 + \beta_1 \ln(PCGDP) + \varepsilon$$

They estimated the model using OLS, and found the estimated coefficient of 0.266 for β_1 respectively. This implies that there is a positive relationship between urbanization and development.

The literatures reviewed suggest that other alternative approaches have not been utilized to

estimate the relationship between urbanization and development. What this study intends to do, first of all, is to pool developed and developing countries together in order to find out whether there exist a relationship between urbanization and development. The claim of this paper is that 'urbanization in LDR is not caused by development'. So, if there is evidence of a causal relationship in the pooled data, the paper will then isolate developed region from less developed region and regress them separately to find out the extent to which the responsiveness of urbanization to development in the LDR differs from that in the DR.

The paper will achieve its scientific result by using empirical test and adopting the stylized facts of the Chenery-Syrquin equation of the relationship of the urbanization and per capita GDP. The Chenery-Syrquin equation uses urbanization as the dependent variable and economic development as the independent variable. Thus, in their model economic development causes urbanization. The basis for this causal link is that an economy starts with a rural, agrarian economy as the dominating sector. As the economy develops, the urban, formal sector expands and higher income and job avenues are created. The higher income and job avenues in the urban formal sector attract the rural folks. This process effectively increases the urban population and decreases the rural population. Economists assert that it is the rising need for industrial labor in urban areas that fuels rural-urban migration[6].

This Chenery-Syrquin causal link also forms the foundation of the empirical analysis in this study, while at the same time I explore the potentially simultaneous relationships between urbanization and development. This study also incorporates other variables that influence

[6] Urbanization and development in Sub-Saharan Africa: Ambe J Njoh

urbanization such as total population, gross capital formation, and the urbanization rate at the base year and values of export as the explanatory variables following the Chenery-Syrquin model. This paper will take a step further to provide reasons why the rate at which urbanization respond to development is different in LDR compared to the DR. Finally, based on what other countries did or are doing to manage the rate of urbanization, this paper will provide policy recommendations to the LDR in other to enhance their development pursuit.

3. Data

The main explanatory variable in my empirical model is economic development. There are several ways of measuring the extent of economic development in a country. Such methods include the use of the Human Development Index, Index of sustainable Economic Welfare, gross national/domestic product, the value of exports, net capital outflows and the like. Following common practices, this paper employs cross-sectional data on Per Capita GDP, HDI and the GDP Growth Rate as development measures. Gross capital formation, Exports as a percentage of GDP, Population growth rate, and the initial year's Urban population as a percentage of total population are the control variables. The initial year for the analysis is 1990, and so all the explanatory variables will be the various figures recorded for the countries involved in the analysis.

The dependent variable, Urbanization, is measured by the annual percentage of the total population living in areas with density of at least 5,000 people / square mile. Technically, urbanization depends on three factors. These are natural demographic changes due to births and deaths, migration exchange between rural and urban area, and the increase in the rural population

to reach the threshold of the urban population mark or a rural area annex into an already urban area. In most cases, however, the impact of natural increases is relatively small so that the dominant driver of urbanization is rural-urban migration exchange[7]. Besides, rural-urban migration is considered to have higher impact and does not show any sign of diminishing in Less Developed Countries[8].

Average annual percentage growth of urban population between 1990 and 2005 was chosen as the dependent variable. In order to capture the movement of people from the rural area to urban area due to changes in a country's development, the paper assumes that the change in the level of development of the country took place in 1990, while the adjustment - movement of people from the rural to the urban area - last from 1990 to 2005. This is because there is generally a time lag between the occurrence of an event and the time economic agents need to fully adjust to that event.

Gross capital formation and Exports variables are included in the model so that their combined effects with the development variable (either HDI, Per capita GDP or GDP growth rate) on the urbanization variable (Average annual percentage growth of urban population) can be controlled. Population growth rate is likely to have a direct relationship with urbanization and so it is a relevant control variable for the analysis. In other to control for the initial urban population in the initial year (i.e.1990), a cross sectional data on the urban population as a percentage of total population in 1990 was also included as one of the explanatory variables. If there are diminishing

[7] Rural-Urban migration, urbanization and Economic Development ; by Jacques Ledent (University of Quebec, Montreal)
[8] A. Roger, 'Migration, Urbanization, Resources, and Development', -1978

returns to urbanization, then the sign of the initial urban population coefficient is expected to be negative.

Data required for the cross-country quantitative analysis were drawn from various sources. Data on Gross Capital Formation, Export as a percentage, Per Capita GDP, Population and GDP growth rate of GDP were drawn from the World Development Indicators (WDI) database; http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers&userid=1&queryId=135

The WBI is the primary source for country's profile in World Bank's studies. The World Bank also provides classification of all its 185 member countries into low income, low middle income, upper middle income and higher income. The low and low middle economies are also referred to as developing economies. According to the World Bank, the classification is done based on the GNI per capita of the country. Countries with Per capita GNI of $975 or less are classified as low income; between $975 and $3,855 are classified as low middle income; between $3,855 and $11,905 are upper middle income; and above $11,905 are classified as high income countries. The classification results in 43, 51, 34 and 50 countries belonging to low income, low middle income, upper middle income and higher income groups, respectively. This paper used the World Bank's classification as the bases for the selection and grouping of the countries for the empirical analysis.

There was other relevant information from the WDI which could have been used to enrich the analysis. However, these data were not available for most of the LDR. Some of the data which could have been used as a measure of development include the net resource flows and changes in

inventory. Besides this, out of the 192 member countries of the UN[9], only a total of 178 were available from the WDI for the analysis.

For my main explanatory variables, the Human Development Index (HDI) was drawn from the WDI Environment chapter, 2002 (http://hdr.undp.org/en/statistics/data). The data provided the HDI for 105 countries in 1990. The data for the dependent variable (Average annual percentage growth of urban population, 1990-2005) and the data for the remaining explanatory variable (Urban population as a percentage of total population in 1990) were drawn from the WDI Urbanization table of 2007 (http://siteresources.worldbank.org/DATASTATISTICS/Resources/table3_10.pdf)

4. Methodology

Basically, the main aim of the empirical analysis is to establish whether a relationship exist between urbanization and aggregate economic development in the pooled data. If there is evidence that development is associated with urbanization, the paper will go further to find out if this association still holds for either LDR or DR separately. Using Per Capita GDP or GDP growth rate as the development indicator, I combine low income countries with low middle income countries to form the LDR, and upper middle income countries with high income countries to form the DR category. The justification for this action is; first, the low income and the low middle income countries have been classified as the developing economies[10]. Second,

[9] http://geography.about.com/cs/countries/a/numbercountries.htm

[10] http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20420458~menuPK:64133156~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html

the number of countries in each income group is not sufficiently large for robust parameter estimations. Therefore, I classify the countries involved in the empirical studies to be either belonging to the LDR or the DR. In the pooled regression, the distinction between DR and LDR is captured by *'dum_g,'* which is a dummy variable that takes the value of either zero (0) or one (1). A country is assigned zero if the country falls into the DR (i.e. with Per capita GNI above $3,855) and one if the country is the LDR (i.e. with Per capita GNI below $3,855). The dummy variable allows fixed effects estimators for LDR and the DR[11].

In the case of HDI as the development proxy, the 105 available countries will be sorted according to their respective HDI scores and divided into two parts. The higher HDI which ranges from 0.935 to 0.732 forms the DR and from 0.732 to 0.274 comprises of the LDR. It should be noted that Ecuador, Moldova and Armenia were categorized as LDR under *'dum_g'* but they happened to fall under the DR in *'dum_h'* because of their score in the HDI. Similarly, countries like Mauritius, Brazil, Belize, Turkey and South Africa were classified as DR under *'dum_g'* but LDR under *'dum_h'*. This is so because, by definition, the components of the development proxies differ and so, having a higher GDP do not necessary means a higher HDI.

Consequently, from the sorted HDI data, the there were 52 Developed countries and 53 Less Developed countries forming the DR and LDR respectively. The regions are reflected in dummy variable denoted by '*dum_h'* in the model. Under the dummy variable, *'dum_h'*, a country is assigned zero (0) if it is developed and one (1) if less developed.

[11] J. M. Wooldridge, 2009. Introductory Econometrics, A Modern Approach, fourth ed: South-Western

In other to ascertain the relationship between urbanization and development, the paper modifies the Chenery-Syrquin equation of the relationship between urbanization and development. Apart from introducing other explanatory variables, the paper also utilizes three different types of development proxies, namely, HDI, Per Capita GDP and the GDP growth rate. The other explanatory variables are Urban population as a percentage of total population in the initial year, Gross Capital Formation, Population growth rate, and Exports. Also, instead of using the same year's rate of urbanization as the dependent variable, the paper used an average annual percentage growth of urban population from 1990 to 2005. This dependent variable was introduced to capture the lagged effects of the development.

So, the proposed model specification is

$$AvUrb_i = \beta_0 + \beta_1 PCGDP_i + \beta_2 Popr_i + \beta_3 Urb90_i + \beta_4 EX_i + \beta_5 GCF_i + \beta_6 dum\_ + \varepsilon \ldots (*)$$

Where,

AvUrb = average annual percentage growth of urban population from 1990 to 2005

Urb90 = Urban population as a percentage of total population in 1990

GCF = Gross Capital Formation as a percentage of GDP in 1990

POPr = Population growth rate in 1990

EX = Export as a percentage of GDP in 1990

Dum_ = dummy variable (0= developed countries and 1= Less developed countries)

And

DM = Development proxy which takes the form of either

GDPr = Gross Domestic Product growth rate in 1990,

PCGDP= Per capita GDP in 1990 or

HDI = Human Development Index in 1990

AvUrb is the dependent variable while *DM (GDPr, PCGDP, HDI), Urb90, POPr, EX, GCF and Dum_g* are the independent variables. The statistical software package for the estimation, inferences and analysis is STATA 10.0.

There is a need to investigate the correlation between the variables to check for possibilities of multicollinearity, indicated by a high (but not perfect) correlation between two or more independent variables[12]. The presence of a high (low) correlation, potentially inflates (deflates) the variance of the estimated coefficients, which in turn can lead to high (low) t-statistics. The table below shows pair-wise correlation between the variables.

Table 4

Pair -Wise Correlation between Variables

	AvUrb	PCGDP	GDPr	HDI	Popr	Urb90	EX	GCF	dum_g
AvUrb	1.0000								
PCGDP	-0.3123	1.0000							
GDPr	0.1123	0.0865	1.0000						
HDI	-0.6760	0.6713	0.1508	1.0000					
Popr	0.6054	-0.2400	0.3067	-0.4519	1.0000				
Urb90	-0.5287	0.5560	0.0424	0.7793	-0.3362	1.0000			
EX	-0.1362	0.1995	0.1883	0.3873	-0.0915	0.3240	1.0000		
GCF	-0.3942	0.0395	0.0807	0.2679	-0.2936	0.1864	0.1176	1.0000	
dum_g	0.4739	-0.5503	-0.1507	-0.7985	0.3878	-0.7092	-0.3987	-0.0819	1.0000

[12] J. M. Wooldridge, 2009. Introductory Econometrics, A Modern Approach, fourth ed: South-Western

From the output (table 4) of the relationship between the variables, it appears that none of the pair-wise correlation figures calls for concern. The highest is the correlation between HDI and Urb90 (r= 0.7793) and the lowest is between Popr and EX (r= -0.0915). By the definition of the HDI, it includes other social factors that correlate with urbanization. For instance, access to health facility per head within a locality is a major input to HDI; it is also a function of the population in the locality. The correlation, however, is only partial.

To ensure that the Ordinary Least Squares (OLS) estimates from the model are unbiased and efficient, there are other Classical Linear Model (CLM) assumptions that need to be satisfied. First, the model must have a linear relationship between the independent variables and the dependent variable so that the intercept and the slope parameters can be realized. The model for the analysis;

$$AvUrb_i = \beta_0 + \beta_1 DM_i + \beta_2 Popr_i + \beta_3 Urb90_i + \beta_4 EX_i + \beta_5 GCF_i + \beta_6 dum\_ + \varepsilon \ldots (*)$$

assumes a linear relationship between the variables satisfying the first CLM assumption.

The next CLM assumption to be satisfied is the random nature of the sample. For this analysis, the unit of observation is a country, and it employs the realized variable values within a specific period. These values do not follow a particular order or sequence. Therefore, the random sampling assumption is not a problem. Another CLM assumption that was easily dealt with is the sample variation in the observed variables. The model variables are DM, Popr, Urb90, EX, GCF, dum_g and AvUrb, and since the various countries recorded different figures during the period in question, the realized variables are not constant over time.

Zero conditional mean is the next CLM assumption that needs to be satisfied in other to ensure unbiasedness. Zero conditional mean implies that any unobserved variables contained in the error term (ε) must not have a functional relationship with the independent variables. This assumption fails when there are omitted relevant independent variables, measurement errors, or simultaneity in the model.

The model specified is a multiple linear regression and by its nature it has more than one observed variable, but it is not exhaustive. Other relevant variables for example government agriculture or industrial policies, which affect employment avenues in agriculture or industry, are treated as unobserved variables. There is no doubt that government policies; like credit to farmers, market for agricultural produce and so on, may lead to an increase in output and employment, which in turn will directly or indirectly affect economic development and/or urbanization. However, data for such variables are not readily available especially for LDR, and so the model omitted such variables and treated them instead as unobserved variables.

Measurement error on the other hand is defined as the difference between the observed (recorded) value and the actual (true) value. All information for the empirical analysis were from secondary sources. As seen in the Data section, these information sources are credible and so to some extent the data can be assume to be with minimum error. Simultaneity, as already discussed, refers to the chicken-and-egg relationship between urbanization and development. If this is the case, urbanization then leads to development, but in turn development also leads to urbanization. The best way to handle simultaneity is through the use of Simultaneous Equation Model (SEM). However, this paper is concern with whether urbanization is determined by development and not

whether development determines urbanization. Hence, the appropriate single-equation model is as stated above.

Another assumption that needs to be satisfied to ensure that the estimates are not only unbiased but also efficient is the homoskedasticity assumption. When heteroskedasticity is present, the vaiance of the error term, ε, changes with the value of the explanatory variable. In such a situation, OLS parameter estimates are inefficient. In other to avoid the variability in AvUrb about the mean, there is the need to assume a constant explanatory variable across all levels. This may not be realistic. For instance, natural resource endowment has been treated as explanatory variable in the model but a country with well endowed natural resources has the tendency to develop faster than those with less resource. So, if there is a positive relation between AvUrb and the development measure then, well endowed countries will have a higher rate of development and so, a higher urbanization than less endowed countries. In other to check whether heteroskedasticity problem is present or not in the various estimates, a heteroskedasticity test would be carried out in each regression analysis using the STATA software.

The tables below report the models' regressions results along with their respective heteroskedasticity test.

First, I report estimation of

$$AvUrb_i = \beta_0 + \beta_1 PCGDP_i + \beta_2 Popr_i + \beta_3 Urb90_i + \beta_4 EX_i + \beta_5 GCF_i + \beta_6 dum\_g + \varepsilon \ldots (1)$$

where per capita GDP (PCGDP) is the development indicator.

Table 5

Regression of Equation 1

Source	SS	df	MS
Model	279.034402	6	46.5057337
Residual	131.866498	126	1.04655951
Total	410.900901	132	3.11288561

Number of obs = 133
F (6, 126) = 44.44
Prob>F = 0.0000
R-squared = 0.6791
Adj R-squared = 0.6639
Root MSE =1.023

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
PCGDP	9.05e-06	.0000152	0.60	0.552	-.000021	.0000391
Popr	.8449828	.0830382	10.18	0.000	.6806527	1.009313
Urb90	-.0234863	.0057779	-4.06	0.000	-.0349206	-.0120519
EX	.000698	.0051069	0.14	0.892	-.0094084	.0108044
GCF	-.0340816	.0121914	-2.80	0.006	-.058208	-.0099553
dum_g	-.1600107	.2880221	-0.56	0.580	-.7299979	.4099765
_cons	2.754804	.5297667	5.20	0.000	1.706412	3.803197

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of avurb

chi2(1) = 3.73

Prob > chi2 = 0.0485

Again, estimation of

$$AvUrb_i = \beta_0 + \beta_1 GDPr_i + \beta_2 Popr_i + \beta_3 Urb90_i + \beta_4 EX_i + \beta_5 GCF_i + \beta_6 dum\_g + \varepsilon \ldots (2)$$

where GDP growth (GDPr) is the development indicator.

Table 6

Regression of Equation 2

Source	SS	df	MS
Model	234.55617	6	39.0926949
Residual	120.496512	116	1.03876303
Total	355.052681	122	2.91026788

Number of obs = 123
F (6, 126) = 37.63
Prob>F = 0.000
R-squared = 0.6606
Adj R-squared =0.6431
Root MSE =1.019

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
GDPr	.0498085	.018677	2.67	0.009	.0128162	.0868007
Popr	.7024719	.0964938	7.28	0.000	.5113537	.89359
Urb90	-.0223001	.0059401	-3.75	0.000	-.0340652	-.010535
EX	.0031268	.00541	0.58	0.564	-.0075884	.013842
GCF	-.0384563	.0128934	-2.98	0.003	-.0639933	-.0129193
dum_g	-.0018101	.2915257	-0.01	0.995	-.5792136	.5755933
_cons	2.850751	.5494822	5.19	0.000	1.762432	3.93907

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of avurb

chi2(1) = 5.42

Prob > chi2 = 0.0199

Finally, estimation of

$$AvUrb_i = \beta_0 + \beta_1 HDI_i + \beta_2 Popr_i + \beta_3 Urb90_i + \beta_4 EX_i + \beta_5 GCF_i + \beta_6 dum\_h + \varepsilon \ldots (3)$$

where HDI is the development indicator.

Table 7

Regression of Equation 3

Source	SS	df	MS
Model	175.652045	6	29.2753408
Residual	90.5469357	81	1.1178634
Total	266.198981	87	3.0597584

Number of obs = 88
F (6, 126) = 26.19
Prob>F = 0.0000
R-squared =0.6599
Adj R-squared =0.6347
Root MSE =1.0573

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
HDI	-1.729063	1.376467	-1.26	0.213	-4.467801	1.009674
Popr	.7831878	.1264191	6.20	0.000	.5316535	1.034722
Urb90	-.0157183	.0085231	-1.84	0.069	-.0326765	.00124
EX	.0003398	.0070132	0.05	0.961	-.0136144	.0142939
GCF	-.0205376	.0160545	-1.28	0.204	-.052481	.0114058
dum_h	-.2015427	.4068792	-0.50	0.622	-1.011105	.6080192
_cons	3.41954	.9941994	3.44	0.001	1.441395	5.397685

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of avurb

chi2(1) = 6.88

Prob > chi2 = 0.0087

Tables 5, 6 and 7 are the estimation output when the development proxies; PCGDP (equation 1), GDPr (equation 2) and HDI (equation 3) were employed as a regressor, respectively. Thus, the difference between the equations is the development proxy used. Below every regression estimate is heteroskedasticity test result. The test revealed that there are statistical evidence that the null hypothesizes should be rejected at 5% level of significant. Thus, the test indicates evidence of heteroskedasticity. In other to ensure a constant variance (homoskedasticity) in the regressions, the paper applied the robust standard-error approach.

Tables 8, 9 and 10 record robust standard error estimates of equations 1, 2 and 3, respectively.

Table 8

Robust Estimate of Equation 1

Linear regression	Number of obs = 133	R-squared = 0.6791
	F(6, 126) = 54.81	Root MSE = 1.023
	Prob > F = 0.0000	

AvUrb	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
PCGDP	9.05e-06	8.59e-06	1.05	0.294	-7.95e-06	.0000261
Popr	.8449828	.0939575	8.99	0.000	.6590437	1.030922
Urb90	-.0234863	.0050402	-4.66	0.000	-.0334607	-.0135119
EX	.000698	.0057188	0.12	0.903	-.0106193	.0120153
GCF	-.0340816	.0105073	-3.24	0.002	-.0548752	-.0132881
dum_g	-.1600107	.2319245	-0.69	0.492	-.6189824	.298961
_cons	2.754804	.5290958	5.21	0.000	1.707739	3.80187

Table 9

Robust Estimate of Equation 2

Linear regression	Number of obs = 123	R-squared = 0.6606
	F(6, 116) = 50.93	Root MSE = 1.0192
	Prob > F = 0.0000	

AvUrb	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
GDPr	.0498085	.0198318	2.51	0.013	.010529	.089088
Popr	.7024719	.1117175	6.29	0.000	.4812014	.9237424
Urb90	-.0223001	.0052822	-4.22	0.000	-.0327622	-.0118379
EX	.0031268	.0052352	0.60	0.551	-.0072422	.0134958
GCF	-.0384563	.0104078	-3.69	0.000	-.0590702	-.0178424
dum_g	-.0018101	.2253733	-0.01	0.994	-.4481903	.4445701
_cons	2.850751	.5453036	5.23	0.000	1.770708	3.930793

Table 10

Robust Estimate of Equation 3

Linear regression	Number of obs = 88	R-squared	= 0.6599
	F(6, 81) = 29.35	Root MSE	= 1.0573
	Prob > F = 0.000		

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
HDI	-1.729063	2.118775	-0.82	0.417	-5.944761	2.486635
Popr	.7831878	.1763313	4.44	0.000	.4323438	1.134032
Urb90	-.0157183	.0091015	-1.73	0.088	-.0338273	.0023908
EX	.0003398	.0062138	0.05	0.957	-.0120238	.0127033
GCF	-.0205376	.0155012	-1.32	0.189	-.0513801	.0103049
dum_h	-.2015427	.3917218	-0.51	0.608	-.9809463	.5778609
_cons	3.41954	1.476097	2.32	0.023	.4825707	6.356509

The tables 8, 9 and 10 are the pooled regressions of the three different proxies for economic development when constant variances are considered. These pooled regressions implicitly assume the same coefficients (of the regressors) for both DR and LDR. Although the coefficients of the dummy variables are statistically insignificant, the pooled regressions are restrictive and will not fully serve the purpose of the paper. The paper is also interested in the differences in the coefficients of DR and LDR and so it requires separate regressions for both regions. Below are the regression outputs of the various development proxies for the DR, followed by the LDR.

Table 11

Robust Estimation of Equation 1 for DR

Linear regression	Number of obs = 57	R-squared	= 0.7875
	F(5, 51) = 19.55	Root MSE	= .69972
	Prob > F = 0.0000		

AvUrb	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
PCGDP	8.59e-06	8.63e-06	1.00	0.324	-8.74e-06	.0000259
Popr	.8786689	.1039434	8.45	0.000	.6699937	1.087344
Urb90	-.0160845	.0052434	-3.07	0.003	-.026611	-.005558
EX	.0096391	.0047318	2.04	0.047	.0001396	.0191386
GCF	-.0281986	.0174296	-1.62	0.112	-.0631899	.0067928
_cons	1.735425	.6410708	2.71	0.009	.4484215	3.022428

Table 12

Robust Estimation of Equation 2 for DR

Linear regression	Number of obs = 50	R-squared	= 0.8227
	F(5, 44) = 25.40	Root MSE	= .6397
	Prob > F = 0.0000		

AvUrb	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
GDPr	.0462893	.0269902	1.72	0.093	-.0081059	.1006846
Popr	.7176336	.1148303	6.25	0.000	.4862084	.9490589
Urb90	-.0166259	.0042962	-3.87	0.000	-.0252843	-.0079675
EX	.0122608	.0033334	3.68	0.001	.0055427	.0189788
GCF	-.0333168	.013118	-2.54	0.015	-.0597545	-.0068792
_cons	2.005635	.4697854	4.27	0.000	1.058845	2.952426

Table 13

Robust Estimation of Equation 3 for DR

Linear regression	Number of obs = 43	R-squared	= 0.8307
	F(5, 37) = 38.79	Root MSE	= .67155
	Prob > F = 0.0000		

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
HDI	3.852398	1.622391	2.37	0.023	.565121	7.139676
Popr	1.073854	.1256347	8.55	0.000	.8192936	1.328414
Urb90	.0086552	.0055741	-3.77	0.001	-.0323108	-.0097223
EX	.0086552	.0067717	1.28	0.209	-.0050656	.0223759
GCF	-.0396938	.0147682	-2.69	0.011	-.0696171	-.0097706
_cons	-1.012836	1.38487	-0.73	0.469	-3.818848	1.793177

Table 14

Robust Estimation of Equation 1 for LDR

Linear regression	Number of obs = 76	R-squared	= 0.5260
	F(5, 70) = 22.38	Root MSE	= 1.1875
	Prob > F = 0.0000		

AvUrb	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
PCGDP	-.0000469	.0002589	-0.18	0.857	-.0005632	.0004695
Popr	.8387816	.1744458	4.81	0.000	.4908604	1.186703
Urb90	-.0213023	.01053	-2.02	0.047	-.0423038	-.0003009
EX	-.0186527	.0106813	-1.75	0.085	-.0399558	.0026504
GCF	-.0282213	.0145549	-1.94	0.057	-.0572502	.0008076
_cons	2.934193	.8464433	3.47	0.001	1.246015	4.622371

Table 15 **Robust Estimation of Equation 2 for LDR**

Linear regression	Number of obs = 73	R-squared = 0.4714
	F(5, 67) = 17.93	Root MSE = 1.1943
	Prob > F = 0.0000	

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
GDPr	.0369622	.0256951	1.44	0.155	-.0143253	.0882497
Popr	.762045	.1905368	4.00	0.000	.381732	1.142358
Urb90	-.0196421	.0090914	-2.16	0.034	-.0377886	-.0014957
EX	-.0167883	.0107364	-1.56	0.123	-.0382182	.0046417
GCF	-.0316139	.0147853	-2.14	0.036	-.0611255	-.0021022
_cons	2.99315	.8450073	3.54	0.001	1.306508	4.679792

Table 16 **Robust Estimation of Equation 3 for LDR**

Linear regression	Number of obs = 45	R-squared = 0.3357
	F(5, 39) = 7.53	Root MSE = 1.1465
	Prob > F = 0.0001	

AvUrb	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
HDI	-3.969542	3.065683	-1.29	0.203	-10.17047	2.231387
Popr	.2656691	.2878198	0.92	0.362	-.3165014	.8478396
Urb90	-.0086587	.0182324	-0.47	0.638	-.0455372	.0282198
EX	-.0078187	.0129348	-0.60	0.549	-.0339818	.0183444
GCF	.0127814	.0202919	0.63	0.532	-.0282629	.0538256
_cons	4.917811	1.540915	3.19	0.003	1.801015	8.034606

Tables 11 to 16 are the separate regressions for the DR and the LDR for the three development proxies. Tables 11, 12 and 13 are the regressions for the DR for the proxies PCGDP, GDPr and HDI respectively. Similarly, Tables 14, 15 and 16 are the corresponding regressions for the LDR.

Another statistical property of the OLS that needs to be highlighted is the Goodness-of-Fit of the regression. This is measured by the coefficient of determination or R-squared. R-squared is the ratio of the explained variations to total variations. From tables for the analysis, we can see that R-squared ranges from 83% (Table 13) to 33% (Table 16). For example, in Table 16, the R-squared means that the observed variables explain about 33% of the total variation in the dependent variable (AvUrb). So, 67% of the variation in AvUrb is left unexplained. According to Wooldridge (2009), low R-squareds in regression equations are common especially for cross-sectional analysis in the social sciences. Although Wooldridge did not state how low R-squareds were not acceptable, this paper assumed that a statically accepted ratio of the R-squared for such a regression should be above 10%. Based on that, the values of the R-squareds in all regressions appear to be statistically acceptable as far as the goodness of fit is concerned.

5. Analysis and Interpretation

Table 17 **Comparism of Estimates**

			DR		LDR		POOLED	
	Variable	Coefficient	Estimate	P>|t|	Estimate	P>|t|	Estimate	P>|t|
Equation 1	PCGDP	β_1	8.59E-06	0.324	-4.7E-05	0.857	9.05E-06	0.294
	Popr	β_2	0.878669	0	0.838782	0	0.84498	0
	Urb90	β_3	-0.01608	0.003	-0.0213	0.047	-0.02349	0
	EX	β_4	0.009639	0.047	-0.01865	0.085	0.000698	0.903
	GCF	β_5	-0.0282	0.112	-0.02822	0.057	-0.03408	0.002
Equation 2	GDPr	β_1	0.046289	0.093	0.036962	0.155	0.049808	0.013
	Popr	β_2	0.717634	0	0.762045	0	0.702472	0
	Urb90	β_3	-0.01663	0	-0.01964	0.034	-0.0223	0
	EX	β_4	0.012261	0.001	-0.01679	0.123	0.003127	0.551
	GCF	β_5	-0.03332	0.015	-0.03161	0.036	-0.03846	0
Equation 3	HDI	β_1	3.852398	0.023	-3.96954	0.203	-1.72906	0.417
	Popr	β_2	1.073854	0	0.265669	0.362	0.783188	0
	Urb90	β_3	-0.02102	0.001	-0.00866	0.638	-0.01572	0.088
	EX	β_4	0.008655	0.209	-0.00782	0.549	0.000339	0.957
	GCF	β_5	-0.03969	0.011	0.012781	0.532	-0.02537	0.189

Table 17 summarizes the relevant information needed for the analysis of the paper. These pieces of information were drawn from tables 8 to 16. Equation 1 is the model which uses PCGDP as the development proxy, Equation 2 uses GDP growth rate and Equation 3 uses HDI as the proxy.

Once again, the questions of this paper are; first, whether development determines urbanization and second, whether development determines urbanization in LDR in the same way it does in the DR. The null hypothesis for the first question is that: development does not determine urbanization. The pooled section of table 17 will help answer this question. In the second instance, the answers will emanate from the LDR and DR sections of the table, which correspond

to separate regions.

Apart from GDP growth rate, the other development proxies are statistically insignificant within the pooled regression. This is because, the null hypothesis cannot be rejected at 10% significant level in the model where HDI and PCGDP proxies. The results suggest that in general, urban migrants are motivated mainly by development prospects (captured by GDP growth) and not so much by existing levels of development (captured by either GDP per capita or HDI).

As expected, the estimated parameter corresponding to the population growth variable, β_2 is significant in all the equations and also there is a positive relationship between population growth and urbanization. That is, rapid population growth on average translates into rapid urbanization.

Another glaring results of the pooled regression is the coefficient of Urb90 (β_3), and its statistical significance. At 10% significant level the analysis fails to rejects the null hypothesis ($\beta_3 \neq 0$), and furthermore the estimates indicate a negative relationship between initial urban population and subsequent urbanization rate. The negative coefficient is an evidence of convergence. That is, countries that started with larger share of urban population in 1990, over time tend to experience slower urbanization. This suggests diminishing returns to city growth: cities cannot grow indefinitely, at some point when cities got too crowded, further urbanization would be discouraged by pollution, crime, etc.

The GCF coefficient is significant and possesses an inverse, negative relationship with urbanization. The Gross Capital Formation variable comprises of both private and government investments. In most countries, government investments form a substantial portion of their investments and mostly, these investments are geared towards bridging the gap between rural areas and urban centers, decentralizing and reducing chaos in the urban centers. These investments include the building of efficient and reliable transportation and communication systems that link the rural areas to the urban centers, provision of social amenities where they mostly lacking (rural areas), upgrading of small towns, and the like. Some private and private-public partnership investments are sometimes anti-urbanization in nature. To avoid the insecurity, chaos, hustle and battle, and other adverse effects in the urban areas, some private investments such as subsidiary plants, real estate developments are done at the periphery, especially, in countries with good transportation and communication networks. Such huge capital investments discourage urbanization and hence the inverse relation between urbanization and GCF. The GCF also shows evidence of convergence.

The separate regressions for the DR and the LDR reveal that HDI and GDP growth are the statistically-significant development proxies for the DR at 10% significant level. By contrast, none of the development proxies are significant for the LDR. This suggests that urbanization in LDR is not caused by development.

Comparing the results from the LDR to the DR, the coefficients associated with development proxies β_1 are smaller in the LDR and require a relatively higher significant level for it to be statistically significant. For instance, the coefficient of GDP growth for DR is 0.04 and that of

the LDR is 0.03, and the coefficient requires a significant level of 10% for the DR and 15% for LDR in other to not reject the null hypothesis. Consequently, urbanization in DR turns to respond to development more than LDR. This result suggests that variables other than development are more responsible for the high rate of urbanization in the LDR. At a significant level of 10%, the results from the LDR is indeed contrary to the theory which says that; as a country develops, production shifts from agriculture to manufacturing, which takes place mostly in cities, hence attracts urbanization.

Except for the equation 3 for the LDR, population growth is significant and positively related to urbanization as in the pooled section. Again, there are evidence of convergence in both the LDR and DR whenever the coefficient is significant. Gross capital formation in both LDR and DR follows the same direction as in the pooled regression. Thus, GCF is inversely related with urbanization where ever there is evidence of significance.

At 10% significant level, there is enough evidence not to reject the null hypothesis, $\beta_4 \neq 0$ in equation 2 and 3 of the DR and the LDR. Thus, Exports has a role to play when it comes to rate of urbanization. A major difference is how exports relate to urbanization. In the DR, exports are positively related to the urbanization while in the LDR it is negative. One possible explanation is that exports in the DR region are typically manufactured items. These manufacturing companies are concentrated in the urban centers and so increasing manufacturing items implies more income and job avenues in urban areas which leads to urbanization. On the other hand, exports from the LDR are typically primary products which are basically from the rural areas. If this is the case, increasing LDR exports mean more income and job avenues in the rural areas.

Hence an inverse relationship between exports and urbanization in the LDR.

From the above analysis, it has become obvious that depending on the data used and the region of interest, the outcome will defer. What is clear is the fact that the urbanization in the DR responds to development or changes in development more than the LDR. Even in Equation 1 which requires that the development proxy (PCGDP) should be rejected, the DR requires a smaller significant level in other not to reject that development determines urbanization than the LDR. The pooled regression also gives out results which seem to have been distorted by the incorporation of the information from the LDR.

Subsequently, my estimates suggest that development is not a major determinant and also in some instance may not have a relationship with urbanization in the LDR. Thus, urbanization in LDR does not follow the modernization theory of urbanization, as stipulated by Morrison (1988) and also by Fay and Opal (1999). That is, it appears that in LDR migration from rural to urban locations takes place irrespective of the development. However, the influence of development level on urbanization in LDR cannot be ignored total since there are some evidences of causality at a higher significant level, say 15% level of significant for in equation 2. Thus, emphasis should not be placed on development as a major determinant of urbanization in LDR although it cannot be ruled out totally.

Fan (1978) attributes the high rate of urbanization of the LDR to his claim that urbanization in the LDR is determined increasingly by expected income rather than current income[13]. Since current income is a vital component of expected income, an increase in current income will have

[13] Development and Urbanization; Min Zhao and Ying Zhang

a positive impact on the expected income. Because expected income was not controlled for in the regression analysis, it is likely to wrongly estimate the actual effect of current income on urbanization in the LDR. Due to lack of information on the expected incomes in both regions and hence the pool, its effects on urbanization through current income could not be partialed out.

The analysis is not without flaws. First of all, the analysis is a static model. Even though the analysis tried to minimize this defect by considering the average urbanization growth between 1990 and 2005 as the dependent variable, the choices of the years were arbitrary. However, economic agents adjust to a change over time and between the years under consideration other factors may impact on the rate of urbanization. For instance, a change in a development proxy in 2000 will impact on urbanization but it is not incorporated in the analysis.

Another limitation of the analysis is the omission of other social and political factors from the models specification. This paper concentrates on the economic variables and therefore focuses on the economic explanations of rural-urban migration. Contrary, economic and social variables have a mutually complementary relationship to migration[14]. According to Howard N. Barnum (1976), there is a strong association of social, political and economic variables with the migration process. Therefore the omission of non-economic variables from the model specification might bias the parameters. Because of lack of non-economic data for the analysis, this paper dealt with the migration that occurs with the differentials in the incomes. What's more, the paper only tested the hypothesis advanced by the modernization theory of urbanization. That is, urbanization as determined by economic development.

[14] The Interrelationship among social and political variables, economic structure, and rural-urban migration; by Howard N Barnum

6. Discussions and policy recommendations

As Chenery and Syrquin (1975) put it, 'urbanization is an inevitable process of economic development'. Through an empirical analysis, this research paper has established a positive relationship between urbanization and development in DR but quite difficult to establish a relationship for LDR or the pool of DR and LDR. However, urbanization is a global phenomenon and if not managed well will have adverse effects on a countries quest for future sustainable development. As David Sanderson (2000) puts it 'the rapidly urbanizing cities of Asia, Africa and Latin America present unprecedented concentrations of poverty, and in so doing mark new levels of vulnerability'. The analysis has indicated that the policy approach to urbanization in LDR should differ from that of DR. According to Lewis (1954), the growth of national output in less developed economies has rarely been sufficiently rapid to keep up with accelerating population growth and prevents a rise in rural underemployment and urban unemployment[15]. Because of such anti-development aspect of rural-urban migration, concerns about the management of urbanization have been expressed by many policy makers and researchers.

Most of the research papers talk about handling urbanization with much care because of its adverse consequences. Generally, most governments responded or are responding to rural-urban drift by promoting the growth of agricultural incomes and the well-being of rural dwellers, providing strict entry barriers to urban areas, creating of new and small towns among others. Such actions are intended to discourage rural-urban migration. According to Mary Lou Egan

[15] Min Zhao and Ying Zhang, 2008. Development and Urbanization: a revisit of Chenery-Syrquin's patterns of development, The Annals of Regional Science

and Marc Bendick, Jr. (1986), various governments have applied such controls. Jakarta, Indonesia for instance, tried to control urbanization by local restrictions on employment and informal sector activities and bulldozing squatter settlements or withholding services from them but proved largely ineffective and difficult to enforce. The authors also claim that Korea's direct controls were somewhat less effective in slowing immigration into the major cities of Seoul, Pusan, and Taegu. Building of new towns to ease the movement into existing urban area is known not only to be expensive but may not serve it purpose. Mary Lou Egan and Marc Bendick, Jr. (1986), reiterated that, in Gwangju New Town, Korea (later renamed Songnam) 60 percent of the initial relocatees to the community eventually left the city to return to Seoul or to move to the peripheral area of the town. According to a country study on South Korea, prepared by Andrea Matles Savada (1997), a master plan drawn and implemented in the mid-1980's to solve the problem of overcrowding in Seoul's downtown area by building satellite towns was not successful. She attributed that to the fact that in the late 1980s, statistics revealed that the daytime or commuter population of downtown Seoul was as much as six times the officially registered population.

On the other hand, some government seriously embraced rural-urban migration by anticipating and building efficient urban public transportation system, building of skyscrapers and affordable houses, well managed utility services among others. James Adams (2008) mentioned in his paper 'Embracing the growth potential of city' that Singapore provides another example where local investment in a comprehensive effort to improve urban management has increased urban absorptive capacity [16]. He also claims that urban planning and management includes the introduction and implementation of regulations governing transportation systems, quality public

[16] http://go.worldbank.org/59YUQ5BQ20

service and administration, and also law enforcing measures.

China has been credited for their impressive urbanization programs. James Adams declares that China has been able to absorb more than 370 million people into its cities without the explosion of urban slums. China managed to exploit the benefits of urbanization by proper management of their mega cities to accommodate the high population. They also implemented a strong decentralizing program in the cities. It has also been reported that China builds twenty cities a year for the past decade. China's case is a typical example of blending rural development and urban development policies to manage urbanization.

The policies mentioned above can be group into three. These are policies geared towards rural development, urban development or the combination of both. From the discussion on what some countries had done to curtail urbanization, it has been argued that urban development or urban biased development alone is not enough to handle urbanization. Michael Lipton (1977) added his voice by stating that development plans of governments and other international bodies in LDR have a conspicuous 'urban bias'[17]. This sort of sustainable urban biased development may promote economic development but widens the gap between rural and urban areas in a country. At the same time, it serves as a *pull* factor since it offers opportunities for better lives for the rural folks. Such urban bias development includes zoning in the urban areas, urban entry barriers, dismantling of squatters within the cities, paying of higher urban wages, efficient urban infrastructure and utility position and so on. Managing the high rate of urbanization in such a manner has not been successful for most LDR. Apart from such activities being expensive, it is also not politically expedient since it might make the ruling party unpopular. Moreover, because

[17] Urbanization and development in Sub-Saharan Africa; Ambe J Njoh

of the cost involved it becomes difficult for LDR to continue with such urbanization controlling program.

Bridging the developmental gap between the rural area and the urban centers and embracing urbanization as part of developmental process is more likely to reduce the high rate of urbanization in the LDR. This is because reducing the imbalance will go a long way to reduce the perceive opportunities which may not even exist in the urban areas. Also the provision of a permanent market for agriculture produces and credit facilities will create sustainable employment in the rural areas.

All said and done, other factors apart from economic development must not be overlooked when it comes to policy formulating. The analysis showed HDI and PCGDP which are more of economic indicators does not determine urbanization in LDR. Social inequality, tribalism, cultural and rural unrest, and discrimination against the rural folks are some of the issues that *push* rural folks to the urban centers. Ensuring that some of these social and cultural vices are mainstreamed and addressed adequately will reduce the rate of urbanization which are not economically induced.

Policy makers and advisors must bear in mind that impeding the rate of urbanization deliberately may adversely affect the rate of development. This is because theories have proved that urbanization crates an avenue for agglomeration economies and knowledge sharing and spillovers. Whether localized or urbanized agglomeration, the source of economies are from the sharing of intermediate inputs, sharing labor pool, labor matching and knowledge spillover. So in

other not for a country to lose these advantages from urbanization, avenue for information and ideas sharing should be encouraged by policy makers. This may take the form of seminars, workshops and social gatherings. Also, innovations and knowledge sources should be identified and rewarded accordingly.

Finally, rural-urban migration has been perceived as an inevitable process of development by the Modernization theory of urbanization. This paper has added on to the theory by establishing that there positive relationship between urbanization and development for DR but not for LDR. Therefore, to get the best out of the urbanization requires policy makers to streamline urban population growth into socio-economic development programs. Good anticipation and strategizing in the provision of utility service, housing facilities, security, and infrastructure to accommodation an increase in the urban population due to increases in the economic growth should be encouraged.

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