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Diery Seck *Editor*

Accelerated Economic Growth in West Africa

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Editor

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Introduction

According to the International Monetary Fund (IMF), the world economy grew in real terms by 3.4 % in 2012, 3.3 % in 2013, and 3.3 % in 2014. Over these same years, the Economic Community of West African States (ECOWAS), which includes all 15 countries of West Africa, recorded real growth of 5.1 %, 5.7 %, and 6.7 %, respectively. For 2015, the world is expected to grow at 3.8 % while West Africa's growth is forecasted at 6.9 %.[1] In other words, West Africa is currently growing faster than the rest of the world and the difference in growth rates is on the rise. However, the subregion has recorded a decline in its economic performance during the last 10 years. Its average rate of growth was 8.2 % between 2004 and 2007, 7.5 % between 2008 and 2011, and 5.8 % between 2012 and 2014. Therefore, although still relatively high, the rate of growth of the economy of ECOWAS has been decelerating albeit on a rebound by about 1 % between 2012 and 2013 on the one hand and 2014 and 2015 on the other hand. The favorable picture that emerges from the recent economic evolution of West Africa suggests several lines of inquiry that could help better understand the current situation and, more importantly, foresee the future path of the region.

Is the current episode of high growth unique in the history of West Africa; how can it be explained and how does it compare to periods of high economic growth in other regions of the world? Examination of the historical record of economic growth, first over the last few 100 years, then during the last half century when most West African countries were independent, and finally the last 10 years, could help answer these questions. Maddison (2001) gives estimates of average annual compound growth rates of several regions of the world for the period 1820–1998.[2] The rate of growth for Africa, not just West Africa, is 1.99 %, while that of the World is 2.21 %. In comparison, current industrialized countries, including Western

[1] International Monetary Fund, World Economic and Financial Surveys, Regional Economic Outlook, Sub-Sahara Africa: Staying the Course, Table 1.1 and Table SA1.

[2] Angus Maddison, The World Economy: A millennial Perspective, OECD, 2001, p. 28.

Europe, Western Offshoots (USA, Canada, Australia, and New Zealand), and Japan, recorded 2.57 %, Latin America 3.05 %, and Asia (excluding Japan) 1.84 %. So, for nearly 200 years, Africa, presumably West Africa also, lagged behind most other world regions, which may explain its current state of relative underdevelopment, a fate shared with Asian countries by 1998.

During the half century that spans the period 1960–2012, the equally weighted average growth rate of GDP per capita was 0.99 %, which compared unfavorably with the average rates for the three emerging economies that are Brazil, 2.4 %, China, 6.8 %, and India, 3.2 %.[3] However, the West African averages for the 10-year and 20-year periods ending in 2012 were higher than the half-century average but lower than the 5-year average for the period 2008–2012. It can be concluded that, after a long period of stagnation, West Africa's economic growth has been slowly on the rise and sharply accelerating during the period 2005–2014. To a certain extent, this evolution explains the title of the book. How can this very evolution be interpreted in light of other regions' experience with growth? Observation of the growth pattern of most countries or regions with a high growth episode indicates existence of a shape over time that can be likened to a bell curve, although not necessarily symmetrical. The main feature to be noted is that, for a time, growth maintains a relatively modest value followed by a significant increase that reaches an apex with varying durations and a gentle decline toward the historical modest value. If West Africa's growth experience follows a comparable pattern over time, based on the evidence of its 10-year boom, at which stage of the curve can it be located today? Two corollary policy questions that arise can then be formulated as follows: First, if Africa's economic growth is rising, how to accelerate it so that it reaches its maximum level as soon as possible? Second, once the economy's rate of growth is at the apex how to maintain that level for as long as possible in order to delay the ensuing decline?

The analysis will proceed first with a digression by discussing the relevance and importance of the characteristics of countries for outcomes on rates of economic growth. Characteristics are understood as traits over which policies have little or no impact. The effect of policies on growth trajectories will follow. One of the main characteristics that is discussed in the development economics literature is geography. It is often proposed that a country located in the tropics or that is landlocked and more seriously that is both tropical and landlocked faces bigger challenges to attain high levels of economic growth. Indeed, most developing countries are situated in the inter-tropical belt and have hot weather and generous flora and fauna that presumably may lead to lower productivity than in temperate climates where mere survival may require a higher level of effort. While there seems to be some degree of correlation between geography and rates of economic growth, causality still needs to be established more unequivocally. Furthermore, over the last few decades, world champions of economic growth, China, India, Brazil, and

[3] World Bank, World Development Indicators, 2015.

the Asian Tigers (Hong Kong, Singapore, South Korea, and Taiwan), have vast portions of their territories located in the tropics.

Another argument related to geography suggests that developing countries that are rich in natural resources often face the challenge of designing growth policies that go beyond exploitation of the rent of the natural resources and fall victims to some degree of resource curse. This hypothesis is also coupled with the idea that such countries often lack strong and democratic institutions, which results in weak governance and predatory governments. Finally, it is suggested that a country that, by mere lack of luck, has poor or fragile neighbors may find it more difficult to achieve high rates of economic growth because the full potential of its cross-border trade is not exploited, and scientific and technological exchange that would be mutually beneficial is thwarted. These hypotheses have common currency in the development debate but also have their critics.

Does size matter for economic growth? One of the characteristics of some West African countries is their very small size. Three of the 15 ECOWAS countries, The Gambia, Cape Verde, and Guinea Bissau, have populations that are lower than two million inhabitants. These three countries and two more, Togo and Sierra Leone, have land areas that are less than 75,000 km^2. It is argued that such small countries do not provide their private sector with a large enough market that would promote research, innovation, and economies of scale. However, it can be noted that, with its strong integration agenda, ECOWAS is actively seeking to remove that obstacle and that Cape Verde, the subregion's country with the smallest population, 500,000 inhabitants, and the smallest surface area, 4,050 km^2, has the highest level of GDP per capita and experienced one of the highest rates of economic growth in the region over the last 20 years.

The initial socioeconomic conditions of West African countries when they became independent about half a century ago can be seen as a major impediment for growth due to unsurmountable inertia. This view would run contrary to the commonly held hypothesis that over time poor countries converged toward rich countries and, therefore, are expected to experience higher rates of growth. Indeed, the empirical evidence suggests that, over the last 50 years, West African economies did not converge toward more advanced economies and may in fact have diverged and consequently fallen behind even further. A consideration that may lend credence to the view that initial conditions may hamper economic growth is that during the 25 years after independence West African countries adopted varied development strategies and undertook markedly different policy packages. Yet, after three decades, their respective levels of GDP per capita could not be distinguished and they were all clustered at the bottom of the ranking on the Human Development Index of the United Nations Development Program (UNDP). This seems to indicate that the similarity of initial socioeconomic conditions was stronger than the diversity of national development strategies in determining the rate of growth in the postindependence era. Although the examples of China, India, Brazil, and the Asian Tigers support the convergence hypothesis, the very large majority of developing countries do not seem to catch up with advanced economies after several decades, not unlike West Africa.

One consideration that is a matter of conjecture is related to the effect of ethnic, cultural, and religious diversity on economic growth. It is difficult to establish not only the existence of causality but also the direction of causality because the opposing views are supported by different examples. For instance, the advent of economic growth, thus of wealth creation, was pinned on the Protestant work and savings ethic, which sought to explain the status of advanced economies such as the United Kingdom, USA, Nordic countries, Germany, Canada, Australia, and New Zealand. But, later, emergence of mostly Shinto Japan and Catholic Southern European countries put a serious challenge to this view. Ethnic diversity was also sought to facilitate cross-fertilization as was the case of the American melting pot, but a highly ethnically homogeneous society like Japan achieved equally impressive economic growth. Finally, it has been suggested that some forms of traditional political organization of society may discourage democracy and hinder emergence of vibrant and innovative leadership most facilitated by modern political competition. Indeed, in most West African countries, the modern state exists in parallel with traditional forms of political authority that are sometimes recognized and nurtured by elected national governments. However, no country in West Africa faces open political competition between the two seats of power or a situation of political duality that could undermine economic growth.

In summary, the impact on economic growth of four key country characteristics, namely, geography, size, initial socioeconomic conditions at independence, and ethnic, cultural, and religious peculiarities, cannot be ascertained unequivocally. While they may be of relevance in some individual West African countries, it would be difficult to establish a generalizable relationship between these characteristics or some of them with economic growth throughout ECOWAS.

Conversely, it is expected that policies that are implemented at the regional or national level could have a significant effect on growth outcomes, which is the focus of the present book. The book is organized into three major sections. The first one focuses on the analysis of West Africa's economic growth and seeks to identify its determinants and challenges. Various facets of the political economy of economic growth are addressed in the second section while the third and last section analyzes the sectoral policy ramifications of growth.

In chapter "Impact of Common Currency Membership on West African Countries' Enhanced Economic Growth," Seck documents the modest economic record and poor savings of West African countries and shows their difficulties in securing external borrowing to finance their development effort. With the theoretical model of Contingent Claims Analysis (CCA), he shows that, if they become members of a common currency union, West African countries can combine their foreign reserves and through a facility of mutual insurance against adverse debt service outcomes, increase the expected level of net foreign assets available for external debt service, and possibly lower its volatility. This will result in lower probability of default, thus of riskiness of their external debt, and give them higher access to private international debt markets. Ndiaye and Korsu investigate in chapter "Growth Accounting in ECOWAS Countries: A Panel Cointegration Approach?" whether economic growth in the ECOWAS region for the period 1980–2012 was driven by factor

accumulation or factor productivity. They estimate a production function with real capital stock and labor as arguments and real GDP as output and apply various panel unit root and panel cointegration techniques that yield the following results. With the exception of Nigeria and Côte d'Ivoire, growth in the region was driven more by factor accumulation than by productivity growth. The contribution of labor is positive but low in all countries and that of capital is negative in Nigeria and Côte d'Ivoire but positive in other countries while total factor has a negative effect in most countries. These results suggest the need to raise productivity of factors of production, especially labor, and increase the level of investment in infrastructure.

In chapter "Growth Without Development in West Africa: Is It a Paradox?," Ekpo examines whether growth has resulted in economic development in West Africa. His panel regression estimations show that public investment and democracy are positively related to development while lack of access to sanitation and water has a negative relationship with economic development. Omotor tests in chapter "Group Formation and Growth Enhancing Variables: Evidence from Selected WAMZ Countries" the degree of homogeneity of countries that are members of the West African Monetary Zone (WAMZ) as a prerequisite for their pooling in the same treatment. The results show that they are dissimilar and should be examined independently. Key positive determinants of economic growth include Foreign Direct Investment (FDI) and democracy while Official Development Assistance (ODA) has a negative effect. In some instances, Government consumption has a negative impact on private sector marginal productivity.

Aspects of the political economy of economic growth in West Africa are studied by Amponsah, Omosegbon, and Agu. In chapter "Revisiting the African Economic Growth Agenda: Focus on Pro-poor Growth?," Amponsah investigates whether the recent growth trajectory in Sub-Saharan Africa (SSA) has been inclusive and pro-poor. He shows that compared to the rest of the world's regions, SSA experienced negative per capita growth from 1985 to 2000 and that this was accompanied by a significant decline in income distribution such that by 2000, the average income of an African in the lowest quintile of economic distribution was only 90 % of the income in 1985. Furthermore, his country-specific results show that while the poorest quintile benefited from growth recorded in many East Asian economies that recorded average income growth, in SSA economies, even when growth in average income occurred, the incomes of the poorest Africans fell. The exceptions were in Gabon and to a smaller extent Ghana. Finally, analyses of recent data show that like the rest of the world's developing regions, after realizing rising poverty rates from 1981 to 1999, SSA also saw steady declines in extreme poverty rate by 10 % from 1999 to 2010. However, SSA's aggregate extreme poverty gap doubled from 2005 to 2010 compared to the developing world whose gap fell by one-half. This underscores the need for SSA's growth to be more inclusive.

Omosegbon in chapter "Freedom, Growth and Development: Evidence from West Africa" revisits ECOWAS's record of economic growth without development. He uses UNDP's Human Development Index, the Democracy Index, and the World Press Freedom Index and finds that the political and market transactional freedoms that are lacking are the main cause for the subregion's current situation.

He concedes that there can be growth without development but finds it inconceivable for a nation to develop without the attendant political liberties and transactional freedom. In chapter "West Africa's Economic Growth and Weakening Diversification: Rethinking the Role of Macroeconomic Policies for Industrialization," Agu investigates possible correlation between West Africa's macroeconomic stability with its poor diversification. He uses an endogenous growth accounting procedure for a panel of 16 West African economies to study the effect of selected macroeconomic variables on their growth. The results are compared to an inclusive panel. He finds that deviations have resulted in distortions in relative prices that hurt domestic production. Therefore, macroeconomic policies have a role to play in diversification but must first address relative prices to be effective.

Three chapters study the relationship between sectoral policy and economic growth in West Africa. Efobi and Osabuohien examine in chapter "Manufacturing Export, ICT Infrastructure and Institutions in ECOWAS Countries" the extent to which manufacturing export in ECOWAS countries is affected by infrastructural development and the role of institutions. They find that poor institutions have caused poor infrastructure which promotes private benefits rather than public goods. As a result, the manufacturing exports and competitiveness of these countries have suffered. In chapter "Industrial Policy and Structural Change: Some Policy Perspectives," Mbate notes that development thinking is gradually shifting in favor of industrial policy and proposes a comprehensive macroeconomic framework that can guide policymakers in the design and implementation of industrial policies in West Africa. He also suggests industrial policy tools that can be implemented to accelerate industrial development on the continent. Beke in chapter "Basic Infrastructure, Growth and Convergence in WAEMU" analyzes the relationship between basic infrastructure and growth and convergence of countries of the West African Economic and Monetary Union (WAEMU). His panel data estimation for the eight WAEMU countries over the period 1980–2012 reveals conditional convergence in the Union. He suggests that improvement in the economic and social infrastructure in the region would result in significant gains in per capita income growth.

As can be seen in the summary of the studies presented in the book, a wide array of issues related to economic growth in West Africa is presented and researched, which provides a deeper understanding of the opportunities and challenges of economic growth in the subregion. However, questions of relative importance remain unanswered. Three of them stand out. First, why has it taken so long for West Africa to start recording significant economic growth performance? Indeed, over the last half century several other developing regions with very comparable initial socioeconomic conditions and natural resource endowment scored impressive economic progress while West African countries struggled to achieve economic growth and sometimes to avoid outright decline. In other words, is there a sound explanation for the timing of West Africa's boom of the last decade? Second, over the last 25 years, West African countries have undergone deep policy reforms aimed at boosting their economies, e.g., Structural Adjustment Programs (SAPs), Highly Indebted Poor Countries (HIPC) Initiative, etc. Why have these programs

not yielded the expected outcomes in the subregion given the diversity of national economies that implemented them and the various degrees of severity of their respective cases? If no satisfactory answer can be provided for these questions, what is the role and future of international development institutions in West Africa's quest for accelerated economic growth? Third, while substantial economic growth has been observed in West Africa over the last decade what lessons can be learned with respect to the right policy mix and appropriate sequencing of policy measures to ensure its long-term sustainability? These questions will no doubt be investigated in future studies.

This introduction opened with three questions related to identification of the current location of West Africa's economy on the hypothesized bell shape of economic growth over time and ways to accelerate its rate of growth and to maintain it as long as possible when it reaches its apex. The last 10 years have shown a marked surge in West Africa's economic growth with annual rates that are of comparable magnitude albeit with a slight downward trend. While it is difficult to pinpoint the exact location of West Africa on the curve, it is probably easier to conjecture that, considering its impressive performance during the recent years of global financial and economic crisis that it has been able to withstand successfully, its economic prognostic can only be better as the world economy slowly emerges from the crisis and embraces a new period of solid growth. As West Africa will ride the wave of future global growth, one would hope that it has not reached the apex of its trajectory and could, if strongly linked to the global economic activity, maintain economic dynamism that has recently called the world attention and turned it into an economic partner of choice.

Dakar, Senegal D. Seck
March 2015

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Part I
Analysis of West Africa's Economic Growth

Impact of Common Currency Membership on West African Countries' Enhanced Economic Growth

Diery Seck

Abstract In spite of their current high growth episode, the level of financing of West African economies is too low to ensure sustainable long term economic growth. Their domestic savings are insufficient and their access to foreign borrowing from official creditors is also low. For most countries foreign indebtedness from private creditors is non-existent because of their poor credit risk ratings. Given their inability to improve their sovereign risk profile in the short to medium term, participation in a broad common currency union (CCU) can be the only means to achieve significant reduction in sovereign credit risk and borrow from international private creditors, the largest source of global finance.

With the theoretical model of Contingent Claims Analysis (CCA), it is shown that West African countries can combine their foreign reserves and, through a facility of mutual insurance against adverse debt service outcomes, increase the expected level of net foreign assets available for external debt service, and possibly lower its volatility. The simulation model of the CCA shows that, as members of a CCU, West African economies can benefit from a lower credit risk score that translates into easier access to private creditor lending than in the absence of CCU membership. Once a suitable level of risk is attained, borrower countries can raise their level of indebtedness without changing their risk profile provided the level of foreign reserves available to service their debt increases commensurately.

Keywords Regional integration • Common currency union • Africa's economic development • Africa's external debt • Contingent claims analysis

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1 Introduction

Over the last few years, the West African sub-region has experienced an episode of high economic growth that seems likely to continue in the near future. While its performance has been rather satisfactory, it did not equal the achievements recorded by leading emerging economies such as China and India during their high growth periods.[1] Furthermore, in spite of relative consistency in the economic outcome of the recent past, it is not certain how long this upturn will be sustained or what could fuel it in the long run. It can be argued that, in the current absence of significant increases in productivity and international competitiveness, West Africa's economic growth is largely fueled by price increases in export commodities and favorable global demand, two factors that are prone to variability and beyond the control of developing countries in general, and West Africa in particular. Then, how to secure long term economic growth of West African countries in the context of their low level of development, relative marginalization from world markets and severely limiting poor capacity to finance their economies?

After years of attempts at economic development at the national level without much success, West African countries have undertaken a strategy of regional integration, the key feature of which is establishment of a common currency that aims to include all 15 countries of the sub-region, members of the Economic Community of West African States (ECOWAS). Can a common currency union contribute to economic growth of its members? Frankel (2004) cites the benefits of a fixed exchange rate regime, which characterizes a common currency arrangement, as follows. The fixed exchange rate regimes (i) provides a nominal anchor for monetary policy and represents a credible commitment to fight inflation; (ii) promotes trade and investment by reducing speculative bubbles; (iii) prevents competitive devaluation and (iv) avoids speculative bubbles in exchange rates.[2] Lee and Barro (2011) add that a developing country stands to gain from a fixed exchange rate regime through membership in a common currency union with increased access to long term international financing because it would be able to borrow on better terms due to lower prospects of devaluation and lower expected domestic inflation. The current paper argues that better access to foreign long term financing can also be achieved thanks to a common currency union through a specific arrangement on foreign reserve management.

The purpose of the study is to show that in spite of their current high growth episode, West African countries have a record of historically low growth

[1] According to IMF's Regional Economic Outlook for Sub-Saharan Africa, April 2014, Table AS1, the Economic Community of West African States (ECOWAS) recorded real GDP growth rates of 6.8 %, 6.8 % and 6.1 % for 2011, 2012 and 2013 respectively. Its growth rate is expected to reach 6.7 % or both 2014 and 2015. By comparison, according to the World Bank's World Development Indicators, the annual growth rate of China's GDP was 10 % in 2003 and 2004, 11.3 % in 2005, 12.7 % in 2006 and 14.2 % in 2007. Over the same period, India recorded 7.9 % in 2003 and 2004, 9.3 % in 2005 and 2006 and 9.8 % in 2007.

[2] Lee and Barro (2011, p. 13).

performance characterized by low investment, low savings rates and very modest access to international sources of credit caused by their poor credit ratings. But, this situation can be improved if they become members of a common currency union that gives them access to additional foreign reserves and enhances their capacity to service their sovereign debt obligations.

The paper is organized as follows. In the next section, the current situation of West African countries is portrayed through the triple lens of their poor record of economic growth over the last half century and over any shorter sub-period except for the last few years, their limited capacity to finance their economies with domestic savings or international borrowing, and their inability to access international debt markets because of their disqualifying low credit ratings.

2 Current Economic Situation of West African Economies

2.1 Historical Economic Growth Performance of ECOWAS Countries

Table 1 displays the statistics on growth of real per capita gross domestic product (GDP) for ECOWAS countries. The statistics are reported for various periods ending in 2012, namely 5 years (since 2008), 10 years (since 2003), 20 years (since 2003) and since independence of most West African countries, i.e. 52 years (since 1961). The means and coefficients of variation of per capita GDP growth are shown separately for member countries of Union Economique et Monétaire Ouest-Africaine (UEMOA) and non-UEMOA members. Statistics for countries that became independent after 1961—Cape Verde, Guinea Bissau and The Gambia—have been adjusted. The average growth of real per capita GDP for all countries is 0.99 % over the entire 52-year period, which represents an accumulated increase of 66.9 %. The breakdown shows that non-UEMOA economies experienced an increase of 114.7 %, which is 3.33 times faster than for members of UEMOA countries that posted 34.4 %. In other words, over more than half a century UEMOA countries improved the per capita GDP of their residents by slightly more than one third. Two countries of UEMOA stand out by their decline over the 52 year-period; Senegal suffered a decline of 5.6 % while Niger reported a drop of 66.6 %.

In contrast, Cape Verde, has recorded a 711 % increase in its per capita GDP since it gained independence in 1975. Between 1961 and 2012, Brazil posted a cumulated real per capita growth rate of 243.24 %, India 404.18 % and China 2,945 %. For ECOWAS countries the average growth rates are very similar over the 10-year and 20-year periods ending in 2012, UEMOA and non-UEMOA economies showing comparable degrees of consistency over time despite the 3.3:1 ratio in their respective average per capita GDP growth rates. Two countries, Côte d'Ivoire and Guinea Bissau, recorded negative growth rates during these two periods—10 years

Table 1 Growth of real per capita GDP of ECOWAS and selected emerging countries (in %)

Country name	Mean 2008–2012 5 years	Mean 2003–2012 10 years	C.V. 2003–2012 10 years	Mean 1993–2012 20 years	C.V. 1993–2012 20 years	Mean 1961–2012 52 years	C.V. 1961–2012 52 years
UEMOA							
Benin	0.90	0.63	155.25	1.10	110.18	0.75	390.53
Burkina Faso	3.05	3.13	67.98	2.91	82.68	1.91	161.61
Cote d'Ivoire	0.61	−0.04	−7,899.74	−0.18	−1,814.73	0.23	2,147.91
Guinea-Bissau	−0.03	−0.77	−636.90	−0.82	−957.37	0.20	3,686.62
Mali	0.36	1.41	169.01	1.68	178.66	1.36	356.63
Niger	2.13	1.08	324.37	0.37	922.50	−0.78	−728.80
Senegal	0.28	1.29	118.52	0.93	207.31	−0.11	−3,247.81
Togo	1.37	0.82	164.00	0.53	1,142.89	0.97	602.07
Average	1.08	0.94		0.81		0.57	
Non-UEMOA							
Cabo Verde	3.46	5.62	67.34	7.11	60.50	5.82	72.73
The Gambia	0.70	0.52	685.01	0.26	1,255.82	0.58	601.03
Ghana	6.12	4.66	62.51	3.18	80.44	0.89	498.12
Guinea	0.23	0.14	985.69	0.66	224.54	0.42	391.42
Liberia	7.13	1.86	687.05	7.76	323.75	0.39	4,876.71
Nigeria	3.61	6.62	122.49	3.40	197.03	1.55	534.14
Sierra Leone	4.96	3.91	85.86	2.01	324.92	0.69	810.89
Average	3.74	3.33		3.48		1.48	
Average all countries	2.33	2.06		2.06		0.99	
Brazil	2.28	2.55	94.14	1.94	112.54	2.40	158.78
China	8.72	9.87	17.54	9.34	20.47	6.79	101.95
India	5.43	6.33	31.07	5.15	42.05	3.16	102.61

Source: World Bank, World Development Indicators, Online, May 2014

and 20 years—mostly caused by their internal civil unrest. The two groups of countries saw their best performance during the 5-year period 2008–2012, and recorded slight convergence towards Brazil, India and China that experienced a decline in their respective growth rates in view of the 10-year period 2003–2012 compared to the 5-year period 2008–2012.

One of the most striking features of ECOWAS economies is their high level of volatility. Considering the 10-year period (2003–2012), the 20-year period (1993–

2012) and the 52-year period (1961–2012) the coefficient of variation is abnormally high for most of the countries, especially when compared to the same statistics for the three emerging countries, Brazil, India and China. This historical high volatility makes prediction of future national income very difficult and point estimation very uncertain. Therefore, the overall average performance of ECOWAS countries can be deemed rather modest and its volatility incommensurately high compared to the three main emerging countries of the last half-century.

Table 2 reports the main sources of finance in 2012 of ECOWAS countries and three key emerging economies, Brazil, China and India. It shows that five countries, Benin, Guinea Bissau, Liberia, Niger and Togo, have no public and publicly-guaranteed (PPG) debt loaned by international private creditors. Burkina Faso, The Gambia, Guinea and Mali have insignificant PPG debt funded by private creditors. Only three countries, Côte d'Ivoire, Nigeria and Senegal have private non-guaranteed debt (PNG) and their respective stock of PNG debt is rather low compared to the stock of PPG debt. In comparison, the stock of debt from private

Table 2 Main sources of finance of ECOWAS and selected emerging economies in 2012

Country	PPG total debt stock in Mln $		PNG debt stock in Mln $	GFCF/GDP in %	Savings/GNI in %
	Official creditors	Private creditors			
Benin	1,303.6	0	0	17.6	13.1
Burkina Faso	2,192.0	12.7	0	16.7	15.6
Cape Verde	1,123.6	118.2	0	46.7	22.8
Côte d'Ivoire	5,808.7	128.6	2,490.2	10.1	13.3
The Gambia	386.2	9.6	0	19.2	12.6
Ghana	5,979.3	2,627.1	0	29.0	9.1
Guinea	830.3	12.0	0	15.0	−7.2
Guinea Bissau	213.4	0	0	7.5	N.A.
Liberia	208.3	0	0	25.4	32.9
Mali	2,793.4	3.5	0	22.2	8.9
Niger	2,078.6	0	0	33.8	N.A.
Nigeria	6,151.6	500.0	850.0	8.2	N.A.
Senegal	3,694.6	356.6	265.5	23.0	22.0
Sierra Leone	623.7	209.6	0	40.3	9.9
Togo	450.0	0	0	18.6	12.3
Brazil	38,959.4	77,668.9	286,829.9	18.1	15.0
China	64,463.5	4,539.9	159,670.5	46.8	51.4
India	78,026.4	41,405.8	160,203.9	30.4	30.7

Source: World Bank, World Development Indicators, Online, May 2014

creditors, whether PPG or PNG, represents a higher percentage of total debt for Brazil, China and India. In other words, sovereign borrowing from private sources plays an important role in the emerging economies, which underscores the important contribution of international credit markets to developing countries' growth strategy. In the absence of significant borrowing from international private creditors, ECOWAS countries face a difficult challenge in sustainably financing their economic growth.

Most of them also have very low Gross Fixed Capital Formation to Gross Domestic Product (GFCF/GDP) ratios and even lower Savings to Gross National Income (Savings/GNI) ratios. These two statics give evidence that ECOWAS countries invest little and save little, which may help explain their historically modest per capita growth record.

Table 3 reports sovereign credit ratings of a number of West African countries published by the three major international rating agencies, Standard and Poor (S&P), Moody's and Fitch as of April 2014. While S&P has ratings for six countries, Moody's and Fitch rated three countries with only Ghana and Nigeria covered by all agencies. For each of the rating agencies, no West African country reaches the minimum rating required to constitute investment grade sovereign. In other words, West African countries cannot access private sovereign debt markets, which constitutes a significant hurdle to international finance for their development. This situation does not preclude the possibility of international borrowing from official creditors although, as can be seen in Table 2, this source is insufficient for the development needs of West African countries. Table 2 also confirms the poor ratings in Table 3 because only Cote d'Ivoire, Nigeria and Senegal have stocks of private non-guaranteed debt and the amounts are very low.

In summary, although West African countries have reached rates of growth of their per capita GDP in the last few years, the historical record over the last half century shows a different picture characterized by low economic growth and a high degree of volatility. Non-UEMOA countries seem to perform significantly better than UEMOA countries Most West African countries have modest levels of investment and the majority does not save enough for their investments. West African governments have low levels of international indebtedness from official as well as private sources while their private sectors have no access to international private debt markets and when they do, the amounts borrowed are insignificant. These countries have sovereign credit ratings that are so low, few of them are actually rated by the international agencies, that they do not constitute investment grade sovereigns and therefore cannot access private international debt markets.

The foregoing analysis underscores the limited capacity of West African countries to achieve long term economic growth without access to international debt finance. Yet, their current sovereign credit ratings show that their level of riskiness disqualifies them from private international debt markets. One of the remedies to this situation that can be explored is whether regional integration through creation of a common currency union can alter the risk profile of individual countries and make them eligible as investment grade sovereigns. The link between currency union membership and improved solvency is established through access to higher

Table 3 Sovereign credit risk ratings of ECOWAS countries

ISO code	Country	S&P rating	S&P outlook	Moody's rating	Moody's outlook	Fitch rating	Fitch outlook
BF	Burkina Faso	B	STA				
BJ	Benin	B	NEG				
CV	Cape Verde	B+	STA			B+	STA
GH	Ghana	B	STA	B1	STA	B+	NEG
NG	Nigeria	BB-	STA	Ba3	STA	BB−	STA
SN	Senegal	B+	NEG	B1	STA		
	Minimum investment grade rating	BBB−		Baa3		BBB−	

Date: 2 April 2014
Source: https://docs.google.com/a/mail.wbs.ac.uk/spreadsheet/ccc?key=0AonYZs4MzlZbdDdpVmxmVXpmUTJCcm0yYTV2UWpHOVE#gid=20
http://www.theguardian.com/news/datablog/2010/apr/30/credit-ratings-country-fitch-moodys-standard#data

levels of financial resources available for service of international debt service obligations made possible by the common currency arrangement. In the next section a model of risk assessment and pricing of sovereign debt is presented for a single country that is not a member of a common currency union. An equilibrium relationship is established between the country's level and variability of its foreign reserves on the one hand, and the probability of default or debt service stress and value of the foreign debt on the other hand. The following section examines the case of the country when it is a member of a common currency union with specific arrangements with respect to management of its pooled foreign reserves.

3 Contingent Claims Approach to Risk Assessment and Pricing of Sovereign Debt

Assessing sovereign country risk and pricing it have been at the forefront of the literature on international credit markets. Several authors have modelled sovereign default risk and proposed methods of pricing it. See Cohen (1991, 1993), Duffee (1999), KMV Corporation (2002), Duffee et al. (2003), Arellano (2008), Borensztein and Panizza (2008) and Hilscher and Nosbuch (2010). One specific approach, the contingent claims analysis, seems appropriate for assessment of the riskiness of sovereign debt of developing countries. It is based on the pricing of options proposed by Black and Scholes (1973) and Merton (1973, 1974) and has been developed by Grossman and Van Huyck (1985), Gray et al. (2007, 2008), Gapen et al. (2008), Francois et al. (2011) and Jobst and Gray (2013).

Gray et al. (2007) present a simple model of the balance sheet approach to the contingent claims risk assessment and pricing of sovereign debt. They portray the economy of the borrower country as a combined balance sheet of Government and

monetary authorities. Assets of the balance sheet include (i) Foreign reserves, (ii) Net fiscal asset and (iii) Other public assets. The Foreign reserves consist of the public sector's net international reserves. Net fiscal assets are the difference between the present value of taxes and revenues on the one hand and the present value of non-discretionary expenditures on the other hand. Other public assets include equity in public enterprises, value of the public sector's monopoly on the issue of money and other financial and non-financial assets.

The liabilities included in the country's balance sheet comprise (i) Base money, (ii) Local currency debt, (iii) Foreign currency debt and (iv) Guarantees. Base money consists of currency in circulation and bank reserves. Local currency debt is owed to domestic creditors outside Government and monetary authorities. Foreign currency debt is sovereign and denominated in foreign currency and owed to foreigners. Guarantees are extended by Government to domestic financial and non-financial entities.

Gray et al. define a distress barrier as the present value of the promised payment related to sovereign debt denominated in foreign currency and propose to measure it as the country's short term debt plus one-half of long term debt plus interest payment up to time *t*. Distress or default occurs when the country's sovereign assets fall below the distress barrier, which may happen considering that the country's foreign assets are stochastic. Therefore the country's debt is risky.

The borrower country's balance sheet can be written as follows: Assets = Equity + Risky Debt, or

$$A\,(t) = J\,(t) + D\,(t) \tag{1}$$

A(t) is the value of assets at time t

J(t) is the value of the country's equity at time t and

D(t) is the country's risky debt at time t.

Based on the contingent claims approach the equity can be considered as an implicit call option on the assets with an exercise price that is equal to the promised payments, B, that will mature in T-t periods. The risky debt can be considered as a risk-free debt minus a guarantee against default which is equal to a put option on the assets with an exercise price equal to B. Therefore,

Risky debt = Default-free Debt − Debt guarantee and

$$D(t) = Be^{-r(T-t)} - P(t) \tag{2}$$

Where P(t) is the value of the debt guarantee.

Assuming t = 0, Black and Scholes's formula for the value of a call option (the equity) gives

$$J = AN(d_1) - Be^{-rT}\,N(d_2) \tag{3}$$

$$d_1 = \frac{\ln\left(\frac{A}{B}\right) + \left(r + \frac{\sigma^2}{2}\right) T}{\sigma\sqrt{T}} \tag{4}$$

$$d_2 = d_1 - \sigma\sqrt{T} \tag{5}$$

r is the risk-free rate

σ is the asset return volatility

$N(d)$ is the cumulative probability of the standard normal density function below d

The "risk-neutral" or "risk-adjusted" default probability is $N(-d_2)$.

The formula for the "delta" of the put option is $N(d_1) - 1$.

The yield to maturity on the risky debt, y, is defined by:

$$D = Be^{-yT} \tag{6}$$

$$y = \frac{\ln\,(B/D)}{T} \tag{7}$$

$$\text{And the credit spread is :} \quad s = y - r \tag{8}$$

The Value of Assets at Time (t)

Gray et al. depict the process of asset return as follows:

$$dA/A = \mu_A dt + \sigma_A \varepsilon\sqrt{t}\,, \tag{9}$$

where μ_A is the drift rate or asset return on A,

σ_A is the volatility of the return on asset A.

e is a normally distributed random variable with zero mean and unit variance.

As indicated earlier, default occurs when assets, A, fall to or below the promised payments, B_t. Therefore, the probability of default is the probability that $A_t \leq B_t$ which is:

$$\begin{aligned}\left(\text{Prob(At} \leq \text{Bt}\right) &= \text{Prob}\left(A_0 \exp\left[\left(\mu_A - \sigma_A^2/2\right)t + \sigma_A\varepsilon\sqrt{t}\right) \leq B_t\right] \\ &= Prob\left(\varepsilon \leq -d_{2,\mu}\right).\end{aligned} \tag{10}$$

Considering that ε : N(0, 1), the "actual" probability of default is $N\left(-d_{2,\mu}\right)$, where

$$d_{2,\mu} = \frac{\ln(A_0/B_t) + \left(\mu_A - \sigma_A^2/2\right)t}{\sigma_{A\sqrt{t}}} \tag{11}$$

Two variables in (11) are of key interest with respect to the determination of a borrower country's sovereign risk. Asset A is expected to increase by μ_A. If μ_A increases, it increases $d_{2,\mu,}$ and lowers the probability of default $N\left(-d_{2,\mu}\right)$, A higher level of volatility, σ_A, lowers the numerator in (11), increases the denominator and results in a lower probability of default. In summary, the riskiness of a borrower

country's sovereign debt can result from a higher level of the assets with which it services its debt or from lower volatility of the return on the assets.

4 Membership in a Common Currency Union and Riskiness of Sovereign Debt

Members of the Economic Community of West African States (ECOWAS) have a regional integration agenda that includes creation of a common currency union (CCU). If implemented the new common currency would replace the West African CFA Franc that is currently used by eight countries that are members of the West African Economic and Monetary Union (WAEMU).[3] The ECOWAS CCU could replace the WAEMU but retain one of its key features, the *"Compte d'Opérations" (Operations Account)*. In accordance with this arrangement each member country would surrender its foreign reserves to the CCU authority, presumably the common central bank, and have accounting of its reserves that would be separate from the reserves of other members. The Operation Account would give the country access to its own foreign reserves, among other things, for its sovereign debt service obligations. It would also make available part of other members' foreign reserves, for the country to service its foreign debt. In other words, through this arrangement, the member country would increase its capacity to make payments on its sovereign debt by the portion of other members' reserves that can be accessed as one of the benefits of its membership in the CCU. An additional feature of this arrangement would be subordination of a country's debt from the CCU authority to sovereign external debt.

Figure 1 portrays the change in a country's sovereign debt risk level that results from membership in the CCU. Consider a country with its own national currency that borrows externally and promises to make a given payment, B, at time T. It currently has foreign reserves equal to A_0 that have an expected drift, m, with a growth path depicted by the dotted line A_0–A_0. The distribution of its assets is given by the curved dotted line and the probability of default on its sovereign debt is represented by the area under the horizontal line of promised payments, B, and the curved dotted line. Now if the country is a member of the CCU and has access to a portion of the foreign reserves of the other CCU members, the level of assets that it can use to service its sovereign debt increases from A_0 to A_1 and the level of its assets available at time T follows the growth path A_1–A_1. If it makes more productive use of the foreign debt the growth path could be A_1–A_2.

Considering that the level of promised payments has remained constant, access to additional means of sovereign debt service shifts the distribution to a higher level and results in a new probability of default that is lower than in the case of a country with its own national currency. The new probability of default is depicted by the

[3] For the lists of members of ECOWAS and WAEMU see Table 1.

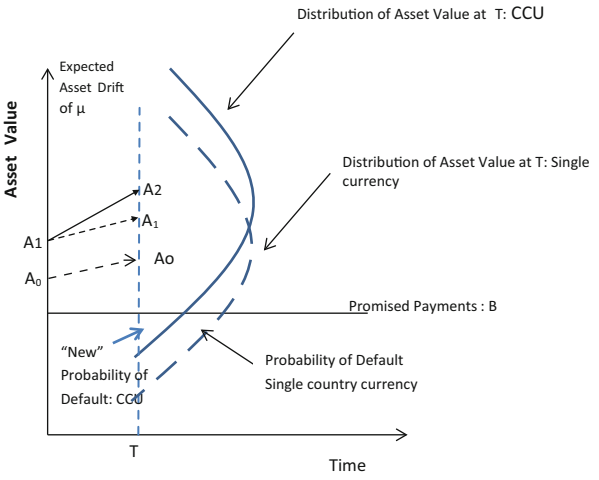

Fig. 1 Probability distribution of asset value under CCU and single country currency

area under the horizontal line of promised payments and the solid curved line of distribution of asset under the CCU.

Numerical Simulation of Impact of CCU Membership on Sovereign Debt

The following numerical simulation is aimed at shedding light on the gains that can accrue to a country that is a member of an ECOWAS CCU under the arrangement of common foreign reserves specified above. The main feature of relevance for the simulation model is that member countries can use their own reserves and a portion of the reserves of other member countries to service their sovereign debt thus increasing their capacity for promised payment on external debt service. The model is based on the contingent claims analysis presented above. Its five arguments are the level of assets of the country (A), the level of its promised payment (B), the rate of interest on its sovereign debt (r), time until the expected payment, T, and the volatility of the return on its assets (s).

A key feature of the model is that the "actual" probability of default is $N(-d_{2,\mu})$, and (11) states that

$$d_{2,\mu} = \frac{\ln(A_0/B_t) + (\mu_A - \sigma_A^2/2)t}{\sigma_A\sqrt{t}}$$

For the sake of simplicity, it is assumed that the rate of return on the country's assets, m, is equal to the rate of interest on the loan, r.

Table 4 presents the probability of default on a loan under various combinations of the expected level of assets and the associated volatility of the return on the assets. The country is assumed to commit to a promised payment, B, equal to \$75 to be made in 1 year (T = 1). The succession of higher levels of assets indicates the impact of increasingly higher access to CCU reserves for a given level of the country's own assets. By the same token, the succession of decreasing levels of

Table 4 Probability of default on sovereign debt under selected levels of assets and volatility (assuming B = $75, T = 1)

Volatility (s)	$100	$125	$150	$175	$200	$225	$250	$300
50 %	33.5 %	19.2 %	10.8 %	6.1 %	3.5 %	2.0 %	1.2 %	0.4 %
40 %	26.0 %	11.5 %	4.9 %	2.1 %	0.9 %	0.4 %	0.2 %	0.0 %
30 %	16.5 %	4.3 %	1.0 %	0.2 %	0.1 %	0.0 %	0.0 %	0.0 %
20 %	5.6 %	0.3 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
10 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
5 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %

Source: Author's calculations

volatility, s, shows the impact of the resulting volatility of the return on the assets to which the country has access under the CCU reserve management arrangement. The main result evidenced by the simulation is that the higher the level of assets, the lower the probability of default. The lower the level of volatility of asset returns, the lower the probability of default. A combination of these two factors accelerates the decrease in the probability of default.

To illustrate, if the level of assets increases from $100 to $150, the probability of default is reduced by two thirds (from 33.5 to 10.8 %) under a volatility of 50 %, by 81 % under a volatility of 40 % and by 93.9 % if volatility is 30 %. At a volatility of 20 % the probability is equal to zero if assets reach $150. The reduction in the probability of default is also quite significant as the level of volatility decreases for a given level of assets. Even for a level of assets as low as $100, the probability of default is halved when volatility decreases from 50 to 20 % and is equal to zero for a volatility of 10 %. Very high levels of assets or very low levels of volatility are of insignificant marginal impact because the probability of default reaches zero for the combination of assets equal to $150 and volatility equal to 30 %. It takes more extreme values of assets or volatility to yield a probability equal or close to zero when they are considered individually. The policy implication is that if facing market parameters described above, a borrower country benefits from a 50 % increase in its capacity to service its sovereign debt and through the diversification effect of the pooled CCU reserves to which it has access, faces volatility of these assets equal to 20 %, the resulting probability of default of its external debt is zero and it becomes a risk-free borrower.

Table 5 displays the value of the sovereign loan of the country for a promised payment of $75 and a time to maturity of 1 year for various combinations of asset value and volatility. In other words it indicates the amount of money the country can raise under these parameters. Considering that, as shown in Table 4, the higher the level of asset value or the lower the level of volatility, the lower the probability of default, Table 5 gives the value of the loan assigned to each of the asset level-volatility combinations. Higher levels of assets command a higher loan value and lower volatility has the same effect. The maximum value of the loan, $71.34, corresponds to a probability of default of zero in Table 4. Table 5 also shows that the highest value of the loan is reached with the combination of assets equal to $150

Table 5 Value of sovereign debt under selected levels of assets and volatility (assuming B = $75, T = 1)

Volatility (s)	$100	$125	$150	$175	$200	$225	$250	$300
50 %	$65.16	$68.30	$69.81	$70.55	$70.92	$71.11	$71.21	$71.30
40 %	$67.63	$69.98	$70.84	$71.15	$71.27	$71.31	$71.33	$71.34
30 %	$69.70	$71.01	$71.28	$71.33	$71.34	$71.34	$71.34	$71.34
20 %	$71.03	$71.33	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34
10 %	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34
5 %	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34	$71.34

Source: Author's calculations

and volatility equal to 20 %. For a country with an initial combination of assets equal to $100 and volatility equal to 50 %, this represents a gain in loan value of $6.18 or 9.5 %. Significantly higher levels of assets or lower levels of volatility have no marginal impact on the value of the loan, especially when the two parameters are considered individually. In policy terms, the results of Table 5 show that, for a given set of market parameters, as the level of assets to which the borrower country has access increases thanks to the CCU reserve arrangement, it will be able to raise more money from lenders for a given level of promised payment. The same effect is also true if, thanks to the CCU arrangement, the volatility of the assets decreases thanks to the effect of diversification on asset returns that is a possible result of the pooling of reserves.

The last question of the study is: how much more can a country borrow as a result of its membership in a CCU. In other words, with respect to the probability of default on the country's debt to what extent can an increase in the level of assets made possible by membership in the CCU counterbalance an increase in the promised payment that would result from a higher level of sovereign debt? Consider a country that benefits from a $25 increase in its level of assets and wishes to increase its debt so that its promised payment also increases by $25. Table 6 displays the resulting probabilities of default for various scenarios of $25 changes for A, from $100 to $125, $125 to $150, $150 to $175, and so on. For the $25 increase in promised payment the following scenarios are considered: $50–$75, $55–$80, $60–$85 and $65–$90. For an initial value of asset of $100, raising B from $65 to $90 would increase the probability of default from15.8 to 42.5 %, a difference of 26.7 %. If on the other hand, for a promised payment of $65 the level of assets is raised from $100 to $125, the probability of default is reduced from 15.8 to 5.9 %, which amounts to a reduction of only 9.9 %.

These results are consistent for all combinations of $25 increases in A and $25 increases in B. However, as the initial risk level of the country diminishes, i.e. for lower initial values of B and higher initial values of A, the changes in A and in B result in lower differences in probabilities of default because intrinsically both initial values are associated with lower probabilities of default in the first place. Another way to illustrate the results obtained above is to compare probabilities of default that are identical although associated with different scenarios. The

Table 6 Probability of default on sovereign debt under selected levels of assets and promised payment (assuming s = 40 %, T = 1)

Prom. Paymt (B)	$100	$125	$150	$175	$200	$225	$250	$300
$60	11.5 %	3.9 %	1.3 %	0.5 %	0.2 %	0.1 %	0.0 %	0.0 %
$65	15.8 %	5.9 %	2.2 %	0.8 %	0.3 %	0.1 %	0.1 %	0.0 %
$70	20.7 %	8.5 %	3.4 %	1.3 %	0.5 %	0.2 %	0.1 %	0.0 %
$75	26.0 %	11.5 %	4.9 %	2.1 %	0.9 %	0.4 %	0.2 %	0.0 %
$80	31.5 %	14.9 %	6.7 %	3.0 %	1.3 %	0.6 %	0.3 %	0.0 %
$85	37.0 %	18.7 %	8.9 %	4.2 %	2.0 %	0.9 %	0.4 %	0.1 %
$90	42.5 %	22.8 %	11.5 %	5.6 %	2.7 %	1.3 %	0.7 %	0.2 %

Source: Author's calculations

probability of default of 11.5 % applies to a loan with a promised payment of $60 and a level of assets of $100. It also applies to a promised payment of $90 and a level of assets of $150. So to maintain the same probability of default a country would need to increase its level of assets by $50 (from $100 to $150) to compensate for an increase of $30 (from $60 to $90) in its promised payment. The policy implication for the results of Table 6 are that a country can benefit from membership in a CCU by increasing its sovereign debt capacity but in a limited fashion unless it can access significantly larger levels of assets as the level of debt increases which can, beyond a certain level, be prohibitively costly for the CCU. However moderate increases in a country's indebtedness as a result of CCU membership can provide a reliable economic gain.

5 Conclusion

The historical record shows that between 1961 and 2012 and over shorter periods since they became politically independent, West African countries have had modest rates of growth of their per capita GDP. They marked a slight improvement in the last few years. Compared to emerging economies such as Brazil, China and India, they have invested and saved modestly and enjoyed limited access to international public lenders and private credit markets. Their limited capacity to borrow internationally can be largely explained by their poor sovereign credit ratings that do not qualify them as investment grade sovereigns. Therefore, their challenge in the short to medium term is to enhance their risk profile and gain access to private international credit market to finance their development efforts. The paper has investigated this possibility and a mechanism through which this could be achieved, namely membership in a common currency union.

The contingent claims approach to assessment and pricing of sovereign debt risk is used to show that if West African countries become members of a common currency union that allows them to use part of the pooled foreign reserves in addition to their own national reserves, they increase the level of assets that can

be used to service their sovereign debt thus reducing the probability of default and consequently the riskiness of their debt. A similar effect could also be achieved if the variability of the return on those assets results from the pooling of the reserves. With the help of a numerical simulation, it is shown that the probability of default on the sovereign loan decreases if membership in a common currency union results in an increase in the level of assets or a decrease of their volatility. If the two effects are combined, the debtor country can reach a risk-free status at moderate levels of improvement of the two unlike the case of improvement in one variable only.

The benefits from common currency membership also translate into higher pricing of the sovereign loan and higher proceeds for the borrower country if the arrangement for foreign reserve management gives access to a higher level of assets or causes reduction in the volatility of the assets. The model also shows that membership in the common currency union enhances the capacity of the country to borrow internationally if the level of assets increases, but only moderately because as the level of promised payment on the debt increases as the result of higher debt levels, significantly higher levels of assets are needed to keep the probability of default constant.

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Growth Accounting in ECOWAS Countries: A Panel Unit Root and Cointegration Approach

Mohamed Ben Omar Ndiaye and Robert Dauda Korsu

Abstract Long term economic growth is necessary for poverty reduction and it can be enhanced by increasing the productivity of factors of production. There have been various policy efforts to strengthen economic growth in the ECOWAS region but sustainable economic growth coupled with accelerated poverty reduction remains a challenge. The paper therefore investigates the sources of economic growth in the ECOWAS region with a view to unearthing whether growth of the region during the period 1980–2012 was driven more by factor accumulation or factor productivity. The methodology involves the estimation of a production function with real capital stock and labour as inputs while real GDP is the output, over the period 1980–2012 for the ECOWAS countries. Panel unit root and panel cointegration tests including the Levin-Lin-Chu, Maddala-Wu and Im-Pesaran-Shin tests for unit root and the Pedroni, Kao and Westerlund tests for cointegration are applied. Fixed and random effect models of production function are estimated. The growth accounting technique is then applied to the estimated shares of capital and labour in production. The results show that during the period 1980–2012, with the exception of Nigeria and Cote d'Ivoire productivity growth was not the hard-core of the growth observed in the ECOWAS countries but the growth was driven by factor accumulation. In addition, the contribution of labour to growth was positive but low in all the countries, the contribution of capital was negative in Cote d'Ivoire and Nigeria but positive in the other countries and that of total factor productivity was negative in Burkina Faso, Cape Verde, Ghana, Guinea, Mali, Niger and Senegal. The policy implication of this result is that in order to enhance long run economic growth in ECOWAS countries there is need to exert more efforts at raising productivity of factors of production. This requires more efforts at building human capacity for labour to be more effective and more investment in infrastructure, especially energy, in order to make capital more productive.

Keywords Growth accounting • Panel unit root • Panel cointegration • ECOWAS

JEL Classification O47 • O55

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1 Introduction

The causes of differences in growth among countries and variations in growth over time is the centerpiece of the growth literature. The Solow growth model (Solow 1957) for example maintains that in the short run, economic growth is driven by savings while long run growth is driven by a mystery variable, representing the effectiveness of labour. This is discussed in Lucas, 1990 and Romer 2012. The effectiveness of labour is represented by knowledge or technology but the dynamics of labour effectiveness or technology is unexplained in the Solow model and the Neoclassical model in general. On this note, the Solow model is considered as an exogenous model. Later developments led to the endogenous growth model though other forms of exogenous models had been in existence (the infinite horizon model-Ramsy-Cass-Koopmans model and the overlapping generations model-the Diamond model). The endogenous model (Romer 1986; Lucas 1988) posit that investment in research and development (R&D) sector determines technology and the stock of ideas. Thus making workers more production determine long run growth. Hence it is productivity that determines long run growth.

Sustainable economic growth is a concern to policymakers as it is necessary though not sufficient for economic development. This has been long documented by academics and policymakers in both developed and developing countries. It is also emphasized in Todaro and Smith (2012). Knowledge of the contribution of factors of production to the growth process relative to their productivity is therefore necessary in an effort to have direction about sustainable growth that is inclusive and pro-poor.

The average growth of the ECOWAS countries was 3.5 % in 2000, which was lower than the Sub-Sahara African average of the same year, 5.5 %. In 2005 it increased to 5.3 % in ECOWAS and 6.2 % in Sub-Sahara Africa. In 2012, ECOWAS average growth was 6.4 % with sub-Saharan Africa average being 5.4 %. Taking country by country case from 1980 to 2012, some countries observed negative growth in some years while in the same years some others had high growth rates. In addition, in a given country, growth was negative in some countries but high in some years. Table 1 presents some growth trend for the ECOWAS region.

There is dearth of empirical studies on the sources of growth in Sub-Sahara Africa in general and ECOWAS Countries in particular. We are not aware of a study on the ECOWAS Countries as a group even though there are numerous common agenda courses discussed by the various ECOWAS Member States and the countries face challenge on poverty reduction and sustainable growth, though some countries have recently recorded extremely high growth rates—for example, Ghana grew by 15.0 % in 2011 driven by rebasing and Sierra Leone grew by 15.2 % in 2012 driven by discovery of iron ore. These rates were more than 100 % of the average growth rates of sub-Sahara Africa.

The objective of the paper is therefore to investigate the contributions of capital, labour and their productivity (total factor productivity) to the growth of the region since the 1980s. Such investigation is imperative as it is informative in terms where

Table 1 Growth rates of ECOWAS countries

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SUb-Sahara Africa	**5.7**	**5.2**	**5.6**	**5.9**	**6.2**	**6.4**	**5.6**	**2.5**	**4.5**	**5.2**	**5.4**
ECOWAS	**3.9**	**7.7**	**5.6**	**5.9**	**5.3**	**5.7**	**5.6**	**5.6**	**6.8**	**6.5**	**6.4**
UEMOA	**1.3**	**3.4**	**2.7**	**4.2**	**2.9**	**3.2**	**3.9**	**3.1**	**3.9**	**4.4**	**5.4**
• Benin	4.4	3.9	3.1	2.9	3.8	4.6	5.0	2.7	2.8	3.5	5.4
• Burkina Faso	4.6	8.0	4.6	8.6	5.5	3.6	5.2	3.2	5.2	5.5	9.0
• Cote d'Ivoire	−1.7	−1.4	1.2	1.7	0.7	1.6	2.3	3.8	3.0	4.0	9.8
• Guinea Bissau	−7.2	0.3	2.8	4.3	2.1	3.2	3.2	3.0	3.5	4.3	−1.5
• Mali	4.3	7.6	2.3	6.1	5.3	4.3	5.0	4.5	4.5	6.0	−1.2
• Niger	5.8	3.8	−0.8	7.4	5.8	3.4	9.6	−0.9	7.5	3.2	11.4
• Senegal	1.2	6.7	5.8	5.7	2.5	4.9	3.2	2.2	4.0	4.4	3.5
• Togo	−1.3	4.8	2.5	1.2	3.9	2.1	2.4	3.2	3.4	3.9	5.9
WAMZ	**4.6**	**9.1**	**6.4**	**6.4**	**5.9**	**6.4**	**6.1**	**6.4**	**7.6**	**7.1**	**6.7**
• Gambia	1.3	7.4	6.6	0.3	3.4	6.0	6.1	4.6	5.5	5.1	3.9
• Ghana	4.5	5.2	5.6	5.9	6.4	6.5	8.4	4.7	6.6	6.5	7.9
• Guinea	4.2	1.2	2.3	3	2.4	1.8	4.9	−0.3	1.9	4.0	3.9
• Liberia	7.8	−1.9	−2.8	1.4	3.1	3.2	3.5	3.6	3.7	3.9	8.3
• Nigeria	4.6	9.6	6.6	6.5	6	6.5	6.0	6.7	7.9	7.3	6.6
• Sierra Leone	6.5	10.7	9.6	7.6	6	6	4.0	3.2	5.0	4.9	15.2
Cape Verde	5.3	4.7	4.3	5.6	10.1	8.6	6.1	4.0	5.6	4.5	**1.0**

emphasis has to be placed by policymakers on their drive towards sustainable growth that is inclusive.

There are studies at country specific levels on the issue but a holistic study on ECOWAS Countries is not a common place in the literature. For example, Dike (1995) and Kallon (2013) where on Nigeria and Sierra Leone respectively. There are also studies on group of countries, for example, Zelleke and Sraiheen (2012) for 31 sub-Sahara African countries and Shaaeldin (1989) on Tanzanian, Zambia and Zimbabwe. The dearth of studies on growth accounting in the region is explained by the fact that data on the stock of capital is not readily available for many Sub-Sahara African Countries. However, data on gross capita formation which is essentially the change in the stock of capital is available in most of the statistical institutions in the ECOWAS region as in the case of data on output and labour—though unemployment data generation remains a challenge to most of the countries. Thus, in an effort to decompose the growth of output into total factor productivity growth and factor accumulation, we also construct a series for capital stock for each of the countries over the period 1980–2012.

The rest of the paper is organized as follows. Section 2 discusses the methodology. Section 3 is the empirical results and Sect. 4 is conclusion and policy implications.

2 Methodology

2.1 Specification of the Production Function

The production function is a function of capital and labour. While it can take various forms, for example the Leontiff form, the trans-log form and the Cobb-Douglas form, the Cobb-Douglas form is the form used in macroeconomic policy framework and the growth literature. Our specification of the production function therefore follows the Cobb-Douglas production function as given in Eq. (1). Constant returns to scale and positive but declining marginal productivity is assumed here.

$$Y = AK^{\alpha}L^{1-\alpha} \tag{1}$$

Where Y is output, K is the stock of capital, L is labour and A is a shift parameter measuring total factor productivity.

Taking the log of Eq. (1) it can then be differentiated with respect to time to yield Eq. (2).

$$\frac{\partial LnY}{\partial t} = \frac{\partial LnA}{\partial t} + \alpha\frac{\partial LnK}{\partial t} + (1-\alpha)\frac{\partial LnL}{\partial t} \tag{2}$$

The parameters α and $1-\alpha$ are the output elasticities of capital and labour respectively and

$\frac{\partial LnY}{\partial t}$, $\frac{\partial LnK}{\partial t}$, $\frac{\partial LnL}{\partial t}$ *and* $\frac{\partial A}{\partial t}$ are the growth rates of output, capital, labour and total factor productivity respectively while $\alpha\frac{\partial LnK}{\partial t}, (1-\alpha)\frac{\partial LnL}{\partial t}$ *and* $\frac{\partial A}{\partial t}$ are the contributions of capital, labout and total factor productivity to growth of output.

Hence, information on the elasticities of capital and labour and the growth rates of output, capital and labour can be used to obtain the growth of total factor productivity. In this regard, our task is to estimate the values of α and hence $1-\alpha$ in Eq. (1) from time series data on output, capital and labour. Once these are known, using the growth rates of capital and labour for historical series, the contributions of capital and labour to growth can be obtained. With these contributions and the growth of output also computed, Eq. (2) can be used to obtain the growth of TFP (its contribution to growth) by the use of Eq. (3), which is obtained from Eq. (2).

$$\frac{\partial LnA}{\partial t} = \frac{\partial LnY}{\partial t} - \alpha\frac{\partial LnK}{\partial t} + (1-\alpha)\frac{\partial LnL}{\partial t} \tag{3}$$

2.2 How the Output Elasticities Are Estimated

In order to estimate the output elasticities, we express Eq. (1) in terms of output per worker (for which labour is used as a proxy). Thus Eq. (1) in terms of output per worker and capital per worker is given as in Eq. (4).

$$\frac{Y}{L}t = A\left(\frac{K}{L}\right)_t^{\alpha} \tag{4}$$

Taking logarithm on both sides of Eq. (4) therefore gives:

$$y = a + \alpha k \tag{5}$$

Thus, with data on output per worker and capital per worker, the parameter α (output elasticity of capital) and hence $1-\alpha$ (output elasticity of labour) can be obtained.

2.3 Data Consideration

Data is obtained on real GDP, Labour and Gross Fixed Capital Formation for all the ECOWAS countries over the period 1980–2012 except for Liberia, which is left out due to data availability, especially on Gross fixed Capital formation (investment) over the estimation period. The data is obtained from World Bank's World Development Indicators (WDI).

To the extent that the available data is on Gross Capital formation and not capital, this data is used to generate the times series for capital stock using the perpetual inventory method.

The stock of capital is obtained for the period 1980–2012 for each country by assuming a depreciation rate (δ) of 5 % for capital and following Hall and Jones (1999) we apply Eq. (6) to obtain the initial capital stock (the capital stock for 1980-initial capital stock-).

$$K_{1980} = \frac{I_{1980}}{\delta + I_{g(1980-2012)}} \tag{6}$$

Where Ig is the growth of investment (gross fixed capital formation) from 1980 to 2012. Because investment growth is negative for some countries over some periods and the possibility of non-normality of the series for some countries, we use the median of the annual growth rates instead of the average of annual growth rates to represent the growth rate of investment over the period 1980–2012. The data for capital stock is in real form as the constant price gross capital formation was is used.

Hence, the following equation which gives the relationship between gross fixed capital formation (I) and capital stock is used to obtain the capital stock for the period 1981–2012 once the capital stock for 1980 (initial capital stock) is known.

$$I_t = \Delta K_t + \delta K_{t-1} \tag{7}$$

From Eq. (7) capital stock is given as:

$$K_t = I_t + (1 - \delta)K_{t-1} \tag{8}$$

2.4 Estimation Technique for the Specified Model

The specified model given in Eq. (5) deals with time series data on 14 ECOWAS countries from 1980 to 2012. Hence the time dimension (T) is 33 and the number of countries (N) is 14. This is a panel data set with large T and small N. To this effect, the conventional spurious regression problems common in time series data emerges here if it is not checked for. To this end, we test for the existence of unit root in output per worker and capital per worker. That is, we apply panel unit root tests to each series. The conventional panel unit root tests are applied. That is, we apply both the homogenous panel unit root and the heterogeneous panel unit root tests. The homogeneous panel unit root tests are the Levin-Lin-Chu (LLC), Breitung and Hadri tests. The heterogenous panel tests are the Im-Pesaran and Shin (IPS), Maddala-Wu and Choi tests. The homogenous unit root tests assume that the unit rot process are the same for all the countries. That is, either the series for all the countries have unit root or they do not have while in the heterogenous case, the assumption is that some countries could have unit root in a series while the others do not have. However, it does not tell the countries that do not have unit root in case the hypothesis of the existence of unit rot is rejected.

Following the tests for unit root is the test for cointegration, as long as the variables are not stationary. This was explored in this paper. However, in panel data context when the variables are stationary, one should proceed to the estimation of the pool, fixed or random effect model while taking note of the need to test which of them is the most appropriate representation of the data. This method is applied in this paper.

Where there is cointegration a panel error correction is estimated. An alternative to the estimation of a panel error correction model is to estimate the dynamic Ordinary Least Squares (DOLS) or Fully Modified Ordinary Least Squared (FMOL) as they ensure having consistent estimators. The existence of no cointegration (long run relationship among the variables) implies that the variables must be differenced appropriately to obtain stationarity and the transformed variables should be used to estimate a fixed and a random effect model to account for country specific heterogeneity effects. Following which the Hausman test can be carried out to determine the more appropriate representation.

3 Empirical Results

3.1 Panel Unit Root Tests

In this section we present the results of the unit root tests. The idea is to avoid estimating the per worker production function with possible non-stationary variables without accounting for the non-stationarity. Such a flaw leads to misleading inferences as the estimates would be inconsistent. In doing so we use the homogenous class of tests as well as the heterogeneous class of tests for panel unit root. While the former assumes that all the countries have a common unit root process or do not have unit root, the latter assumes that the countries have different unit root processes, implying that while some of them may have unit root others do not have unit root. The Levin-Lin-Chu (LLC), Breitung and Hadri tests, which are the homogenous panel tests, are applied and under the heterogenous panel tests the Im-Pesaran and Shin (IPS), Maddala-Wu and Choi tests are applied. It is also important to note that while the LLC and the Breitung tests have the null hypothesis as '*the variable has unit root*' the null hypothesis under the Hadri test is '*the variable is stationarity*'. In addition, while the IPS test and the homogenous panel tests are individual test, the Maddala-Wu and Choi tests are Fisher type tests in the sense that they involve application of unit root tests to each country followed by combining the results through an F-test of joint existence of unit root in the variable for all the countries.

Table 2 shows the results of the unit root tests. The results show that while output per worker is stationary after first differencing capital per worker is stationary after second differencing. It is also necessary to mention that among the homogenous panel unit root methods applied, while the LLC and the Breitung tests suggests

Table 2 Results of the panel unit root tests

	LLC	Breitung	Hadri	IPS	Maddala-Wu	Choi	Conclusion
Lny	0.9057	0.9947	0.0000	0.9908	0.3884	0.9845	Lny is I(1)
ΔLnY	0.0000*	0.0003*	0.0000	0.0000*	0.0000*	0.0000*	
Lnk	0.0000*	0.9956	0.0000	0.0402*	0.0001*	0.0427*	Lnk is I(2)
ΔLnK	0.4331	0.7365	0.0000	0.2194	0.2560	0.2247	
Δ^2Lnk	0.0000*	0.0000*	0.0429*	0.0000*	0.0000*	0.0000*	

Note: The figures in the table are the probability of failing to reject the null. Hence, a p-value that is higher than 0.05 implies that we fail to reject the null hypothesis of the existence of unit root (the null of stationarity—in the case of the Breitung test). Asterisks have been placed on cases of rejection of the null hypothesis

output per worker is stationary in first difference form, the Hadri test suggests that it is not stationary even after first differencing. However, all the heterogenous panel tests reveal that output per worker is stationary in level. Hence, we support the option that output per worker is stationary after firs differencing. It is thus said to be I(1). In the case of capital per worker, apart from the results of the Breitung and Hadri tests which suggests non-stationarity, all the other tests reveals stationarity in level. However, the tests for the stationarity of the variable in first difference form reveals that it is not stationary in the first difference form, according to all the test types. Given that when a variable is stationary in level its first difference must be stationary, which is not the case here we tested the second difference of the variable for stationarity. The result reveals that by all the test types, capital per worker is stationary after second differencing. Hence, it is said to be I(2).

3.2 Panel Cointegration and Panel Error Correction Model Test Results

To the extent that the model variables are not stationary we proceed to the test for cointegration, which tests for the existence of a long run relationship between output per worker and capital per worker in the ECOWAS countries. We use the Pedroni, Kao, Johansen Fisher type and the Westerlund test. It is also necessary to mention that the null hypothesis of the Pedroni and Kao tests is that there is no cointegration, the null hypothesis of the Johansen Fisher type test is that these are at most k cointegrating vector (for $k = 0, 1$ as there are only two variables in the model), the null hypothesis for the Westerlund test is that there is no panel error correction model (PECM) underlying the two variables. It is worthy to note that the existence of panel error correction implies the existence of cointegration, as it is only under the existence of cointegration that there can be a panel error correction model. In addition, while the Pedroni, Kao and the Johansen Fisher type tests are tests for homogenous panels, the Westerlund test is a test for heterogenous panel. Tables 3, 4, 5 and 6 show the results of the various panel cointegration tests Table 7

Table 3 Result of Pedroni residual test for cointegration

Series: LNYPW DLNKPW				
Sample: 1980–2012				
Null hypothesis: no cointegration				
Trend assumption: no deterministic trend				
Automatic lag length selection based on SIC with a max lag of 7				
Newey-West automatic bandwidth selection and Bartlett kernel				
Alternative hypothesis: common AR coefs. (within-dimension)				
			Weighted	
	Statistic	*Prob.*	*Statistic*	*Prob.*
Panel v-statistic	−2.354231	0.9907	−1.774932	0.9620
Panel rho-statistic	1.338345	0.9096	1.051731	0.8535
Panel PP-statistic	−0.503396	0.3073	0.153665	0.5611
Panel ADF-statistic	−0.994842	0.1599	0.118871	0.5473
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	*Prob.*		
Group rho-statistic	1.865396	0.9689		
Group PP-statistic	0.736924	0.7694		
Group ADF-statistic	1.154369	0.8758		

is the country Johansen cointegration test from which the Johansen Fisher type panel cointegration test is obtained. Apart from the result of the Johansen Fisher panel test, the null hypothesis of no cointegration is not rejected by all the panel test types.

The Johansen Fisher panel test however shows that there is one cointegrating relationship at the 5 % level of significance by both the trace and maximum-Eigen versions of the test. Because of the fact that this test is a combination of individual p-values from various country Johansen cointegration tests, we therefore tested the robustness of this result by examining the individual country result, given in Table 7. This reveals that the null hypothesis of no cointegration is rejected only in Benin and Ghana at the 5 % level of significance while it is not rejected for all the other countries. Hence, it is more robust to conclude the existence of no cointegration between output per worker and capital per worker in the ECOWAS countries than concluding on the existence of cointegration. This is confirmed by the fact that the Pedroni and Kao tests for cointegration and the Weterlund test for the existence of panel error correction model (an indirect way of testing for cointegration) all reject the null hypothesis of cointegration between the two variables.

Table 4 Result of Kao residual test for cointegration

Series: LNYPW DLNKPW		
Sample: 1980–2012		
Included observations: 462		
Null hypothesis: no cointegration		
Trend assumption: no deterministic trend		
Automatic lag length selection based on SIC with a max lag of 8		
Newey-West automatic bandwidth selection and Bartlett kernel		
	t-statistic	*Prob.*
ADF	0.697909	0.2426
Residual variance	0.002323	
HAC variance	0.003306	

Table 5 The Westerlund panel error correction test

Statistic	Value	Z-value	P-value
Gt	−1.953	1.902	0.971
Ga	−8.836	1.747	0.960
Pt	−5.241	3.045	0.999
Pa	−6.009	1.784	0.963

Table 6 The Johansen Fisher cointegration test

Series: LNYPW DLNKPW				
Sample: 1980–2012				
Included observations: 462				
Trend assumption: linear deterministic trend				
Lags interval (in first differences): 1 1				
Unrestricted cointegration rank test (trace and maximum Eigenvalue)				
Hypothesized No. of CE(s)	*Fisher Stat.*[a] *(from trace test)*	*Prob.*	*Fisher Stat.*[a] *(from max-Eigen test)*	*Prob.*
None	65.74	0.0001	60.12	0.0004
At most 1	39.89	0.0676	39.89	0.0676

[a]Probabilities are computed using asymptotic Chi-square distribution

3.3 The Output per Worker Model

Inasmuch as output per worker is integrated of order one and capital per worker is integrated of order two and the two variables are not cointegrated, the relationship between the two model is estimated by transforming the variables to ensure stationarity. In this regard, the first difference of output per worker and the second difference of capital per worker are used to estimate the output per worker production function. This is estimated without incorporating an error correction term in the model as there is no cointegration between the two variables. The model is estimated by assuming that the country specific heterogeneity is fixed and then

Table 7 The individual country results of the Johansen cointegration test

	Trace test		Max-Eigen test	
Cross section	Statistics	Prob.[a]	Statistics	Prob.[a]
Hypothesis of no cointegration				
Benin	30.7597	0.0001	30.7547	0.0001
Burkina	10.4108	0.2505	7.8171	0.3976
Cape Verde	11.6677	0.1736	10.2201	0.1979
Cote d'Ivoire	21.6956	0.0051	16.5315	0.0215
The Gambia	10.7822	0.2252	7.6804	0.4121
Ghana	18.4396	0.0175	15.2366	0.0350
Guinea	5.8062	0.7183	5.6737	0.6554
G Bissau	9.7633	0.2994	7.3836	0.4448
Mali	6.4809	0.6387	6.4506	0.5561
Niger	15.1709	0.0559	13.2782	0.0711
Nigeria	12.3855	0.1394	12.2782	0.1006
Senegal	8.8930	0.3754	8.6798	0.3138
Sierra Leone	6.6096	0.6234	6.0035	0.6128
Togo	10.5315	0.2420	9.2886	0.2629
Hypothesis of at most one cointegration relationship				
Benin	0.0050	0.9428	0.0050	0.9428
Burkina	2.5937	0.1073	2.5937	0.1073
Cape Verde	1.4476	0.2289	1.4476	0.2289
Cote d'Ivoire	5.1640	0.0231	5.1640	0.0231
The Gambia	3.1018	0.0782	3.1018	0.0782
Ghana	3.2030	0.0735	3.2030	0.0735
Guinea	0.1325	0.7159	0.1325	0.7159
G Bissau	2.3797	0.1229	2.3797	0.1229
Mali	0.0303	0.8618	0.0303	0.8618
Niger	1.8926	0.1689	1.8926	0.1689
Nigeria	0.1073	0.7433	0.1073	0.7433
Senegal	0.2132	0.6442	0.2132	0.6442
Sierra Leone	0.6061	0.4363	0.6061	0.4363
Togo	1.2429	0.2649	1.2429	0.2649

[a]MacKinnon-Haug-Michelis (1999) p-values

assuming that it is random. The two models are then tested for choice of the appropriate form, though with large time dimension in panel the fixed effect result is the same as the random effect result. However, the Hausman test is also used to choose the appropriate model from the two.

Tables 8 and 9 show the results of the fixed effect and random effect models respectively. The former is estimated using the within estimator while the latter is estimated using the GLS. Both fixed effect and random effect models show that, the share of capital in production is 0.95 in the ECOWAS countries. Implying that the share of capital in the output of ECOWAS was 95 % and that of labour was 5 %

Table 8 Fixed effect estimates of the production function

Dependent variable: DLNYPW				
Sample (adjusted): 1982–2012				
Periods included: 31				
Cross-sections included: 14				
Total panel (balanced) observations: 434				
Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
DDLNKPW	0.948601	0.135957	6.977209	0.0000
C	0.007081	0.002183	3.243196	0.0013
Effects specification				
Cross-section fixed (dummy variables)				
R-squared	0.201688	Mean dependent var		0.006916
Adjusted R-squared	0.175014	S.D. dependent var		0.050072
S.E. of regression	0.045480	Akaike info criterion		−3.309159
Sum squared resid	0.866653	Schwarz criterion		−3.168386
Log likelihood	733.0876	Hannan-Quinn criter.		−3.253593
F-statistic	7.561224	Durbin-Watson stat		1.956798
Prob (F-statistic)	0.000000			

during the period 1980–2012. Table 10 shows the result of the Hausman test, which reveals that the null hypothesis of random effect specification cannot be rejected based on the p-value (0.6221). It is important to note that under the alternative hypothesis of random effect, the random estimators are consistent and efficient but the fixed effect estimator is inconsistent and inefficient. In addition however, when the time dimension T is large, the random effect coefficient and the fixed effect coefficient are the same. This is observed here as our T is large (from 1980 to 2012) with the coefficient in the fixed effect model being 0.948 and the random effect coefficient being 0.947. Table 11 shows the tests for random versus pool model, which uses the Breausch-Pagan test. The result shows that the null hypothesis that the pool model is the same as the random effect model is rejected in favour of the alternative that the random effect is the appropriate model.

3.4 Estimating the Productivity of Labour and Capital

Having obtained the share of capital and labour in output, we present in this sub-section the estimates of their productivity and determine whether the growth of the ECOWAS countries was more of factor-quantity growth or factor productivity growth. In doing this we give recourse to the production function and then decompose the growth of output into the contribution of capital accumulation, the contribution of labour growth and the contribution of total factor productivity.

Table 9 Random effect estimates of the production function

Dependent variable: DLNYPW				
Sample (adjusted): 1982–2012				
Periods included: 31				
Cross-sections included: 14				
Total panel (balanced) observations: 434				
Swamy and Arora estimator of component variances				
Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
DDLNKPW	0.946777	0.135907	6.966378	0.0000
C	0.007080	0.004747	1.491475	0.1366
Effects specification				
			S.D.	*Rho*
Cross-section random			0.015772	0.1074
Idiosyncratic random			0.045480	0.8926
Weighted statistics				
R-squared	0.101153	Mean dependent var		0.003180
Adjusted R-squared	0.099072	S.D. dependent var		0.047873
S.E. of regression	0.045440	Sum squared resid		0.891977
F-statistic	48.61561	Durbin-Watson stat		1.901087
Prob (F-statistic)	0.000000			
Unweighted statistics				
R-squared	0.091392	Mean dependent var		0.006916
Sum squared resid	0.986390	Durbin-Watson stat		1.719121

Table 10 The Hauseman tests for fixed versus random effect model

Test cross-section random effects				
Test summary		Chi-Sq. statistic	Chi-Sq. d.f.	Prob.
Cross-section random		0.242965	1	0.6221
Cross-section random effects test comparisons				
Variable	Fixed	Random	Var (Diff.)	Prob.
DDLNKPW	0.948601	0.946777	0.000014	0.6221

Table 11 Breusch-Pagan LM test for random effects versus pool model

ya[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
		Var	*sd = sqrt(Var)*
	ya	0.0025072	0.0500717
	e	0.0020684	0.0454795
	u	0.0002488	0.0157724
Test: Var(u) = 0			
	chi2(1) = 55.21		
	Prob > chi2 = 0.0000		

Table 12 Contributions of capital, labour and TFP to growth in ECOWAS

Country	Contribution of capital to growth	Contribution of labour to growth	Contribution of TFP to growth	Actual GDP growth	Actual growth of capital	Actual growth of labour
Benin	2.2	0.2	1.6	4.0	2.4	3.2
Burkina	6.6	0.1	−1.6	5.1	6.9	2.8
Cape Verde	7.8	0.1	−0.4	7.5	8.2	1.6
Cote d'Ivoire	−1.9	0.1	3.2	1.5	−2.0	2.8
Gambia	1.7	0.2	1.5	3.5	1.8	3.5
Ghana	8.9	0.1	−4.7	4.4	9.4	2.7
Guinea	6.9	0.1	−3.6	3.4	7.3	3.0
Guinea Bissau	1.3	0.1	1.3	2.7	1.4	2.2
Mali	4.3	0.1	−0.9	3.5	4.5	2.5
Niger	3.0	0.2	−0.6	2.5	3.1	3.4
Nigeria	−2.7	0.1	6.3	3.7	−2.8	2.6
Senegal	4.9	0.1	−1.8	3.3	5.1	2.9
Sierra Leone	1.4	0.1	0.8	2.3	1.5	2.0
Togo	1.9	0.1	0.1	2.2	2.0	2.8

Table 12 shows the contributions of capital accumulation, labour growth and total factor productivity to growth in the ECOWAS countries during the period 1982–2012.

The table shows that in seven (7) of the 14 ECOWAS countries in the Sample, total factor productivity made a negative contribution to growth. These are Burkina Faso, Mali, Niger and Senegal among the UEMOA countries (with TFP growth of −1.6 %, −0.9 %, −0.6 % and −1.8 % respectively) and Ghana, Guinea and Cape Verde in the non-UEMOA countries (with −4.7 %, −3.6 % and −0.4 % respectively). While in the rest of the countries TFP contributed to growth, the contribution to growth was strong in Nigeria and Cote d'Ivoire with a growth contributions of 6.3 % and 3.2 % respectively. Another observation is that the countries that had high contribution of capital accumulation, which are Cape Verde (7.8 %), Ghana (8.9 %), Guinea (6.9 %), Mali (4.3 %) and Senegal (4.9 %) are the countries with negative contribution of total factor productivity. This suggests that while capital accumulation was evident in these countries, its productivity was not an opportunity to the countries, implying there was decay in capital quality rather than increase in its quality or productivity. It was in Nigeria and Cote d'Ivoire that TFP growth was strong, contributing 6.3 and 3.2 % to growth of output. However, in both countries real capital accumulation was negative. Suggesting that capital declined in real terms but its productivity however increased. It is also observed that from all the countries that had higher than 3 % growth rate during the period 1980–2012, which are Benin (4.0 %), Burkina Faso (5.1 %), Cape Verde (7.5 %), Gambia (3.5 %),

Ghana (4.4 %), Guinea (3.4 %), Mali (3.5 %), Nigeria (3.7 %), Senegal (3.3 %) it was only Gambia and Nigeria that experienced positive contribution of TFP growth to growth of output. This also suggests that higher growing economies in ECOWAS are not factor-productive bias. This is a reflection of poor standard of leaving since it is increased in the productivity of factors of production, including labour that has a long term welfare impact on the economy.

Another observation from the table is that in spite of differences in real GDP growth among the countries, the contribution of labour growth in all the countries is 0.1 % with the exception of Benin, Gambia and Niger where it was 0.2. This suggests a limit to the contribution of growth of labour to output growth in the region and it also suggests that there is no relationship between labour growth and its productivity. That is, in spite of growth in the number of workers, for which the labour force is the proxy here, the contribution of its growth to growth of output is very limited.

4 Conclusion

Economic growth is desired by policymakers in both the developed and developing countries. It is however desired not for its own sake but for development purpose, which involves improvement in the welfare of the people. Economic growth varied across the ECOWAS Countries in the last four decades with higher growth in countries that were relatively politically stable and in those that experienced relative macroeconomic stability as well, though external shocks in various forms were occasionally constraints—for example, the 2008 financial crisis was an external shock component. The labour force in the region also grew though unemployment issue still remains a challenge. The environment also attracted capital, especially in the 2000s, which experiencing more stability in the political and macroeconomic sense.

The paper south to investigate in the ECOWAS countries whether output growth during the period 1980 to 2012 was driven by total factor productivity or accumulation of capital and growth of labour. The methodology involved estimation of a production function with output per worker depending on capital per worker. Series for capital stock was first of all constructed for each country from 1980 to 2012 based on data on Gross Fixed Capital formation based on the perpetual inventory method. The method of estimating the production functions involved testing for unit root in the variables and the results of the unit root tests necessitated testing for co-integration. Growth accounting technique was then applied to decompose the growth of the countries into capital accumulation, labour growth and factor productivity growth.

A number of results were obtained. First, output per worker variable is not stationary but is stationary after first differencing while capital per worker is stationery after second differencing. The cointegration tests reveal that there is no cointegration between output per worker and capital per worker in the ECOWAS

region. The share of capital in total output during the period was 0.95 and the share of labour was 0.5. Growth of total factor productivity was negative in 7 of the 14 countries, during the period 1980–2012 and where it was positive, it was low in most of the countries. It was strong only in Nigeria and Cote d'Ivoire with 6.3 % and 3.2 % respectively. In the two countries with relative strong growth of total factor productivity, the contribution of capital to growth during the period was negative. This emanated from negative growths in real capital in the two countries (Nigeria and Cote d'Ivoire). The two countries that had relatively strong growth of output (above 4.0 %) had negative total factor productivity growth and strong growth of capital (Ghana 8.9 %, with average annual Real GDP growth of 4.4 % and Cape Verde, 7.8 %, with average annual real GDP growth of 7.5 %) during the period 1980–2012. Hence growth of the region during the period 1980–2012 was driven more by factor accumulation, especially capital but not factor productivity, which is what sustains long run growth and development. The contribution of labour force growth to growth of output (representing worker growth) was 0.1 % in each country except in Benin, Gambia and Niger where it was 0.2 %. Suggesting weakness in absorbing labour in jobs (high unemployment).

In terms of policy implications, since capital is the greatest contributor to growth in the ECOWAS region, it is imperative for the policy makers to design strategies for labors' contribution to increase as this would ameliorate income inequality problem. This rests on the idea that ECOWAS Countries are labour surplus and capital scare. As a majority of the people are employed in the agricultural sector, which do not involve huge capital in operation while few individuals have access to capital inequality in income widens.

Supply side policy should be directed to putting weight on increasing the productivity of labour, which would not only reduce income inequality problem but would also help to reduce poverty, hence contributing to inclusive growth. This requires efforts at expanding access to quality education; ensuring increased access to health care that is affordable; and increased investment in rural infrastructure. Raising productivity growth should also involve strong weight on technological progress, which can be easily achieved in the case of the ECOWAS countries through technological transfer rather than innovation. This requires efforts at building good governance, the legal framework, political stability and attractive package for foreign direct investments in the agricultural sector.

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Growth Without Development in West Africa: Is It a Paradox?

Akpan H. Ekpo

Abstract In the last 15 years, countries in West Africa have had reasonable growth rates averaging about 5 %; growth has been propelled by high prices of commodity exports. The paper examined whether growth has resulted in economic development of the sub-region. The lack of consistent data on relevant economic and social variables such as unemployment, primary and secondary school completion rates prevent a robust analysis of the growth—development nexus. Nonetheless, panel regression results show that public investment and democracy are positively related to economic development while lack of access to sanitation and water reveal a negative relationship to development. In addition, stylized facts show that marginal gains were achieved as regards development indicators. It is important that leaders, policy-makers and technocrats implement policies and programmes that stress sustained growth and inclusive development.

Keywords Growth • Inclusive development • West Africa

JEL Classification H11 • 011

1 Introduction

It is recorded in history that no modern economy has developed without growing. However, the drivers of growth though similar in certain aspects had to be adapted to fit the realities of a particular economy; early economies like Britain experienced growth through industrialization propelled by technical progress (technology) with human labour. A country like China is being modernized through technology not necessarily discovered in the country; there are instances where economies have

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grown and developed by 'stealing' technology. In the neo-classical economic framework, growth is propelled by capital, labour, technology and other resources; other theoretical postulations of growth have only augmented and/or re-interpreted the neo-classical theory of growth (Solow 1956; Mankiw et al. 1992).

The determinants of growth have not been too controversial in economics. However, what is economic development and how it can be realized remains debatable depending on the schools of thought as well as the inherent ideological orientation.

Furthermore, the role of the state (public sector) generates heated debate within the growth—development nexus. In the neo-classical tradition (foundation of the Washington consensus and neo-liberal economic framework) growth would eventually trickle-down resulting in development; direct state intervention is not necessary to stimulate growth, redistribute growth and bring about development. The collapse of the neo-classical framework during and after the great depression saw the emergence of the state an economic agent directly involved in economic activities. Today, the debate among the contending schools of thought in economics (New-classical, monetarist, business cycle, new-classical, Keynesian, neo-Keynesian, new-Keynesian, Marxist, neo-Marxist etc.) still rests on the degree of direct state involvement in economic activities. India, China, Malaysia, Indonesia, Singapore and others have been able to move millions out of poverty by registering not only robust growth rates over a long-period of time but also through systematic economic planning gingered by an 'elite' group committed to positive structural transformation.

Most of the countries in West Africa were at the same level with those in Asia in the 1950s, 1960s and 1970s; Nigeria, Ghana, Cote d'Ivoire, Senegal had similar growth rates with Singapore, Malaysia, Indonesia and Taiwan. During the late 1970s and early 1980s, Nigeria averaged a growth rate of 10 % yet the economy still remained underdeveloped. The economies in West Africa have enormous human and natural resources and at each episode growth has been driven by the rise in the price of export commodities. The West African sub-region is experiencing robust growth rates during and after the on-going sluggish recovery of the global economic crisis. The sub-region grew by almost 7.0 % in 2012 and is projected to grow at the same rate up to 2015. Multilateral institutions like the African Development Bank, World Bank and the International Monetary Fund (IMF) agree that the West African sub-region is experiencing macroeconomic stability derived from implementing reforms based on rules rather than discretion. Yet, countries in the sub-region are not experiencing economic development; almost all the countries have very high and rising rates of unemployment, high incidence of poverty, deteriorating social services, among others.

"It is fundamental that growth must generate employment, reduce poverty and provide a reasonable mix of goods and services to majority of citizens. The growth process ought to guarantee that an economy is transforming or transiting from primary production (reliance on agriculture) to manufacturing (industrialization) and finally to services based activities" (Ekpo 2013a, b, c, p. 18). In recent times and

in most countries growth has not translated into development; rather than confronting the seeming paradox, economists, especially those in the Breton-woods Institutions have coined a new concept known as "inclusive growth". The concept de-emphasizes economic development and thus reduces the role of the state in the growth and development praxis. All economies that have leap frogged from underdevelopment to developed knowledge-based countries have been guided by well thought and executed economic blue prints. In West Africa, growth has been driven by high prices of commodity exports particularly in the mining/mineral sector. The growth rate of 7 % in the sub-region seems not to have translated unto development.

The objective of this paper is to examine the growth development nexus in the sub-region. Section 2 provides stylized facts on the economies of West Africa while Sect. 3 examines the review of the underlying theoretical issues; Sect. 4 reviews the methodology and empirical results. We conclude in Sect. 5. It is expected that the analysis in the paper would generate further robust debate on the subject matter.

2 Performance of the West African Economy: Stylized Facts

The performance of the economies in West Africa provides insights of the growth trajectory. It is important to mention up front that the absence of relevant data (for example, rates of unemployment, incidence of poverty etc.) on a consistent time series prevents a robust analysis of the performance of the economies of the sub-region. Tables 1 and 2 summarize the growth of GDP and its per capita measure during the period 2000–2013. The West African economy grew by almost 7 % in real terms in 2012 and the rate is projected to improve slightly in 2014 and 2015; these rates are higher than that of the African continent for the same period. For almost all the countries, the growth of output was robust except for Guinea, the Gambia and Niger. However, they recovered in 2013. During the period 2005–2012, Sierra Leone registered the highest growth rate of 19.7 % followed by Burkina Faso, Ghana, Liberia and Nigeria. Guinea Bissau registered a negative growth rate of −1.2 % during the period 2000–2005 (see Table 3). During the period of the global economic downturn, almost all the countries had on the average positive growth rates except for Niger and Cote d'Ivoire which had negative growth rates of −4.7 % in 2011 and −0.9 % in 2009. In 2007, Ghana showed an output growth rate of 6.1 % at the height of the global economic crisis. The Gambia recorded 6.3 % while Liberia recorded 9.5 % during the same period. These growth rates were driven by high mineral and commodity export prices.

In terms of real GDP per capita, for the period 2005–2013, almost all the countries showed growth rates higher than that of the growth of population. The real GDP per capita growth for Sierra Leone which stood at 3.4 % in 2005 rose sharply to 17.8 % in 2012 but declined to 11.1 % in 2013; given that the growth of

Table 1 Macroeconomic indices for West Africa

Real GDP growth %	2012	2013[a]	2014[b]	2015
Africa	6.4	3.9	4.8	5.7
West Africa	6.9	6.7	7.2	7.1
Benin	5.4	5.0	4.9	5.3
Burkina Faso	9.0	6.9	7.0	6.3
Cape Verde	2.5	1.0	3.1	3.3
Cote d'Ivoire	9.8	8.8	9.1	9.2
Gambia	6.1	5.6	7.5	6.7
Ghana	7.9	4.4	7.7	8.0
Guinea	3.9	2.0	4.2	4.3
Guinea-Bissau	−1.5	0.3	2.8	2.6
Liberia	8.3	8.1	6.8	8.2
Mali	−1.2	5.0	6.7	5.6
Niger	11.1	3.6	6.0	6.2
Nigeria	6.7	7.4	7.2	7.1
Senegal	3.4	4.0	4.8	5.3
Sierra Leone	19.7	13.0	13.8	11.6
Togo	5.9	5.6	6.0	6.3

Source: African Development Bank. African Economic Outlook (2014)
Notes: [a]estimates, [b]projections

Table 2 Real GDP growth for West African countries 2000–2013 (%)

Country	2000	2005	2012	2013
Benin	4.9 (1.9)	2.9 (−0.4)	5.4 (2.7)	5.0 (2.3)
Burkina Faso	1.3 (−1.6)	8.7 (5.7)	9.0 (6.1)	6.9 (4.1)
Cabo Verde	16.6 (14.7)	6.5 (5.5)	2.5 (1.7)	1.0 (0.1)
Cote d'Ivoire	−2.5 (−4.6)	1.8 (0.4)	9.8 (7.5)	8.8 (6.4)
Gambia	−27.3 (−30.2)	−0.9 (−4.1)	6.1 (2.9)	5.6 (2.4)
Ghana	3.8 (1.4)	5.9 (3.3)	7.9 (5.8)	4.4 (2.3)
Guinea	−5.6 (−7.3)	3.0 (0.9)	3.9 (1.3)	2.0 (−0.5)
Guinea Bissau	−35.8 (−38.0)	4.3 (2.1)	−1.5 (−3.9)	0.3 (−2.1)
Liberia	55.1 (49.8)	5.9 (3.2)	8.3 (5.6)	8.1 (5.6)
Mali	−4.7 (−7.5)	6.1 (3.0)	−1.2 (−4.2)	5.0 (2.0)
Niger	−2.9 (−6.5)	7.2 (3.5)	11.1 (7.3)	3.6 (−0.3)
Nigeria	6.3 (3.8)	6.5 (3.9)	6.7 (3.7)	7.4 (3.4)
Senegal	3.0 (0.5)	5.6 (2.9)	3.4 (0.5)	4.0 (1.1)
Sierra Leone	−23.3 (26.0)	7.3 (3.4)	19.7 (17.8)	13.0 (11.1)
Togo	−1.7 (−4.3)	1.2 (−1.4)	5.9 (3.3)	5.6 (3.1)

Source: African Development Bank
Notes: Real per capita GDP growth rate (%) is in parenthesis

Table 3 Growth of output in selected West African countries 2000–2011 (%)

Country	2000–2005 Average	2006	2007	2008	2009	2010	2011
Cape Verde	5.75	10.8	7.8	5.9	4.1	7.1	5.0
The Gambia	4.60	6.5	6.3	5.9	4.6	6.1	3.3
Ghana	4.80	6.4	6.1	7.2	3.5	6.4	13.6
Guinea	2.90	2.5	1.8	4.0	0.3	2.4	3.6
Liberia	–	7.8	9.5	7.1	4.6	6.8	6.4
Nigeria	5.30	6.1	6.4	5.3	5.6	6.4	7.2
Sierra Leone	12.10	7.4	6.4	5.5	4.0	6.0	5.3
Benin	–	3.6	4.6	5.0	2.7	3.8	3.1
Burkina Faso	4.90	5.5	3.6	5.0	3.2	5.2	5.6
Cote d'Ivoire	5.12	0.7	1.6	2.3	3.7	2.4	−4.7
Guinea-Bissau	−1.25	0.6	2.7	3.3	3.0	2.6	5.3
Mali	1.30	5.3	4.3	5.0	4.5	5.0	2.7
Niger	4.76	5.8	3.3	9.5	−0.9	4.9	2.3
Senegal	3.20	2.4	4.7	2.5	1.5	3.6	2.6
Togo	4.61	3.9	1.9	1.0	2.5	4.1	6.8

Source: WAIFEM annual report, various issues

real GDP per capita is a proxy for development, does it imply that the economy of Sierra Leone is experiencing growth and development? Though growth must not only be double digit but must also be sustained for a reasonable period of time, whether growth has resulted in economic development is an empirical matter.

The data on Table 4 show that all the economies experienced macroeconomic stability using the rate of inflation as a proxy. In 2005, Ghana, Guinea, Nigeria and Sierra Leone registered double-digits rates of inflation; all the other countries had single-digit rates of inflation. During the period of the global economic crisis (2007–2008), the same countries except Nigeria had double-digit inflation; except for Guinea, the rate of inflation for all the countries was within their inflation threshold (WAMI 2011). It is possible that both the growth in output and the acceptable rates of inflation were due to efforts by all the countries to better manage their economies. For example, in Nigeria, beginning in 1999, with the promulgation of both the Fiscal Responsibility and Procurement Acts, policy-makers relied more on rules than discretion. All the other countries passed Procurement Acts to ensure the proper management of contracts; the debt profile of most of the countries were within their acceptable thresholds of key debt indicators (Ekpo and Omoruyi 2013; Ekpo 2012a, b, c). Nonetheless, structural rigidities in these economies remain a challenge. It is important to state that all the Franco-phone speaking countries except Guinea registered very low rates of inflation; in 2009 and 2013, Senegal had deflation.

The fiscal side of the economies portrays a different picture. For the period, 2005, 2012 and 2013, all the countries except Mali had fiscal deficits. Some of the economies have huge infrastructure gap hence the need for increased capital

Table 4 Rate of inflation in selected West African countries (%)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cabo Verde	0.4	4.8	4.4	6.8	1.2	2.1	4.5	2.5	1.5
The Gambia	5.0	2.1	5.4	4.5	4.6	5.0	4.8	4.2	5.0
Ghana	15.1	10.2	10.7	16.5	19.3	10.7	8.7	9.2	11.7
Guinea	31.4	34.7	22.9	18.4	4.7	15.5	21.5	15.2	11.9
Liberia	6.9	7.2	13.7	17.5	7.4	7.3	8.5	6.8	7.7
Nigeria	17.9	8.2	5.4	11.6	12.4	13.7	10.8	12.2	8.5
Sierra Leone	12.0	9.5	11.8	14.8	9.2	17.8	18.5	13.7	9.9
Benin	5.4	3.8	1.3	8.0	2.2	2.1	2.7	6.6	2.6
Burkina Faso	6.4	2.4	−0.2	10.7	2.6	−0.6	2.7	3.8	2.1
Cote d'Ivoire	3.9	2.6	1.9	6.3	1.0	1.4	1.9	2.0	2.7
Guinea-Bissau	5.6	−0.1	4.6	10.4	−1.7	1.1	5.0	2.1	1.0
Mali	6.4	1.5	9.1	11.3	2.2	1.3	3.1	5.3	0.3
Niger	7.8	0.1	0.1	11.3	4.3	0.9	2.9	0.5	1.9
Senegal	1.7	2.1	5.9	5.8	−1.1	1.2	3.4	2.1	0.7
Togo	6.8	2.2	1.0	8.7	2.0	3.2	3.6	2.6	1.8

Source: 2011 Annual Report, WAIFEM, Lagos

expenditure which fueled the deficits; the observed deficits included grants, hence it would be necessary to examine how the deficits may result in fiscal dominance. Another disturbing trend is the evidence of twin deficits—fiscal deficit and negative current account/GDP ratio in all the countries except Nigeria. The negative current account/GDP confirms challenges with the balance of payments particularly the trade account of the affected countries (Table 5).

3 Growth and Development: Review and Theoretical Issues

A literature review on growth and development would be a herculean task given the vast literature on the subject: We, therefore, attempt to discuss briefly theoretical issues associated with the subject matter.

According to Solow (1956, p. 65) "All theory depends on assumptions which are not quite true. That is what makes it theory. The art of successful theorizing is to make the inevitable simplifying assumptions in such a way that the final results are not very sensitive". This quote is apt and has implications for all theories of economic growth. The neo-classical growth model stresses why some countries are rich while others are poor with technology and factor accumulation as exogenous. The Romer growth model endogenizestechnology utilizing microeconomic foundations emphasizing that technology is not only the engine of growth but that it can also be derived within the economic system.

Table 5 Fiscal balance, including grants (% of GDP) for West African countries, 2000–2013

Country	2000	2005	2012	2013
Benin	−1.7 (−44)	−2.5 (−6.2)	−1.3 (−8.5)	−1.2 (−8.2)
Burkina Faso	−3.8 (−13.2)	−5.1 (−11.5)	−3.1 (−0.8)	−3.2 (−0.7)
Cabo Verde	−7.4 (−10.9)	−3.6 (−4.1)	−9.8 (−11.7)	−7.9 (−5.7)
Cote d'Ivoire	−1.2 (−2.8)	−0.8 (0.2)	−2.6 (−3.8)	−2.0 (−6.4)
Gambia	−0.7 (−5.7)	−7.2 (−11.2)	−4.4 (−16.4)	−3.3 (−16.0)
Ghana	−5.3 (−6.6)	−1.2 (−6.2)	−5.8 (−12.4)	−7.8 (−12.3)
Guinea	−3.4 (−5.6)	−0.9 (−5.4)	−3.2 (−33.9)	−5.2 (−20.2)
Guinea Bissau	– (8.8)	−5.9 (−1.8)	−2.7 (−9.5)	−4.7 (−6.6)
Liberia	0.3 (−16.0)	0.6 (−23.3)	−2.3 (−33.9)	−2.6 (−48.0)
Mali	−3.0 (−9.6)	−4.7 (−10.1)	−1.3 (−3.0)	2.5 (−9.8)
Niger	−3.8 (−6.7)	−2.1 (−9.2)	−1.1 (−15.1)	0.1 (−15.2)
Nigeria	5.9 (12.5)	−1.2 (25.3)	−1.4 (4.9)	−1.8 (8.2)
Senegal	0.5 (−7.0	−3.2 (−7.8)	−5.9 (−10.3)	−5.4 (−9.0)
Sierra Leone	−9.3 (−6.5)	−1.3 (5.8)	−1.4 (5.6)	00 (−2.1)
Togo	−4.7 (−6.2)	−2.4 (−21.8)	−5.8 (−11.9)	−4.6 (−11.7)

Source: ADB, Tunisia
Notes: Current account/GDP (%) are in parenthesis

Building from the Romer model of economic growth with the addition of technology transfer (Jones 2002), we endogenize the mechanism by which different economies achieve the ability to use various capital goods. Countries produce a homogenous output good thus:

$$Y = L^{1-\alpha} \int_{o}^{h} x_j^{\alpha} \, dj \tag{1}$$

where:

Y = Output
L = Labour
x_j = range of capital goods

The number of capital goods that workers can use is constrained by their skill level h: A worker with a high skill level can utilize more capital goods than a worker with a low skill level. The assumption is that the economy is single and small, far removed from the technology frontier. The country grows by learning to use the more advanced capital goods available in the world. The countries in West Africa fit this characterization.

In the value chain, one unit of intermediate capital good can be produced with one unit of raw capital. Thus[1]:

[1] The section draws from: Jones (2002).

$$\int_{o}^{h(t)} x_j(t)dj = K(t) \tag{2}$$

From Eq. (2), the total quantity of capital goods of all types used in production is equal to the total supply of raw capital; the intermediate capital goods are similar hence $x_j = x\ for\ all\ j$. Consequently, the aggregate production technology for this economy follows the Cobb-Douglas type:

$$Y = K^{\alpha}(hL)^{1-\alpha} \tag{3}$$

Capital (K) is accumulated by foregoing consumption hence:

$$\dot{k} = s_k Y - dk \tag{3a}$$

Where s_k = the investment share of output (the balance going to consumption); d = constant exponential rate of depreciation greater than zero.

It is interesting to state that 'skill' is defined as the range of intermediate goods which an individual has learned to use. Individuals can make progress as the economy grows:

$$\dot{h} = \mu e^{\psi} A^{\gamma} h^{1-\gamma} \tag{4}$$

where

μ = the amount of time an individual spends accumulating skill instead of working, for example, years of schooling, $\mu > o$

A = world technology frontier in an index of advanced capital goods invested; $o < \gamma \leq 1$

Dividing both sides of Eq. (4) by h:

$$\frac{\dot{h}}{h} = \mu e^{\psi\mu}\left(\frac{A}{h}\right)^{\gamma} \tag{J}$$

Equation (5) makes explicit the hidden assumption that it is difficult to learn to use an intermediate good that is currently close to the frontier. "The closer an individual's skill level (h) is to the frontier, A, the smaller the ratio A/h, and the slower the individual's skill accumulation".

Another assumption is that the technology frontier expands at a constant rate, g:

$$\frac{\dot{A}}{A} = \mathrm{g} \tag{5}$$

Assuming that the investment rate and the amount of time spent accumulating skill are exogenously determined and constant, Eqs. (1)–(5) can be solved for the

balanced growth path (steady-state) in the economy. Assuming that output per worker $\left(y \equiv {}^{y}/_{L}\right)$ and capital per worker $k \equiv {}^{k}/_{L}$ then from Eq. (5) $\frac{\dot{h}}{h}$ will be constant if and only if A/h is constant so that h and A must grow at the same rate. Hence, we have:

$$g_y = g_k = g_h = g_A = g \tag{6}$$

Equation (6) states that the growth rate of the economy is shown by the growth rate of human capital or skills and this rate is tied down by the growth rate of the world technology frontier.

If governments in West Africa have stable institutions, good policies, right environment etc. then the production function of Eq. (3) can be altered thus:

$$Y = GK^{\propto} \ (hL)^{1-\propto} \tag{7}$$

Where G denotes the influence of government on the productivity of the factors in its economy. Economies grow over time based on the use of new kinds of capital (h). But two countries with the same k, h and L may still produce different amounts of output because the economic environment dictated by government (public sector) denoted by G may not be the same. If the interest of G is in collecting bribes then growth may be slower. Our argument is that G (government) would have to be involved in both the productive stage (if interested because government is also an economic agent) and in distributing the growth to avoid wide inequality as well as increasing poverty.

However, because growth in recent times has not resulted in development, the concept known as "inclusive growth" has emerged. Inclusive growth is defined as rapid, sustained growth that is inclusive of a large portion of a country's labour force. It stresses productive employment rather than income redistribution (Ianchovichina and Gable 2009). We have argued elsewhere that the conventional definition of economic growth is not different from that of inclusive growth. "The fundamental difference lies in how the growth is distributed, the extent of the role state in the economy as well as that of the market. Therefore, the notion of inclusive growth is to ignore how the 'cake' should be distributed and reject the multidisciplinary approach to development; growth has always been inclusive—as the production possibility frontier shifts based on innovations, idea, knowledge and technology, an economy moves to a higher growth trajectory." (Ekpo 2013a, b, c). A responsible Government/state would then address the questions: What is happening to unemployment? What is happening to education? What is happening to health? What is happening to the provision of food, shelter, clothing and water? What is happening to poverty reduction? These burning issues have been left to the market according to the inclusive growth approach, thus drastically reducing the role of the state in the growth-development nexus. There cannot be development without growth but there can be growth (even if it is inclusive) without development. Countries such as India, China, Singapore, Malaysia and Indonesia that grew

double–digits in 40 years had strong public sector participation in economic activities. What then is economic development?

Baran's (1968) definition of economic development is classic: "Economic development has always been propelled by classes and groups interested in a new economic and social order, has always been opposed and obstructed by those interested in the preservation of the status quo, rooted in and deriving innumerable benefits and habits of thoughts from the existing fabric of society, the prevailing mores, customs and institutions. It has always been marked by more or less violent clashes, has proceeded by starts and spurts, suffered setbacks and gained new terrain. It has never been a smooth, harmonious process unfolding placidly over-time and space". This notion of economic development allows us to investigate whether sustained growth in any economy has resulted in improved standard of living for majority of persons; whether growth has provided basic needs to majority of persons; what is happening to inequality, (issues of distribution), among others.

4 Methodology and Empirics

Econometric techniques can be utilized to examine the relationship between growth and selected indices of economic development. However, the big challenge is the availability of relevant data on a consistent basis for 15 countries. For example, there is no data on completion rates for primary, secondary and tertiary levels of education; enrolment rates though useful would not capture to some extent the quality of education. There is no consistent data on incidence of poverty, access to water, sanitation and rates of unemployment on a consistent basis. Based on the theoretical review, we postulate the following broad relationship:

$$Y = f\,(h, L_s\,, P_r, P_s,\; G, A, T, X_i) \tag{8}$$

Where:

Y = growth rate of GDP
h = ideas and innovations
Ls = acquiring skills and learning by doing
Ps = primary school completion rate
Pr = secondary school completion rate
G = public sector strategies and policies
A = adult literacy rates
T = technology
Xi = control variables such as rate of inflation, public investment in GDP, access to drinking water, access to sanitation, shelter etc.

It is expected that an increase in any of the independent variables would stimulate growth. The variables on the right-hand side are proxies for capturing concrete economic development. The availability of data would necessitate the

discussion on the appropriate econometric technique to be utilized.[2] Because of the paucity of data, we examine some of the available empirics.

Table 6 provides selected social indicators for some of the countries in the sub-region. The growth of public spending on education as a ratio of government expenditure partially confirms that none of the countries met the United Nations threshold on public spending on education. The Gambia, Ghana and Togo are close to the threshold of 26 %; the quality of public education which is important is not captured in the data. Most of the countries registered improvement in primary and secondary school enrolment but no data on how many actually completed school. The adult literacy rates reflect the need to stress education; for the 2012, only Cape Verde showed impressive adult literacy rates. The selected countries improved slightly on life expectancy at birth as well as infant mortality rates for the period 2005–2013 (see Table 7).

In a previous work (Ekpo 2014) we had estimated and obtained the following result on the relationship between growth on GDP per capita (y) and democracy, inflation as well as public investment in GDP:

$$\begin{underset{}{Y = 0.146} + \underset{(0.285)}{0.057\ \text{dem}} + \underset{(4.370)}{0.012\text{P}} + \underset{(0.507)}{0.096\ \text{Inv}} \\ (1.712)\end{underset{}{}} \tag{9}$$

$R^2 = 0.80$; adjusted $R^2 = 0.71$; DW = 1.92

t scores are in parenthesis, P = rate of inflation;

Inv = public investment in GDP; Significant at 5 %

From the above, inflation and public sector investment are positively related to the growth of income per capita. Democracy has a positive impact on development and is statistically significant. Public Investment represents government in the model.

The stylized facts on selected social indicators and the dearth of data could not confirm whether growth in the sub-region has resulted in economic development. There is some evidence of marginal improvements in life expectancy at birth, primary and secondary school enrolment. Consequently, whether growth without development in West Africa is a paradox cannot be properly addressed without robust analysis based on consistent and relevant economic and social indices.

However, we attempt a panel regression for 15 countries in West Africa for the period 2005–2011. The estimated results are as follows:

[2] Attempts on examining precise relationships between the growth and the independent variables through regression did not yield meaningful results. However, some of the results are discussed below.

Table 6 West Africa: education indices, 2000–2013

	Gross primary school enrolment ratio				Gross secondary school enrolment ratio				Adult literacy rates			
Country	2000	2005	2012	2013	2000	2005	2012	2013	2000	2005	2012	2013
Benin	81.2	98.5	118.6	–	21.6	34.6	47.7	–	–	–	42.4	–
Burkina Faso	45.0	58.3	82.2	–	10.4	14.3	23.8	–	–	23.6	–	–
Cabo Verde	122.8	114.2	111.5	–	67.2	72.2	90.4	–	–	–	84.3	–
Cote d'Ivoire	77.3	–	90.0	–	–	–	–	–	–	–	56.2	–
Gambia	90.5	90.8	82.5	–	–	–	57.5	–	36.8	–	50.0	–
Ghana	86.0	90.4	106.7	108.8	36.9	42.9	54.0	58.2	57.9	–	67.3	–
Guinea	57.5	80.1	89.3	–	–	19.4	29.4	–	–	–	41.0	–
Guinea Bissau	76.0	114.0	116.2	–	17.9	32.4	–	–	41.4	–	54.2	–
Liberia	112.7	–	102.4	–	35.2	–	45.2	–	–	–	60.8	–
Mali	62.2	80.1	85.7	–	18.5	27.6	36.9	–	–	–	43.4	–
Niger	33.6	50.0	68.9	–	7.0	10.1	14.7	–	–	–	28.7	–
Nigeria	98.4	100.9	84.8	–	24.5	34.7	43.8	–	–	–	61.3	–
Senegal	68.1	80.5	83.5	–	15.9	22.6	41.0	–	–	–	–	–
Sierra Leone	68.7	–	128.1	–	–	–	–	–	–	–	42.1	–
Togo	112.8	113.3	129.5	–	32.1	45.0	54.9	–	53.2	–	–	–

Source: ADB, Tunis

Table 7 West Africa social indicators 1990–2013

Country	Public expenditure on education (% total expenditure)		Life expectancy at birth			Infant mortality rates (per 1,000)			
	2001–2010	1990	2009–2010	2012	2013	2000	2005	2012	2013
Benin	–		–	59.2	59.3	87.1	77.7	69.0	68.1
Burkina Faso	–		–	55.9	56.3	95.2	85.3	70.9	68.9
Cabo Verde	14.4	–	–	74.8	75.1	31.8	24.6	17.5	16.8
Cote d'Ivoire	20.8	50.2	54.7	50.4	50.7	46.4	47.2	50.4	50.9
Gambia	22.8	55.2	58.2	58.6	58.8	67.1	62.6	55.9	54.9
Ghana	24.4	58.4	63.8	61.0	61.1	63.9	58.0	51.4	50.7
Guinea	–	48.1	53.6	55.9	56.1	103.3	87.4	73.9	72.7
Guinea Bissau	–	–	–	54.1	54.3	111.5	105.1	94.8	93.2
Liberia	–	46.0	56.1	60.2	60.6	112.8	82.7	61.4	59.8
Mali	–	–	–	54.6	55.0	113.5	104.9	88.3	85.8
Niger	–	–	–	57.9	58.4	91.7	71.9	54.2	52.5
Senegal	–	55.7	59.0	63.3	63.5	65.0	57.5	49.6	48.8
Sierra Leone	–	39.7	47.4	45.3	45.6	144.4	133.4	117.7	115.7
Togo	23.2	54.8	56.6	50.2	56.5	78.8	76.4	67.5	65.8

Source: ADB, Tunis

$$Y = \underset{(34.81)}{6.154^{**}} + \underset{(1.95)}{.4785\text{Inv}} + \underset{(.670)}{.002\,\text{Dem}} - \underset{(-8.28)}{1.975\text{SN}^{*}} + \underset{(1.66)}{.236\text{SN}} \tag{10}$$

R2 = 0.58; t scores are in parenthesis; *significant at 1 %; **significant at 5 %; Number of observations = 77.

Where:

Y = income per capita as a proxy for economic development;
Inv = public investment as a proxy for government;
Dem = democracy;
SW = lack of access to sanitation and water;
SN = lack of access to sanitation.

It is interesting to state that relevant statistics such as adult literacy rates, completion rates for primary and secondary schools as well as poverty incidence were not available for all countries on a consistent basis. The results in Eq. (10) show that public investment and democracy are positively related to economic development while the lack of access to sanitation and water indicate a negative relationship and it is statistically significant. An increase in the lack of access to

water and sanitation would reduce income per capita which is used here as a proxy for development. The lack of access to sanitation alone has a relationship that is difficult to interpret. Though democracy and public investment have the expected signs, they are statistically not significant. The panel regression results must be read with the stylized facts to have a better perspective of the growth-development nexus in the West African sub-region.

5 Conclusion

We have analyzed whether growth has resulted in economic development in the economies of West Africa. While the region has witnessed positive growth trajectories during the period 2005–2013, it is not clear whether economic development has occurred. This is partly due to the rather short period of analysis and lack of relevant data to adequately examine the subject. However, stylized facts show that the economy maintained reasonable rates of inflation while suffering from the challenges of twin deficits. An examination of relevant social indicators point to marginal gains in the areas of life expectancy at birth, primary and secondary school enrolment as well as adult literacy rates. Panel regression results indicate that democracy and public investment have positive relationship with development though they are statistically not significant. The lack of access to sanitation and water decreases growth and development. Whether growth without development in the sub-region is a paradox remain inconclusive. Nonetheless, leaders, policymakers and technocrats in the sub-region should emphasis sustained growth and inclusive development.

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Group Formation and Growth Enhancing Variables: Evidence from Selected WAMZ Countries

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Abstract This paper sets out to empirically examine two issues. First, whether countries which belong in the same geographical area are apparently homogeneous and be pooled together in studying their growth drivers. Second and arising from the first, if homogeneity does not hold, what other growth enhancing variables drive the growth process for the group of selected WAMZ countries. The cross-sectional dependence result suggests dissimilarity among the countries and as such, the selected WAMZ countries should be studied independently. Foreign Direct Investment and democratic variables are prominent in the growth process of the WAMZ. However, Official Development Assistance (ODA) negatively impacted on economic growth of the economies studied, thus suggesting that it is highly fungible. To maximize the returns of government spending on growth and avoid the fungibility of foreign aid, fiscal discipline and consolidation are required for the apparent growth of the WAMZ economies.

Keywords Growth • Cross-section dependence • Pesaran's *CD* test • WAMZ • Dynamic ordinary least squares • Economic integration

JEL Classification C210 • C220 • O2 • O4 • F130 • F150

1 Introduction

The seminal work of Mankiw et al. (1992) is one cross-country study on economic growth that has aroused much interest and debate since the 1990s (Durlauf and Quah 1999; Dinopoulos and Thompson 1999; Durlauf et al. 2001; Narayan et al. 2010; Jalles 2012; Jongwanich and Kohpaiboon 2013; Cooray et al. 2013; etc). The study is an empirical evaluation of an extended version of the Solow-Swan

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growth model that incorporates human capital. The results of the applied model, among others, are adjudged to have yielded plausible estimates of output elasticity with respect to capital. A plethora of studies that have applied the Mankiw et al. (1992) framework underscores the importance of additional heterogonous factors that could enhance growth of countries even when such countries belong in the same region and are homogeneous by some macro stylized facts.

The second West African Monetary Zone (WAMZ) is a group of six countries within the Economic Community of West African States (ECOWAS) region that has planned to implement a monetary cooperation program among other objectives through a harmonized payments system. The objectives amid other measures are expected to enhance effectiveness of monetary policy, promote macroeconomic stability; increase cross border trade that would crystallize into economic expansion and growth. The accomplishment of the monetary union despite the perceived political will and the associated gains particularly in accelerating the economic growth process of member states has been a daunting task. Some other reasons often adduced have included the economic disparities and poor linkages of the WAMZ economies, perceived fear of domination of smaller economies by bigger ones; weak institutions, dissimilar economic structure, loss of monetary policy sovereignty etc.

In the literature on economic growth and group formation, some studies have opined that heterogeneity be considered when determining whether countries which belong to the same region would follow the same growth process as when they are adjudged homogenous by some macro stylized facts including similar technology. Most of the leading studies, save that Cooray et al. (2013) applies cross-country data in this determination. It is our view that following Cooray et al. (2013) approach, country-specific time series estimation technique is precisely more suitable in detecting growth enhancing variables in different countries, even when they belong to the same geographical area. This view is collaborated by that of Luintel, Khan, Arestis and Theodoridis (2008) who aver that panel regression undermines the importance of cross country differences; a constraint often associated with data pooling in the absence of balanced growth. This study sets out to empirically determine whether other than the apparent homogeneity argument of countries belonging in the same geographical area, which enhances group formation, there could be other sources of heterogeneity such as different political, legal, economic, national policies and interactive forces that drive growth in the WAMZ countries. The study applies appropriate statistical and econometric tests to deal with parameter heterogeneity estimates with a view to reaching unbiased and consistent conclusions. A frippery scan at the available data suggests that the WAMZ countries may be dissimilar as a result of institutional variations; however, rationalizing this is a matter of empiricism. The implication of this if it holds, is that in studying and recommending countries for the monetary union and group formation, countries which share common stylized facts be studied and recommended together in a sequence of monetary union formation! As such, if policy needs are implemented along country specific characteristics, it could serve as a shorter pathway to economic integration of the zone.

Following the introduction in Section 1, the rest of the paper is structured as follows: Section 2 discusses some of the stylized facts of the WAMZ economies, while Section 3 reviews the cross-sectional dependence tests. In Section 4, the empirical results and some economic implications are highlighted. Section 5 concludes the paper.

2 Sub-regional Characteristics and Some Stylized Facts

The WAMZ like other African sub-regions is home to flourishing agriculture and trade characterized by very diverse ethnic and tribal make up. The WAMZ countries are faced with a number of growth impediments such as corruption, high fiscal deficits and inflation, among others. Most of them became independent in the early 1960s with the exception of Liberia established by the American Colonization Society in 1847 and they have had their own share of different types of governance.

At the early stage of their independence, the phase of growth was initiated by the planned industrialization-based strategy of import-substitution to reduce dependence on manufactured imports and widespread protection. Agriculture was ascribed a secondary role of supplying raw materials and providing tax revenues to finance developments in other sectors (Acemoglu et al. 2001). Like South-Asia, the import-substitution based strategy was marred by inefficiency and stagnation; and a series of economic reforms in the form of trade liberalisation, industrial and financial sector deregulation were undertaken as a growth revival approach backed and prescribed by the International Monetary Fund (IMF) and the World Bank in the 1980s (Rao and Cooray 2012). The introduction of this agenda (which are classical/neoliberal in features) in the name of Structural Adjustment Programmes (SAP) albeit marginally reversed the declining and non-satisfactory performance of these economies (Ekpo 2014) especially during the 1990–2000.

The study considers the six countries of the West African Monetary Zone—The Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone in its general discussion and specifically four countries (The Gambia, Ghana, Nigeria and Sierra Leone) in its empirical analysis.

The WAMZ may be perceived to be homogenous and hence, striving towards a monetary and economic union. In order to show whether these countries are very similar or heterogeneous requires an empirical investigation through a cross-sectional dependence test (Cooray et al. 2013). However, it is equally necessary to display some basic preliminary evidence in terms of their economic performance (GDP growth, inflation rates, GDP per capita and fiscal deficit), economic characteristics (capital accumulation, structure of GDP or output and skills measured by average years of schooling), demographic structure (population growth rate, life expectancy at birth and adult literacy rate), external operation (trade openness and foreign direct investment, net inflows) and political profile (corruption indices, political independence and successful military coups). The panels (A, B and C) of Table 1 present these characteristics.

Table 1 Economic and socio-political characteristics of the West African monetary zone

Panel A

	Economic performance			GDP per capita (constant 2005 US$)			GDP growth	Capital accumulation	Structure of GDP (in 2011)			2013
	GDP growth[a]	Inflation[a]	Inflation[b]	1980–1989	1990–2009	2010–2012	2012	Gross capital formation (% of GDP)[c]	Agriculture sector	Industry sector	Services sector	Corruption score (rank)
The Gambia	3.87	11.43	4.02	439.11	416.79	476.66	6.01	16.49	18.89	13.46	67.65	28 (127)
Ghana	3.77	31.59	15.90	359.35	406.06	542.28	7.91	24.15	25.34	25.56	49.10	46 (63)
Guinea	3.51[d]	NA	14.75	NA	274.55	303.05	3.94	16.83	22.06	44.84	33.10	24 (150)
Liberia	2.97	93.52	11.25	512.30	102.39	206.49	10.24	16.73	44.52	8.34	47.14	38 (83)
Nigeria	4.48	20.29	7.63	623.30	554.11	814.55	6.53	8.69	30.99	44.29	24.72	25 (144)
Sierra Leone	2.49	29.41	12.88	404.28	305.63	333.77	15.22	13.36	56.69	8.29	35.02	30 (119)

Panel B

	Trade openness[a]	Population growth rate (%)				Life expectancy at birth, total (years)		Literacy rate, adult female (% of females ages 15 and above)		Foreign direct investment, net inflows (BoP, current US$)		
	Trade (% of GDP)	1980–1989	1990–1999	2000–2012	2012	1980	2011	Gender gap		2003	2012	% Growth
The Gambia	80.63	4.09	3.03	3.13	3.19	46	58	25 (2000)	42 (2011)	18,272,720	33,524,674	83
Ghana	54.00	2.99	2.56	2.48	2.17	52	61	50 (2000)	65 (2010)	136,751,000	3,294,520,000	2,309
Guinea	59.34[d]	2.58	4.03	2.20	2.56	41	56	18 (2003)	12 (2010)	78,966,000	605,400,000	667
Liberia	101.84	1.55	2.49	3.26	2.79	46	60	32 (1994)	27 (2007)	372,220,000	1,354,100,000	264
Nigeria	50.64	2.63	2.52	2.64	2.68	46	52	44 (1991)	41 (2008)	2,005,390,033	7,101,031,884	254
Sierra Leone	47.52	2.52	0.09	3.03	1.91	41	45	37 (2004)	52 (2011)	8,615,050	548,073,515	6,262

Panel C

	Average years of schooling									Fiscal deficit		
	1970	1975	1980	1985	1990	1995	2000	2005	2010	Average 2008–2012	Political independence	Number of military coups
Ghana	3.58	4.27	4.94	5.52	5.89	6.06	6.57	6.80	7.26	−2.26	1957	5 (1981)
Gambia	0.51	0.73	0.97	1.27	1.81	2.45	2.64	3.08	3.58	−8.44	1965	1 (1994)
Guinea	NA	NA	NA	NA	NA	NA	2.4	2.8	3.3	−8.34	1958	2 (2008)
Liberia	1.14	1.66	2.14	2.59	2.91	3.01	3.43	4.16	5.11	−0.64	1847	1 (1980)
Nigeria	1.6	2.1	2.70	3.30	3.90	4.60	5.50	6.10	6.80	−2.6	1960	6 (1993)
Sierra Leone	0.87	1.12	1.40	1.73	2.05	2.38	2.67	3.07	3.42	−4.74	1961	5 (1997)

Panel D

	Growth of output 2006–2011					
Country	2006	2007	2008	2009	2010	2011
The Gambia	6.5	6.3	5.9	4.6	6.1	3.3
Ghana	6.4	6.1	7.2	3.5	6.4	13.6
Guinea	2.5	1.8	4	0.3	2.4	3.6
Liberia	7.8	9.5	7.1	4.6	6.8	6.4
Nigeria	6.1	6.4	5.3	5.6	6.4	7.2
Sierra Leone	7.4	6.4	5.5	4	6	5.3

Sources for Panel C: (a) World Development Report (2013), (b) Transparency International (2013) and (c) Barro-Lee (2013)

[1]Average values over the period 1970–2012; ^ average values (1986-2012)

[2]Average values over the period 2008–2012

[3]Average values over the period 2000–2012

[4]Average values (1986–2012)

The growth rates of the WAMZ member economies have increased especially when the 1970–2012 average values are compared with those of later years from 2006 to 2012. In 2012 Sierra Leone recorded the highest growth rate of 15.22 % followed by Liberia and Ghana. Along the same trajectory, the growth rates of the other WAMZ economies except Guinea were above 6 %. This impressive growth rates including that of Guinea interestingly were achieved during the period of the global economic downturn and principally driven by mineral and commodity exports (Ekpo 2014) and above the population growth rates.

Gross capital formation as a percentage of GDP in the WAMZ has been very impressive as the data in Table 1 also show. In count, the economies have been experiencing relative macroeconomic stability using inflation as a proxy. Inflation rates though are mostly still double-digits, they have been substantially subdued. During the period 1970–2012, average inflation rates were 11.43 % for The Gambia, 31.59 % Ghana, while Liberia, Nigeria and Sierra Leone recorded 93.52, 20.29 and 29.41 percent, respectively. The average inflation rates for the countries during the period 2008–2012 plummeted to 4.02 % for The Gambia, 15.9 % for Ghana and 11.25 % for Liberia. Nigeria, nonetheless recorded a single digit of 7.63 % during the same period. The implication is that WAMZ countries macroeconomic management is improving.

In addition, female literacy rate is improving as gender gaps are declining except in countries just emerging out of political instability. Skill acquisition, proxied by average years of schooling has been maintaining increased trajectory. On corruption ranking by the Transparency International indices in Table 1 shows that except for Ghana which recorded 63rd position in ranking of 177 countries in 2013, other WAMZ member countries' position was abysmally poor. The Gambia was ranked 127th most corrupt country out of 177 counties, while Liberia and Nigeria ranked 150th and 144th, respectively. This implies that corruption and rent-seeking constitute a challenge in the WAMZ member economies (Ekpo 2014).

From the foregoing, it is crystal clear that a conclusion as to whether the WAMZ economies are similar and hence are good candidates for economic union or are characterized by heterogeneous growth path is beyond mere discussion of the descriptive data and hence requires some modest empirical investigation for example, through a cross-sectional dependence test in panel analysis. The cross-sectional dependence test describes the interaction between cross-sectional units (i.e. households, firms and countries) and has been widely discussed and applied in the spatial literature [see for example, Cooray et al. (2013), Bailey et al. (2012), Sarafidis and Wansbeek (2010), Hoyos and Sarafidis (2006), Pesaran (2004), Cerrato (2001)].

Since the last decade and a half, there has been a plethora of evidence in the literature that substantial panel data models exhibit cross-sectional dependence in the errors. The errors may arise from the presence of common shocks and unobserved components which eventually become part of the error term, spatial dependence, and idiosyncratic pairwise dependence in the disturbances (Hoyos and Sarafidis 2006). Some sources of cross-sectional dependence so far identified are; first, the interdependencies between cross-sectional units as a result of increasing

countries integration of economic and financial entities; second, microeconomic applications as a result of individual propensity to respond similarly to common unobserved factors, or common shocks. This could result from neighborhood effects, interdependent preferences, group behavior, social norms, etc. The estimation of cross-section dependence according to Hoyos and Sarafidis (2006) depends on factors such as the magnitude of the correlations across cross-sections and cross-section dependence. In the estimation process, different possibilities arise. If cross-sectional dependence is caused by unobserved presence of common factors which are uncorrelated with the controlled variables, the standard fixed-effects and random effects models could be consistent but they are biased and not efficient.

The issues considered in cross-sectional dependence include modelling cross-sectional dependence, measuring it, testing for its presence, and carrying out counterfactual exercises under alternative network formations (Bailey et al. 2012). This study, however, partly focuses on testing for the presence of cross-sectional dependence. Cross-sectional dependence arises from unobservable common factors or common shocks akin to serial correlation in time series analysis. Cooray et al. (2013) are of the view that if cross-correlation exists from the test results in the case of countries test, then the countries move together, i.e., they are driven by common factors and hence, they have some similarities. The following section discusses some of the various tests and statistics used in determining the presence of cross-sectional dependence.

3 Tests of Cross-Section Dependence

The formal statistical procedures designed to test for cross-sectional dependence in small-T, large-N panels are the Pesaran (2004) cross-sectional dependence (CD) test, Friedman's statistic (1937), and the test proposed by Frees (1995). The CD test is the Lagrange multiplier (LM) test developed by Breusch and Pagan [BP] (1980) often applied when the time-series dimension T of the panel is larger than the cross sectional dimension N as the case in our data. The Pesaran's CD statistic is a variant or an alternative to the BP test (LM statistic) which has a mean at exactly zero for fixed values of T and N, under a wide data space of panel-data models that include homogenous/heterogeneous dynamic models. When T is lesser than N, the LM test statistic exhibits substantial size distortions and loses the desirable statistical properties (Hoyos and Sarafidis 2006). The following subsections further summarize the statistical tests conditioned in the consideration of a standard panel data model:

$$y_{it} = \beta' x_{it} + \gamma_i + v_{it}, \quad i = 1, 2, \ldots, N, \; t = 1, 2, \ldots, T, \tag{1}$$

Where y_{it} is the observation on the dependent variable for individual i at time t, x_{it} is a column vector of regressors with dimension K ($K \times 1$ vector regressors), β is the

corresponding parameter vector to be estimated, and γ_{it} is an individual-specific time-invariant nuisance parameter (unobserved effect), and υ_{it} under the null hypothesis is the error component that may be cross-sectionally correlated but assumed to be independent and identically distributed (i.i.d.) over periods and across cross-sectional units. Under the alternative, the error component possesses the assumption of no serial correlation. The null hypothesis according to Sarafidis and Wansbeek (2010) implies the following to be true:

$$\rho_{ij} = \rho_{ji} = \mathrm{Cor}\left(\upsilon_{it}, \upsilon_{jt}\right) = 0 \text{ for some } t \text{ and some } i \neq j, \tag{2}$$

as against

$$\rho_{ij} = \rho_{ji} \neq 0 \text{ for some } i \neq j$$

where the number of possible pairings (υ_{it},υ_{jt}) increases with N and ρ_{ij} is the product moment correlation coefficient of the disturbances and is given by

$$\rho_{ij} = \rho_{ji} = \frac{\sum_{t=1}^{T} v_{it} v_{jt}}{\left(\sum_{t=1}^{T} v_{it}^2\right)^{1/2} \left(\sum_{t}^{T} v_{jt}^2\right)^{1/2}} \tag{3}$$

As further observed by Sarafidis and Wansbeek (2010), the cross-sectional dependence in the error term is a consequence of model misspecification. This connotes that if the model was specified correctly, cross-sectional dependence would have been taken into cognizance and the resulting disturbance uncorrelated across units.

3.1 Pesaran's CD Test

The Breusch and Pagan statistic (1980) tests the null hypothesis of zero correlation using an LM statistic, which holds for fixed N to $T \to \infty$ and is given by

$$CD_{LM} = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}^{\,2}$$

Where $\hat{\rho}_{ij}^{\,2}$ is the sample estimate of the pair-wise correlation of the residuals

$$\hat{\rho}_{ij} = \hat{\rho}_{ji} = \frac{\sum_{t=1}^{T} \hat{v}_{it}\hat{v}_{jt}}{\left(\sum_{t=1}^{T} v_{it}^2\right)^{1/2}\left(\sum_{t}^{T} v_{jt}^2\right)^{1/2}}$$

and v_{it}^2 is the estimate of v_{it} in Eq. (1). The Breusch and Pagan (1980) statistic shows that under the null hypothesis of no cross sectional dependence, the CD_{LM} statistic is asymptotically distributed as χ^2 with $N(N-1)/2$ degrees of freedom with N fixed and $T \to \infty$. What is commonly experienced in empirical applications is a situation where $T < N$ and the LM test statistic exhibits substantial size distortions, is biased and loses the desirable statistical properties. Pesaran (2004) subsequently proposed the following alternative CD test:

$$CD = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right) \tag{4}$$

assuming under the null hypothesis of no cross-sectional dependence $CD \to N(0,1)$ for $N \to \infty$ and T sufficiently large.

3.2 Friedman's Test

The Friedman's test (1937) is nonparametric and based on Spearman's rank correlation coefficient. The coefficient is a regular product-moment correlation coefficient that accounts for the proportion of variability and computed from the ranks of the Spearman's rank correlation coefficient. The Friedman's statistic is given by:

$$R_{ave} = \frac{2}{N(N-1)}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{r}_{ij} \tag{5}$$

Where

$$r_{ij} = r_{ji} = \frac{\sum_{t=1}^{T}\left\{r_{i,t} - \left(T+\frac{1}{2}\right)\right\}\left\{r_{j,t} - \left(T+\frac{1}{2}\right)\right\}}{\sum_{t=1}^{T}\left\{r_{i,t} - \left(T+\frac{1}{2}\right)\right\}^2} \tag{6}$$

Equation (6) is the Spearman rank correlation by defining $\{r_{t,1}, \ldots, r_{i}T\}$ to be the ranks of $\{u_{t,1}, \ldots, u_{i}T\}$, given the average rank to be $(T + ½)$. As for Eq. (5), $\hat{r}_{ij}$ is the sample estimate of the rank correlation coefficient of the residuals. Large values of R_{ave} imply presence of nonzero cross-sectional correlations (Hoyos and Sarafidis 2006).

3.3 Levene Test

Levene (1960) proposed a test statistic which determines whether two or more groups are significantly different. Specifically, the Levene's test [LT] examines if k groups have equal variances. Where there is a significant difference in the variances of the groups, it indicates a strong evidence of that the groups are dissimilar and not selected from an identical population. In particular, Levene shows that if a variable X with sample size N divided into k subgroups (where N_i is the sample size of the ith subgroup), the LT equals

$$LT = \frac{(N-K)\sum_{i=1}^{k} N_i\left(\widetilde{Z}_i - \widetilde{Z}_{..}\right)^2}{(k-1)\sum_{i=1}^{k}\sum_{j=1}^{N}\left(Z_{ij} - \widetilde{Z}_i\right)^2} \tag{7}$$

Where $Z_{ij} = \left|X_{ij} - \widetilde{X}_i\right|$ with $\widetilde{X}_i$ indicating the median of the ith subgroup, $\widetilde{Z}_i$ are the group means of the Z_{ij} and $\widetilde{Z}_{..}$ is the overall mean of the Z_{ij} (Cooray et al. 2013). The null hypothesis of the LT is that the groups have equal variances; and accepting the null hypothesis implies homogeneity.

3.4 Frees' Test

Frees' test (1995, 2004) is a power test aimed at detecting false null hypothesis even when there exits plenty of cross-sectional dependence left out in the disturbances. The Frees' Test (FT) is a statistic based on the sum of squared rank correlation coefficients and equals (Hoyos and Sarafidis 2006), and can be computed as:

$$\begin{aligned} FT &= N\left\{R_{ave}^2 - (T-1)^{-1}\right\} \xrightarrow{d} Q \\ &= a(T)\left\{x_{1,\ T-1}^2 - (T-1)\right\} + b(T)\left\{x_{2,\ T(T-3)/2}^2 - T(T-3)/2\right\} \\ &\text{Where} \quad R_{ave}^2 = \frac{2}{N(N-1)}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{r}_{ij}^{\,2} \end{aligned} \tag{8}$$

and, $x_{1,T-1}^2$ and $\mathrm{x}_{2,\mathrm{T(T-3)/2}}^2$ are independently χ^2 random variables with $T-1$ and $T(T-3)/2$ degrees of freedom; $a(T) = 4(T+2)/\left\{5(T-1)^2(T+)\right\}$ and $b(T) = \frac{2(5T+6)}{\{5T(T-1)(T+1)\}}$. If $R_{ave}^2 > (T-1)^{-1} + {}^{Q_q}/_{N}$, where Q_q is quantile of the Q distribution.

3.5 *Application of Cross-Sectional Dependence: The* CD *Test*

In this section, we analyze the cross-dependence tests. Specifically, we estimate one of the four statistical tests; precisely the CD. The data set used in the analyses is obtained from the 2013 World Development Report and the 2013 African Development Report. Given a standard panel model:

$$y_{it} = \beta_i + \varphi_i x_{it} + v_{it} \tag{9}$$

where y_{it} is GDP growth rate of country i; x_{it} = vector of variables in Eq. (9) for unit i and time t; these are capital accumulation (cap_{it}, gross capital formation/investment), human capital development (hcd_{it} health expenditure), inflation (p_{it}) and one period lagged GDP growth rate (y_{it-1}). The β_i *and* φ_i are respectively the intercept and slope coefficient which are allowed to be heterogeneous across i. Furthermore the intercept is allowed to vary across units.

The test for cross-sectional dependence is analyzed using Stata 12. The dataset consists of four countries (The Gambia, Ghana, Nigeria and Sierra Leone), each observed for 17 years (1995–2011) and a panel, declared as strongly balanced.

As reported in the estimated results presented in Table 2 once we account for country Fixed Effects (FE), human capital development (hcd_{it}) has no effect upon the selected WAMZ economic growth. The inflation variable (p_{it}), and investment (fcf_{it}) reject the null hypothesis at 1 % significant level, since both regressors exhibit p-value of 0.000 and 0.003 respectively. Consequent upon this, only human capital development exhibits homogeneity among the four WAMZ countries.

The assumption implicit in estimating the null hypothesis of Eq. (4); and precisely the Pesaran's *CD* test is that the cross-sectional units are independent. The Pesaran *CD* test is reported as follows:

$$Pesaran's\ test\ of\ cross-sectional\ independence = 12.321,\ \ Pr = 0.146$$

From the above result, the *CD* test does not reject the null hypothesis of no cross-sectional dependence. Therefore, we can conclude there is strong evidence against the hypothesis that the sampled WAMZ countries move together with respect to the group of growth enhancing variables. This suggests dissimilarity among the countries and as such, the selected WAMZ countries should be studied independently, thus arousing application of time-series estimation as against longitudinal data technique in the detection of growth enhancing variables. Second, arising from this result, though with caution, the formation of the group (WAMZ integration) may be better accomplished if there is 'sequencesation' of one economy after another; unless the political will to fuse 'real-time' is feasible.

Table 2 Test of cross-sectional dependence

.xtreg gdp hcd gdpl infla infcf, fe						
Fixed-effects (within) regression Number of obs = 68						
Group variable: n Number of groups = 4						
R-sq:	within = 0.2841 Obs per group: min = 17					
	between = 0.1619 avg = 17.0					
	overall = 0.1390 max = 17					
corr (u_i, xb) = −0.0541 F (4,60) = 5.95						
Prob > F = 0.0004						
gdp	Coef.	Std. Err.	t	P > |t|	(95 % Conf. Intervall)	
hcd	−0.0144901	0.3257851	−0.04	0.965	−0.6661573	0.6371771
gdpl	0.0045317	0.116999	0.04	0.969	−0.2295012	0.2385646
infla	−2.897832	0.6829427	−4.24	0.000	−4.263921	−1.531744
infcf	2.509277	0.7972994	3.15	0.003	0.9144408	4.104113
_cons	5.42289	3.2303	1.68	0.098	−1.038672	11.88445
sigma_u = 2.6991583						
sigma_e = 4.1202693						
rho = 0.30028164 (fraction of variance due to u_i)						
F test that all u_i = 0: F(3, 60) = 4.36 Prob > F = 0.0076						

3.6 Theoretical Model of Growth Enhancing Variables

The model of the individual economies is relatively small, open to rest of the world and consists of three sectors: government, banking sector and corporate with the household subsumed apparently more because there is lack of time series data. Furthermore, it is presumed that capital and labour are substitutable. The corporate sector produces non-capital goods using labour and imported physical capital as inputs. The government collects taxes from corporate sector and spends on consumption activities. The banking sector services the corporate and government sectors in domestic and international activities. All activities are geared to enhance growth; while prices as assumed, adjust to clear the goods and money markets.

In the empirical literature on economic growth process, several factors have been simulated for its enhancement. The notable pioneers are Kuznets (1955, 1966, 1971), Solow (1956) etc.; while in recent times, the works of Chenery and associates (e.g., Chenery et al. 1986), Barro (1989), Mankiw et al. (1992), Rao (2010), Rao and Hassan (2012) have also been prominent. The studies provide confirmation of the importance of some factors in growth determination; e.g. investment (often times broken down as private/public), trade openness, prices, human capital and government policies.

Some non-economic factors have been recognized in the literature to interact with economic growth process. The works of North and Thomas (1973) and North (1990) argue that strong political institutions and democracy enhance economic development. According to North (1994, p. 1), as cited in Kibritcioglu and Dibooglu (2001):

> Institutions are the incentive structure of a society and therefore the rules, norms, and enforcement characteristics that make up the institutional foundations of a society direct the allocation of resources of that society and economy. Economic growth throughout history could only be realized by creating an institutional and organizational structure that would induce productivity enhancing activity – a supply side argument; and equally that the consequent tensions induced by the resulting societal transformation have resulted (and are continuing to result) in politically-induced fundamental changes in the institutional structure to mitigate these tensions – a demand side argument. Both the supply side and demand side institutional changes have been and continue to be fundamental influences on productivity change.

This quotation cascades the relation economic growth has with macroeconomic and institutional variables including democracy. However, one limitation of the model is the subsuming of labour and particularly the role of human capital particularly knowledge stock as a complementary input in the growth process.

4 Data and Empirical Results of Growth Enhancing Variables

The study of growth is principally about the demand and supply sides and generally about the medium or long-run. It revolves around issues about accumulation of physical capital and intensity, population growth, knowledge and innovation, utilization and combination of factors and so forth (Stern 1991). In this section of the study, we employ annual data range spanning 1961–2012 depending on the time series for each of the four countries studied. Following the literature, we use growth rate of total GDP for the analysis. Openness to trade is measured as ratio of real exports and imports to real GDP. Private and government investments are expressed as ratios of GDP. Official Development Assistance is expressed as a ratio of GDP. The data set used in the analyses is obtained from the 2013 World Development Report and the 2013 African Development Report.

4.1 Empirical Results and Economic Implications

4.1.1 Stationarity Tests

As a first step, the time series properties of the variables tested include the stationarity test by conducting the Augmented Dickey-Fuller (ADF) and Dickey-Fuller GLS (DF-GLS) unit root tests. The results presented in Table 3 offer strong evidence of almost all the variables to be integrated of order one; that is $I(1)$. Variables that are integrated at levels are the output growth variable (gdp) for all the sampled countries (The Gambia, Ghana, Nigeria and Sierra Leone); foreign direct investment (fdi) for The Gambia and Sierra Leone; government consumption expenditure (gc) for Sierra Leone; foreign aid or official development assistance (oda); for Nigeria; trade openness (trad) for Sierra Leone and inflation variable (inf) for The Gambia, Ghana and Nigeria. Consequent upon this, we applied the Dynamic Ordinary Least Squares (DOLS) to estimate a single cointegration vector that characterizes the long-run relationship among the variables in each country's economic growth function. The DOLS "simply regress one of the variables onto contemporaneous levels of the remaining variables, leads and lags of their differences, and a constant using ordinary least squares" Stock and Watson (1993, p. 784). The DOLS model *a la* Stock and Watson is specified as:

$$Y_i = D_{1t}\gamma_1 + \vec{\alpha}X + \sum\nolimits_{j=-q}^{p} \vec{d}_j \, \Delta X_{t-j} + \mu_i \tag{11}$$

Y_i = dependent variable
X = matrix of explanatory variables

Table 3 Results of unit root test

	The Gambia 1978–2011		Ghana 1965–2012		Nigeria 1981–2012		Sierra Leone 1965–2012	
Variable	ADF	DF-GLS	ADF	DF-GLS	ADF	DF-GLS	ADF	DF-GLS
fdi	−2.83	−2.89	−9.21*	−7.74*	−2.99***	−1.15	−4.89*	−4.92*
Δfdi	−7.77*	−6.97*	–	–	−2.93***	−10.03*	–	–
lgc	−1.12	−3.13	−2.58	−2.51	−2.11	−1.92	−4.01**	−4.01*
Δlgc	−7.46*	−7.17*	−6.78*	−6.79	−4.75*	−4.92*	–	–
gdp	−6.53*	−6.05*	−5.42*	−5.50*	−5.87*	−4.31*	−6.19*	−6.02*
lm2	−0.92	−0.98	−1.70	1.69	−2.85	−2.48	−1.96	−1.85
Δlm2	−5.76*	−5.83*	−6.75*	−6.89*	−4.81*	−4.80*	−7.20*	−7.35*
ldcp	−0.85	−1.00	−0.83	−0.91	−3.19	−3.07***	−1.71	−1.86
Δldcp	−5.13*	−5.25*	−6.29	−5.71*	−7.36*	−7.34*	−8.01*	−8.10*
loda	−1.48	−1.59	−1.70	−1.69	−4.70**	−4.60*	−2.97	−2.60
Δloda	−6.01*	−6.14*	−6.75*	6.89*	–	–	−5.17*	−7.23*
ltrad	−1.85	−1.95	−2.25	−2.11	−2.95	−3.03**	−3.78**	−3.82*
Δltrad	−6.36*	−6.53*	−5.00*	−4.63*	−3.42**	−7.60*	–	–
infla	−3.12**	−3.18*	−3.39**	−3.41*	−3.71**	−3.80*	−2.79	−2.82
Δinfla	–	–	–	–	–	–	−8.09*	−10.52*

*, **, *** are the significant levels of 1% - 3.610, 5% - 3.055 and 10% - 2.762 levels of significance

$\vec{\alpha}$ = cointegrating vector; i.e., represents the long-run cumulative multipliers or, alternatively, the long-run effect of a change in X on Y
p = lag length, and
q = lead length

DOLS regression includes the lag and lead terms in order to make its stochastic regressors (Camacho-Gutierrez 2010). The method involves augmenting the cointegration regression so that the resulting cointegration equation error term and addition of the p lags and q leads of the differenced regressors soaks-up the long-run correlation between μ_{1t} and μ_{2t} and least squares estimates of $\theta = \left(\vec{\alpha}, \gamma'\right)'$. Finally, stationarity test are performed on the residuals of the estimated DOLS regression. This is to determine whether the estimated results are spurious. The EViews 7 is applied in the estimation processes.

4.1.2 Estimated Results

The DOLS estimated results for the countries are presented in Table 4. The number of leads and lags are selected according to the Akaike information criterion. In order to preserve space, only the best and plausible results are reported. This is subsequently followed by the post-estimation diagnostics.

The estimated results for The Gambia show that the coefficient on the share of investment in GDP is significant at 1 % level and high. This implies a gross rate of return on investment of 15 % per year. The negative but significant coefficient on official development assistance (oda) might be that it is less productive at the margin and probably mis-directed according to political, rent-seeking objectives. The democratic variable has a positive effect on the growth of The Gambia and statistically significant. The openness and inflation coefficients are not statistically significant and as such, may not have impacted much on the growth path of the country.

Column 3 of Table 4 reports the DOLS estimated results of Ghana. The growth enhancing variables which drive the economy are investment (gfc), openness (trad), democratic institution (democ) and foreign direct investment (fdi). Of significant note is the official development assistance (oda) variable which is negatively signed. This may not be surprising as Osei et al. (2005) study underscores the 'fungibility' of foreign aid in the case of Ghana.

The DOLS results of Nigeria are, however, not as robust as those of Ghana. The foreign direct investment (fdi) coefficient appears to be the most plausible of the growth enhancing variables that entered the Nigerian growth function. Such investments may have occurred more in the oil and gas sector; however, the communication sector in last decade has equally witnessed unprecedented foreign investments. Government consumption represents government in the model. Its attached coefficient is negative and significant at approximately 8.5 % while private investment is not significant statistically (p-value = 0.573). This may perhaps to

Table 4 DOLS estimates for the four WAMZ countries

Variables	The Gambia	Ghana		Nigeria	Sierra Leone
		(a)	(b)		
Intercept	2.186 (2.201) [0.080]	9.146 (2.263) [0.066]	3.422 (2.293) [0.070]	−3.513 (−2.341 [0.063]	−5.424 (−2.733) [0.043]
GFC	5.890 (4.594) [0.000]	8.836 (3.777) [0.003]			
ODA	−8.114 (−4.696) [0.000]	−6.599 (−3.906) [0.003]	−2.759 (−2.518) [0.063]	−7.821 (−2.379) [0.083]	−2.311 (−2.269) [0.038]
TRAD	4.070 (1.602) [0.122]	3.763 (2.105) [0.059]	−3.598 (−2.325) [0.068]		8.010 (4.698) [0.000]
DEMOC	1.644 (3.766) [0.001]	0.999 (4.200) [0.001]		−8.858 (−2.857) [0.065]	0.282 (1.138) [0.272]
INFLA		0.001 (0.025) [0.980]	0.208 (1.416) [0.216]	−2.338 (−2.579) [0.082]	−1.792 (−2.430) [0.027]
GC			7.001 (3.815) [0.012]	−0.009 (−2.531) [0.085]	6.620 (5.309) [0.000]
FDI			−3.016 (−3.102) [0.027]	−3.730 (−3.412) [0.042]	
M2			5.010 (0.379) [0.720]		9.04 (5.813) [0.000]
K				1.387 (0.631) [0.573]	
DCP					−7.442 (−2.741) [0.014]
ECM	−0.431 (−2.435) [0.025]	−0.663 (−2.628) [0.042]	−0.252 (−2.48) [0.049]	−0.688 (−2.386) [0.054]	−0.517 (−2.413) [0.053]

Notes: Dependent variable is growth of output
t-statistics in ()
Probability in []
DOLS Dynamic ordinary least squares

some extent imply 'crowding out' situation. In explaining government consumption expenditure negatively correlating with growth, Barro (1990) observed that government activity is taken to be a productive input into private sector production, albeit with decreasing effect on private sector marginal productivity. One reason for this is that for government to finance its activities, it requires distorting taxation.

Tax drives a wedge between private returns to investment and social returns, thus reduces private agents interest to invest and consequently reduces the long term growth rate of the economy (Dowrick, 1995). Like in the other economies, Official Development Assistance (ODA) negatively and significantly impact on the growth of the Nigerian economy. The fungibility of ODA in Nigeria, particularly in capital expenditure and as a disincentive to non-export domestic tax has been established elsewhere (Omotor 2010). Fungibility also inhibits diversification and competition.

The DOLS results for Sierra Leone follow the same path as those of Ghana and others. The significant difference of the empirical results relative to other WAMZ selected economies is the striking level of statistical non-significance of the democratic institution coefficient. Sierra Leone, after all, can be aptly described as a post-conflict country.

4.1.3 Post-estimation Analysis

The results of the various post estimation tests are reported in Table 5. The diagnostic tests show that the models are correctly specified as attested to by the Eagle-Granger stationarity of the residual tests. Second, the stability tests of the estimated vector process using the maximum eigenvalue for all the model is also established as all the values stayed within a unit circle. Third, there is absence of autocorrelation in the residuals as attested to by the LM tests. In summary, the empirical analyses are not spurious.

Table 5 Post estimation test

	The Gambia	Ghana		Nigeria	Sierra Leone
		(a)	(b)		
EG residual test	−4.064**	−4.814*	−5.012*	−4.211**	−5.261*
BPG *(p-value)*	0.216	0.463	0.408	0.621	0.611
LM test (1) *(p-value)*	0.521	0.536	0.711	0.314	0.406
LM test (2) *(p-value)*	0.428	0.501	0.488	0.269	0.387
JB *(p-value)*	0.146	0.769	0.308	0.117	0.121

Notes: *EG* Engle–Granger *t*-test for cointegration, *BPG* Breusch–Pagan–Godfrey Heteroskedasticity test, *LM test* Breusch–Godfrey serial correlation LM test, *JB* Jarque–Bera Normality test
*, **, *** are the significant levels of 1% - 4.94, 5% - 4.35 and 10% - 4.02 levels of significance

5 Conclusion

The paper empirically examines the growth enhancing variables for a group of selected WAMZ country (The Gambia, Ghana, Nigeria and Sierra Leone), over different periods due to gaps in the availability of data. The countries share some common characteristics in culture, geographical proximity, lingua-franca and imperialisation with respect to some economic features. On the contrary however, this does not necessarily imply homogeneity as the appropriate statistical test reveals that the countries are dissimilar. This may be as a result of differences in institutions and as such, policy needs should be implemented according to country-specific characteristics, but may not necessarily be at the expense of the economic integration exercise. The integration exercise of the group should thus be undertaken in 'sequencestation'.

The results also suggest that the selected WAMZ economies should be studied individually while determining their growth enhancing drivers using time series data rather than by longitudinal approach. The other results bring to mind that Official Development Assistance (ODA) is highly fungible in the economies of the WAMZ countries, particularly in capital projects. This inhibits domestic tax drive, diversification and competitiveness. Government consumption expenditure crowds-out private sector in Nigeria. As such small government is plausible. The marginal net effect of government is positive if (government) is small as such positive effect on the private sector productivity could dominate the discretionary tax effect. Corruption was also identified as one of the inhibiting factors in the zone's development path. In overall, to maximize the returns of government spending on growth and avoid the 'fungality' of foreign aid, fiscal discipline and consolidation is required for the growth process of the WAMZ economies.

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Part II
Political Economy of Economic Growth

Revisiting the African Economic Growth Agenda: Focus on Inclusive and Pro-poor Growth?

William A. Amponsah

Abstract This paper determines whether the recent growth trajectory in Sub-Saharan Africa (SSA) has been inclusive and pro-poor and discusses potential policies in making growth more inclusive. The motivation for the study is that in the economic literature, economic growth is viewed as fundamental in achieving poverty reduction, changes in income distribution are expected to lead to improving the poverty reduction outcome stemming from growth, and initial inequality would reduce the impact of growth on poverty reduction. Two conventional definitions commonly used in the literature to measure whether economic growth is pro-poor require knowledge of whether there have been distributional changes in income and whether those changes have improved the welfare of the poor. First, regional analyses show that compared to the rest of the world's regions, SSA experienced negative per capita growth from 1985 through 2000, and that this was accompanied by significant decline in income distribution such that by 2000 the average income of an African in the lowest quintile of economic distribution was only 90 % of the income in 1985. Second, country-specific analyses show that unlike many East Asian economies that recorded average income growth along with their poorest quintile, in SSA economies even when growth in average income occurred, the incomes of the poorest Africans fell. The exceptions were in Gabon and to a smaller extent Ghana. Third, analyses of recent data showed that like the rest of the world's developing regions, after realizing rising poverty rates from 1981 to 1999, SSA also saw steady declines in extreme poverty rate by 10 % from 1999 through 2010. However, it was the only region where the number of extreme poor rose from 205 million in 1981 to 414 million in 2010 with its global share rising from 11 to 34 %. The average gap of the extremely poor in SSA rose from $0.53 per day in 1981 to $0.54 a day compared to the $1.25 per day threshold for the extremely poor, and compared to the developing country average of $0.51 per day to $0.29 per day for the same time period. Therefore, the aggregate SSA extreme poverty gap

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doubled from $40 billion in 2005 PPP terms in 1981 to $82 billion in 2005 PPP terms in 2010 compared to the aggregate for all developing countries that fell by half from $362 to $169 billion all in 2005 PPP terms during the same time period. Therefore, the paper concludes that recent growth in SSA has not been pro-poor. Suggestions are provided to sustain growth across the SSA region to make growth more inclusive.

Keywords Poverty • Pro-poor growth • Inclusive growth

JEL Classification I32 • O40

1 Introduction

More than two decades ago, international donor groups began focusing attention on the idea of pro-poor growth in Africa (Page 2006; Patillo et al. 2006; OECD 2006). Research showed that Africa was the only developing region in which the number of people living below the international poverty level of $1.00 a day had increased for over 25 years. In response to this dire situation, donor organizations began placing the poor at the center of development assistance policy in the early 1990s. A new nomenclature appeared in the development literature when groups began advocating for "pro-poor growth" strategies in Africa. Renewed emphasis by bilateral and multilateral development agencies increased the focus on halving income and non-income poverty, for example, through the Millennium Development Goals (MDGs) by 2015. The issue is being revisited, especially following recent gains in economic growth by African countries. Largely because many African economies were not growing, research works such as Ravallion (2001), Thomas et al. (2000), UN (2000), and World Bank (2000) identified pro-poor growth as the most important ingredient for achieving sustainable poverty reduction.

Page (2006) indicates, for example, that the poverty reduction strategy paper (PRSP) initiative of the World Bank and the International Monetary Fund, launched in 1999, appeared to reinforce the mindset at the time in associating the PRSP with lending instruments by encouraging governments in Africa to focus on poverty reduction strategies, primarily on increases in social expenditures.[1] Starting from the mid-2000s governments in Africa grew more vociferous in their demand to place economic growth at the center of their poverty reduction strategies (World Bank 2004). Moreover, donor agencies at the same time have been expressing concern about increasing gaps in infrastructure and declining agricultural productivity in Sub-Saharan Africa (SSA) in particular, by asking questions about the role of development assistance in ameliorating those gaps. Recently, among the eight key areas recognized by the African Union as important in achieving the *African*

[1] See the discussion in World Bank (2004a).

Union Agenda 2063, are regional integration and the agenda for social and economic development (African Union 2013). The overall objective of the exercise is to develop a plan which will chart Africa's development trajectory over the next 50 years. It is also described as a shared strategic framework for inclusive growth and sustainable development.

A report by a High-Level Panel of Eminent Persons (HLP) was delivered to the UN Secretary-General in 2013. The HLP argues for a series of five transformative shifts considered important to the post-2015 development Agenda. Three of the transformative cores are to leave no one behind, put sustainable development at the core, and transform economies for jobs and inclusive growth. On April 17, 2014, the World Bank (2014a) released results of a study that revealed that the number of people living on less than $1.25 per day[2] has decreased dramatically in the past three decades, from half the citizens in the developing world in 1981 to 21 % in 2010, despite a 59 % increase in the developing world population. The report also indicated that there were still 1.2 billion people in the world living in extreme poverty, and despite recent impressive progress, the SSA region accounted for more than one-third of the extreme poor.

This paper is motivated by recent reports and prognoses that contrary to previous expectations by researchers in the mid-2000s, many African economies have generally been experiencing accelerated growth through the last decade. Indeed, the African Development Bank's *Economic Outlook* (2012) reports that on average, excluding the distortions by volatile gross domestic product (GDP) developments in Libya, Africa's economic growth was 4.2 % in 2012 and was projected to accelerate to 4.5 % in 2013 and further to 5.2 % in 2014. The forecast assumes a gradual improvement of global economic conditions. However, especially where countries have recently discovered petroleum, reports bemoan the lack of inclusiveness in the enjoyment of economic benefits by significant segments of the population, giving rise to high unemployment and economic inequities. Against this background, this paper seeks to determine whether the recent growth trajectory in SSA has been pro-poor and to discuss potential policies in making growth more inclusive.

The OECD (2006) reports that their Development Assistance Committee (DAC) in its *Guidelines on Poverty Reduction* show that poverty has multiple and interlinked causes and dimensions: economic, human, political, socio-cultural, and protective/security. This paper takes on the challenge of reducing poverty from one dimension of that bigger picture; and that is reducing economic poverty through inclusive pro-poor growth. The paper is organized as follows. The second section draws from a survey of literature to explain what has been learned about the concept of pro-poor growth. The third section provides some regional evidence of growth in per capita income compared to the per capita income of the poorest quintile of the population. The fourth section delineates some country examples of economic growth and poverty reduction. In the fifth section, the paper determines

[2] The World Bank (2014a) uses the $1.25 a day threshold to define those living in extreme poverty.

whether the recent reported African growth episode has been inclusive. The sixth section outlines lessons learned from promoting inclusive growth that is pro-poor. Finally, conclusions are drawn from the study.

2 The Concept of Pro-poor Growth

Both theoretical and empirical evidence have shown that a country or region can achieve poverty reduction by accelerating its economic growth. For example, Kraay (2004) found that approximately half of the variation in short-run changes in poverty can be explained by growth in average incomes. In the medium- to long-run, the author found that between 66 and 90 % of the variation in changes in poverty can also be accounted for by the growth in average incomes. Dollar and Kraay (2002) also found that incomes of the poor[3] appear to rise proportionately with rise in average income. The converse argument also has been found to hold in that low or declining economic growth was found to also lead to increasing incidence of poverty (Chen and Ravallion 2004; Lopez 2004).

It is quite clear that the precise effect of growth on poverty depends on the initial level of income inequality in a country or region and how it changes during an economic growth period. For example, Lopez (2004) found that Senegal and Burkina Faso had similar levels of economic growth of about 2.2 % per capita per year over a similar period of time. However, poverty declined by 2.5 % annually in Senegal and just about 1.8 % in Burkina Faso in that period. The author concluded that Senegal made better progress in reducing poverty because it is a less unequal society. Therefore, a potential approach in reducing poverty is by changing the income distribution in favor of the poor. Indeed, historical experience shows that persistent efforts at sustaining economic growth may help in reducing poverty; although it is not clear that every growth episode in every country led to an increase in the average income of the poor (Ravallion 2001; Kakwani and Pernia 2000).

The concept of pro-poor growth has its genesis in the 1990s when there was growing clamor to explain the relationship among economic growth, poverty, and income inequality. Conceptually, it provides a yardstick of the way in which national income growth improves the welfare of the poor through changes in income inequality. The broad definition of pro-poor growth by a number of international organizations is economic growth that leads to significant reductions in poverty (OECD 2001; UN 2000; World Bank 2000). This gives rise to the notion that pro-poor growth occurs when economic growth leads to increased welfare of

[3] The authors defined the poor as constituting the bottom quintile of income distribution for a country. This is treated as a relative measure of a proportion of the population, compared to an absolute measure of poverty such as income below a pre-specified threshold of $1.25 per day (based on the purchasing power parity or PPP).

the less well-off in a society. Putting it bluntly, pro-poor growth is growth that raises the incomes of the poor.

Two operational definitions have emerged in the literature. The first strand defines growth as pro-poor when the poor benefit disproportionately from it; that is to say that it shows whether the distributional shifts accompanying growth favor the poor. The second strand defines growth as pro-poor if it absolutely reduces poverty. In the first case, the rate of income growth of the poor would exceed that of the non-poor, such that growth is pro-poor if it is accompanied by a decrease in inequality. The second case implies that average income growth results in pro-poor growth except when the incomes of the poor are stagnant or when they decline.[4] Therefore, to assess whether growth is pro-poor would require knowledge of the shifts in income distribution during the growth episode, and how this absolutely affects the welfare of the less well-off based on changes in an appropriate measure of poverty.[5] Although the literature admits that neither definitions of pro-poor growth is satisfactory, yet it is agreed that they attempt to address a common public policy objective—reducing poverty through economic growth. Additionally, both definitions suggest that there may be tradeoffs between development strategies that are pro-poor and those that are pro-growth.

Clearly, from the first definition of pro-poor growth it is apparent that policies that promote growth at the expense of increasing income inequality are not pro-poor. However, the second definition does not make a clear distinction between pro-poor and pro-growth policies. It appears that to the extent that policies that support economic growth continue to raise the incomes of the poor, they may also result in increasing income inequality and still remain pro-poor. An alternative and important strand of the literature on growth and poverty reduction proposes that the distinction between growth and pro-poor growth as a public policy goal is not that relevant in the case of low income countries (such as those in SSA) in that policies that are designed to maximize the rate of growth in those countries as a whole also maximize the growth in income of the poor. For example, Dollar and Kraay (2002) found that the poor typically share in rising aggregate income and suffer from declining aggregate income in the same proportion as the non-poor. Therefore, they argue that on average growth is as good for the poor as it is for everyone else. Other researchers have also argued that growth oriented policies are unlikely on average to impact income distribution and result in pro-poor growth (Foster and Szekely 2000; Deininger and Squire 1996; Ravallion and Chen 1997). Easterly (1999), on the other hand, simply observes that growth in low income countries has been illusive and that most poor countries have not been experiencing growth. In other words, since most poor countries are not growing the issue is to "put growth at the center of the policy agenda and poverty reduction will (necessarily) follow."

Therefore, based on the two conventional definitions of pro-poor growth, it appears that to measure whether economic growth is pro-poor would require

[4] For a complete survey of the definitional debate see Cord et al. (2003) and Klasen (2003).

[5] The measures of poverty that are generally used are the headcount index and the poverty gap.

knowledge of whether there have been distributional changes in income and whether those changes have improved the welfare of the poor. In the literature, poverty is broken into two components; poverty attributed to economic growth and poverty attributed to changes in income distribution (Datt and Ravallion 1992; Kraay 2005). Kraay defines three sources of pro-poor growth, namely: (i) a high rate of growth of average incomes, (ii) a high sensitivity of poverty (also referred to as "poverty elasticity") to growth in average incomes, and (iii) a poverty-reducing pattern of growth in relative incomes.

The literature also discusses results from the distributional effect of growth on the rate of poverty reduction. For example, Bourguignon (2003) revealed that distributional changes in income contributed to variations in response of poverty to growth over time. The author suggested that income redistribution contributed to an increase in the elasticity of poverty, and accelerated the rate of poverty reduction given a certain level of growth. In other words, distributional changes also explain rates of poverty reduction in certain countries. Bourguignon (2003) also found that a reduction in the Gini coefficient from 0.55 to 0.45 caused poverty to drop by more than 15 % in 10 years. However, if inequality remained unchanged, then it would take about 30 years to achieve comparable reduction in poverty.

Additionally, Ravallion (2001) shows that the median rate of decline in the $1 per day headcount index was 10 % per year in countries that combined policies of growth with falling inequality, but was only 1 % per annum otherwise (for those countries which adopted policies encouraging growth with rising inequality). The author also revealed that extreme income inequality unequivocally disrupts using income growth to reduce poverty. He found that for countries with high inequality, a 1 % increase in average household income led to lower reduction (0.6 %) in poverty than in countries where income inequality was very low (at 4.3 %). Ravallion (2001) also found that rising inequality reduced the impact of future economic growth on poverty reduction.

3 Regional Evidence of Growth and Poverty Reduction

Existing literature documents changes in growth rates across countries relative to those of the poor. For example, Ravallion (2001) revealed that based on cross country evidence at the 95 % confidence interval, a 1 % increase in average household income for consumption results in a drop in the poverty rate from 0.6 to 3.5 %. Figure 1 shows the evolution of per capita income and per capita income of the lowest income quintile of the population for all developing countries. It reveals that the extent to which the poor have benefitted from the economic growth process has varied over time. It appears that from 1970 through 1990 the income of the poorest quintile (20 %) of the population (YP20) grew at a similar pace as the average income (Y) in developing countries; indeed, there appears to be pro-poor distributional variation associated with the 1980s expansion. However, during the 1990s there was a fall in per capita income levels of the poor of about an average of 2 % per year in developing countries. Despite the growth in average income during

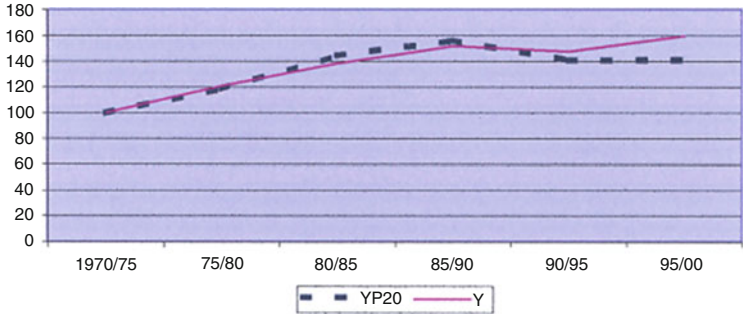

Fig. 1 Evolution of per capita income and income of the lowest quintile: developing countries. *Source*: Cord et al. (2003)

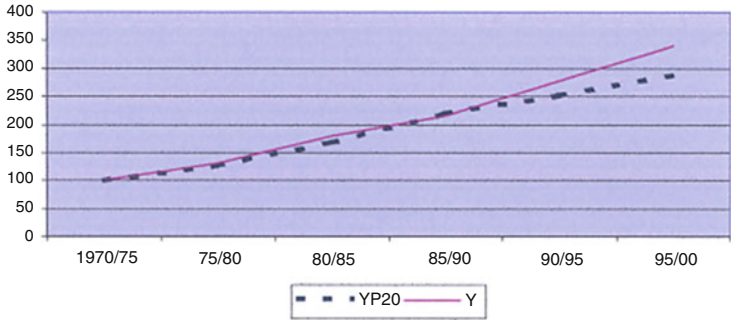

Fig. 2 Evolution of per capita income and income of the lowest quintile: East Asia and Pacific countries. *Source*: Cord et al. (2003)

the second half of the 1990s, the poor experienced stagnant income growth. Therefore, the data appears to support the notion that the poor failed to sufficiently benefit from the growth experiences of low income countries during the 1990s but not in prior years.

This observation is also maintained by East Asia and Pacific data (Fig. 2); although south Asian data reveal strong pro-poor bias to growth starting from the 1980s (Fig. 3). However, poverty headcount data (available from the mid-1980s) revealed that poverty has fallen more in East Asia than any other part of the developing world (Ravallion 2001). In fact, while in East Asia the income of the lowest quintile increased from 100 to 300 % from 1970 to the late 1990s, the corresponding income in South Asia grew by about 225 %. This leads to the conclusion that although East Asia experienced decline in income distribution following 1990, it also experienced the largest gain in income to the poor between the two regions.

Not so in SSA (see Fig. 4; where data only existed from the mid-1980s). In contrast with all other developing regions, SSA experienced negative per capita income growth from 1985 through 2000. Moreover, the contraction in average incomes was accompanied by a significant decline in income distribution such that

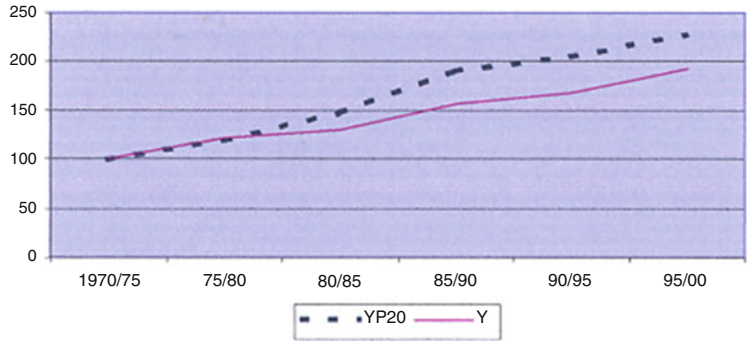

Fig. 3 Evolution of per capita income and income of the lowest quintile: South Asia. *Source*: Cord et al. (2003)

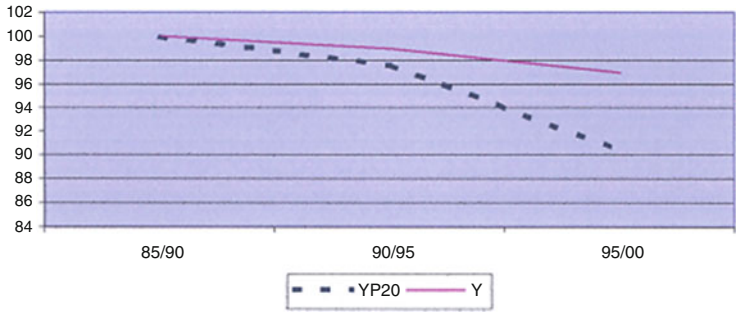

Fig. 4 Evolution of per capita income and income of the lowest quintile: Sub-Saharan Africa. *Source*: Cord et al. (2003)

by 2000 the average income of an African in the lowest quintile of economic distribution was only 90 % of the income in 1985.

4 Country Evidence of Growth and Poverty Reduction

Table 1 presents data on evidence of pro-poor growth experiences of the bottom quintile along with growth in average income for a diversity of countries for which data on growth and distribution existed for 10 or more years.[6] The north-west (NW) quadrant shows countries with spells of "growth" that are characterized as anti-poor recessions. Those countries experienced negative growth with

[6] This Table is borrowed from Page (2006). However, the original computation and analysis of the growth rates in per capita income and in the income of the lowest quintile for all the countries are from Cord et al. (2003) based on the Dollar and Kraay (2002) data set. It excludes data from developed countries.

Table 1 Cross country evidence of pro-poor growth

Negative growth inequality rises				Positive growth inequality rises							
Anti-poor recession	Years	g	g20	Broadly shared growth	Years	g	g20	Not pro-poor by any definition	Years	g	g20
Poland	20	−0.2	−1.4	Korea, Rep	32	6.7	6.6	Costa Rica	35	1.6	−0.1
Iran, Islamic	15	−0.4	−0.7	Taiwan, China	31	6.3	6.2	Tanzania	27	1.5	−2.1
Republic Slovak	10	−0.4	−0.5	Hong Kong, China	20	5.8	5.2	Bulgaria	10	1.5	−3.5
Republic Niger	32	−0.6	−1.3	Singapore	20	5.4	5.2	Panama	26	1.4	−2.3
Sierra Leone	21	−0.8	−7.7	China	15	5.0	1.6	Nigeria	38	1.2	−0.5
Zambia	37	−1.0	−2.7	Malaysia	25	4.7	4.1	Dominican Republic	20	1.0	−0.2
Estonia	10	−1.7	−6.2	Thailand	36	4.2	3.1	El Salvador	30	0.7	−1.2
Latvia	10	−4.2	−7.4	Mauritius	11	3.7	1.6	Senegal	31	0.2	−0.5
Russian Federation	10	−5.6	14.3	Brazil	33	2.5	0.3	Ethiopia	14	0.2	−1.2
				Colombia	31	2.3	2.1				
				Mexico	38	2.1	0.9				
				Ecuador	26	1.7	0.3				
				Philippines	40	1.5	0.5				
				Chile	24	1.4	1.1				
				Peru	33	0.4	0.1				

Negative growth/inequality falls				Positive growth/inequality falls						
Pro-poor recession	Years	g	g20	Pro-poor biased growth	Years	g	g20	Years	g	g20
Guyana	37	−0.4	−0.1	Gabon	15	7.7	9.0	Trinidad & Tobago	31	1.8	2.1
Jordan	17	−0.6	1.0	Indonesia	35	3.7	4.4	India	34	1.8	2.2
Belarus	10	−1.8	−1.1	Tunisia	25	3.4	3.6	Bangladesh	32	1.3	1.5
Medagascar	33	−2.1	−1.7	Egypt, Arab Rep	32	2.8	4.5	Nepal	18	1.2	3.9

Table 1 (continued)

Negative growth/inequality falls				Positive growth/inequality falls							
Pro-poor recession	Years	g	g20	Pro-poor biased growth	Years	g	g20	Years	g	g20	
				Ghana	10	2.4	4.3	Jamaica	35	1.1	1.5
				Sri Lanka	32	2.3	3.4	Honduras	28	0.5	1.3
				Hungary	31	2.2	2.7	Bolivia	22	0.3	1.0
				Turkey	26	2.2	2.9	Venezuela, RB	31	0.1	0.1
				Pakistan	32	2.2	2.8				

Source: Cord et al. (2003) as reported by Page (2006)

deteriorations in income distribution (calculated as the difference in growth rates between per capita income and income of the lowest quintile). Countries in this quadrant were mainly transitional and conflict affected countries. For example, in Sierra Leone, from 1968 to 1989 the income of the lowest quintile fell by 80 % whereas the average income level fell by about 18 %. This compares with Russia where from 1988 to 1998 the income of the lowest quintile fell by 76 % whereas the average income level fell by slightly less than 50 %.

The south-west (SW) quadrant includes countries that experienced what was characterized as pro-poor recessions; that is recessions that were accompanied by progressive distributional change. Jordan is the only country in the sample where there is evidence that poverty may have decreased in tandem with economic decline; while average income levels over 1980–1997 declined by 10 %, the income of the lowest quintile increased by 18 %. In Madagascar, the income of the lowest quintile of the population appears to have fallen by 40 % while the average income was halved between 1960 and 1993.

The north-east (NE) quadrant shows a majority of the countries with positive income growth and regressive income redistribution. Those country experiences provide support to the notion that the growth process for many nations has been accompanied by increasing inequality. The data delineated two sub-groups; those cases where growth was broadly shared (consistent with the working definition of pro-poor growth or growth that benefits the poor), and those cases where growth was not pro-poor and could have likely been associated with increased poverty.

The shared growth countries included many of the highly successful East Asian economies that recorded significant growth accompanied largely by some decline in income distribution. For the period for which data was available, the top four countries (Korea, Taiwan, Hong Kong and Singapore) recorded growth rates of per capita income of the lowest quintile at about 5 %; which was less than but close to the rate of per capita income growth for each country. Contrast that with the case of China in which average per capita income growth was 5 % over the 1980–1995 period, but the lowest quintile of the population experienced only about one third the rate of income growth. However, records show that sustained rate of income growth at the bottom of the income distribution sufficiently lifted millions of people out of poverty. Note, however that in the Latin American countries in this group, the per capita income growth rate at the bottom quintile was sufficiently low, recorded at less than 1 % on average, and had no discernible impact on poverty alleviation.

The second group of countries in the NE quadrant is those characterized as not pro-poor by any means, meaning that despite aggregate growth, the income of the poor has fallen. Therefore, poverty may have risen among those countries. For example, for Tanzania, between 1964 and 1991 per capita income increased by 1.5 % per year whereas the income of the poorest quintile fell by 2 %. In Senegal and Ethiopia the differences between the growth of per capita income and the decline in income of the lowest quintile were much lower.

Lastly, the south-east (SE) quadrant shows cases where growth was associated with progressive distributional change. This is the case that meets the strict definition of pro-poor growth and suggests that the relative rate of growth of income of

the poor exceeded that of the non-poor. SSA examples in this category are Gabon and Ghana. Looking at the data, it is clear that the median growth rate of income for the poor in the shared growth category (NE quadrant) is higher than that for the pro-poor biased growth category. That implies that the countries where the poor have benefited the most in terms of income growth are in the NE quadrant. The outlier is the case of Gabon where during 1960–1975 the lowest quintile of the population enjoyed growth rates of 9 % per year on average when compared to 7 % per year for the whole population. Therefore, it appears that increased overall income growth that is accompanied by modest declines in income distribution had a greater impact on the welfare of the poor than growth that was biased in their favor, when it took place in a relatively low growth environment.

5 Has the Recent Growth Episode in Africa Been Pro-poor?

Without question, economic growth in Africa has accelerated in the past decade and has remained relatively robust. Many recent reports paint a picture of a continent in resurgence. For example, recent data from the United Nations (UN 2014) show that despite recent global decline in growth, economic growth in Africa that has been growing in the past decade is expected to continue its secular increase from 4 % in 2013 to 4.7 % in 2014 and 5.0 % in 2015. West Africa is expected to continue enjoying the strongest growth on the continent, with an anticipated increase from 6.7 % in 2013 to 6.9 % in 2014. The UN report is bullish on the region and suggests that the region will continue to attract investment in oil and minerals, especially in Burkina Faso, Ghana, Guinea, Liberia, Niger, Nigeria and Sierra Leone. The top performers in the SSA region include Mauritius, South Africa, Ghana, Rwanda, Angola, Botswana, Nigeria, Zambia, Mozambique, Namibia, Tanzania, Ethiopia, Cape Verde, Gambia and the Seychelles. The UN (2014) report also anticipates other important factors that would influence the region's medium-term growth prospects such as increasing domestic demand—especially from a growing class of new consumers with rising incomes associated with the urban sector—and improvements in economic governance and management. Additionally, projected improvement in major developed economies is expected to fuel growth in the region through trade, investment and capital flows.

A news report released by the World Bank (2014b) stated that economic growth in SSA continued to rise from 4.7 % in 2013 to a forecasted 5.2 % in 2014. According to the report, recent performance is boosted by rising investment in natural resources and infrastructure, and strong household spending. Capital flows to the region reached 5.3 % of regional GDP 2013 and that was above the developing-country average of 3.0 %. Net foreign direct investment (FDI) inflows grew 16 % in 2013 to a near-record $43 billion, boosted by new oil and gas discoveries in many countries including Angola, Mozambique and Tanzania.

Remittances to the region grew 6.2 % to $32 billion in 2013, exceeding the record of $30 billion previously recorded in 2011. Conspiring with lower food prices, these inflows boosted household real incomes and spending.

Sy (2014) indicates that demand for natural resources from emerging markets, especially China, has increased in the last decade and remains important. In describing the "most likely" trajectory of the world's energy system, the *BP Energy Outlook 2035* also noted that Africa will remain an important producer of oil and natural gas, accounting for 9 % of global oil and 9 % of natural gas production in 2035. Generally, recent reports indicate that the region's growth prospect is expected to be supported by improvements in the global economic and regional business environment, relatively high commodity prices, easing infrastructural constraints, and increasing trade and investment ties with emerging economies such as China.

Furthermore, the continuation of good medium-term policies and structural reforms are expected to bode well for continuing future growth in the region. Moreover, Sy (2014) suggests that many countries in the region have adopted democratic institutions to some extent, and despite a few spots experiencing instability, violence and armed conflicts have decreased. Invariably, however, it is expected that half of the world's future population growth will come from Africa.[7] This trend could lead to a "demographic dividend" of an adult population of 800 million by 2030 (compared to 460 million in 2010). Africa's rapid urbanization and burgeoning middle class could also generate hundreds of millions of consumers (Sy 2014).

Nevertheless, pressure on the labor market from a steady stream of new entrants, mainly the youth, has meant that the recent solid GDP growth rates have not translated into adequate job creation and the broad-based development necessary to reduce high poverty and rising inequality rates in many countries (UN 2014). The UN report further clarifies why positive growth in many African countries has had limited impact on employment; the informal sector is still large in many countries with limited opportunities for those seeking to enter the labor market. Therefore, youth unemployment rates are typically high and gender disparities in earnings continue.

The central message of the *2013 Economic Report on Africa* published by the United Nations Economic Commission for Africa (UNECA 2013) is that as the world has witnessed sweeping political and economic changes over the last half century, global power structures have been reformed, trade and capital flows have been reconfigured, old hegemonies have loosened and allowed new ones to emerge, and led to serious rethinking of development paradigms. According to the UNECA (2013) Report, given its remarkable growth since 2000, there is now a huge opportunity for Africa to emerge as a global economic power; but the continent faces serious challenges. To fulfill development expectation, African countries will require robust and sustained, broad-based and inclusive economic growth.

[7] This is not because of higher fertility, which is declining, but because of longer life expectancy.

The Report bemoans the reality that recent economic performance has not generated enough economic diversification, job growth or social development to create broad based wealth and lift millions of Africans out of poverty. A key challenge, therefore, is how Africa can pursue more effective policies to accelerate and sustain high growth and make that growth more inclusive and equitable.

5.1 Analysis of Poverty Growth in Africa

Analysis of what triggers and sustains growth acceleration is beyond this paper. Additionally, empirically exploring country-specific variations linking growth, poverty, and inequality pose various methodological challenges. Therefore, in the absence of critical multidimensional data on poverty (for example the incidence of poverty, measures of wage and price differentials, and access to critical infrastructure such as water and electricity), the methodological approach taken is to determine how Africa as a region has fared, compared to other developing nations and regions in the world in reducing the number of poor (using data on poverty headcount), and to determine if recent growth has been inclusive and pro-poor. This regional study suffers from country-specific analysis that may explain concentrations of poverty and inequalities (for example, between urban centers and rural areas and also mineral-rich rural areas).

Figure 5 shows the evolution of extreme poverty rates[8] in the world by region as reported by the World Bank (2014a). Whereas in 1981 more than half the citizens in the developing world lived on less than $1.25 a day, the rate dropped to 21 % in 2010. Despite a 59 % increase in the developing world's population, there were significantly fewer people (about 1.2 billion) living on less than $1.25 in 2010 than three decades ago (about 1.9 billion). The extreme poverty headcount rates appear to have fallen recently in all developing countries, including SSA. After steadily increasing from 51 % in 1981 to 58 % in 1999, the extreme poverty rate fell 10 percentage points in SSA between 1999 and 2010 to 48 %.

However, SSA is the only region in the world for which the number of poor individuals rose steadily and dramatically between 1981 and 2010 (see Fig. 6). Indeed, there were more than twice as many extremely poor people living in SSA in 2010 (414 million) than there were three decades ago (205 million). Therefore, the number of extreme poor relative to the world's total in SSA rose from 11 % in 1981 to 34 % in 2010 (see Fig. 7).

Figure 8 delineates the average daily per capita income of the extremely poor in the developing world, in the SSA region, and in the developing world excluding SSA. It shows that the average income of the extremely poor in the developing world has been rising toward the $1.25 per day poverty line. In fact, the average

[8] In this figure generated by the World Bank (2014a), extreme poverty is defined as living on less than $1.25 a day.

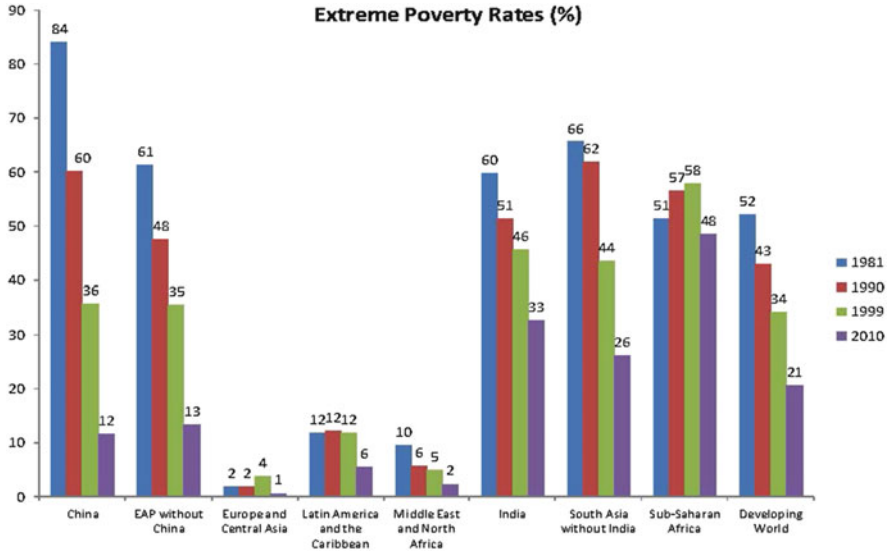

Fig. 5 The evolution of extreme poverty rates by region. *Source*: World Bank (2014a)

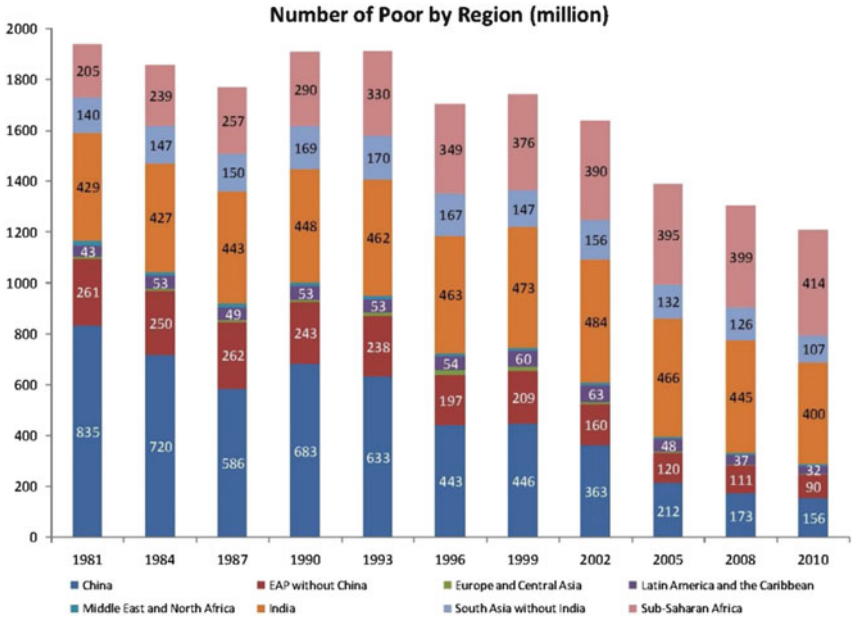

Fig. 6 Number of extremely poor individuals by region (million). *Source*: World Bank (2014a)

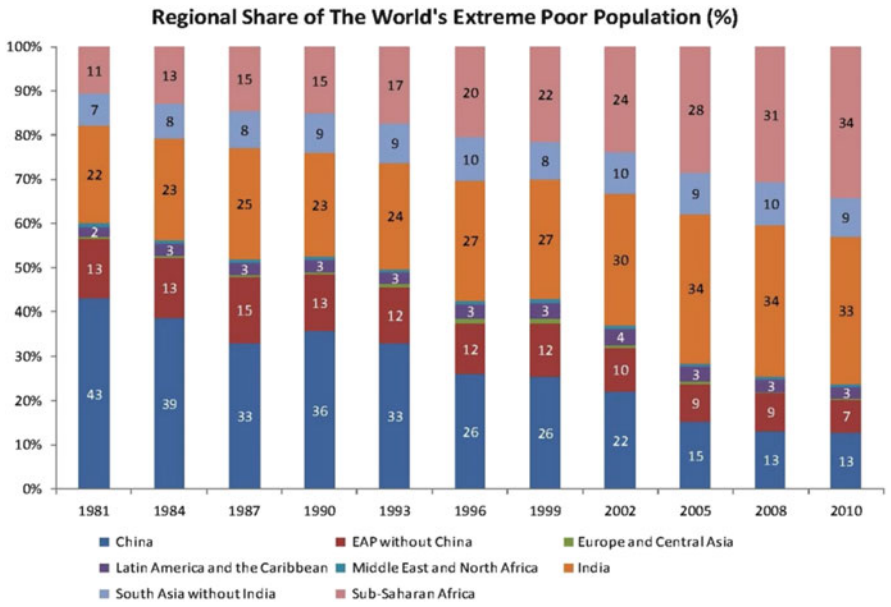

Fig. 7 Regional shares of the world's extreme poor population. *Source*: World Bank (2014a)

income of the extremely poor in the developing world rose from 74 cents per capita per day in 1981 to 87 cents per capita per day in 2010 (in 2005 U.S. dollars). Excluding the extremely poor in SSA leaves the average income of the poor in the rest of the world to converge faster toward the $1.25 line. Unfortunately, the pattern of increase in incomes of the extremely poor in other developing countries was not realized in SSA. The figure shows that the average income of the extremely poor in SSA remained at about half (at $0.71) of the $1.25 line in the region by 2010 and that was below the amount of $0.72 observed in 1981.

What do these numbers imply in terms of potential for extreme poverty reduction? Looking at Fig. 6, poverty reduction would be a huge challenge for SSA and South Asia where there were about 400 million and 500 million extreme poor people, respectively. Typically, the depth of extreme poverty is measured by the extreme poverty gap.[9] The extreme poverty gap is measured in dollars based on purchasing power parity (PPP) calculations, and gives the average amount of additional daily income required by the extremely poor to reach the poverty line of $1.25 per day. Working with the numbers on Fig. 8, the average gap of the extremely poor in the world was 38 cents per day in 2010, or approximately $140 per year in 2005 PPP dollars. Now, since there were about 1.2 billion extremely

[9] Note that extreme poverty gap is the conceptual amount of direct additional income an average extremely poor person would need to get to $1.25 per day and may not be indicative of the level of assistance required to close the gap.

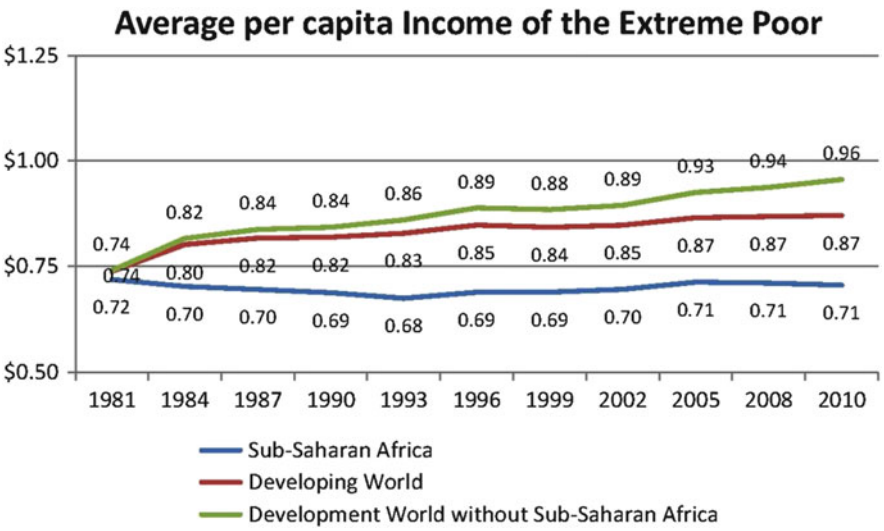

Fig. 8 The evolution of the average per capita income of the extreme poor. *Source*: World Bank (2014a)

poor individuals in the world in 2010, the aggregate global extreme poverty gap amounted to nearly $168 billion in 2005 PPP dollars.

Based on the analysis, for SSA the average gap of the extremely poor was 54 cents per day in 2010, or approximately $197 per year in 2005 PPP dollars. Since there were 414 million extremely poor people in SSA in 2010, the aggregate poverty gap amounted to $81.6 billion in 2005 PPP dollars.

Therefore, if the incomes of each extremely poor person were to rise to $1.25, then the aggregate increase in their income would have to total at least $169 billion in 2005 PPP terms for the developing world and about $82 billion in 2005 PPP terms for SSA. These numbers represent the aggregate extreme poverty gap for the developing world and SSA, respectively. The amount for the developing world represents about 0.25 % of global GDP. Additionally, the aggregate global extreme poverty gap in 2010 was less than half the gap in 1981 (at $362 billion in 2005 PPP terms). This represents a faster reduction than the reduction in the number of poor people. In SSA with 205 million extremely poor in 1981, the total income needed to make up the extreme poverty gap was approximately $40 billion in 2005 PPP terms. That implies that the SSA aggregate extreme poverty gap in 2010 was approximately double the gap in 1981. This presents SSA with a major challenge that puts the region's recent experience of economic growth in a different perspective.

Based on these calculations, it appears that at least in the SSA region as a whole, recent economic growth has not risen in tandem with poverty reduction contrary to the research conclusion by Dollar and Kraay (2002). However, we must remember that the authors based their studies mainly on individual country data in the 1990s (the period for which the most comprehensive data existed). It appears that incomes

of the poor in the last decade have not risen proportionately with average income growth in the region, and the poor are being left behind in the growth process. This implies that recent growth in SSA has not been pro-poor.

The World Bank (2014b) has also reported that between 1990 and 2003 in African countries such as Ghana, Tunisia and Uganda a 1 % increase in GDP per capita reduced poverty by rates of between 3 and 6 % per year. Therefore, it appears that very high and sustained increases in growth rates would be necessary for the African region to have a realistic prospect of significantly reducing income poverty. In fact, a study by the World Bank and IMF (2005) projected that to meet the poverty MDG, SSA's real GDP growth rate would have to double from a base scenario to about 7.5 % annually. Despite the recent decent levels of growth, the region does not appear to have realized the 7.5 % annual projected growth. At the time, the cited study showed that only five countries (Cameroon, Ethiopia, Senegal, South Africa and Swaziland) were well positioned to meet the poverty goal of the MDG by 2015. It is not clear that this target would be met in 2015.

Since the evidence shows that many countries in the region have not realized nor sustained annual growth in income at the projected target rate, it is clear that a sharper public policy focus on growth is still needed. However, consistent with Page's (2006) observation, the benefits of recent growth have not reflected in improving incomes and welfare of the poor. Therefore, this paper takes the position that although growth is viewed as generally good for the poor, recent evidence shows that African economic growth has not favored the poor. Therefore, African policymakers must continue to promote inclusive growth and pro-poor agenda.

6 Lessons on Policies for Promoting Inclusive Growth in Africa

The concept of "inclusive, shared, sustainable or balanced growth"[10] underscores the importance of developing policies to address both economic and social inequalities, including inequalities in income, assets, financial and human capital (education and health), and economic opportunities. The consensus in the literature is that rapid, sustainable economic growth must also be equitable, which matters for poverty reduction (Stuart 2011).

This section catalogues certain lessons learned to date in attaining economic growth while pursuing inclusive and pro-poor policies. Obviously, African policymakers face the daunting tasks of ensuring better coordinated efforts with their donor community, as well as tough tradeoffs and sacrifices in directing public policies and investment funds principally toward growing and sustaining their

[10] The terms have been used interchangeably in the literature. However, they share the same meaning.

economies, and then secondarily investing in the poor to resolve any current inequities in growth so as to achieve inclusive growth that is also pro-poor.

First, the World Bank (2000) conducted interviews of the poor and assessment of experiences of poverty reduction and conceptualized a simultaneous attack on poverty based on three intimately related fronts—empowerment, security and opportunity. The Bank's report defined empowerment as addressing directly a range of interconnected inequalities (economic, social and institutional) which disadvantage the poor and which prevent them from having influence over policies and interventions which influence their lives. Security means addressing the issues of risk and vulnerability, at the micro and macro levels such that reversals and risks of reversals do not trap households and nations into poverty. Opportunity means sustainable economic expansion and human development in which the poor participate fully, to provide the material basis for poverty reduction. The World Bank recommended that such a multidimensional attack on poverty must be envisioned at the local, national and international levels.

Second, a comprehensive policy statement issued by the OECD (2006) provided additional suggestions on pro-poor growth.[11] Three key messages stemming from the statement were:

(1) Rapid and sustained poverty reduction requires pro-poor growth; that is a pace and pattern of growth that enhances the ability of poor women and men to participate in, contribute to and benefit from growth. Public policies must, therefore, look to the extent to which the poor participate in growth both as agents and beneficiaries, since they are interlinked and both are critical for long-term growth and sustained poverty reduction.
(2) Policies to tackle the multiple dimensions of poverty, including the cross-cutting dimensions of gender and environment, are mutually reinforcing and should go hand-in-hand. Policy tradeoffs do exist, however, and those must be better coordinated.
(3) Empowering the poor is essential for bringing about policies and investments needed to promote pro-poor growth and to address the multiple dimensions of poverty beyond economic poverty and inclusive of political, socio-cultural, human, and protective (security) dimensions. The state must first be open, transparent and accountable to the interests of the poor, and second, set policies that place resources in the hands of the poor to expand their economic activities.

The OECD statement also indicated that in part because the poor are not homogeneous, any policy implementation to reduce poverty must take into consideration the importance of understanding the characteristics of the poor; for example, identifying who they are and how they earn a living. Since this paper takes an economic view, the focus is guided by understanding how public policy impacts the incomes and assets of the poor.

[11] One necessary caveat in this discussion is to recognize that the poor may not be a homogeneous group and that country contexts may differ.

To this end, policies for sustaining growth such as those aimed at macroeconomic stability, institutional quality, democratic and effective governance and favorable investment climate must engage the poor as catalysts for economic growth by increasing incentives, opportunities and capabilities for employment and entrepreneurship. Policies must also create the conditions and remove obstacles to the participation of the poor in the growth process, for example, by assuring access to land, labor and capital markets and to invest in basic social services, social protection and infrastructure. Additionally, the poor must remain informed and empowered to participate in the policy-making process which is accountable to their interests. The OECD document also provided specific guidelines to donors on how to make their support to pro-poor growth more effective.

Third, critical search of the development literature suggests that one of the development successes have emanated from East Asia. The development strategies that countries such as Hong Kong, Indonesia, South Korea, Malaysia, Singapore, Taiwan, and Thailand pursued have been characterized as shared growth strategies.[12] The shared growth strategy is composed of two parts. First leaders in those countries enhanced growth by encouraging high savings, long-term investments, and upgrading organization, with technological growth and managerial know-how. Second, the leaders visibly put in place wealth sharing mechanisms such as universal primary education, land reform and free basic health care to induce greater productivity. These strategies sent the right signals in building trust that all parties (elites and non-elites) were interested in playing their parts in supporting and benefitting from the economic growth process.

Fourth, the development literature also abounds with studies on inclusive growth in developing countries and specifically in Africa. For example, Fosu (2011) focuses on whether enhanced economic growth in developing countries has led to poverty reduction and to assess the distributional impact of growth. Gaddah and Munro (2011) have conducted benefit incidence analysis of health expenditure in Ghana. There is general agreement that growth reduces poverty and that relationship appears to be reciprocal; in that poverty reduction is also good for growth (Clements et al. 2011). Therefore, providing the poor relief from poverty is expected to unleash their productive potential to contribute to the general growth of a nation. Yet, Collier (2007) bemoans that it is not clear whether the poor in Africa have shared in the benefits of globalization that have accrued in many of the developing and developed world.

Garcia-Verdu et al. (2011) have also demonstrated the value of conducting robust assessment of the inclusiveness of SSA growth by examining case studies of household survey data for six countries (Cameroon, Ghana, Mozambique, Tanzania, Uganda and Zambia). The authors found that the poorest quintile experienced substantial annual household per capita consumption growth in three of the high-growth countries (Ghana, Tanzania and Uganda). On the other hand, the poorest quintile of the consumption distribution in the low-growth countries

[12] For a greater exposition on the subject, see Campos and Root (1996).

experienced low (in Cameroon) or negative (in Zambia) changes in consumption. Results in Mozambique were not clear.

Following the Garcia-Verdu et al. (2011) study, Adedeji et al. (2013) have also conducted analyses of inclusiveness of growth in Africa by studying how equitable are access to economic and social opportunities, specifically in education and health access. The authors employed the social opportunity function to assess inclusiveness of growth in Cameroon, Ghana, Tanzania, Uganda and Zambia (countries that have experienced growth episodes in the past decade). The results show that consistent with the results of Garcia-Verdu et al. (2011), periods of growth also coincided with periods of increased access or opportunities to education and health, and that average access to and distribution of education and health care had increased across all the six countries over the period of study. The results indicated that the countries experienced inclusive growth in access to education (both primary and secondary) and health care.

The empirical results are important since they point out the importance of understanding the distributional consequences of effective wealth sharing mechanisms specific to the country context. For example, public policies geared toward the effective design and implementation of investments in education and health services of the poor in African countries or even infrastructure for market access would sustain reforms and growth momentum. Adedeji et al. (2013) further suggest that the results could be extended to include how policy may be initiated to direct limited resources of governments to the poor to ensure access to and equity of job opportunities, finance and land ownership so as to reduce poverty. Therefore, the poor must be trained and given incentives to participate in the marketplace as productive members of society.

Indeed, a review of the development literature shows that typically the poor have limited access to financial services, infrastructure (including roads, water, electrical power, and telecommunication), education, and health services. Typically, whenever people have money to spend, it serves as an incentive mechanism to induce all manner of service providers (such as banks, telecommunication firms, water providers, transport operators, etc.) to offer their services. These services are necessary for the average person to develop their creative potential by investing in their education, protecting their health (with good nutrition and medicine), moving goods to market, and communicating with potential clients (employers and customers, etc.). Therefore, the literature generally supports the claim that healthy people find greater incentive to be productive and are more likely to thrive in their jobs (regardless of the enterprise), and so are healthy and nourished students able to realize better performance in school. Since these factors are interconnected in ensuring growth, businesses typically locate in areas that are richer in such factors.

Acemoglu (2009) indicates that people need incentives to invest and prosper; they need to know that if they work hard, they can make money and actually keep that money. And the key to ensuring those incentives is sound institutions—the rule

of law and security and a governing system that offers opportunities to achieve and innovate.[13]

In Africa the advantage in receiving incentives naturally goes to the burgeoning urban centers that have been teeming with people clamoring for jobs in both the modern formal and informal sectors due to the forces of agglomeration. The rural sectors with the greatest concentration of the poor tend to be also poorer in the identified factors and typically languish because firms find them unattractive as centers of economic activity. Therefore, policymakers would have to come up with better coordinated policies to make growth inducing advances in both the urban and rural fronts. Absent such coordination, just investing public funds to facilitate economic growth activities in areas with poor access to education, health care, infrastructure and markets would appear to have the perverse effect of lowering overall aggregate economic growth.

The pursuit of inclusive growth strategies that are also pro-poor by African countries are gaining renewed focus. The African Union's *Agenda 2063* reflects the commitment toward advancing positive and sustained growth trajectories for many African countries. The African Union recognizes that Africa today is faced with a confluence of factors that present a great opportunity for consolidation and rapid progress. These factors include unprecedented GDP growth rates resulting from sound macroeconomic policies and strategies. Additionally, there has been significant reduction in violent conflicts, increased peace and stability, advances in democratic governance, and rising prospects of the African middle class coupled with the youth bulge that can act as catalysts for increasing growth. Moreover, there is global change in the international finance architecture stemming from the rise of Brazil, Russia, India, China and South Africa (BRICS) as potential and rising sources of FDI inflows to Africa.

However, investing in the poor will call for greater innovative strategies. As Page (2006) notes, governments need to know which segments of the population may benefit from particular programmatic commitments and which may be excluded, and then align budget allocations with wealth sharing priorities that receive well-harmonized support from donors. The author suggests three policy areas for further research as potential building blocks in constructing shared growth strategies in many countries in the SSA region. These are (i) strategies for managing natural resource revenues; (ii) creating an export push in Africa; and (iii) strengthening sub-regional integration.

Since natural resource revenues accrue primarily to the state, public decision choices influence their allocation. Therefore, governments in the countries experiencing natural resource boom, for example, may choose to invest in growth promoting assets such as infrastructure and those geared toward improving the capacity of the poor to participate in markets such as education and health care. Additionally, African countries will have to do a better job negotiating at

[13] For more exposition on the subject, read Acemoglu, Daren and James A. Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Random House.

multilateral and regional trade forums to ensure better market access and the removal of tariffs on African traded manufactured and value-added goods and services in international markets.

Many of Africa's poor live in rural areas and they derive their incomes from agriculture. It is well understood that a good strategy in successfully reducing poverty would be to increase incomes of rural households (World Bank 2005). Therefore, poverty levels must be responsive to agricultural sector growth (Aryeetey and McKay 2004; Okidi et al. 2005). Aryeetey and McKay (2004), for example, found that in Ghana from 1991 to 1992 and 1998 to 1999, increase in agricultural incomes accounted for about 44 % reduction in poverty. Okidi et al. (2005) also found that in Uganda between 1992 and 2003 agricultural sector growth resulted in more than 50 % of the reduction in headcount poverty. However, it was reported that governments in the two countries achieved those impacts by allocating just 2.5 % and 1.5 % of the budget, respectively, to agriculture.

The agricultural sector in African countries must play a critical role in the overall economic growth and inclusive growth strategies of the region. Yet, decades following the Asian agricultural Green Revolution, African farmers generally lack access to improved technology and extension. Therefore, agricultural productivity in Africa continues to lag behind all other developing countries in both output per unit of land and output per unit of labor (Byerlee and Jackson 2005). Total factor productivity in agriculture for the region only rose from −2 % in the 1960s to about 1.7 % by mid-2000, irrigated area is only about 3.7 % of land mass and fertilizer consumption is just 12 kg/ha of arable land.

Juma (2011) has proposed a vision for transforming and modernizing African agriculture as a major catalyst in achieving rapid economic growth. The author also proposes using agriculture to create mass employment to rural youth. Three themes have been suggested: (i) advances in science, technology, and engineering worldwide offer Africa new tools needed to promote sustainable agriculture; (ii) efforts to create regional markets will provide new incentives for agricultural production and trade; and (iii) a new generation of African entrepreneurial leaders must help the continent to focus on long-term economic transformation through knowledge-based entrepreneurial activities. Innovative agribusiness ventures must be encouraged by recognizing the importance of offering incentives to induce agricultural research, investing in infrastructure, building human capacity, stimulating entrepreneurship and improving the governance of agricultural innovation.

One key strategy is to divert some of the revenues earned from oil, gas and minerals exports into agricultural sector investment to boost domestic food production as well as expanding agricultural valued-added processing aimed toward markets both within and outside the region. The UNECA (2013) report indicates that structural economic changes, driven by information and communication technology, have led to substantial increases in domestic and cross-border financial capital flows and trade in intermediate and processed goods. These reflect the rising importance of value chains. Targeting in-country and intra-regional trade in a two-pronged value-chain (up- and down-stream) approach would have the potential to raise both overall industrial and agricultural growth rates and increase on and off

farm incomes of the rural sector. This approach must be viewed strategically from the recent regional integration frameworks, in that any effective regional integration frameworks that reap benefits of growth would also be broadly shared within and across national boundaries.

Improving the productivity of small holder agriculture can be done through enhanced targeted fertilizer and other input subsidies (or even encouraging competitive input markets) and massive investments in rural infrastructure such as roads, irrigation, reliable electricity supply, market infrastructure and water systems. Commercial agribusiness ventures must be encouraged by governments through public-private partnerships that take advantage of new regional agribusiness initiatives, such as the Agriculture Fast Track Fund (AFTF).

The AFTF is a new multi-donor trust fund managed by the African Development Fund (AfDB), and it is designed to boost investment in Africa's agricultural sector. It is funded by the U.S. Agency for International Development (USAID), the Swedish Development Agency (SIDA) and the Danish International Development Agency (Danida). The AFTF provides grant funds up to $1.5 million (and a minimum of $1 million) for project development cost such as feasibility studies, market research, financial modeling, business development, and environmental and social impact studies. Six pilot countries in which project funds may be awarded are Burkina Faso, Ghana, Ivory Coast, Ethiopia, Ghana, Mozambique and Tanzania. The Fund's main objective is to reduce the infrastructure deficiency in the African agriculture sector by developing a pipeline of projects that are attractive to development finance institutions and that can engage private investors as project sponsors by offering potential entrepreneurs the opportunity to transform their good ideas into bankable investments.

7 Conclusion

The paper has provided a broad survey of economic literature to understand lessons learned from recent growth experiences in SSA. The penultimate objective was to determine if recent economic growth acceleration in SSA has been inclusive and pro-poor. Multilateral and donor institutions began investigating the pro-poor growth agenda for developing countries some two decades ago. Three important related issues upon which economists have reached consensus are delineated. First, sustained economic growth is fundamental in alleviating poverty. Second, the poor are not typically left behind in the growth process but share in the gains from growth. However, the rate at which poverty reduction occurs with growth differs in each country based on the level of income inequality and changes in inequality over time. Third, changes in income distribution should lead to improving poverty when economic growth occurs.

From a thorough review of the economic literature, it appears that the initial levels of income and inequality in a country are important in determining how economic growth affects the poor. This is crucial enough that in many low-income

developing countries, including many in SSA, there is expressed urgency to accelerate pro-poor growth strategies as the means to reducing poverty and in making growth more inclusive. This agenda has been given voice through the call to accelerate progress toward achieving the poverty dimension of the MDGs by 2015.

This paper has also revealed that despite reports of recent growth acceleration in the African region, growth trajectories have not moved in tandem with poverty reduction. This calls for a greater focus on pro-growth strategies that are more inclusive and also pro-poor. Since growth is found to be the most important long-run driver of poverty reduction, it is important that pro-poor growth policies overlap with intensified overall aggregate growth policies for each SSA economy. Poverty reduction is also found to be good for growth. The paper provides many suggestions on how public policies may be used to stimulate inclusive and pro-poor growth. They include macroeconomic, institutional and social dimensions to reduce poverty.

To improve growth, SSA economies must implement further reforms. There is room for many countries to increase their growth rates as a precondition to undertaking inclusive growth policies aimed at reducing poverty. Such growth rates must also be sustained well into the future beyond what even leading SSA accelerators have experienced, and must be spread to all countries in the region. Substantially higher growth rates per capita would be needed for many countries to make giant strides in reducing poverty. African countries must provide appropriate incentives to boost infrastructure, strengthen human capital and skills development, foster technological growth, embark on industrial growth, increase agricultural sector investment, and develop policies to target poverty reduction goals. To be successful, these countries must strengthen their institutions and foster regional market integration, and then use agreements and protocols to induce greater intra- and inter-regional trade.

However, there may be country-specific challenges that are not captured by the regional analysis undertaken by the paper. Although country level analysis of inclusive and pro-poor growth is at an early stage, it is important to find data to empirically analyze and orient policies toward growth, inclusiveness, the elasticity of poverty to growth, and the distributional components of growth in alleviating poverty.

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Freedom, Growth and Development: Evidence from West Africa

Oladele Omosegbon

Abstract Everywhere, economists and policy makers, as well as almost everyone involved in development, are calling for more growth as the best recipe to world's problems of poverty, famine and many other social and economic malaises. In the case of West Africa, growth is even more alluring, now that authorities of the International Monetary Fund, IMF, and the World Bank, among others, have pronounced Africa as the new growth pole of the world [NewsfromAfrica (Africa: Finance Ministers to discuss turning continent into the New Growth Pole of the World. 2012), ECA (Africa is new global growth pole, but continent must not rest on its laurels, says Janneh. 2011)]. Everywhere, also, governments and civil society groups are redoubling their efforts and the resources devoted to economic growth.

This paper revisits the historical oddity, first documented in Liberia by Clower et al. (Growth without development: an economic survey of Liberia. Northwestern University Press, 1966), in which economic growth not accompanied by development was seen as the bane of transforming shifting cultivation and commercial farming in Liberia. Our attempt encapsulates this oddity in the breakdown of freedom and its constitutive values from economic growth and development. Following the hypothesis, first put forward by Amartya Sen (What is development about? World Bank/Oxford University Press, 2001), that no major famine has ever occurred in a democratic country that has regular polls, opposition parties, and relatively free media, we examine the countries of the Economic Community of West African States, ECOWAS, for political and market transactional freedoms, using the Human Development Index, HDI, the Democracy Index and the World Press Freedom Index. Results clearly show that whereas, ECOWAS countries have been growing better than most parts of the world, their performance in ensuring that the values of freedom get passed down to their citizens leaves a rather disappointing conclusion.

Economic growth will no doubt aid the availability of the inanimate objects of pleasure and material comfort for West Africans. But the apparent lack of deliberate and active policies to integrate political freedom and market transactional liberties into the agenda for growth will hurt all efforts to develop the region both individually and as an economic, social and political bloc, for years to come.

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The paper concludes by hypothesizing that whereas there is plenty evidence to show there can be growth without development, it is inconceivable for a nation to develop without the attendant political liberties and transactional freedom.

Keywords Freedom • Development • ECOWAS

JEL Classification 015 • 043 • P16 • R58

1 Introduction

Everywhere, economists and policy makers, as well as almost everyone involved in development, are calling for more growth as the best recipe to world's problems of poverty, famine and many other social and economic malaises. In the case of West Africa, growth is even more alluring, now that authorities of the International Monetary Fund, IMF, and the World Bank, among others, have pronounced Africa as the new growth pole of the world (NewsfromAfrica 2012; ECA 2011). Everywhere, also, governments and civil society groups are redoubling their efforts and the resources devoted to economic growth. It is like economic growth is being posited as an end by itself. The efficacy in pursuing economic growth as a panacea to Africa's myriad of problems of unemployment, insecurity, violence, and yes, indeed, bad governance, is bolstered, in part, by a third party affirmation of Africa's potential resurgence as a pole of reckoning. For instance, Pascal Lamy, the chieftain at the World Trade Organization, WTO, recently dropped this representative line, of world's disposition to a new Africa:

> The old theories governing the way that countries produce and trade are being replaced. The pattern of trade is being transformed by increasingly sophisticated technology and innovations in transportation; and the topography of actors is shifting to reflect new poles of growth. This is no longer the clearly delineated North-South order of the 20th century. . . .. And Africa, both as a continent and as the sum of individual sovereign states, is poised to lead the new patterns of growth for the foreseeable future. Six of the world's ten fastest-growing economies over the past decade were in sub-Saharan Africa. Five years into the global financial crisis, Africa as a region has shown great resilience, with an average growth rate of over five percent over the last decade. This is in contrast with the advanced economies, most of which are yet to fully recover from the economic downturn (Lamy, P., In Omosegbon and Okeke 2014, p. 121)

While there is much to commend in growing economies, this paper revisits the historical oddity of growth, first rigorously documented for Liberia by Clower et al. (1966), in which economic growth not accompanied by development was seen as the bane of transforming shifting cultivation and commercial farming in Liberia. That environment was eerily similar to the one West Africans, including, Liberians, are facing today. For the whole of the 1950s and much of the first half of the 1960s, Liberia was the fastest growing economy in the world, faster than the new economic powerhouse of Japan (Lowenkopf 1967). Since the path breaking findings of Clower and his colleagues at Northwestern University, many

generations of economists, planning professionals and their students have developed that concern along the line of whether economic growth leads to more capacity building, a fairer income distribution and to structural changes. Current effort looks at this erstwhile breakdown in the nexus between growth and development by attempting to encapsulate this oddity in the form of the breakdown of the relationship between freedom and its constitutive values from economic growth and development.

2 Which One Leads the Other: Economic Development or Political Liberty? A Debate

At the time I was preparing this manuscript, a related fruitful debate was actively forming under the platform of AFEA@googlegroups, which is a professional listserve for African economists and finance professors to interact on research and policy issues affecting Africans and African societies. Hosted by the African Finance and Economics Association, AFEA, current debates and discussions on the subject of African economic development and democracy are shown in Appendices 1 and 2. It is as well noteworthy that the impetus for the exchange actually began in Uganda, on the choice between economic and political rights, legitimately buoyed by professors at the East African apex research and teaching citadel, Makerere University.

While each reader will find a treasure of primary data and spins to the debate in Appendices 1 and 2, the following is offered as representative of that exercise. Please join me in examining their [the positions of those who wrote in] consistencies.

1) Is democracy more endogenous to economic prosperity? Oh Yes.
   "*The history of democracy shows that economic development is a necessary precondition for democracy to gain traction. So, if the citizens are poor and not empowered, as the situation is, they cannot freely exercise their democratic rights*," (Dr. Julius Kiiza).
2) Does economic foundation provide the basis for political character in a state? Oh Yes.
   "*The economic foundation of any society provides the roots for the political character of the state. Ideally, the definition of the political character of the state is a mandate given to the people through their choice of leaders and how such leaders exercise their power*" (Prof. Mahmood Mamdani)
3) Are economic rights short-term preferences and political rights long-run preferences? Oh Yes.
   I also love the long-run emphasis of political rights in this statement. "*In a society like ours where voters are 'hungry', they can sell their sovereignty for food since it is their immediate need—not the long-term goals that are always reflected in the [political parties' election] manifestos*," says Kabumba.

4) Is democracy more endogenous to productive structures (evidence from the East Asian Miracle)? Oh Yes.
   "*Representative democracy came from a society that had gone through industrialization*" (Prof. Mulindwa Rutanga).
5) Do African cultures matter (evidence from Somaliland bicameral (sic0 democracy)? Oh Yes
   "*Rutanga argues that popular democracy is the most plausible way through which African countries could have established a democracy in tandem with its cultural context*"
6) . . .. . .The list is long.
   Africa in poverty is not ripe for short-term liberal democracy. Whether advocates of the Washington Consensus like it or not, it is an economic fact that the Chinese model is a reference for short-run or initial development. For unknown reasons, some Africans are more willing to protect the Washington consensus than Dr. Jim Yong Kim himself (president of the World Bank) who has strongly advocated the need for multipolar solutions. The era when the Washington consensus was considered 'the holy economic gospel' has past (AFEA. Please, see Appendix 1 below)

Clearly, even current thinking regarding growth and development among African experts remains in the context of whether growth leads to development and on the choice of which one should Africans focus their attention under current state of economic and political transformation—economic or political rights. It is noted that this debates essentially posits economic rights and political rights [democracy] as incompatible, at the least, under ongoing transformation of African societies.

3 Market Transactional and Political Freedoms

Following the hypothesis, first put forward by Amartya Sen (2001), that no major famine has ever occurred in a democratic country that has regular polls, opposition parties, and a relatively free media, we examine the countries of the Economic Community of West African States, ECOWAS, for political and market transactional freedoms, using the Human Development Index, HDI, the Democracy Index and the World Press Freedom Index. Figure 1 shows low but stable HDI rankings for ECOWAS countries. HDI ranks countries of the world on a composite index of three dimensions of human development: living a long and healthy life, being educated, and having a decent standard of living (Tristam 2014). Figure 2 depicts an undesirable relationship between HDI ranks and scores for ECOWAS. A desirable relationship will be lower ranks and high scores. ECOWAS has high ranking and low HDI scores.

ECOWAS has relatively superior performance in growing its economies compared to the other regions of the World shown in Fig. 3.

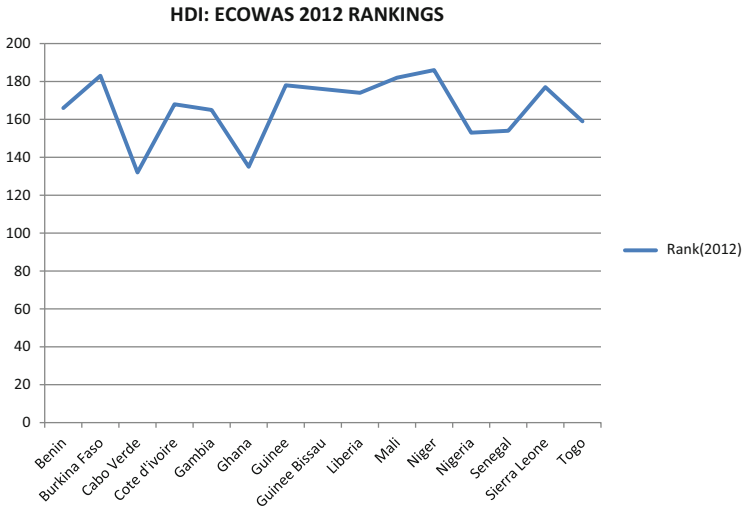

Fig. 1 ECOWAS, Human Development Index. *Source*: United Nations Development Program (2014a). Table 1: Human Development Index and its components

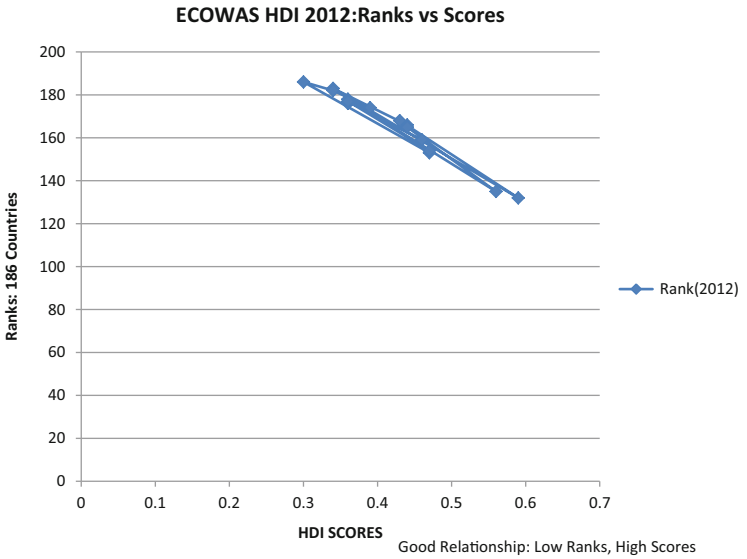

Fig. 2 Ranks versus scores. *Source*: United Nations Development Program (2014b). Table 1: Human Development Index and its components

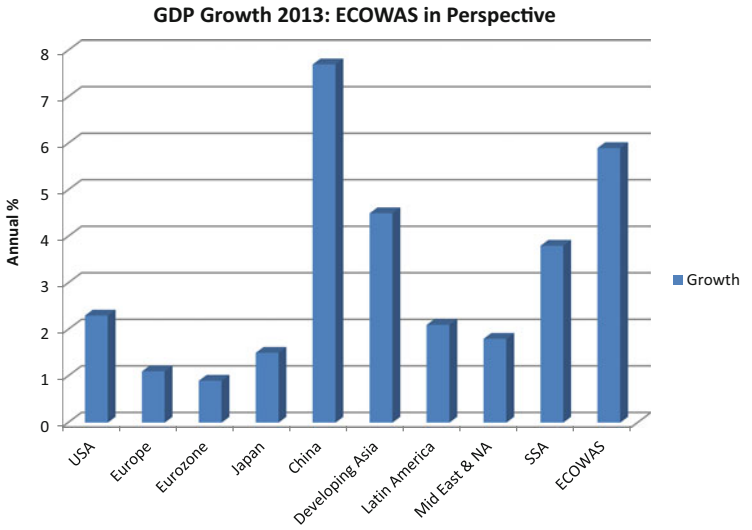

Fig. 3 Regional GDP growth around the world. *Source*: The Conference Board (2014). Global economic outlook 2014

In Fig. 4 we observe a rather embarrassing destruction of the relationship between economic growth, vertical axis and economic development, measured by the Human Development Index, horizontal axis.

4 Market and Transactional Freedom

Economic growth will no doubt aid the availability of the inanimate objects of pleasure and material comfort for West Africans. But the apparent lack of deliberate and active policies to integrate political freedom and market transactional liberties into the agenda for growth is hurting all efforts to develop the region both individually and as an economic, social and political bloc. Such breakdown in transactional liberty and political freedom is portrayed in Figs. 1, 2, 3 and 4.

Freedom is, indeed, the primary objective of development; that is, there can be no development without human freedom. Freedom is the end to development efforts. So, a rise in GNP and a huge advancement in technology by themselves will not cut it! For development to take place, we have to ask the question, "What are the effects of rapid growths in GNP and technological advancement on the ways people choose to live or on the freedom to choose the lives the people desire"? Freedom is the principal means of development. Various forms of freedom are consistent and mutually reinforcing. Some of these forms of freedom are (Sen 2001, p. 507):

I. Economic Opportunity
II. Political Liberties

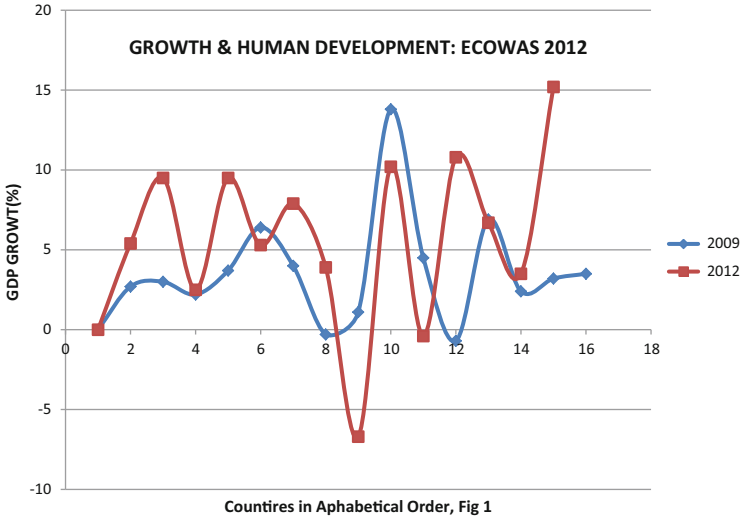

Fig. 4 Economic growth and human development in ECOWAS: Global Index. *Source*: United Nations Development Program (2014a). Table 1: Human Development Index and its components

III. Social facilities and infrastructures
IV. Good health
V. Basic education
VI. Freedom of speech and of association

> Sen (2001) compares freedom to carrying out transactions and freedom to exchange in the market place to the freedom we enjoy when different people engage in conversations in their ordinary business of living. Constraining transactions and exchange in the market place will seriously limit or deny the existence of progress of any kind. In particular it will scuttle the ability to produce, consume and to give. Free markets exist, they will spur and spun all kinds of material and psychosocial benefits to the society that creates them.

Without the interconnections and co-variability in all of these, an efficacious human agency cannot emerge from the development process (Sen 2001, p. 507). This is important, as a focus on freedom as an end in itself allows us to see development for what it is about: individual liberty and quality of life. This also contrasts with the more traditional and rather narrow look or approach to development which emphasizes technological advancement, the growing of GDP and the availability of more gadgets.

5 Political Liberty

Is political liberty consistent with economic development? A negative correlation will justify the Kigali [Rwanda] Success and the Chinese Model. Some of the ongoing debates among African economists, discussed earlier, support the implied

hypothesis that democracy, at least in developing economies, is inhibiting to economic progress. In Sen's work, and in line with the focus of this paper, we see the argument in a different way: that political freedom is a component of economic development, and not a mere driver (explanatory variable) of it! To coin a phrase, political freedom, as indeed freedoms of all sorts, is endogenous to economic development!

6 Trust in National Governments in Africa

No trust in leadership can germinate in a governance environment where the leadership is consistently 'morgue'—brain dead!—and consistently obtains failed grades in governance, no matter how fast the economy is growing. This situation of failed leadership is shown in Fig. 5. On the core measures of political liberty, The Democracy Index, only 10 ECOWAS countries are ranked at all, among the 186 countries on this component, and as Fig. 6 shows, only half of the 10 countries recorded some gains; the other half lost in ranks.

7 Civil Liberties, Education and Economic Security

When compared to the rest of the world, ECOWAS countries are behind in basic education, measured by the mean years of schooling, illustrated in Fig. 7. The mean-years-of-schooling in ECOWAS is 3.4 years with an HDI of 0.42, whereas the world averages for these measures are 7.5 years and 0.69 respectively.

For ECOWAS, there is no comfort either, in some of the other forms of freedoms, including Press Freedom. ECOWAS countries appear to be on the cliff here, as indicated in Fig. 8, where virtually all of them lost in the rankings, often precipitously.

8 The Power of Freedom to Bring About Development

As mentioned earlier, Sen (2001) claimed that no major famine has occurred in societies with regular polls, flourishing opposition parties, and free media. This is a testimony to the "protective power of political liberty", Sen (2001, p. 507). The weak form of this claim holds for high income, advanced democratic societies while the strong form will hold even in economies with pervasive poverty and food insecurity. A proof of this hypothesis is the case of post-independence democratic India compared to an authoritarian government in China. In the former, the last known major famine occurred in Bengal in 1943 (4 years before independence from Britain). In the latter, the most fatal famine in history was experienced in 1959–

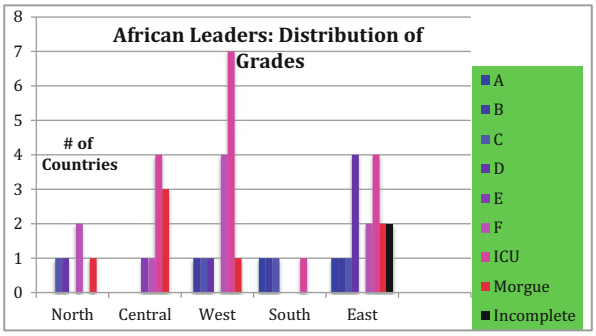

Fig. 5 Distribution of governance grades. *Source*: Omosegbon and Okeke (2014), Fig. 4

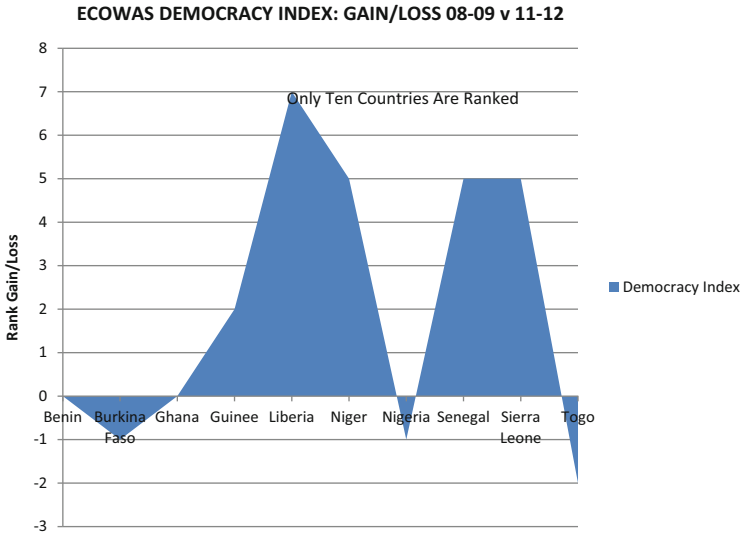

Fig. 6 ECOWAS Democracy Index, '08–'09 and '11–'12. *Source*: Campbell et al. (2013)

1962, with an estimated extra mortality of up to 30 million perishing (Sen 2001). In Africa, the 1983–1985 famine is the last major one of its kind in Ethiopia, and especially since the country moved to parliamentary democracy and the devolution of governance to the regions. Recorded history of famine and food insecurity in Ethiopia dates back to antiquity and remained so until 1994, a period characterized by royal autocracy and military dictatorship. The country became a republic with the adoption of a democratic constitution in December, 1994 (Wikipedia 2014).

Figure 9 shows a combination of three social integration indices, Satisfaction with Community, SWC, Trust in National Governments, TING and Perception of Safety, PoS. Now, if a society does not do well in these categories, it seems that development seen in terms of how many cars are driven or how expensive are

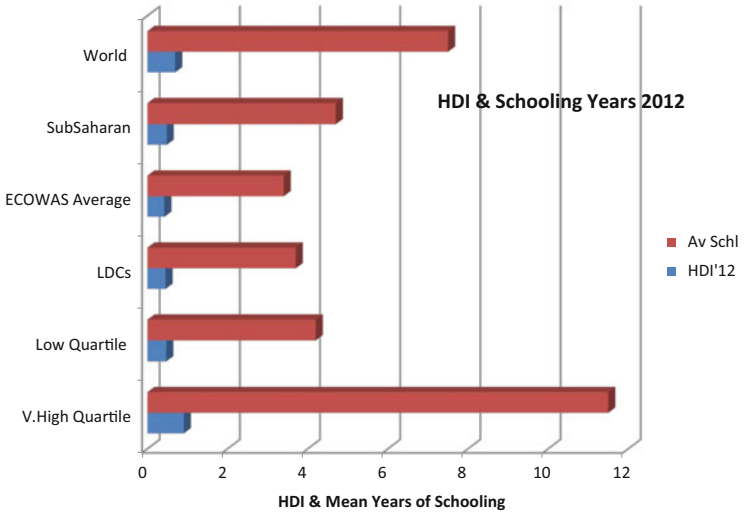

Fig. 7 Basic education. *Source*: United Nations Development Program (2014b). Table 1: Human Development Index and its components

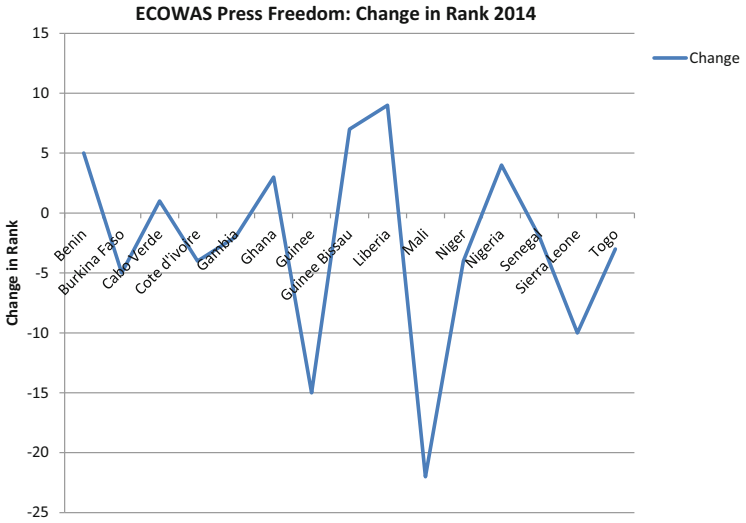

Fig. 8 Change in press freedom rank in ECOWAS 2014. *Source*: Campbell et al. (2013)

homes is devoid of a true and fulfilling life. Here, again, ECOWAS members are not performing to par with the rest of the world and certainly not any different from the poor showing of their cousins in Sub-Saharan Africa.

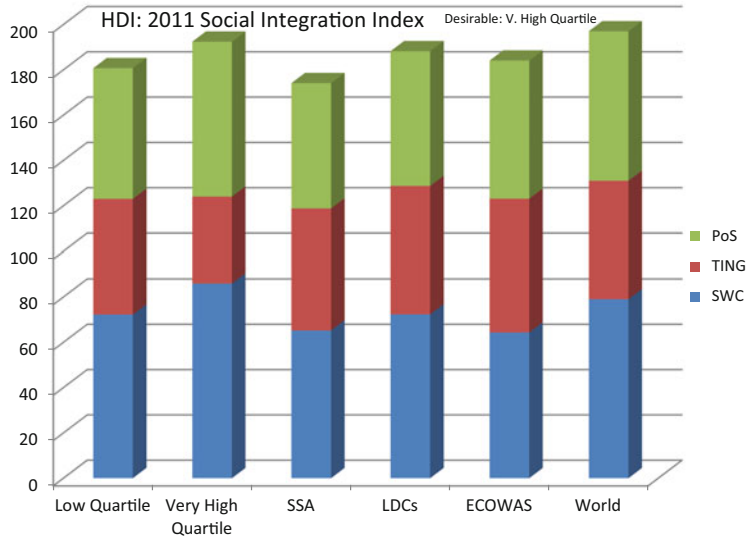

Fig. 9 Social Integration Indices. *Source*: United Nations Development Program (2014a). Table 9: Social integration. *SWC* Satisfaction with community, *TING* Trust in National Government, *PoS* Perception of safety

9 An ECOWAS Wide Agenda for Political and Market Transactional Freedom

"Only a fast and an uninterrupted economic integration of the people can bring about the desired living among West Africans, as indeed in all of Africa. This is no secret anymore. The African Union has always maintained that it is committed to the complete integration of the continent and its people. In the now famous, Sirte Declaration, African Heads of States unanimously called for the establishment of an African Union, with a view, inter alia, to accelerating the process of integration in the continent to enable it play its rightful role in the global economy" (African Union, 2014).

10 Conclusion

Results clearly show that whereas, ECOWAS countries have been growing, on average, quite better than most parts of the world, their performance in ensuring that the values of freedom get passed down to their citizens leaves much to be desired. Whereas, there is plenty evidence to show there can be growth without development, it is inconceivable, demonstrated in this paper, to claim that economic

development has taken place or has been achieved without the existence of plural, civil and political liberties and transactional freedom.

Appendix 1: African Economists and Finance Professionals Speak on Economic Development and Democracy

Last Post Was Made on May 19, 2014

RE: [AFEA—LIST] What some Ugandans say: economic versus political rights

From	Ssozi, John M. John_Ssozi@baylor.eduhide details
To	afea afea@googlegroups.com

Simplice,

Yes, six times.

However as we develop this thesis and advocate for its experimentation, we need to pay attention to its limitations and possible abuses when a low income nation slides into the arms of Kleptocratic individuals.

Cases of abuses of unconstrained political power are not an exception in Africa. We have to articulate the assumptions, optimal conditions, limitations, and legacy it would create.

Thanks.

John

From: afea@googlegroups.com [afea@googlegroups.com]

Sent: Sunday, May 18, 2014 11:50 PM

To: afea@googlegroups.com

Subject: Re: [AFEA—LIST] What some Ugandans say: economic versus political rights

Dear John,

The Moyo hypothesis is taking shape. I'm happy we have finally come to a converging point of view. Indeed, with poverty, the smoke screen of *de jure* power in principle is *de facto* power in practice. The people have been so thoroughly dissipated by hunger and lack of shelter that they are ready to accept and follow any leadership that promises the alleviation of their stringencies with 'white elephants'. Liberal democracy cannot pragmatically strive without a growing middle class. Hence, economic rights should come first in the scale of

preference. I am not the person making the noise this time. In essence, the 'white noise' is now 'added news'. In the piece you just sent, the following (inter alia) are all of the same view point: Dr. Kizza Besigne (former FDC president and three times presidential candidate); Dr. Julius Kiiza & Prof. Mulindwa Rutanga (political economy lecturers at Makerere University) Prof. Mahmood Mamdani; Prof. Kabumba; . . ..etc.),

Please join me in examining their consistencies.

1) Is democracy more endogenous to economic prosperity? Oh Yes.
   "*The history of democracy shows that economic development is a necessary precondition for democracy to gain traction. So, if the citizens are poor and not empowered, as the situation is, they cannot freely exercise their democratic rights*," (Dr. Julius Kiiza).

2) Does economic foundation provide the basis for political character in a state? Oh Yes.
   "*The economic foundation of any society provides the roots for the political character of the state. Ideally, the definition of the political character of the state is a mandate given to the people through their choice of leaders and how such leaders exercise their power*" (Prof. Mahmood Mamdani)

3) Are economic rights short-term preferences and political rights long-run preferences? Oh Yes.
   I also love the long-run emphasis of political rights in this statement. "*In a society like ours where voters are 'hungry', they can sell their sovereignty for food since it is their immediate need—not the long- term goals that are always reflected in the [political parties' election] manifestos*," says Kabumba.

4) Is democracy more endogenous to productive structures (evidence from the East Asian Miracle)?. Oh Yes.
   "*Representative democracy came from a society that had gone through industrialization*" (Prof. Mulindwa Rutanga).

5) Do African cultures matter (evidence from Somaliland bicameral (sic0 democracy)? Oh Yes

   "*Rutanga argues that popular democracy is the most plausible way through which African countries could have established a democracy in tandem with its cultural context*"
6) . . .. . .The list is long.
   Africa in poverty is not ripe for short-term liberal democracy. Whether advocates of the Washington Consensus like it or not, it is an economic fact that the Chinese model is a reference for short-run or initial development. For

> unknown reasons, some Africans are more willing to protect the Washington consensus than Dr. Jim Yong Kim himself (president of the World Bank) who has strongly advocated the need for multipolar solutions. The era when the Washington consensus was considered 'the holy economic gospel' has past.

Cheers

The Economic Consequences of China-Africa relations: debunking myths in the debate.

http://www.tandfonline.com/toc/rcea20/11/4#.U0I6zah_tA0

On Monday, May 19, 2014 5:55 AM, Voxi Heinrich Amavilah <vhsamavilah@gmail.com> wrote:

Lol, simplice will be happy to see this.

On May 18, 2014 8:39 PM, "Ssozi, John M." <John_Ssozi@baylor.edu> wrote:

http://www.observer.ug/index.php?option=com_content&view=article&id=31788:no-wealth-no-democracy&catid=34:news&Itemid=114

skakaire@observer.ug

With dire poverty and rampant unemployment, the ordinary people's priority is not democracy or human rights but, rather, salt or soap

When Maj Gen (rtd) Kahinda Otafiire was quoted as slamming "the fast-growing culture of vote buying" earlier this month, the NRM historical was not saying anything new. In fact, he became the latest ruling party loyalist to openly say Uganda's politics had become heavily monetised.

"I feel sad when I see people asking for money," said the Justice and Constitutional Affairs minister, while closing a workshop in Kampala.

"I want to go and ask for votes and my people address the election question by issues," he said.

Days earlier, another NRM historical, Gen (rtd) Salim Saleh, a presidential adviser on military affairs, had told local leaders in Luweero sub-county that he doesn't condone the notion of renting political support.

President Museveni's younger brother argued that the NRM did not go to the bush [in 1981] to fight vote rigging only to capture power and then buy votes to retain it. Gen Saleh was mobilising support for the NRM candidate in the Luweero district Woman MP by-election, whose campaign is currently ongoing ahead of polling on May 22.

Coming at a time when the NRM has given Shs four million per sub-county for each NRM MP to popularise the so-called 'sole candidacy' project, the

comments by the senior NRM leaders offer an opportunity to examine Uganda's democratisation process.

Over the last 20 years, Uganda has promulgated a constitution, conducted four presidential and parliamentary elections, and revived a multi-party political arrangement. However, the disputes that have surrounded each election, the regular interference of the military in political matters, and allegations of rigging, continue to trouble Uganda's fledgling democracy.

Insufficient Emancipation

Some legal and political analysts believe this is the case because the masses are not sufficiently emancipated to influence the democratic process. Dr. Kabumba Busingye, a lecturer of constitutional law at Makerere University, says the sovereignty that the 1995 Constitution purports to provide to ordinary Ugandans is illusory.

"Due to the poverty levels in our society, people have been induced by those who have money to provide consent on how they are to be governed. And where such power is obtained, it is not exercised in accordance with the people's aspirations," argues Kabumba.

Among the glaring incidents where politicians have used money to undermine the institutions of democracy is bribery of voters and payment of inducements to MPs to pass laws.

"Most electoral petitions show how people have been given money in exchange for a vote," adds Kabumba.

He also pointed at the ongoing campaign by NRM MPs to popularise a resolution they passed during their retreat at Kyankwanzi in February. The resolution seeks to install President Museveni as NRM's sole candidate in the 2016 elections.

In 2005, MPs of the Seventh Parliament received Shs five million each, a sum widely understood as inducement to support the lifting of presidential term limits, which allowed Museveni to extend his rule until now.

NRM is further accused of raiding the treasury ahead of the 2011 presidential elections to get the money it splashed around the country to secure Museveni's victory. Later on, MPs received Shs 20 million each, ostensibly to monitor government programmes in their areas.

Poverty vs. Democracy

That lopsided political terrain is what convinced former FDC president Kizza Besigye, a three-time presidential candidate, that he could not possibly win an election organised and controlled by President Museveni.

Senior opposition figures, including Besigye, and civil activists, are currently combing the countryside to amass support for electoral reform in a bid to cultivate an even political and financial playing field.

With unemployment quoted by Uganda Bureau of Statistics (Ubos) to be in the region of 60 %, while other agencies put it even higher, Dr. Julius Kiiza, a political economy lecturer at Makerere University, says social organisation based on democratic institutions is unlikely to produce effective results.

"The history of democracy shows that economic development is a necessary precondition for democracy to gain traction. So, if the citizens are poor and not empowered, as the situation is, they cannot freely exercise their democratic rights," he says.

In his book, Politics and Class Formation in Uganda, Prof. Mahmood Mamdani says the economic foundation of any society provides the roots for the political character of the state. Ideally, the definition of the political character of the state is a mandate given to the people through their choice of leaders and how such leaders exercise their power.

However, in a situation like Uganda's, where poverty levels are high, analysts say the people's collective conscience is often rented out in exchange for money and other incentives.

"In a society like ours where voters are 'hungry', they can sell their sovereignty for food since it is their immediate need—not the long-term goals that are always reflected in the [political parties' election] manifestos," says Kabumba.

Elitists Mentality vs. Popular Demands

While there is a general consensus amongst analysts that poverty impedes democracy, Prof. Mulindwa Rutanga of the Political Science and Administration department at Makerere University, calls for context.

Rutanga argues that representative democracy came from a society that had gone through industrialisation.

"So, if you impose representative democracy in a society which is majorly peasantry, like ours, what is likely to happen is people are likely to vote based

on their immediate benefits such as food as opposed to things like human rights and the size of the economy," he argues.

What is needed in such a setting, according to Rutanga, is popular democracy, where people can define what they need and as such choose leaders who can make them achieve i Rutanga argues that popular democracy is the most plausible way through which African countries could have established a democracy in tandem with its cultural context. That opportunity, he adds, was, however, lost with the arrival of imperialism.

RC Experiment

In Uganda, attempts to establish a semblance of popular democracy happened in the Resistance Council system. But it could not work after the coming into force of the 1995 constitution.

"The Constitution says, 'one man one vote' and everything is about human rights. So, if it is like that, what is to happen? My vote has the same value like that of a peasant even when the level of judgment is not the same," says Rutanga.

Deliberate Move

President Museveni says in his book, Sowing the Mustard Seed, that when European colonialists came to Africa, they denied the continent "the natural process of growth and advancement, which as such produced the dominant exploitative relations in production, distribution and exchange where imperialist/capitalist ones have always worked to the detriment of the African people."

Museveni, who published his book a year after the 1995 constitution had been promulgated, acknowledged the fact that in such a situation, democracy was not the immediate demand for society but social reconstruction to alleviate poverty.

Kiiza of Makerere University argues that Museveni took advantage of the circumstances at the time to develop a system that would perpetuate his continued stay in power rather than put in place the building blocks for democracy.

"If reconstruction was the agenda, we would be far by now. Countries like Taiwan and South Korea transformed in only 20–30 years, but after 28 years in power, you realise that we are heading nowhere," says Kiiza.

"When he goes to the rural poor and gives sacks of money like he did in Busoga, they embrace him but this is all patronage."

Kiiza believes Museveni's government systematically destroyed some of the institutions that would have fostered democracy. For instance, he points out, Museveni found in 1986 a farmers' cooperative movement with a bank of its own.

Both the bank and the cooperatives are essentially no more. The government's official explanation was that the bank was heavily indebted but Kiiza believes it was intended to disempower farmers and make them beholden to the regime.

In his book, Citizen and Subject, Contemporary Africa and the Legacy of Late Colonialism, Prof. Mahmood Mamdani writes that without a reform of the local state... democratisation will remain not only superficial but also exploitative.

"Urban politicians harness rural constituencies through patron-client relations. Where despotism is presumed, clientelism is the only non-coercive way of linking the rural and the urban," notes Mamdani.

Way Forward

As the opposition pushes for electoral reforms as a means to improve the democratisation process, some analysts believe a push for socio-economic transformation is even more important.

"What is most important is a responsive state that will provide the infrastructure, education for the masses and health care," says Rutanga.

"The opposition can demand for this because it will in turn produce a critical mass that will understand their cause." Kabumba agrees.

"We cannot abandon any of the two... and countries like Ghana are doing it. If we say that we do one and avoid the other, the results will not be any better and it will backfire."

Appendix 2: Benefits of Liberal Democracy: What Do African Economists Think?

Last Post Was Made on June 12, 2014

Re: [AFEA—LIST] Time and Level hypotheses for the benefits of liberal democracy revisited

From	Ssozi, John M. John_Ssozi@baylor.eduhide details
To	<afea@googlegroups.com>afea@googlegroups.com

Simplice,

These are undeniably very complex facts, and lessons on hard power versus soft power.

John

On Jun 12, 2014, at 6:19 PM, 'Anutechia asongu Simplice' via AFRICA FINANCE and ECONOMIC ASSOCIATION<afea@googlegroups.com>wrote:

Prof. Ssozi et al.

I hope you are closely following the spectular march of the ISIS to Baghdad. Other collateral damages of the Arab Spring are fully validating our hypothesis, inter alia:

- the definition of democracy has been revisited and redefined several times in Egypt over the past months. President A F Al Sissi (coming to power with less than 50 % of voters going to the polls) has said it will take the country about 25 years to mature (time hypothesis) in democracy;
- the law of the land of post-Ghadaffi Libya is substantially that of the rebels;
- Yemen is failing to honour the terms of its socio-political contract;
- the West is now confused on its funding of the rebels (with non lethal weapons though) and Bashar al Assad's thesis has been fully validated by the ISIS of Iraq.

the list is long

Cheers

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West Africa's Economic Growth and Weakening Diversification: Rethinking the Role of Macroeconomic Policies for Industrialization

Chukwuma Agu

Abstract Despite the gains in growth, West Africa remains a very marginal (and fragile) player in the global economy. Neither the sterling growth performances nor the quadrupled commodity prices seem to have affected the region's share of world export. *This paper aims to question the coexistence (or even correlation) of improved macroeconomic stability in West Africa with poor diversification. Using an endogenous growth accounting procedure, the paper generates coefficients of effect of selected macro variables on growth for a panel of 16 West African countries. The sample is divided along the lines of resource dependency (agriculture, aid, oil and solid minerals). The outcome is then compared to that from an inclusive (regional) panel. Explanatory variables of interest include the key rates (interest and exchange) fiscal measures and selected structural measures.* The paper found that overall effect of deviations of these variables has been distortions in relative prices that hurt domestic production. This distortion has fuelled a rise of a set of interest groups that feed upon the sectoral inefficiencies. *Using insights from structuralism, post-structuralism and Nurksism, the paper argues that macroeconomic policies do have a role to play in diversification, but that this role is played through their impact on relative prices. Specifically, where policies are not able to work on relative prices first, they are ineffective in leading to diversification.*

Keywords Diversification • Structuralism • Industrialization

JEL Classification E23 • E61 • E63

Fifth Annual Conference on Regional Integration in Africa (ACRIA 5), Praia, Cape Verde

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D. Seck (ed.), *Accelerated Economic Growth in West Africa*, Advances in African Economic, Social and Political Development, DOI 10.1007/978-3-319-16826-5_7

1 Introduction

Africa's recent growth performance presents a number of reasons for cheer—rising per capita income, falling inflation, growing private sector share . . .and so much more. The mood is captured by the December 2012 edition of the Economist, which blazoned "Africa rising", showing no less than a dozen African countries posting 6 % growth consistently for upwards of 6 years. This growth has been both resilient and buoyant, withstanding the 2008 global economic crisis at a time some of the best performers elsewhere made do with being steered from implosion. But questions abound. First, Africa's improvements have, so far, been accompanied by a continued decrease in both Africa's share of global industrial production and share of industrial production in African output. Second, Africa's growth has seemingly not been followed by increased job creation and/or poverty reduction, has not been broad-based and are considered in some quarters are not sustainable!

Probably more than other regions of Africa, disconnect between growth on the one hand and employment, poverty and inequality reduction numbers on the other in West Africa is alarming. Nigeria, for example, which represents nearly half the population and output of the region, managed to combine an average of more than 6 % growth for over a decade since 2002 with poverty rising from 54 % average in 2004 to 70 % in 2010. With oil in Ghana, the battle to prevent massive distortion of incentives that could negatively affect real sector productivity and job creation is at the brink. In the UEMOA region and for a number of the smaller countries, it is even harder to associate the growth numbers with any form of structural change in production. In part, reforms introduced in the 1980s and onwards tended to rely on the premise that with external stability, all that is required is the removal of public sector distortions to "get prices right" and achieve a reallocation of factors towards high productivity industries. But with the unprecedented macro growth coexisting with weak industrialization and structural transformation, there is reason to worry. Importantly, the concentration of production in West Africa cannot be disregarded as minor, indifferent to the sustainability of external balances. In and of itself, a concentrated production structure represents a threat to macroeconomic stability.

This paper aims to question the coexistence (or even correlation) of improved macroeconomic stability in West Africa with poor diversification. Could the region have been telling a growth story yet to be captured in the literature? Are there factors underlying its improvement that makes growth compatible with rising poverty, unemployment and deindustrialization? Can the shortfall in diversification be blamed on a deficit of structural reforms; have countries in the West African region not reformed 'enough'? Or is it possible that macroeconomic policies have more roles to play in supporting and sustaining diversification than have been acknowledged by support frameworks that underpin the region's policymaking? Should macroeconomic policies actually remain neutral and leave the job of diversification to structural reforms?

The methodology of the paper is twofold. The first is empirical; using an endogenous growth accounting procedure, we generate coefficients of effect of

selected macro variables on growth for a panel of 16 West African countries. The sample is divided along the lines of resources dependency (agriculture, aid, oil and solid minerals). The outcome is then compared to a whole West African regional panel. It weighs the relevance of identified indicators for growth and structural transformation policies. The second approach is theoretical. Using insights from structuralism, post-structuralism and Nurksism, the paper argues that macroeconomic policies do have a role to play in diversification, but that this role is played through their impact on relative prices. Specifically, where policies are not able to work on relative prices first, they are ineffective in leading to diversification. We demonstrate this by looking at policy focus and their links to growth, employment and poverty outcomes in a number of countries within the region.

The rest of the paper is organized as follows: Sect. 2 discusses growth in West Africa while Sect. 3 briefly reviews the literature on growth. Section 4 outlines the methodology for the work while Sect. 5 discusses the findings. In Sect. 6, the study briefly lays out some insights from the structuralist literature that may be useful for policy considerations in West Africa and Sect. 7 concludes.

2 The West African Growth Story

We map West Africa's growth at two levels—the language and sub-regional grouping regions and the commodity grouping. The first consists of two groups—UEMOA and the rest while the second consists of three groups—Solid minerals and oil producing (consisting of three countries), agricultural exporting (comprising six countries) and aid dependent (consisting of seven countries). The full list of countries is shown in Table 1. Figures 1 and 2 respectively show the growth rate of the two sub regions as well as the commodity groups since 1980.

As can be seen from the figures, growth among West African countries has been volatile and irregular. But it has also been decidedly higher in the non-UEMOA countries. Both groups have had unstable growth, but it growth of the UEMOA group has been much lower on average than that of their counterpart in the region. Much of growth has been driven by commodity fortunes. For example, average growth, which was quite high post-independence went down in the late 1970s and remained so through the 1980s and 1990s. As has been much advertised, growth rebounded in the 2000s. The excitement of the 2000s growth is in part because it has been higher and remained relatively for longer than was the case in the 1970s. The high growth of the 1970s was largely driven by commodity boom and it is not yet clear that the present growth surge is structurally different in terms of factors driving it. Specifically, commodity prices have been up and China's influence on demand and pricing of Africa's primary exports has not only meant more opportunities and options, but also higher returns to these exports.

Interestingly, when the countries are grouped along product lines, the group with the highest growth rate comprises those supposedly dependent on official development assistance. The growth data for this group was partly influenced by Liberia's

Table 1 West Africa by commodity groups

Oil producing and solid minerals exporting	Agricultural commodities exporting	Aid dependent
Nigeria	Chad	Benin
Guinea	The Gambia	Burkina Faso
Niger	Ghana	Cape Verde
	Guinea-Bissau	Liberia
	Cote d'Ivoire	Mali
	Senegal	Sierra Leone
		Togo

Source: Authors

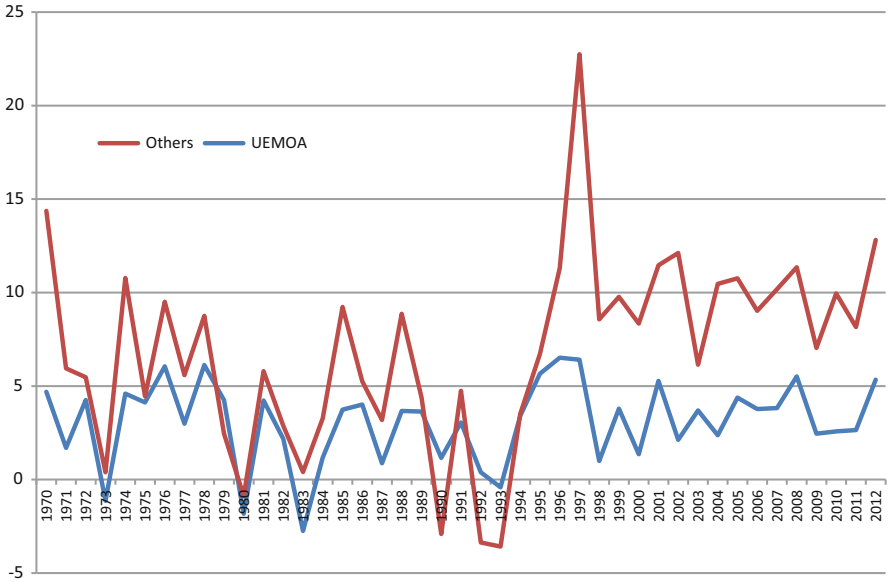

Fig. 1 Average annual growth of W/African country groups

where post conflict rebuilding efforts translated to very high growth rates for some years in the 1990s and 2000s. This is followed by the agricultural exporting group while the group of oil and solid minerals exporting countries has the lowest average growth rates. Again, the growth has been relatively more stable and longer with less volatility for all groups in the 2000s than it was in the 1970s or 1980s.

As noted earlier, West Africa's growth story has closely followed commodity prices. The commodity price glut of the late 1970s and early 1980s, driven by reduction in global aggregate demand for primary commodities, led to growth implosions affecting most countries in the continent. At the peak of the recession in the mid-1980s, average growth was negative. Temporal divergences in the growth rate for West African countries should necessarily be a concern for sustainability and diversification. The gyrations in growth rate between one decade and

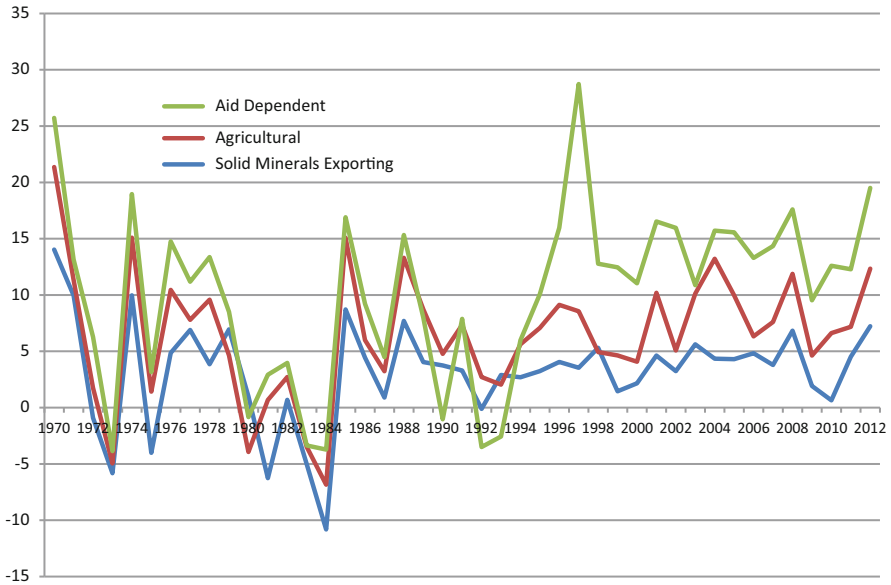

Fig. 2 Average annual growth of W/African product groups

another clearly indicates that growth is yet to find a solid and sustainable anchor. The figures depicted so far are group averages, implying substantial smoothening of the numbers through aggregation (of countries and years). Despite this, virtually all the groups seem to have very large variations in growth rates between 1 year and the other.

So what currently drives growth among African countries? Despite the temptation to an easy conclusion, a deeper insight into the growth numbers may reveal more than meets the eye. For example, Table 1 shows a list of West African countries by size of exports (topped by Nigeria and followed immediately by three countries in the agricultural exporting group) as well as the average growth rate of these countries in the 2000s. A cursory assessment shows that the correlation between exports value and growth rate is −0.049, indicating not only a weak, but also a negative relationship. In particular, the recent resurgence of growth among the group marked as 'aid dependent' and the fact that they top the growth chart raises a number of fundamental questions on what could have been a simple answer of 'growth is driven by natural resources'. While a number of natural resource-endowed countries in the continent have grown, some others quite less endowed have also grown. In effect, while it is possible to attribute West Africa's growth to external forces, such external forces can no longer be limited to only the global commodity market nor is it possible to easily discountenance domestic factors that may have been at play. There are arguments that Africa's current growth is more than just the outcome of resource boom. Specifically, the McKinsey Global Institute (MGI) produced some evidence indicating that resources accounted for only

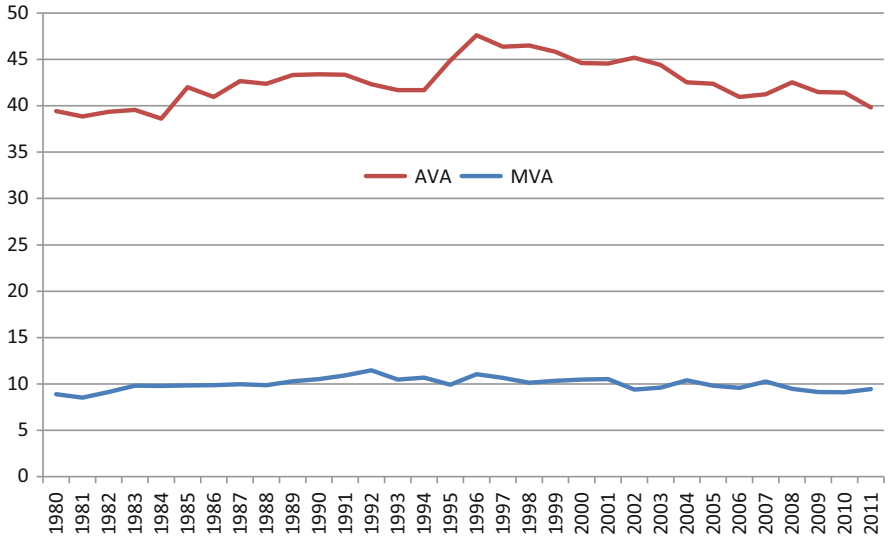

Fig. 3 Trends in agricultural and manufacturing value added

about 32 % (roughly a third) of Africa's growth between 2000 and 2008 with the rest resulting from internal structural changes that have activated higher levels of activity within the broader domestic economy. Such higher levels of economic activity have particularly centered on sectors such as wholesale and retail, transportation, telecommunications, and manufacturing. The report argues that the current growth resurgence is particularly widespread, covering at least 27 of the continent's 30 largest economies and that both countries with and those without significant resource exports have had similar output growth rates.

But the challenge is that whether external o internal forces, the sort of structural changes that should follow growth for countries with very weak initial conditions, are not showing up among West African countries. Figure 3 shows trends in Manufacturing and agricultural value added. So far as such theories as the structural change model go, agriculture should gradually be donating labour and other resources to the secondary sector spurring growth in manufacturing. But as the figure shows, even though the share of agriculture is currently below what it was in the mid-1990s, it is not lower than its value in the early 1970s. In addition, whatever seems to have been lost in agricultural value added is picked up by services and not necessarily manufacturing. This would not have been such a challenge were the services to be high value added ones, as opposed to what obtains in many countries where the service sector comprises of exchange activities that merely support production in countries outside the continent.

3 The Literature on Growth and Policy

3.1 Growth Models

One of the oldest and most basic growth models is the classical growth model, which perceives increases in profits to induce investment, and thereby raise the stock of capital. The model believes in a capitalist economy in which the main motivator is profit. A growth in the stock of capital allows a steady growth in technological progress and the wage fund. A growth in the wage fund in turn accelerates population growth and expansion in the labour force causes diminishing returns to set in. This increases labour costs, forcing the profit margin to decline. The literature that evolved afterwards identified two major limitations of this model—first, its inability to assign any important role to entrepreneurship despite recognizing it as critical and second, the inability of the model to envisage the changing role of increasing returns to scale that could make profits not to fall against the predictions of the model.

Consequently, Keynes proposed a model of economic growth that suggests growth as being largely self-adjusting, moving through a cycle of peaks and troughs, or "booms and busts". At the start of the upturn, firms produce increasing amounts of goods and services, increasingly employing more people at higher wages. Consumption expenditures from wages fuel the boom further, until the economy reaches full capacity. To prevent price pressures, investment must increase at this point to expand the economy's production possibilities. But this investment process takes some time so that inflation cannot be completely avoided thereby forcing prices to nearly always start to rise. This causes demand for goods and services to begin to drop. Firms will begin to scale back production and lay off workers—the slowdown has begun. The economy keeps shrinking until economic growth sometimes goes negative before prices begin to drop in response. This reduction in inflation kick-starts another recovery process, causing growth to pick up again. Contrary to the classical view, Keynes' model suggests that the government should intervene to level out the cycle by employing various methods of aggregate demand management—the manipulation of interest rates, taxation and public spending levels. During downturns, the government can reduce interest rates, pump money into the economy by raising public spending, and cut back taxes to boost aggregate demand and hence economic growth. During boom periods, reverse tactics should be employed to reduce aggregate demand. One major shortcoming of this model is that it omits important factors such as the supply side (whether the conditions exist for firms to be able to invest and expand), and external shocks from the global economy such as trade and foreign exchange rate levels. In the face of global economic forces such as the oil price shocks of the 1970s and the Wall Street crash of 1987, there was little national governments could do to cushion the effects (Sally and Khaw 2006).

The neoclassical growth model, also known as the Solow-Swan growth model or exogenous growth model attempts to explain long run economic growth by looking

at productivity, capital accumulation, population growth and technology. It extends the Harrod-Domar model by adding labour as a factor of production and by ensuring that capital-labour ratios are not fixed. These extensions allow increasing capital intensity to be distinguished from technological progress. Since capital is produced based on known technology and technology improves with time, new capital will be more productive than old capital. By implication, policy measures like tax cuts or investment subsidies can affect the steady state level of output but not the long-run national curve (Solow 1956). Growth is affected only in the short-run as the economy converges to the new steady state output level. The rate of growth as the economy converges to the steady state is determined by the rate of capital accumulation. Capital accumulation is in turn determined by the savings rate (the proportion of output used to create more capital rather than being consumed) and the rate of capital depreciation. The long-run rate of growth is exogenously determined. A country with a higher saving rate will experience faster growth. For example, Singapore had a 40 % saving rate in the period 1960–1996 and annual GDP growth of 5–6 %, compared with Kenya in the same time period which had a 15 % saving rate and annual GDP growth of just 1 % (Haines 2006). In the very long-run, capital accumulation appears to be less important than technological innovation in the Solow model.

A key prediction of the neoclassical growth models is that the income levels of poor countries will tend to catch up with or converge towards the income levels of rich countries as long as they have similar characteristics—for instance saving rates. Since the 1950s, the opposite empirical result has been observed on average. Haines (2006) posits that if the average growth rate of countries since, say, 1960 is plotted against initial GDP per capita (i.e. GDP per capita in 1960), one observes a positive relationship. In other words, the developed world appears to have grown at a faster rate than the developing world, the opposite of what is expected according to a prediction of convergence. However, a few formerly poor countries, notably Japan, do appear to have converged with rich countries. In the case of Japan, it actually exceeded other countries' productivity. Some theorize that this is what has caused Japan's poor growth recently—convergent growth rates are still expected, even after convergence has occurred; leading to over-optimistic investment, and actual recession. Haines rather insists that the evidence is stronger for convergence within countries. For instance, the per-capita income levels of the southern states of the United States have tended to converge to the levels in the Northern states. Whether convergence occurs or not, according to him, depends on the characteristics of the country or region in question, such as institutional arrangements, trade policy with other countries and education policy.

Researchers have also found that while the standard approach of Solow model requires the growth rate of the labour force to be taken as exogenously determined, the structuralist growth model takes investment growth to be determined exogenously in the long run. Also, for the structuralist model to reliably converge to steady growth, considerable attention must be given to how agents make investment decisions. The standard model relies less on agency than does the structuralist. The structuralist growth model (SGM) has its roots in the General Theory of Keynes to extend the Keynesian principle of effective demand to the long run. The central

concept of growth models in this tradition is the dual role played by investment, both as a component of aggregate demand and as a flow that augments the stock of capital. The basic structuralist model has been extended to cover a wide variety of topics, including foreign exchange constraints, human capital (Gibson 2005), the informal sector and macroeconomic policy analysis (Lima and Setterfield 2008). The exogenously given rate of growth of a key variable in the case of the standard model is the labor force and for the structuralists, it is the growth of effective demand. So part of the structure is the investment climate. The capital stock will only achieve steady growth when investment and the capital stock are growing at the same rate, and this is true for both the standard and the structuralist models. Steady growth of the capital stock, at whatever rate, therefore necessarily implies steady growth of investment. One of the major hurdles of the structuralist framework is getting the effect of capacity utilization on the growth path of investment to dampen out as the model reaches full capacity utilization. Here the shortage of capacity is at its greatest and one would expect that investment would surge. In fact, other forces must always come into play to keep investment in check. The irony of the structuralist model is that these forces are themselves variables that cannot be determined structurally but requires that agencies must intervene. Also in the neo-classical growth models, the long-run rate of growth is exogenously determined by either the savings rate (the Harrod-Domer model) or the rate of technical progress (Solow model), yet the savings rate and rate of technological progress remain unexplained.

Finally, the endogenous growth models, otherwise known as knowledge-based growth models developed because in the mid-1980s, a group of growth theorists became increasingly dissatisfied with common accounts of exogenous factors determining long-run growth. They favored a model that replaced the exogenous growth variable (unexplained technical progress) with a model in which the key determinants of growth were explicit in the model. Paul Romer (1986), Lucas (1988) and Rebelo (1991) omitted technological change. Instead, growth in these models was due to investment in human capital which had spillover effect on the economy and reduces the diminishing return to capital accumulation. A general feature of these models is rather the presence of constant or increasing returns in the factors that can be accumulated. The model holds that investment in human capital, innovation and knowledge are significant contributors to economic growth. It also focuses on positive externalities and spillover effects of a knowledge-based economy leading to growth. The long run growth rate of an economy, according to this model, depends on policy measures. For example, subsidies for research and development or education increase the growth rate by increasing the incentive for innovation. The A-K model which is the simplest endogenous model assumes that the production function does not exhibit diminishing returns to scale. It attributes this to the positive spillovers from capital investment to the economy as a whole and improvements in technology leading to further improvements (i.e. learning-by-doing). Spillovers are positive externalities, benefits that are attributed to costs from other firms. The model also incorporates imperfect markets and R&D to the growth analysis. The endogenous growth model implication is that policies which embrace

openness, competition, change and innovation will promote economic growth. Conversely, policies which have the effect of restricting or slowing change by protecting or favouring particular existing industries or firms are likely over time to slow growth to the disadvantage of the community. Sustained economic growth is a process of continual transformation. To this effect, Howitt (2006) insists that the sort of economic progress that has been enjoyed by the richest nations since the Industrial Revolution would not have been possible if people had not undergone wrenching changes. Economies that cease to transform themselves are destined to fall off the path of economic growth. The richest countries, according to Howitt, need to engage in the never-ending process of economic development if they are to enjoy continued prosperity. Researchers, however, argue that this new growth theory has proven no more successful than the exogenous growth theory in explaining the income divergence between the developing and the developed countries despite usually being more complex.

3.2 Empirical Evidence

The debate on the fundamentals of economic growth in Africa has divided social scientists. In this section, we refer to a few works that have been done to outline major drivers of growth in Africa. First, evidences suggest that there is a strong correlation between economic growth and export performance. The consensus is that increased export growth leads to overall economic growth, thus supporting the experiences of the Asian Tigers and more recently of Brazil, China, India and South Africa. This correlation stems from the fact that increasing exports is associated with access to larger markets which in turn enables exploitation of economies of scale, efficiency gains from technological spillovers and better resource allocation, employment generation and foreign exchange earnings. African exports rose from 22 % of GDP in 1983 to an average of 32 % during the last two decades. Likewise, real GDP growth rose from an average of negative 3 % in 1983 to an average of over 4 % during the past two decades (Mutenyo 2013). But this rise in export revenues has not impacted significantly on its overall export performance as a share of the world total since that share has persistently been declining during the same period. This is in sharp contrast to export performance in China. For instance, Mutenyo insists that Africa's share of total world exports declined from 4.1 % in 1981 to 1.7 % in 1998, only rising slightly to 2.4 % in 2009. Over this entire period, growth has on average only accounted for about 2 % of total global exports, of which 30 % is attributed to South Africa. But for China, export revenue was 28 % of that of Africa in 1980 but by 2009, that same ratio had risen to 408 %. More importantly, China's exports accounted for 1.1 % of total global exports in 1981, but by 2009 its share had risen to 9.8 %.

Researchers have observed that one of the problems facing exports, and consequently growth, in Africa is that African exports are not diversified, with 80 % of its exports concentrated in oil, minerals and primary agricultural commodities. Fuel

and minerals alone account for over 50 % of Africa's total exports. Stressing this point further, Mutenyo (2013) posits that "in Angola, 94 percent of exports are in crude oil; in Burundi, 72 percent of exports are in coffee; in Equatorial Guinea, 99 percent of exports are oil and gas; in Malawi, 55 percent of exports are in tobacco; in Nigeria, 82 percent of exports are in crude petroleum; in Sierra Leone, 90 percent of exports are in diamonds; in Zambia, 70 percent of exports are in copper". Africa's lack of export diversity and dependence on commodities are further compounded by its share of industry to total GDP, which declined from 37 % in 1981 to 33 % in 2010. But primary commodities are vulnerable to changes in world prices, leading to deterioration in the terms of trade. Experience from the recent global financial crisis, according to Mutenyo, shows that less diversified African countries-particularly those that are natural resource rich and depend on oil and minerals such as Angola, Botswana, Equatorial Guinea-were affected most during the crisis. Those African countries with greater diversification tended to be more resilient during the global financial meltdown (Ghana, Senegal, Tanzania and Uganda) or recovered faster (Kenya, Mauritius and South Africa). Another problem confronting export growth in Africa is that the destinations for its exports are also less diversified. About 70 % of Africa's exports go to the United States and the European Union, while less than 10 % is traded within Africa. Researchers have shown that countries that are more dependent on the U.S. and EU markets for exports were more negatively affected by the global financial melt down than those countries that depended on intra-regional trade within Africa because of the spill-over effects. Thus, in addition to expanding exports, there is need for African countries to exploit intra-Africa trade for sustainable economic growth. Other problems constraining exports in Africa include high levels of corruption, high costs of doing business due to poor institutions and infrastructure and trade protectionism in the form of non-tariff barriers on Africa's exports.

Many Researchers (Ndulu and O'Connell 1999, 2009; Hoeffler 2002; Tahari et al. 2004) often argue that low total factor productivity is the main impediment to African growth. Others (Berthelemy and Söderling 2001; Aka et al. 2004) argue that physical and human capital accumulation on the other hand have been identified to facilitate growth in Africa. But Badunenko et al. (2012) employed bootstrap techniques (see Simar and Wilson 1999) in a production frontier framework to provide statistical inference for each component in the decomposition of labor productivity in 35 African countries over the 1970–2007 period. They differed from Henderson and Russell (2005) and Kumar and Russell (2002) who had taken cross-country labor productivity growth over two time periods and decomposed it into different sources by insisting in their study that African countries have access to their own production frontier, and not necessarily to the world production frontier, thus benchmarking African economies against one another. Furthermore, other studies that had used nonparametric production frontier measurement have largely ignored the issue of statistical inference when identifying the sources of labor productivity growth.

Badunenko et al. (2012) is a bit detailed enquiry into the application of the endogenous growth model in Africa. The study uses the HR methodology to

decompose labor productivity growth into components attributable to (i) efficiency changes (ii) technological change (iii) capital deepening and (iv) human capital accumulation. They specified the technology that contains four macroeconomic variables: aggregate output and three inputs—labor, physical capital, and human capital. In their model, the number of workers is obtained as the product of per capita GDP computed via the chain method and the population taken as a ratio of real GDP per worker. The measure of output is calculated output per worker multiplied by the number of workers. Real aggregate investment is computed as the product of 2005 indexed real output, population and the investment share of GDP. The study follows Caselli and Feyrer (2007) and applied the perpetual inventory method to the real investment series to construct the physical capital stock. They also followed the method of HR and adopted the Hall and Jones (1999) construction of human capital using an updated education database (Barro and Lee 2010) to find the average (African) returns for each level of education. Their results suggest that capital deepening is the primary driver of labor productivity growth in Africa followed by human capital accumulation. Technological change is essentially nonexistent and of the four components, only efficiency changes and human capital accumulation are significant on average. They attributed the insignificance of physical capital contribution to the fact that the value of capital stock in developing countries does not necessarily reflect its public investment cumulated at cost. The researchers also maintain that if government investment spending has created little useful capital, its contribution to productivity growth will likely be insignificant. Their results indicate that human capital accumulation plays a larger role than physical capital.

4 Methodology

We classify West African economies broadly into three—the mineral (including oil) producing, the agricultural product exporters and the aid dependent. The mineral producing group is made up of those for which oil and solid minerals comprise at least 50 % of exports. The agricultural group consists of countries for which such commodities as cotton, coffee, animals, cocoa, peanuts tea, tobacco, seafood, and sugar (canes) carry large weight in their export basket (again comprising 50 % or more in the export basket). The aid dependent group comprises of countries for which official development assistance form up to 50 % of government budget. The study will be based on a panel analysis. The research shall adopt an eclectic growth model that combines structuralist variables with monetary variables to generate estimates for the West African region as a whole and for each group of countries. In addition to the product grouping, the work will also obtain estimates for the two major regional blocs, the UEMOA group and ‘the rest’. The approach is to specify a highly over-parameterized model incorporating both structural and monetary variables and then let the data generating process establish what matters and what does not. In effect, we limit the imposition of arbitrary restrictions.

The model for analysis is a modification of the Bassanini and Scarpetta (2001) model for growth in the OECD. The approach used pooled cross-country time-series data. In addition, the econometric technique allows short-term adjustments and convergence speeds to vary across countries while imposing (and testing) restrictions only on long-run coefficients (i.e. those related to the production function). The researchers tried to shed light on these issues by presenting evidence on the long-term links between policy settings, institutions and economic growth in OECD countries while controlling for underlying differences in technological progress. In particular, the focus is twofold: first, on the possible influences of human capital, research and development activity, macroeconomic and structural policy settings, trade policy and financial market conditions on economic efficiency; second, on the effects of many of the same factors on the accumulation of physical capital.

Formally, the policy-augmented growth equation can be derived from a growth model built around a constant-returns-to-scale technology (Bassanini and Scarpetta 2001). Output is a function of capital, employment, the efficiency with which they act together, and the level of technology. "Given straightforward assumptions on how the factors of production evolve over time, the steady-state level of output per capita can be expressed as a function of the propensity to accumulate physical capital, the population growth rate, the level and growth rates of technological and economic efficiency, and the rate of depreciation of capital". Moreover, if the concept of capital is widened to include human capital, then the propensity to accumulate the latter is also a factor shaping the steady-state path of output per capita.

The Bassanini and Scarpetta (2001) approach started with a parsimonious specification of the growth equation and then analysis of extended models. The initial specification is consistent with the standard neo-classical growth model and includes only a convergence factor and the basic determinants of the steady state, namely the accumulation of physical capital and population growth. The first extension involves the introduction of human capital while further extensions consider R&D and a set of policy and institutional factors potentially affecting economic efficiency. The growth equation, in its more general form, can be written as follows:

$$\Delta \ln y_{i,t} = -\phi_i \left(y_{\text{i,t-1}} - \phi_1 \ln sk_{i,t} - \phi_2 \ln h_{i,t} + \phi_3 n_{i,t} - \sum_{1-4}^{m} \phi nv_{i,t}^{i} - a_{m+1} t_1 - \phi_{0,1} \right)$$
$$b_{1,i} \Delta \ln ski_{,t} + b_{2.1} \Delta \ln h_{i,t} + b_{3,i} \Delta n_{i,t} + \sum_{1-4}^{m} b_{i,i} \Delta \ln V_{i,t}^{i} + \varepsilon_{i,t} \tag{1}$$

where y is GDP per capita, sk is the propensity to accumulate physical capital; h is human capital; n is population growth the Vj is a vector of variables affecting economic efficiency; t is a time trend; the b-regressors capture short-term dynamics

and ε is the error term. It should be stressed that Eq. (1) is a fairly general specification, and different growth models are nested in it. This is important for the interpretation of the policy variables which could be taken to represent either growth effects or level effects.

The current study retains the influence of physical capital formation through gross fixed capital formation and domestic savings. Given the paucity of data on employment and that population would be a very biased proxy for human, capital, the study drops the influence of human capital and restricts itself to inflows from indigenes resident abroad through remittances. We make additional modifications in the treatment of prices (including relative prices) as well as the incorporation of structural variables regularly taken for granted in most developed countries, but which are still rudimentary and may affect growth in West Africa. Given that the effects of prices have been removed from most real variables (including output), they could enter the modeling process as either policy-induced or exogenous variables. Diverse measures of domestic and relative prices that affect output will therefore be included in the models. Some of the prices to be considered include interest rate (and its spread), the real exchange rate, export and import value indices and interest on external debt. Structural factors to be considered include age dependency, electric power transmission and distribution, domestic credit (to the private sector) and tax revenue. We also incorporate effects of exogenous variables from the external sector including remittances (which also is able to reflect effects of human capital formation, albeit externally), foreign direct investment and reserves to debt ratio. We leave off considerations of short term trends and specifically define the factors that affect economic efficiency to be those relating to policy, including but not limited to monetary and fiscal policy stance of government.

$$\Delta \ln y_{i,t} = y_{\mathrm{i,t\text{-}1}} - \phi_1 \ln sk_{i,t} - \phi_2 \ln h_{i,t} - \sum_{1-4}^{m} \phi nv_{i,t}^{i} + \sum_{1-4}^{m} \phi_4 P_{i,t} + \sum_{1-4}^{m} \phi_5 S_{i,t} + E_{i,t} + \varepsilon_{i,t} - 2$$

Where the P, S and E vectors are prices, structural variables and external factors (all as listed earlier). As in the Bassanini and Scarpetta (2001) model, the study will adopt the pooled mean group (PMG) estimator. It is an intermediate choice between imposing homogeneity on all slope coefficients (DFE) and imposing no restrictions (MG). The PMG allows intercepts, the convergence parameter, short-run coefficients and error variances to differ freely across countries, but imposes homogeneity on long-run coefficients. Under the assumption of long-run slope homogeneity, the PMG estimator increases the efficiency of the estimates with respect to mean group estimators. The main advantage of pooled cross-country time-series data for the analysis of growth equations is that the country-specific effects can be controlled for, e.g. by using a dynamic fixed-effect estimator (DFE). However, this

estimator generally imposes homogeneity of all slope coefficients, allowing only the intercepts to vary across countries. The validity of this approach depends critically on the assumption of a common growth rate of technology and a common convergence parameter. The first assumption is difficult to reconcile with evidence on multifactor productivity patterns across countries. The second assumption is not consistent with the underlying growth model, where the speed of convergence depends, amongst other factors, upon the rate of population growth. An alternative approach is to use the mean-group approach (MG) that consists of estimating separate regressions for each country and calculating averages of the country-specific coefficients. While consistent, this estimator is likely to be inefficient in small country samples, where any country outlier could severely influence the averages of the country coefficients, thus the choice of PMG estimator.

5 Findings: Drivers of Growth in West Africa

Table 2 shows the output results from our models for different groupings. The results are presented along the two broad divides for this study—regional and product, in addition to the aggregate West Africa result. As can be seen from the result, a few variables seem to be pervasive, with potent effects across all (or nearly all) classifications. Those that are significant in as much as four of the six groups include lending interest rate, domestic credit, electric power transmission and distribution, the real effective exchange rate and import value index. Of these, two (interest rate and domestic credit) can be regarded as monetary variables while the rest (electric power transmission, real exchange rate and import value index) are prices reflecting deeper (and relative) macroeconomic fundamentals of the economies. Other variables which equally were consistently significant for at least two of the estimations include foreign direct investment (for aggregate West Africa and the aid dependent), remittances (for the aggregate and non-UEMOA group, probably affected by Nigeria), export value index (for the non-UEMOA group), debt service (for the UEMOA and non-UEMOA groups, though more significant for the latter and tax revenue (for aggregate and non-UEMOA estimations).

In understanding the interest rate effect on growth, it is important to situate the discussion within the development of the broad set of monetary variables in the region. Figure 4 graphs average inflation and money supply growth across West Africa. The figure shows that West Africa's inflation has drastically fallen since 1998. Average inflation rates in the region in the 1970s were relatively low. But the collapse of global oil and commodity prices later in the 1970s led to immediate reduction in reserves, rise in country debt profile leading to abandonment of projects, adoption of austerity measures and later structural adjustment policies among others. One area where the impact of the policy changes that followed showed up the most was in broad domestic prices, such that by the mid-1990s, most countries had inflation rates that ranged between 10 and 20 %; with the rates in several countries far exceeding that. But beginning late 1990s, the rate of inflation fell from

Table 2 West African country export products and ranking

Country	Africa rank	World rank	Amount or value of items exported	Major export commodity	Proportion of exports
Nigeria	3	50	$21,800,000,000	Oil	98
Cote D'Ivoire	9	80	$5,299,000,000	Cocoa	19
Ghana	11	97	$2,642,000,000	Cocoa	19
Senegal	21	124	$1,230,000,000	Seafood	27
Liberia	23	126	$1,079,000,000	Iron (metal)	55
Mali	26	131	$915,000,000	Seafood	67
Guinea	29	138	$726,000,000	Bauxite	57
Benin	34	155	$485,000,000	Cotton	64
Togo	37	161	$398,100,000	Phosphates (other mineral)	45
Chad	38	163	$365,000,000	Cotton	91
Burkina Faso	39	166	$293,000,000	Cotton	63
Niger	40	167	$280,000,000	Uranium (other mineral)	80
Gambia	n.a.	n.a.	n.a.	Peanuts	n.a.
Cape Verde	n.a.	n.a.	n.a.	n.a.	n.a.
Sierra Leone	n.a.	n.a.	n.a.	Titanium	47
Guinea Bissau	n.a.	n.a.	n.a.	n.a.	n.a.

an average of 26 % to single digits in about 5 years, and has remained so ever since. But interestingly, West Africa's broad money growth has not fallen the same way, as shown in the figure.

As at the 1970s, growth in M2 averaged less than 20 %. But this figure gradually increased as countries either got more confident about the macroeconomic environment or persuasions about the overall effects of money supply changed, leading up to an average of 27 % in 1994. The growth, like most other macro variables, has continued to gyrate falling to as low as 6 % in 1998 before rebounding to the 1920s. Thus, while inflation has gone quite down, growth of money supply remains up. The implications of this for the sort of growth the region has experienced and even for growth going forward are not miniscule. It therefore is important to understand the driving force behind this unique 'coincidence' of low inflation and rising money supply and its impact in the determination of which sectors can contribute to growth and how.

First, it is difficult to dissociate the rise of the concept and practice of Central Bank independence in many countries from the phenomenon described above. Having acquired independence, many central banks in West Africa set themselves singular goals of inflation management, with targets regularly put at single digit, for

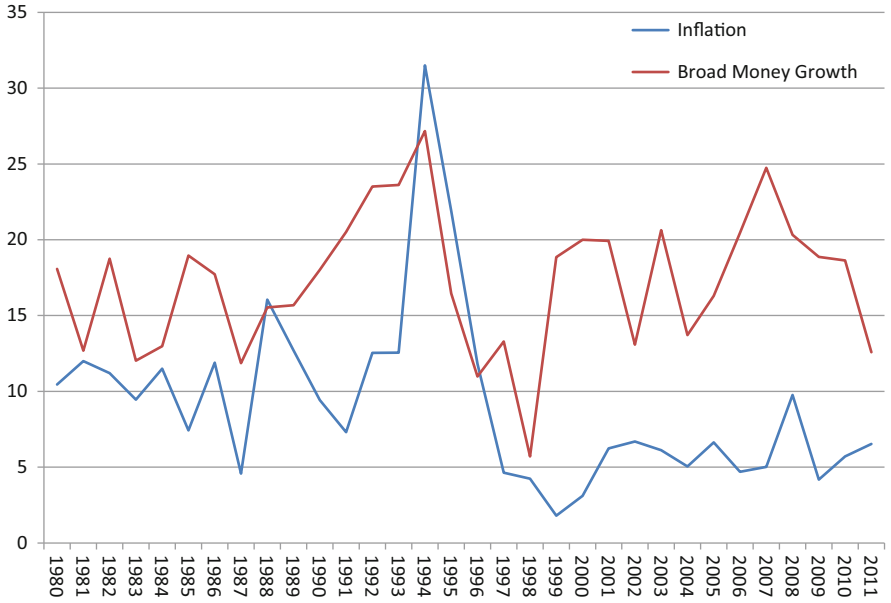

Fig. 4 Trends in West Africa's inflation and broad money. *Source*: Authors' calculations (from WDI and IFS)

good cause of achieving macroeconomic stability. Given the recurrent theme of high volatility and the need to engender macroeconomic stabilization (often proxied most by inflation) for most of the 1980s and 1990s, the very narrow focus among "liberated" Central Banks on inflation management, seemed reasonable. Some countries went full-scale and explicit on inflation targeting while others adopted implicit targeting regimes. This was not helped by the fact that inflation is among closely monitored indices in IMF Article 4 consultation and since most low income countries were struggling to regain relevance and access to global capital markets, inflation had to be forced down.

But there was also a misreading of the macroeconomic environment under which most of these Central Banks operated. Two factors complicate the issues—first is the monetization of foreign exchange earnings and the second are the operations of fiscal authorities. Both remain very huge sources of money supply. Thus, inflation control for many of the central banks turned to no more than monotonous mopping up excess liquidity, a fire-fighting process aimed at curtailing the negative toxins injected into the broader economy by these two agents. This the Central Bank does by continually getting on the money market and selling instruments in order to control the liquidity of the banking system. In effect, most of West Africa has had no more than reactionary central banking, imposed upon it by its unique characteristics of producing and dealing in natural resources. Only few countries that have managed to coordinate the receipts and use of resources or had banking reforms that minimize the overall impact of such 'toxification' of the macro economy. For the

UEMOA group of countries, with unified monetary rules and activities, this effect is even stronger.

The result of the above configuration of events showed up in the costs and pricing of money market instruments and affected capacity of national governments to manage structural factors that help growth. One such is interest rate, which matters for growth, and very negatively too! High rates of lending rates have coexisted with very low returns to saving, forcing down savings while at the same time serving as critical disincentive to investment. Thus, most African countries have traded off savings and investment for low inflation within a macroeconomic system where fiscal authorities are improperly reined in and foreign inflows are not tied to levels of activities and investments in the productive sectors of agriculture and manufacturing but to natural resources, and where the Central Banks have been trained to trade off productivity for stability, and the latter is almost exclusively defined in terms of low inflation. In effect, funds are flowing within the individual economies, but the flow merely supports a rent-sustaining growth that creates artificial financial barriers which ultimately do not add to improvements in the real sector. Unfortunately, without a robust capital market, real sector investment funding is stalled, leaving growth in sectors that can match both the risk and returns available in the money market or are so short term in outlook as to make do with resources from banks at the very high rate of interest.

The above is further complicated by the real exchange rate channel, which as the results also indicate, is equally important and pervasive. This has been much discussed in the literature[1] (referred to as the Dutch disease) for resource dependent countries. For the purpose of the current work, it suffices to tie that bit of the discussion to the capital formation challenge, in part made difficult by the negative role played by credit to the domestic private sector, both of which are shown in the regression results. That is not in any way to downplay the vexed issue of price distortions that alter incentives in favour of high-and-fast-return resource-based investments, but to draw attention to another link that has often been ignored in mainstream literature. As is widely acknowledged, domestic capital formation is a function of credit availability or capital imports. In many African countries, it is taken as given that investments in the real sector (particularly agriculture and manufacturing) are fraught with risks. Such risks often mean that beyond considerations of capacity to take on the very high cost of finance on the part of the investor, the financial intermediary has very low incentive to lend to an agent with high risk of default. The tweaking of incentives towards short-gestation, quick return trade and services (particularly in importation and natural resource exploitation and distribution) means less funds (and attention) to long-gestation, high risk investments in agriculture and manufacturing. Thus, while the economy may record

[1] See Gylfason et al. (1999), Sachs and Warner (2001) and Raghuram and Subramanian (2011) where perhaps through an appreciated exchange rate or classic Rybczinski effects, resource booms depress manufacturing activity.

significant capital formation, the sectoral distribution of such capital is regularly skewed against the real sector.

Since gaps between aggregate demand and supply would always be met from the external sector, the effect of weak domestic production has been a rise in import for nearly all countries in the region. It is important to note at this stage that the structure of imports has changed in two ways. First, there is the change in volume and value which has been persistent across Africa. But even more fundamental is that the composition of such imports is not the same in the current boom as it was in the boom of the 1970s. The boom of the 1970s was followed by an import substitution industrialization that placed emphasis and therefore import demand on capital goods, raw materials and industrial production components for the newly established domestic firms. The current boom neither has an import substitution industrialization nor indeed any form of industrialization programme following. The result is that imports have mainly gone to fill the gap in demand for final goods across all sectors. Consequently, West Africa's current growth is driven by a rising urbanization (or more specifically, the growing middle income group within these urban centres). Interestingly, these middle income groups are basically a class of consumers, mostly employed in the services sub sector. They are not only highly import-dependent, but quite vocal. In addition to fiscal authorities, activities of this group are the next second most important pressure point on relative prices. Therefore, rise in import value index hurts economic growth through activities of these middle income group whose consumption basket comprise mostly of imported products. Neither middle income-induced nor public sector-induced imports have supported production; instead, they help final consumption.

And this brings us to the import-export dilemma. Despite the gains in growth, West Africa remains a very marginal (and fragile) player in the global economy. Neither the sterling growth performances nor the quadrupled commodity prices seem to have affected the region's share of world export. Africa's export deflator has been largely stagnant. In effect, while the region has seen a rise in the value of its exports, when this is indexed and related back to the history of the value of the exports in previous decades, such value diminishes or altogether disappears. By implication, export gains were, in reality, not as significant as the nominal values of its performances would project. By contrast, the region's import basket has not only consistently become more diversified; the overall value of items in the basket has risen significantly over the period under consideration. It is difficult to dissociate this weak performance in export value index from the structure and concentration in Africa's export basket. There has been increase in volume of West Africa's exports, especially with the ascendancy of alternative markets (especially India and China). However, as the facts seem to indicate, this has neither meant Africa is better off in terms of the returns to its products, nor has it increased the overall value of the items it is offering in the market over the years.

That this concentration of exports emanates from concentration of production is equally difficult to deny. The rise in imports value deflator may not be unconnected to a subtle pressure that emanates from a change in partnership and the need for continued 'bilateral' reciprocation of trade relations. While the new trading partners

have managed not to either support increase in the value of items exported by the region, they have also strongly (and steadily) pressured a rise in imports, increasing not only the value, but also the diversity, of imported items. It might be difficult to prove that this is merely the outcome of voluntary bilateral relations as much as it might be the outcome of a rising new trend in global geopolitics. It seems there is a demonization of the old masters that has managed to silently keep eyes off a new trend of unilateral (or unreciprocated) value addition from Africa to its new trading partners. While the export basket can, and indeed, does give a broad indication of the weak and deteriorating diversification in most of Africa, the more profound story lies in the composition of domestic value added. For an export-oriented economy, there could be huge gaps between domestic composition of output and export concentration. But this presupposes differences in incentives facing the production of tradables and non-tradables (Zietz 1996). Where such differences are not pronounced, export concentration would mirror domestic concentration. Evidence seems to suggest this to be the case.

Earlier in Sect. 2, we showed trends in manufacturing and agricultural value added. At the risk of retelling an old story, attention has to again be drawn to the divergence in trends between industry and manufacturing value added. Africa's import substitution industrialization (ISI) strategy has received much knock in both the literature and policy circles over the years. But evidence seems to indicate that the impact of the ISI persisted all the way through the late 1980s. The broad growth implosion of the early 1980s may have emanated from natural resources, leading to the downward spiral of industry value added, but the longer term effects were on manufacturing. Whatever name could be given to the alternative adopted by Africa following the failure of the ISI, it has hardly produced as good a result as the discredited policy. Africa's unique growth fragility—in particular the simultaneous existence of large (commodity price and export volume) booms and sterling domestic growth on the one hand and stagnant export unit value index as well as non-diversification on the other—could find easy explanations in the divergence between industry and manufacturing. In particular, the continent has managed to sustain investment in natural resource extraction without translating any of the proceeds to higher value products in other sectors. For some, this is a sure ratification of the already quite celebrated literature on Dutch disease and the consequent weak (or lack of) inter-industry and sectoral spillovers, exchange rate overvaluation and (to use the words of Lederman and Maloney 2012) 'toxic political economy effects'. Interestingly, adoption of import substitution industrialization was part of a bid to restructure and prevent such toxic political economy effects. When therefore the ISI was declared null and void, recourse to natural resources, the known devil, was preferred to any unknown angel, an uncertain search for a new industrial anchor. Add this to the availability of trading partners ever more willing to sign for the Africa's raw materials and the cycle is complete for the concentration on industry that has plagued the continent.

The above is part of the reason why real exchange rate (relative prices) reflecting relative differences between domestic fundamentals and the rest of the world, has seemed to be against the region. Real exchange rate depreciation is good for

growth. But the reliance on raw materials and the monetization of proceeds have also meant that obtaining depreciated real exchange rate among West African countries is difficult. Domestic real production is therefore hurt and importation becomes much more attractive. But it is not only imports that benefit, the services sector, which has capacity for quicker returns than manufacturing and agriculture, easily benefit from this. Thus, the region has become increasingly 'servicified'. But the 'servicification' is not as much the challenge as the quality of products from the service industry. Given that the services sector is a derived industry, its overall quality and the quality of its products draw from the quality of the real sector it supports. Consequently, the quality or advancement of the real sector ahead of or concurrent with the development of the services sector matters for the quality of the service sector. Where the real sector is advanced, services, even when non-tradable, will produce equally advanced products that could either feed into this advanced real sector and produce quality exports or increase intra-industry linkages that will enhance overall performance of the economy. Over time and in many climes, it has evolved into an exporting industry on its own, serving not only as an enhancer of real exports, but also producing 'advanced services' exported to the rest of the world. However, its origin would always be the real sector. So where the mother real sector is underdeveloped or weak, the emanating services sector is equally weak—at least during initial stages of development. In saying this, we are yet to refer to the fact that a significant proportion of products from the services subsector is non-tradable.

That the support of the services subsector for an extractive industry has been part of the complications of growth without diversification is best demonstrated by the trends in the export unit values. If growth in export unit values can act as proxy for the accumulation of underlying factors of production that yield high quality goods, then the stagnancy of Africa's export unit values imply that the continent has failed to accumulate high-value factors of production. Interestingly, because it derives from an industry that is neither efficient nor productive, it cannot produce value that is superior to the agriculture which it has managed to displace. Thus for many commodity dependent African countries, the transition has merely been from low value added agriculture to low value services, with little or no change in its linkages to the global value chain. This is not mere rhetoric; its implications for sectoral linkages and overall dynamism of the production structure are not minuscule.

The foregoing leads up to the second point namely, the rise of a set of interest groups that feed upon the sectoral inefficiencies. Clearly, as such groups increasingly take root and spread, dislodging them becomes more difficult should restructuring be required at any point in the future. Whatever may be said in favour of the current production structure in Africa, it is difficult to deny that it is unsustainable—given its reliance on an uncertain global demand and other variables that are not only outside the control of the policymaker, but also inherently unstable. In effect, restructuring will become inevitable at some point. For some countries, this will be a deliberate programme (maybe by a reform minded regime); for others it will be involuntary (as in the wake of commodity price glut or the emergence of new technologies that outmodes the commodity). But therein will be

challenges. History has shown that dislodging such entrenched interests regularly prove more difficult that the process that enthroned them.

The structural support that should come from domestic energy (and expectedly other critical infrastructure) seems to be critical (following the results), but lacking. At the broad ECOWAS level and for the three product groups, electric power transmission and distribution remains important. The results seem to indicate that this one factor is hurting growth for the mineral exporting and aid dependent groups. Electricity supply and export and import value indices are about the most critical determinants of growth in the group of mineral exporters. For the agricultural countries, domestic credit, electric power transmission and the real effective exchange rate are the important explanatory variables. For the group of aid dependent countries, such factors as foreign direct investment flows, reserves to debt ratio interest rate, lending interest rate, electric power transmission and the real effective exchange rate are the critical determinants of growth. As can be seen, the set of determinants are similar across the different product groups except that factors that make credit and investible resources more readily available affect growth more deeply in the agricultural countries than they do in the mineral exporters. This reflects the relative lower liquidity in these economies relative to their mineral exporting counterparts (Table 3).

6 Insights from Structuralism

Commodity reliance is by no means a curse. For most of today's industrial economies, the starting point had always been one or two natural endowments. So it is not a challenge. Rather it is the reliance on natural commodities beyond the pre-take-off point that is detrimental. Breast milk is nature's most wonderful gift to a new baby. But after 5 years, that same gift can become problematic if the baby is still sustained by it—leading to perpetual underfeeding and possibly stalled growth. Relying on natural commodities at the point of take off sounds alright. However, it is managing a transition away from them at the earliest possible time that is critical. In this direction, the make-or-mar variable has to remain the macroeconomic policy environment and the diverse micro policies that support them as the continent manages the transition away from natural resources while maintaining the sterling growth it has acquired over the last couple of years (Agu and Caliari 2013; Papageorgiou and Spatafora 2013).

We think through the way forward by premising potential for West Africa's growth to be most possible if some of the insights obtainable from the structuralist tradition can be applied. One such insight is that diversification of the production structure matters for macroeconomic stability. The challenge for many countries is "dualism,"—enclaves of progress coexisting alongside backward areas. This dualism came from the fact that heterogeneous economic actors coexist in the export and subsistence sectors, raising a gap of productivity between them; often in terms of high productivity in the primary export sector coexisting with a relatively

Table 3 Drivers of growth

	Variable	W/Africa	UEMOA	Non-UEMOA	Solid minerals and oil exporting	Agric	Aid dependent
1	GDP growth						
2	Foreign direct investment	0.303 (2.57)			−0.575 (−1.34)		2.643 (3.18)
3	Reserves/debt ratio			−0.0383 (−0.62)			−0.777 (−3.43)
4	Broad money		−18.064 (−2.22)				
5	Inflation rate						
6	Lending interest rate	−0.1695 (−2.24)	−3.941 (−2.67)	−0.224 (−2.85)			−4.797011 (−3.90)
7	Interest rate spread	−0.136 (−0.86)	3.504 (2.00)				
8	Net ODA	0.072 (1.35)	0.301 (0.70)	0.168 (2.07)			
9	Domestic credit	−0.488 (−2.79)	−1.109 (−2.22)	−0.186 (−1.06)		−1.894 (−2.09)	
10	Gross fixed K formation			0.167 (1.55)			
11	Remittances	1.480 (2.40)	0.263 (1.13)	4.611 (2.28)			
12	Electric power trans/dist	0.162 (2.23)			−0.242 (−2.45)	0.135 (1.89)	−0.612 (−2.44)
13	Gross domestic savings	−0.068 (−1.34)		−0.0512 (−0.23)			
14	REER (Index, 2000)	0.033 (1.67)	−0.181 (−1.93)	−0.0034 (−2.16)	−0.0099 (−1.70)	−0.0033 (−3.65)	−0.304 (−2.01)
15	Age dependency		0.521 (2.61)				
16	Export value index			−0.008 (−2.89)	0.071 (2.90)		
17	Import value index	0.024 (5.50)	0.028 (1.93)	0.038 (2.69)	−0.063 (−3.20)		
18	Tax revenue	0.196 (1.74)		0.726 (1.62)			

(continued)

Table 3 (continued)

	Variable	W/Africa	UEMOA	Non-UEMOA	Solid minerals and oil exporting	Agric	Aid dependent
19	Goods and services exports						
20	Total debt service		0.298 (1.69)	−1.859 (−3.44)			
21	Interest on external debt			−1.601742 (−2.18)			
	Constant	−6.248 (−1.67)	563.870 (2.38)	9.449 (2.99)	16.742 (3.36)	6.409 (3.09)	144.637 (3.81)

inefficient sector producing agricultural and manufactured goods for domestic consumption, and of course a large subsistence masses living outside the market economy (Saad-Filho 2005). The heterogeneity is reinforced by high profits in the highly concentrated high productivity-sectors, often repatriated abroad by exporting firms or wasted through luxury goods imports by the solvent classes...or both! Thus, attempts to industrialize via incorporation of imported technical means of production, in a context of heterogeneous economic structure, rather than overcoming the backwardness condition would reinforce it, while generating high productivity enclaves disconnected from the rest of the economy. Even the behaviour of developing country economies post 2008–2009 recession confirms that this holds across board for all dualistic economies. Fall in trade associated with the global financial crisis affected many developing countries because of high and growing dependence on exports. But Asia, the region with the most diversified export basket, weathered the crisis far better, losing 18 % of export revenue, compared to Africa, which lost more than 30 %. the implications for differences in growth were such that while East Asia's growth declined by 1.4 %, Africa went from 5 % growth rate in 2008 to 1.6 % in 2009.

Of particular interest to West African countries should be the question of whether macroeconomic stability supports greater diversification. In light of the emphasis on stability over the years and the resultant myriad of reforms that have run across the continent, is it plausible to assume that Africa's efforts at macroeconomic stability are paying off in the way of increased growth. It is possible to answer this question in the positive. However, it has to be either believed that the stability programmes, if deepened further, can also further deepen and spread the growth. But another argument could be that without such stabilization programmes followed up through policies encouraging innovation, research and development, infrastructure, education of the workforce, institutional mechanisms for private-public coordination, among a host of other structural changes, the growth will remain fragile (Hailu and Weeks 2011; Page 2008; Rodrik 2006; Lall 2004). There could even be reasons to question the ability of macroeconomic stability to play any role, even a complementary one, in diversification. And particularly, since macroeconomic stability can be achieved in a number of ways, it becomes important to find out if some of the ways are more conducive to diversification than others. We think so; based on the strength of theory and the weight of evidence. Having raised issues in respect of selective taxation in order to reduce the profitability of certain sectors, it is then helpful to think of macroeconomic diversification, not just in terms of diversification of sectors, but also diversification of instruments, capacity to mix them with long term objective that balances growth between extractive and other industries.

According to Nurske, while up to a point a country can benefit from concentrating along lines of international comparative advantage, it is much more difficult if it can achieve continued growth if external demand conditions do not induce it (Kattel et al. 2009). There just has to be comparative designed as a move away from the original sectors that induced such advantages to sectors that may have been dormant but have the capacity to even accelerate it beyond that which induced it. Anything

short of this keeps an economy in a boom-bust cycle—a specialty that many African countries have enjoyed for over four decades of post-independence, and which has the potential to continue if not arrested.

To turn the tide then, first the limitations of neoclassical market management have to be acknowledged and addressed. Most African countries are structuralist in the sense of being inhibited by irregular factors—supply constraints, absorptive capacity, structural imbalances, among a host of others. The old wisdom of mapping instruments to challenges still holds and many African countries have managed to ignore it at great peril, limiting response to only a limited set of instruments. In some cases, it is difficult to blame the policymaker who may not only have inherited the limited instruments but have no means of creating additional ones. For example, for many years, the warning of watching against appreciated exchange rate has sounded clear from the horn speakers of guardians of the classical market economy. But for a developing country, the question goes beyond just depreciation. Understanding for example that the channel of sustained impact of depreciation is through traditional activities likely in manufactures and natural resource based products (Rodrik 2008). So pursuing a broadly undervalued exchange rate provides little comfort; even that has to be properly channeled to desired sectors—sectors that increases in aggregate savings and technological change, learning by doing that support climbing the technological ladder and generating spillovers (Gala 2008; Frenkel 2004).

7 Conclusion

It has been severally posited that it is acceptable for growth to be anchored on favourable terms of trade, natural resources abundance, geography (location to the cost), and endowment. Arguably, West Africa has (relative to history) managed the triple successes of disinflation, external debt reduction and reserves build-up. But countries in the sub region have clearly been helped by changing trade patterns, rising aid inflows and political structural reform, both within and among potential trading partners.

So will the sub-region's natural resources lead to prosperity? In answering the question, Waeber and Wassermann (2013) insist that whether Africa turns its natural resources into blessings or curse again depends on more than global factors such as commodity prices and demand, but equally on domestic conditions such as political stability, fiscal management and industrial policy. Clearly it is not only the inflows that matter; as most countries increase dependence on commodity exports, an immediate bubble burst may not be close in sight. But while these flows may for now, specifically given resource scarcity, be a necessary condition, the sufficient condition is that 'regular' macroeconomic management instruments be urgently complemented and enlarged to take on broader mandates of ensuring that resources from the high profit sectors are settled in the lower profit sectors—especially since the latter has little power of generating its own resources and kick starting growth.

It might be useful to end the discussion on prospects for West Africa with the below comments from a recent World Bank report coordinated by Shanta Devarajan.

> While the broad picture emerging from the data is that Africa's economies have been expanding robustly and that poverty is coming down, the aggregate hides a great deal of diversity in performance, even among Africa's faster growers. The conclusion of the World Bank is that better administration of mineral wealth, development of agriculture and a careful managing of rapid urbanization would help governments to lift more people out of poverty. Africa's golden decade can be matched closely to China's soaring demand for commodities; Chinese demand accounts for half of many industrial metals exported from Africa. This has raised fears that the continent is overly dependent on the relationship and vulnerable to a sudden downturn.

The need therefore is for effective channeling of resource funds to employment generating productive sectors. And such channeling has to be deliberate; it does not occur haphazardly.

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Part III
Sectoral Policy and Economic Growth

Manufacturing Export, Infrastructure and Institutions: Reflections from ECOWAS

Uchenna R. Efobi and Evans S. Osabuohien

Abstract This study examines the extent of manufacturing export in ECOWAS countries, how it has been affected by the extent of infrastructural development and the distilling role of institutions. In retrospect, we present stylized facts that proves that ECOWAS poor infrastructural development has largely being driven by the poor institutions, which promotes private benefits rather than public good (such as infrastructure). In essence, this has hampered manufacturing export and reduced the extent of competitiveness of these countries.

Keywords ECOWAS • Infrastructural provision • Institutions • Manufacturing export • Manufacturing value added

JEL Classification F13 • F31

1 Introduction

The main focus of this paper is to examine the role of institutions in underscoring the linkage between infrastructures and manufacturing export in countries in the Economic Community of West African States (ECOWAS).

The manufacturing sector plays a vital role in enhancing countries' global competitiveness and the extent of their internationalisation drive. This includes their ability to adequately provide goods and services that are able to compete effectively in the international market, where demand is mostly based on the quality and efficiency of the products being sold. This has brought about the reiteration that countries in Africa should pay more attention to improving the manufacturing sector, unlike the traditional export baskets that include the composition of primary

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products like those from the agriculture or natural resource. The address by the World Bank's president in 2014 clearly states that the hope of African countries should focus on developing the light manufacturing sector, which could help in the development of industrialization, export diversification, and job creation (Kim 2014). Kim also stated that recent analysis suggest that the development of this sector could create about seven million new jobs in the continent and the drastic effect on a continent that currently faces unemployment situation, is immeasurable.

The issues relating to the development of the manufacturing sector cannot be discussed in isolation. There are catalysts to this development, called infrastructure. Infrastructure encompasses those physical components or structures that is needed to enhance the operation of a particular process in a society. With regard to the manufacturing sector, infrastructure plays two important roles: the enhancement of the input and the output process in a production system. With regards to the input process, infrastructure enhances the procurement of material input and also in the preservation of these inputs. The output processes involve the use of infrastructure in preserving, securing and transporting the finished products to the potential market.

The cost of poor infrastructural development is seen in the increased cost of trading, in the form of production and transportation cost (Limao and Venables 2001; Abe and Wilson 2009). For instance, the recent industrial migration from Nigeria to neighbouring countries—like Ghana—was attributed to increased cost of production due to poor power supply and port congestions that consequently resulted to increased overhead cost of production of manufacturing companies (Sunday Trust 2013). Likewise, industries in most of these countries (African countries) experience increased trade cost on transportation of raw materials and finished goods, as a result of poor infrastructural facilities (World Bank 2013). Actually, poor infrastructural development in African countries (including ECOWAS countries) is one of the main impediment to trade development. This cannot be denied seeing the Statistics that shows that limited road access in Africa reaches only about 34 % of the rural community, compared to the 90 % for the rest of the world (African Development Bank-ADB 2010a). Likewise, less than 40 % of the region's population have access to electricity and about one-third, living in rural areas, are within 2 km of an all-season road, compared to two-thirds of the population in other regions (ADB 2010b; Obilomo and Ojo 2013).

The World Bank (2013) predicted that for African countries to be effectively competitive in the global sphere, there is the need for an annual investment of about US$93 billion until 2020 for infrastructural development. Noting this prediction, most African countries have resorted to the consideration of increased inflow of Foreign Direct investment (FDI) and Official Development Assistance (ODA) to offset the huge infrastructural deficit. It is no wonder that across Africa, over 70 % of the public funding comes from foreign aid (Moyo 2009); Asiedu (2006) earlier confirmed that the need for African countries to attract FDI in order to fill their resource gap is needed for development projects. The inflow of these forms of capital is not without a cost. Apart from the fact that the continent has experienced increased poverty and institutional breakdown as a result of these funds (Moyo

2009), the uncertainty of these funds is another encumbrance to their reliance for developmental projects (African Economic Outlook 2014).

In the light of these, the quality of institutions and governance structure is considered as a sustainable alternative. In essence, we argue that African countries can begin to play less on depending on foreign resource for financing their infrastructural deficit, by improving their institutional and governance structure to effectively manage funds and reserves to aid this. This argument stems from the fact that African countries experience huge resource leakages from fund outflow that is predicated on poor institutions. For instance, in 2002, the African Union estimated the annual cost of corruption on the continent to be US$150 billion.[1] Putting this in perspective, African countries will experience a windfall from public resources (in the form of channelling these funds to development projects like infrastructural development) if institutions are developed and the governance structure is enhanced.

The theoretical justification for this argumentation is intense, as proponents of institutional economics (e.g. Acemoglu et al. 2001; Blair-Henry and Miller 2008; Acemoglu and Robinson 2012; Osabuohien and Efobi 2013; Efobi 2015), have argued that the distinguishing factors between countries—in the global sphere—is the strength of their institutions and policies. Acemoglu and Robinson (2012) portrays a compelling discuss by noting that institutions are political forces that creates incentives for government and politicians and determines the quality of policies that are put forward by them. Sometimes, these forces are either overt or explicit, but the common peculiarity is that these rules—no matter the form—structure social interactions (Hodgson 2006). Some other contributors to the literature on institutional economics include North (1990, 1991) and a host of others like Osabuohien and Efobi (2013), Asongu (2014). Putting this in perspective, we suspect that the reason why African countries—ECOWAS inclusive—have not recorded much progress in infrastructural development that would have hitherto enhanced growth is because of the poor institutional forces that exist in these countries. Analogically, political actors in these countries would have had incentive to pursue the development of infrastructure for trade facilitation if only the extent of institutional development was emphasised.

Noting this, policy analysts have consistently presented a wake-up call for the strengthening of the institutional framework of African countries to pursue improved infrastructural development. For instance, in the ECOWAS region, the regional community is beginning to emphasise the need for regional actions that will propel member states to put in place policies to enhance infrastructural development. Some of these actions include the Supplementary Act of 2007 that focused on the harmonisation of policies and regulatory framework for the

[1] Considering that African countries' average inflation rate of 7.08 for 2003–2010 (according to the United Nations Statistics, available at http://www.un.org/en/development/desa/policy/wesp/wesp_archive/2012annex_tables.pdf), then the value for US$150 billion in 2010 would be about US$1 trillion, which is over 11 times more than the annual contribution required for infrastructural development.

development of soft (ICT) infrastructure in the sub-region. Article 33 of the Act provides that member states should participate in the modernisation and development of infrastructure in order to provide reliable interconnectedness, both for regional and international communication (ECOWAS 2007). Among the notable achievements of this effort is the declaration for the support of the deployment of submarine cable project that links member countries to Southern Europe (Osabouhien and Efobi 2014).

It is on this note that this study intends to empirically examine the linkage between institutional development and its effect on infrastructure and manufacturing export in African countries—especially ECOWAS countries—to be precise. The main reason for focusing on ECOWAS countries is highlighted in the subsequent section (stylized trend) of this paper. The remainder of the paper is organised as follows: Sect. 2 presents discuss from the empirical literature, while Sect. 3 provides some stylized facts. In Sect. 4 we present some bi (and multivariate) relationships between the three elements of study. Section 5 concludes with policy implications.

2 Insights from Literature

It is advantageous for countries to begin to focus on the improvement of the productivity of their manufacturing sector. This is especially when countries are beginning to think towards enhancing their global competitiveness. In Africa, this cannot be overemphasised due to the fact that there has been an over reliance on primary product by most of the countries in this region. In a policy document by the United Nations Economic Commission of Africa-UNECA (2013), the need for the development of the manufacturing sector of African countries was tied to the fact that the productivity gains that emanates from the linkages (backward and forward) between the manufacturing sectors and other sectors gives rise to increased scope for technology transfer and diffusion, and improved managerial and technological spill-overs. Generally, the manufacturing sector has also been known to be an economic growth enhancer through its functional role in capital accumulation, knowledge and managerial skills transfer, increasing economies of scale and learning by doing effects.[2]

The literature on the relevance of infrastructural development on trade is rather much with reiterating stances cutting across regions. For instance, the Asian's region trade expansion was in turn facilitated and encouraged by the development of supporting infrastructure including physical and institutional infrastructure (Douglas and Jayant 2005). This massive investment in infrastructure for trade facilitation was facilitated by the structural reforms in this region that was targeted

[2] For more discussion on the importance of the manufacturing sector, see Mbate (2014), who examined industrial policy and structural changes in ECOWAS countries.

at improving the environment for investment, production and trade. In essence, countries within the region understood that the duo (infrastructure and trade) are complimentary in themselves, although there is still the need to boost infrastructural provision in this region.

In an earlier study on European countries' trade performance, the conclusion was reached that infrastructural availability drastically affected transport cost of trade (Bougheas et al. 1999). Their theoretical model predicts that for pairs of countries for which investment in infrastructure is optimal, a positive relationship between the level of infrastructure and the volume of trade is predictive. Focusing on Africa, Tomasz and Colin (2009) estimated a standard gravity model with particular reference to Africa: they concluded that trade facilitation—in the form of improved quality of the basic transport and communications infrastructure—improves export performance in Africa. Somewhat similar conclusion was reached on a global perspective by Portugal-Perez and Wilson (2012) that the marginal effect of the transport efficiency on exports appears to be decreasing with per capita income. In contrast, they emphasise that the impact of physical infrastructure on exports appears increasingly important for richer countries.

It is not surprising that infrastructure services plays a significant role in trade costs by reducing distribution margins, lowering prices and raising consumer welfare; more so, infrastructural provisions increases the profitability for exporters—by lowering transaction costs and value addition to the production process—while expanding linkages to the global distribution networks (Douglas 2005, 2008).

Of course, the influence between trade and infrastructure is expected as Nordas and Piermartini (2004) clearly highlights four possible interactions that stems from the relationship. The first is the *direct monetary outlays*, which covers the charges for infrastructural services. As expected, in countries with poor infrastructural service, this outlay becomes higher and even increases the overhead cost for the benefit from such services. *Timeliness* of delivery of goods and services is another outcome that is influenced by infrastructural services. The third is *risk* of damages, losses and higher insurance cost on goods produced, while poor *market access* is the fourth issue caused by poor infrastructure.

Noting the relevance of infrastructure on trade, it is therefore puzzling on why countries do not pay much attention to the development of this social good. In understanding these reasons, it is important to address this issue from the institutional perspective. The reason for this approach is because institutions are supposed to be a form of framework that creates incentives for public officers to consider efficient actions for the overall good of the society (Acemoglu and Robinson 2012; Efobi 2015; Asongu 2014). These actions are in the form of policies that pertains to the overall progress of the society (Blair-Henry and Miller 2008). Therefore, it is prudent to assume that states that do not experience considerable progress in infrastructural development are lacking in the development of efficient institutions to drive these progress. Francois and Manchin (2007) seem to support this suspicion.

Likewise, recent study by Cissokho et al. (2013) further buttress this stance, noting that for West African countries to maximize their agricultural export, they need to engage in investments in better infrastructure and institutional frameworks in the form of faster customs clearance and fewer police payoffs at the borders. Cissokho et al.'s study is the closest to this current study. They emphasized the role of institutions and supplemented their recommendation based on an interview carried out at two borders (Dakar-Kayes and Dakar-Bissau). Their submissions calls for the need for further investigation on the linkage between institutions, infrastructure and trade.

Also, a more compelling literature on the role of institutions on trade is emerging. Proponents of this debate have examined this linkage in diverse perspectives. Some have concluded that there is a strong relationship between investment in productivity (which affects country's trade performance) and the quality of institutions (Knack and Keffer 1995; Mauro 1995; Rodrik 1995; Brunetti and Weder 1998). On another perspective, some authors noted that weak institutional framework actually affects productivity by either reducing aggregate productivity or slowing productivity growth (Hall and Jones 1999; Olson et al 2000). Yet from another perspective, poor institution is accused for a country's poor integration in the international market because poor institutions can hurt a country's capacity to export manufactured goods (Meon and Sekkat 2008; Osabuohien and Efobi 2011).

With these compelling arguments, this current study considers the role of institutions in determining the extent of provision of public infrastructure for enhanced trade. This perspective is germane considering that poor institutional framework creates a disincentive for public officers to act accordingly for state interest. In essence, this is not about creating rules to guide behaviors of economic agents but that the emphasis should be on the rules. Thus, the behaviors of individual are only guided by the rules and not any form of informalities like norms and accepted ways of behaviors prevalent in a particular system (World Bank 1997). Putting this in context, the rising trend of poor institutions in a country will give rise to the erosion of governmental legitimacy and consequently hampers the effective delivery of public goods and services (Lawal 2007). This has been empathetically reemphasized in the case of African countries (e.g. Asiedu 2006; Asiedu and Lien 2011; Fosu 2011; Osabuohien and Efobi 2013; Efobi 2015).

3 Stylized Trends: Manufacturing Sector,[3] Infrastructure and Institutions

To understand the performance of the manufacturing exports of African countries (especially ECOWAS countries), this study first of all observes the performance of the manufacturing sector. The main indicator in achieving this is the manufacturing

[3] Emphasis was on the extent of productivity and export of the manufacturing sector.

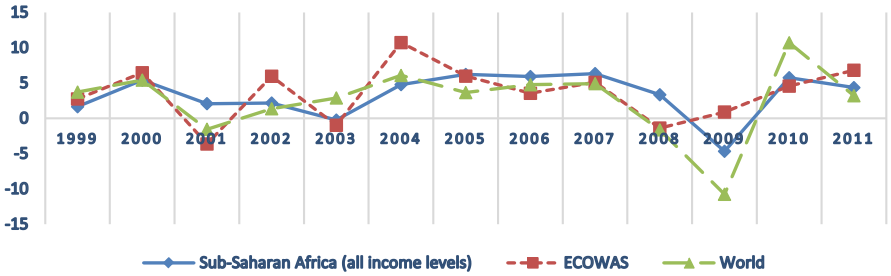

Fig. 1 Manufacturing value added annual growth rate. *Source*: Authors' computation from World Bank (2013)

value added, which explains the net output of industries in a particular country after adding up all outputs and subtracting intermediate inputs (World Bank 2014).

Obviously, the manufacturing sector in many of African countries have experienced an undulating growth rate, as displayed in Fig. 1. However, this direction of flow is not peculiar to African countries, as the trend for world average was not stable as well. However, there is a need to appreciate the manufacturing sector growth rate of African countries, noting that apart from the earlier period prior to the financial crisis and during the crisis, these countries have exhibited a stable rising of the productivity of this sector. For instance, in the ECOWAS region, the manufacturing sector witnessed a consistent rising trend from 2008 onward from −1.38 % to about 6.30 % in 2012. Similar trend was displayed for SSA countries, except that after 2008, the rising trend was not as smooth as that of ECOWAS region.

Noting this seemingly 'success story' for ECOWAS countries, the extent to which the manufacturing sector contribute to the GDP of these countries is still minimal. For the period 1995–2012, the manufacturing sector contributed below 10 % to the GDP and this trend is decreasing by the year, except for 2012 as depicted Table 1. Other African countries in the SSA region also witnessed similar modicum contribution of the manufacturing sector to GDP, at-least when comparing both regions with the average of countries from other regions of the world as displayed in Table 1. For instance, countries in East Asia and Pacific (EAP)—such as China and Malaysia—experienced a whooping contribution of the manufacturing sector to their economy with rates above 20 % for most of the period. Likewise, countries in Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), and South Asia (SA) all had manufacturing sector contributions rate of about 15 % or more in most of the period presented in the table.

The trifling contribution of the manufacturing sector of ECOWAS countries and countries in SSA to the overall economy reflects the performance of these countries in manufacturing export. As displayed in Fig. 2, the manufacturing sector in ECOWAS and SSA countries, are able to account for between 20 and 30 % of the total merchandise export. This rate is far below the global average that was consistently within the range of about 70 %. The manufacturing sector in countries

Table 1 Manufacturing, value added (% of GDP)

	1995–1999	2000–2004	2005–2009	2010	2011	2012
East Asia and Pacific—EAP	24.271	23.203	22.991	22.969	22.370	19.224
Europe and Central Asia—ECA	19.347	17.572	15.959	15.117	15.168	14.824
Latin America and Caribbean—LAC	18.646	18.436	17.349	16.753	16.300	15.228
South Asia—SA	15.862	15.136	15.647	14.852	14.870	14.344
Sub-Saharan Africa—SSA	13.558	13.076	11.695	10.941	10.340	9.835
ECOWAS	9.031	8.040	7.366	7.135	7.090	8.451
World	19.107	17.792	16.697	16.188	16.100	NA

Note: The region—Middle East and North Africa—was not included due to data unavailability for the period considered
Source: Computations from World Bank (2013)

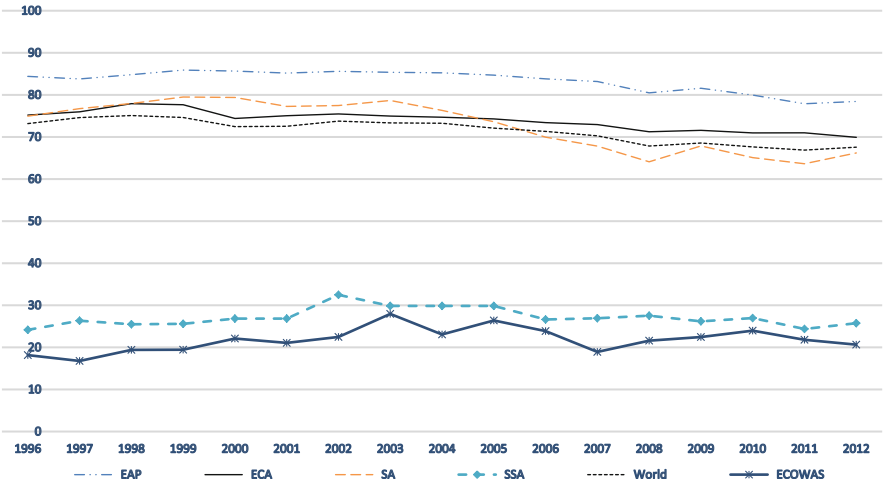

Fig. 2 Manufacturing export as % of total merchandise export. *Note*: *EAP* East Asia and Pacific, *ECA* Europe and Central Asia, *SA* South Asia, *SSA* Sub-Saharan Africa. Latin America and the Caribbean and Middle East and North Africa were not included due to data unavailability for the period. *Source*: Computations from World Bank (2013)

in East Asia and Pacific, Europe and Central Asia and South Asia exported way above 70 % of the total merchandise export.

To be exact, not only have the manufacturing sectors of countries in these regions performed below the world average, they have experienced decreasing trend in terms of percentage of manufacturing export to total merchandise export. For instance, the percentage dropped from 26.39 % in 2005 to 20.64 % in 2012, after it increased from 19.44 in 1999. Of course, the manufacturing export in SSA countries also dropped from 29.84 % in 2005 to 25.75 % in 2012, after it increased from 25.61 % in 1999. No wonder the sea port of countries in this region have

Table 2 Container (20 foot equivalent units) Port Traffic

	1995–1999	2000–2004	2005–2009	2010	2011	2012
EAP	–	50.83	52.00	52.98	53.70	54.12
ECA	–	21.06	19.24	17.44	17.50	17.32
LAC	–	6.55	6.77	7.40	7.15	7.17
MENA	–	0.00	5.32	8.58	8.61	8.55
SA	–	2.35	2.87	3.20	3.09	3.01
ECOWAS	–	0.20	0.07	0.07	0.07	0.08

Note: The region—SSA was not included due to data unavailability for the period considered
Source: Computations from World Bank (2013)

experienced low traffic compared to those in other regions (see Table 2), reflecting the low participation in international trade relative to the shipping activities in the ports. As a matter of fact, much more less than 1 % of the total global flow of containers from land to sea are to or from the sea ports of ECOWAS countries.

The poor infrastructural provision[4] in this region (ECOWAS) cannot be denied as a likely suspect (Table 3). Apart from policy submissions to this effect (e.g. African Development Bank-ADB 2010a, b; World Bank 2013), the statistics of some infrastructural indicators validates these claim. For instance, considering the electric power consumption per capita—presented in the first segment of Table 4—which measures the Kilo Watt per capita of electricity available for public consumption, ECOWAS countries (and SSA at large) had a dismal statistics. For the entire period, countries in these regions had a highest KWh per capita consumption of about 223 (for ECOWAS) and 534 (for SSA). This is many folds less than the global average KWh consumption and those countries in other regions such as EAP, ECA, LAC and MENA.

In the same vein, in Table 4, the average total rail lines in ECOWAS region dropped from 1,572.71 km in the period (1995–1999) to 630.50 km in 2013. Comparably, the statistics for countries in the EAP region presents a dissimilar trend. In the EAP region, the average rail lines increased from 276,655.75 to 374,221.00 km in similar period. The decreasing trend in the rail lines per km is likely traceable to poor maintenance of the rails and in some cases, fund mismanagement that would have been used to maintain the rails. For instance, Nigeria recounts incidences of misappropriation of public fund that would have hitherto improved public infrastructure. Recently, railway staffs of the Nigerian Railway Corporation were indicted for fraud that is worth over US$6 million (PM News 2014).

Likewise, the road and ICT (internet) infrastructure in ECOWAS and other SSA countries is still below the world average. In frantic, compared to other regions of the world such as the EAP, ECA, LAC and MENA, countries in ECOWAS and SSA region are many folds below the average infrastructural development obtainable.

[4] Other measure of infrastructure (Logistic Performance Index) was presented in Table 3.

Table 3 Logistics performance index on quality of trade and transportation and related infrastructure

	2007	2010	2012
Benin	1.89	2.48	2.57
Burkina Faso	1.89	1.89	2.40
Cape Verde	NA	NA	NA
Cote D'Ivoire	2.22	2.37	2.31
Gambia	2.33	2.17	2.19
Ghana	2.25	2.52	2.05
Guinea	2.33	2.10	2.34
Guinea Bissau	2.25	1.56	2.68
Liberia	2.14	2.00	2.41
Mali	1.90	2.00	2.00
Niger	1.40	2.28	2.45
Nigeria	2.23	2.43	2.27
Senegal	2.23	2.43	2.27
Sierra Leone	2.09	2.64	2.31
Togo	1.83	1.61	2.50
ECOWAS	2.07	2.18	2.34
World average	2.58	2.64	2.76

Source: Authors' compilation from World Trade Indicators

However, there is need to emphasise that ECOWAS region records an impressive road network compared to other regions in Africa. From Table 4, we observe that the ECOWAS region had an average paved road network ranging from 19.12 to 35.50 % of the total roads, while those in other SSA countries ranged from 15.61 to 17.96 %.

Not beguiled by the seemingly impressive performance of ECOWAS countries compared to other sub-regions in Africa—in relation to some infrastructural provisions—the poor performance of the manufacturing sector of African countries in general (including ECOWAS countries) raises serious concerns. In this study, the poor institutional development in this region is ascribed as a likely culprit. The statistics for the indicators of institutions—as reported by the World Governance Indicators—and as displayed in Table 5 does not deny this fact. As it is, countries in ECOWAS region and SSA (at large), recorded lower scores for the control of corruption and government effectiveness. Although in regulatory quality measures, the performance of these countries in relation to those in other regions of the world, is kind of murky.

Emphasis is placed on the control of corruption and government effectiveness because of the significant role they play in the improvement of infrastructural facility. Considering the control of corruption, it measures the extent to which public offices are exercised for private gains—including both petty and grand forms of corruption—and other forms of "capture" of the state by elites and private interests (World Bank 2013). It also measures the strength and effectiveness of a country's policy and institutional framework that are put in place to prevent and combat corruption. On the other hand, government effectiveness captures the

Table 4 Infrastructural development

Electric power consumption (kWh per capita)						
	1995–1999	2000–2004	2005–2009	2010	2011	2012
EAP	1,465.55	1,837.81	2,558.37	3,063.47	3,263.54	–
ECA	4,722.48	5,107.15	5,457.38	5,515.09	5,465.18	–
LAC	1,434.98	1,589.24	1,804.44	1,954.67	2,045.50	–
MENA	1,547.43	1,910.07	2,327.01	2,667.04	2,704.73	–
SSA	534.46	524.71	536.85	529.92	534.93	–
World	2,255.15	2,457.13	2,781.32	2,981.61	3,045.01	–
ECOWAS	150.06	158.06	171.85	211.72	223.01	–
Roads, paved (% of total roads)						
EAP	–	41.08	41.57	–	64.97	–
ECA	–	86.00	87.01	–	86.22	–
LAC	–	31.48	32.96	–	25.97	–
MENA	–	78.00	73.51	–	80.39	–
SSA	–	17.96	18.00	–	15.61	–
World	–	46.01	40.76	–	57.01	–
ECOWAS	21.67	19.12	20.88	35.50	20.57	–
Internet users (per 100 people)						
EAP	1.41	9.00	21.36	34.23	37.24	41.15
ECA	4.18	22.67	43.01	56.30	59.29	63.97
LAC	0.86	8.83	23.72	34.71	39.35	43.43
MENA	0.35	4.20	15.44	26.63	30.99	35.92
SSA	0.20	0.96	4.43	10.16	12.74	14.68
World	2.40	10.38	20.62	29.35	32.02	35.58
ECOWAS	0.08	0.86	3.47	7.11	8.46	9.28

Note: The regions presented were based on data availability

Table 5 Institutional quality

	Control of corruption				Government effectiveness				Regulatory quality			
	1996	2000	2005	2008	1996	2000	2005	2008	1996	2000	2005	2008
EAP	−0.43	−0.6	−0.53	−0.57	−0.3	−0.48	−0.46	−0.53	−0.35	−0.61	−0.56	−0.69
ECA	−0.70	−0.62	−0.52	−0.48	−0.58	−0.51	−0.37	−0.31	−0.59	−0.49	−0.32	−0.1
ECOWAS	−0.59	−0.61	−0.70	−0.62	−0.83	−0.76	−0.86	−0.79	−0.73	−0.57	−0.70	−0.64
LAC	−0.35	−0.18	−0.16	−0.12	−0.34	−0.15	−0.14	−0.10	0.22	0.07	−0.07	−0.12
MENA	−0.46	−0.57	−0.55	−0.62	−0.45	−0.63	−0.63	−0.61	−0.64	−0.78	−0.73	−0.63
SSA	−0.63	−0.58	−0.68	−0.62	−0.66	−0.72	−0.78	−0.78	−0.65	−0.64	−0.75	−0.7
World	−0.03	−0.02	−0.02	−0.02	−0.04	−0.01	−0.01	−0.01	−0.05	−0.03	−0.02	−0.01

Notes: The values ranges from −2.5 (worst) to +2.5 (best) i.e. the higher the better. *EAP* East Asia and the Pacific, *ECA* Europe and Central Asia, *MEA* Middle East and North Africa, *LAC* Latin America and Caribbean, *SSA* Sub Saharan Africa. The years reported are those that have values for the regions afterwards the data has been mainly reported for countries not regions

Source: World Governance Indicators as computed by Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010) for the World Bank (2010)

Table 6 Institutional quality of ECOWAS countries

	Control of corruption		Government effectiveness		Rule of law	
2001–2005	2006–2010	2001–2005	2006–2010	2001–2005	2006–2010	
Benin	−0.664	−0.614	−0.393	−0.522	−0.462	−0.625
Burkina Faso	−0.088	−0.354	−0.616	−0.621	−0.598	−0.314
Cape Verde	0.283	0.746	−0.042	0.098	0.309	0.508
Cote D'Ivoire	−0.987	−1.119	−1.089	−1.234	−1.390	−1.379
Gambia	−0.496	−0.677	−0.560	−0.664	−0.167	−0.372
Ghana	−0.236	0.033	−0.121	0.009	−0.044	−0.044
Guinea	−0.774	−1.138	−0.896	−1.194	−1.221	−1.493
Guinea Bissau	−1.026	−1.078	−1.279	−1.079	−1.248	−1.348
Liberia	−3.032	−0.630	−3.954	−1.563	−4.369	−1.289
Mali	−0.527	−0.509	−0.676	−0.815	−0.224	−0.341
Niger	−0.921	−0.731	−0.839	−0.811	−0.779	−0.654
Nigeria	−1.248	−0.970	−0.955	−1.069	−1.380	−1.145
Senegal	−0.006	−0.552	−0.157	−0.366	−0.012	−0.311
Sierra Leone	−0.908	−0.915	−1.333	−1.181	−1.273	−0.980
Togo	−0.810	−0.991	−1.452	−1.469	−0.943	−0.894

Note: The three measures are valued from −2.5 (weak institutions) to +2.5 (strong institutions)
Source: Authors' computations from World Governance Indicators (World Bank 2013)

quality of the public services, the civil service and its independence from political pressures. Likewise, the quality of policy formulation and implementation, and the credibility of the government's commitment to its stated policies, is also indicative of the extent of government effectiveness. These two measures, in some form, are expected to affect the extent of infrastructural development. Pathetically, the performance of countries in ECOWAS and SSA were not impressive (see further description in Table 6).

4 Empirical Strategy

The basic empirical model that underpins this relationship takes its clue from the empirical model Sekkat and Varoudakis (2000) that was applied in Meon and Sekkat (2008), which assumes that the exports of manufacturers are explained by the following relationship:

$$log(X_{it}) = \alpha_{0i} + \alpha_1.log\,(E_{it}) + \alpha_2.RYP_{it} + \alpha_3.log\,(I_{it-1}) + \mu_{it} \quad (1)$$

Where the main explained variable is the ratio of exports to GDP for the relevant year (X_{it}), while the explanatory variables include the real effective exchange rate (E_{it}) that captures the countries' currency appreciation/depreciation. The other

variables include the GDP growth rate of country 'i's' partners (RYP) and the lag of investment in the relevant sector over GDP ($I_{it\text{-}1}$).

Noting that the empirical model of Sekkat and Varoudakis (2000) closely relates to the thesis of this study, we apply this model in this study by including some of their covariates and our main variables of interest. In this study, we are interested in the infrastructural provision and the interactive variable with institutions. The covariates—from Sekkat and Varoudakis' model—that is relevant to this study are the exchange rate and investment. The main reason for the choice of these covariates include the fact that exchange rate will reflect the relevant price for trade as an increase in the exchange rate will mean an appreciation of the exporter's currency and this will have a negative effect on trade. Likewise, the inclusion of investment variable is based on the grounded assumption that investment will improve manufacturing output and consequently, trade (Liu et al. 2001, 2002; Makki and Somwaru 2004).

Therefore, the empirical model for this study is presented as:

$$log(X_{it}) = \alpha_{0i} + \alpha_1.log\,(E_{it}) + \alpha_2.log\,(I_{it-1}) + \alpha_3.Infras_{it} + \alpha_4.Inst_{it} + \alpha_5.Infras \times Inst_{it} + \mu_{it} \quad (2)$$

It is expected that infrastructure '*Infras*' and institution *'Inst'* will have a positive effect on manufacturing export. This—in no gainsay—is expected due to the role of infrastructure and institution on export (Meon and Sekkat 2008; Cissokho et al. 2013). The main focus of this study is the behavior of the interactive variable '$Infras \times Inst_{it}$', which presents the multiplicative between institutions and infrastructural provision. A positive variable connote that the improvement of institution will improve infrastructural provision that affects growth. In essence, the complimentary effect is being portrayed by a positive sign. On the contrary, a negative sign connote that our argument is flawed and the relationship between the variables is substitutive.

4.1 Variable Definition and Source

The variables that was included in the model [Eq. (2)] are defined in Table 7 and the sources were also presented.

4.2 Method of Analysis

To ensure that the estimated results are not spurious, alternative econometric methods was applied in the estimation. The Ordinary Least Square (OLS) regression will be applied in the estimation. Noting the issues—like heteroscedasticity

Table 7 Variables definition and source

Variable	Identifier	Definition	Source
Manufacturing export	X_{it}	Manufacturing export, measured as percentage of merchandise export	WDI
Exchange rate	E_{it}	Real exchange rate	WDI
Investment	$I_{it\text{-}1}$	We applied the growth rate of the manufacturing value added as a proxy for the extent of investment in the manufacturing sector. Gross fixed capital formation as a percentage of GDP would have being used but this is more generic	WDI
Infrastructure	$Infras_{it}$	Measured as the average of internet users per 100 persons, mobile and fixed line telephone subscribers per 100 persons, and telephone users per 100 persons	WDI
Institutions	$Inst_{it}$	*Corruption (CC)* is the extent of corruption and the extent to which public offices are misused for private gains; *Government Effectiveness (GE)* captures the quality of government policies and the commitment of the government to such policies	WGI

Note: The institutional variables are standardized on a scale from −2.5 (weakest institutions) to +2.5 (strongest institutions). *WDI* World Development Indicators, *WGI* World Governance Indicators

and autocorrelations—related with the OLS technique, the Feasible Generalised Least Square (FGLS) technique was also applied because it allows for the presence of heteroscedasticity across the sampled countries and autocorrelation within the panels. This provides for panel-corrected standard errors. These two approaches will be relevant for sensitivity checks. As a matter of importance, the Systems type of GMM estimation technique, which has been favoured by some studies like Asiedu and Lien (2011); Asongu (2014). The uniqueness of the SGMM technique is that it uses internally generated instruments to addresses issues of endogeneity (Blundell and Bond 1998, 2000). For the SGMM technique to be relied upon, it is expected that the test for autocorrelation *AR (2)* and the Sargan test for instrument over-identification must be ≥ 0.05.

The SGMM equation type for Eq. (2) is as follows:

$$\log(X_{it}) = \alpha\log(X_{it-1}) + \alpha_1.\log(E_{it}) + \alpha_2.\log(I_{it-1}) + \alpha_3.Infras_{it} + \alpha_4.Inst_{it} + \alpha_5.Infras \times Inst_{it} + \eta i + \varepsilon_i \quad (3)$$

The other variables are as earlier defined and the lag of the explained variable has 'α' coefficient. The variable 'η' is the unobserved country-specific effects and the error term is 'ε_i'.

4.3 Sample

The 15 ECOWAS countries were included for the period 2000-2012. The sampled countries include: Benin, Burkina Faso, Cape Verde, Cote D'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The period chosen was based on data availability for the chosen variables.

5 Juxtaposing the Relationship: Atleast for ECOWAS

The summary statistics of the main variables for ECOWAS countries are presented in Table 8.

As a first check, the validity of the internal instruments that was used in the SGMM, was considered. The checks are the Sargan and AR (2) test. Considering the statistics of the two tests [Sargan and AR (2)], in all the columns in Table 9, the instruments were valid and were not over-identified. This is following the p-values of the test results. This confirmation renders the result from this study relevant and reliable for inference.

To be concise, focus was only on the interactive variables (Control of Corruption × Infrastructure; Government Effectiveness × Infrastructure) that shows the juxtaposing between institutions, infrastructure and manufacturing export. This results was displayed in the last segments of Table 9. The signs and significant values of these interactive variables show that when considering the development of institutions (i.e. corruption), infrastructure and manufacturing export, we perceive that institutions and infrastructure play a substitutive role. As a matter of fact, infrastructural development will impact less on manufacturing export in countries where the control of corruption is improved. The coefficient of this variable is '−0.761' and it is significant at 1 % level of significance.

This result contradicts the prediction in this paper as we expected that institutions are complimentary factors in the infrastructure-manufacturing export nexus. Put different, infrastructure development was expected to improve manufacturing export in countries where the control of corruption is improved. Likewise, when considering government effectiveness and the role it plays in the infrastructure-manufacturing export nexus, we also perceive that infrastructure impacts less on manufacturing export in countries where the government effectiveness is improved. In essence, institutions play a substitutive role with infrastructure in influencing manufacturing export. The coefficient of this variable is '−0.552' and it is significant at 10 % level of significance.

Faced with this somewhat contradiction, we raise a very important point: despite the fact that institutional development is supposed to enhance the influence of infrastructural development on manufacturing export, the case of ECOWAS is different. Possibly, mere institutional development is not enough to enhance

Table 8 Summary statistics of variables

	Description of variables	Mean	Std. Dev	Min.	Max.
Mafex	Ratio of manufacturing export to total merchandise export	25.85	21.33	0.08	95.68
Magr	Manufacturing value added	8.16	4.73	2.24	21.68
Exch	Real exchange rate	793.09	1,161.88	0.54	6,658.03
Infra	Indicator of infrastructural provision	10.58	10.80	0.08	44.27
CC	Control of corruption (an indicator of institutions)	−0.60	0.48	−1.37	0.80
GE	Government effectiveness (an indicator of institution)	−0.79	0.49	−1.84	0.33

Source: Authors' computation

Table 9 SGMM results (dependent variable: manufacturing exports)

	1	2	3	4
Manufacturing exports (−1)	0.381* (0.000)	0.364* (0.000)	0.373* (0.000)	0.350* (0.000)
Manufacturing value added	0.564** (0.025)	0.453*** (0.073)	0.585** (0.018)	0.544** (0.032)
Real exchange rate	0.245 (0.347)	0.250 (0.337)	0.101 (0.698)	0.1458 (0.549)
Infrastructure	0.103 (0.325)	−0.291*** (0.095)	0.120 (0.252)	−0.190 (0.327)
Control of corruption	1.887 (0.487)	8.971** (0.016)		
Control of corruption × infrastructure		−0.761* (0.005)		
Government effectiveness			−4.124 (0.140)	1.340 (0.741)
Government effectiveness × infrastructure				−0.552*** (0.058)
Constant	9.152 (0.016)	14.465 (0.001)	5.460 (0.148)	9.968 (0.028)
AR (1)	0.005	0.003	0.001	0.001
AR (2)	0.657	0.718	0.639	0.647
Sargan test	0.393	0.568	0.435	0.473

Note: The values in parenthesis are the probability values
*, **, *** are the significant levels of 1, 5 and 10 % levels of significance

infrastructural improvement for manufacturing export. As it is evidence from this study, there are other undertones that affect the expected result. We suspect that the available structures to drive institutions are not readily available and so, institutions are not able to achieve its objective of complementarity. In most developing countries—for which ECOWAS is no exception—institutions are measured by the policies that shows government's objective in reducing corruption and enhancing their effectiveness (see Henry and Miller 2008). Not to forget, the measures of

institutions (control of corruption and Government effectiveness) are based on the perception of some groups, whose opinions are not distant from the public policies that support institutional growth. Like Acemoglu and Robinson (2012) observed in their blog on "Why Nations Fail: The Origins of Power, prosperity and Poverty", institutions should go beyond policies and focus on structures that constraint, enhance and facilitate the application of policies. Most likely, ECOWAS countries are lacking in this regard and that's why the measures of institutions are not in sync with the improvement of infrastructure for enhanced manufacturing export.

Another important undertone is the 'power' of public officers who are supposed to enforce public policies. In African countries and ECOWAS, we find public officers who are very powerful and most times, they use their power to inform the dictates of public policies (Jo-Ansie 2007). In situations like this, it is expected that institutional development will most likely not achieve its objective. In this case, the submission of Acemoglu and Robinson (2012) that institutions should create a structure that drives incentives for the implementation of policies and in the case of Africa, create a cost for non-compliance. The situation in Africa is that: it is not as if cost and incentives are not embedded in the institutional structures, but such structures are not compelling to curtail excessiveness of public officers. Probably, the regional community can begin to play oversight to check public officers' compliance with institutional dictates.

5.1 Sensitivity Checks

The first sensitivity check is to ascertain the consistency of the result when excluding Nigeria from the sample of this study. The main reason for this is due to the economic size of Nigeria in the region. As it is, Nigeria's economic size is more than 57 % of the entire ECOWAS' economy (World Bank 2010) and this imply that their presence in the composition of the sample will likely influence the result. However, the result in Table 10 contradicts this expectation and it was obvious that—irrespective of the inclusion or exclusion of Nigeria, the interactive variable was signed similarly. In the last rows of the table, the behaviour of the interactive variables (Corruption × Infrastructure; Government Effectiveness × Infrastructure) was negative in all the columns. This further validates our earlier findings and submissions.

The second sensitivity check is to confirm whether the interactive variable still maintains its signs—as it is in the earlier Table 10—by checking the effect of alternative estimation technique and measures of investment. The alternative estimation technique is the use of OLS and FGLS; and instead of using the manufacturing value added, the gross fixed capital formation was used. The essence of the Feasible Generalised Least Square (FGLS) technique was applied because it allows for the presence of heteroscedasticity across the sampled countries and autocorrelation within the panels. This provides panel-corrected standard errors estimates.

Table 10 SGMM results excluding Nigeria

	1	2	3	4
Manufacturing exports (−1)	0.376* (0.000)	0.363* (0.000)	0.369* (0.000)	0.343* (0.000)
Manufacturing value added	✓	✓	✓	✓
Exchange rate	✓	✓	✓	✓
Infrastructure	✓	✓	✓	✓
Corruption	✓	✓		
Corruption × Infrastructure		−0.733*** (0.009)		
Government effectiveness			✓	✓
Government effectiveness × infrastructure				−0.514*** (0.083)
Constant	10.274 (0.010)	14.647 (0.001)	6.988 (0.082)	11.102 (0.018)
AR (1)	0.004	0.004	0.011	0.002
AR (2)	0.655	0.714	0.644	0.649
Sargan test	0.471	0.633	0.494	0.555

Note: The values in parenthesis are the probability values. The sign '✓' imply that the variables were included in the estimated model. When this sign is not included, it imply that the variable was not included

*, **, *** are the significant levels of 1, 5 and 10 % levels of significance

The Ordinary Least Square (OLS) regression was included as a complementary estimation technique.

The result from this analysis presents the same sign for the interactive variables. As it is, column 1–4 of Table 11, where the alternative estimation technique was used for the baseline model that was estimated in Table 10, still presents negative signs. In essence, the stance that institutions in ECOWAS countries do not play a complimentary role in the infrastructure-manufacturing export nexus is valid and not informed by the estimation technique applied in reaching such conclusions.

In the same Table 11, the fifth to the eighth Column present a scenario where an alternative measure of investment and estimation technique was used. In these columns, the main variable of interest (Infrastructure × Institution) still maintains its negative sign and significant in all the columns. We can re-emphasise at this point that irrespective of the covariate applied (especially with regards to the measure of investment), the interactive variable still maintains its negative sign.

5.2 Conclusion

The main result from this study is that: contradictorily, institutions in ECOWAS countries do not play a complementary role to infrastructural development for improved manufacturing export. This result is robust, despite the alternative

Table 11 Sensitivity checks (dependent variable: manufacturing exports)

	Control of corruption		Government effectiveness		control of corruption		Government effectiveness	
	OLS	FGLS	OLS	FGLS	OLS	FGLS	OLS	FGLS
Exchange rate	✓	✓	✓	✓	✓	✓	✓	✓
Manufacturing value added	✓	✓	✓	✓				
Gross fixed capital formation (% of GDP)					✓	✓	✓	✓
Infrastructure	✓	✓	✓	✓	✓	✓	✓	✓
Institution	✓	✓	✓	✓	✓	✓	✓	✓
Infrastructure × Institution	−0.139 (0.226)	−0.139 (0.205)	−0.227*** (0.060)	−0.227** (0.047)	−0.117* (0.000)	−0.117* (0.000)	−0.161* (0.009)	−0.161* (0.006)
Constant	2.203 (0.000)	2.203 (0.000)	2.178 (0.000)	2.178 (0.000)	2.805 (0.000)	2.805 (0.000)	2.547 (0.000)	2.547 (0.000)
R^2	0.199		0.241		0.237		0.191	
Wald		20.320		26.040		31.720		24.150
Prob. value	(0.004)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)

Note: The values in parenthesis are the probability values. The sign '✓' imply that the variables were included in the estimated model. When this sign is not included, it implies that the variable was not included

*, **, *** are the significant levels of 1, 5 and 10 % levels of significance

estimations. In the light of this finding, two main issues were identified as possible reasons for this contradictory result: the unavailability of structures that drive institutions may be a possible cause and the powerfulness of public officers who are supposed to enforce public policies.

Based on this finding, it is recommended that ECOWAS—as a regional economic community—can begin to play a supervisory role for countries in the community. By supervisory role, we imply that despite the 'beautiful' policies made by countries to forestall institutional development, there is the need for ECOWAS to ensure that related public officers adhere to the enforcement of such policies. Apart from this, the regional community can begin to develop frameworks that put public officers in member countries to check the applicability of member countries' policies. The reason for this policy recommendation is that; ECOWAS countries are not lacking in the development of policies—that shows institutional development—but the political will to put in place structures that ensures the accomplishment of the policies is probably not sufficient to enhance its effect. Therefore the regional community can act as a monitoring/enforcing body.

Just like it is obtainable in most empirical studies, we identified an area for future studies: that is, future empirical studies can focus on the consistency of our result when other measures of infrastructure are applied in our empirical model. The realisation of such study will be faced with data constraint in terms of macroeconomic data that reflects infrastructural development in African countries. If this constraint is mitigated, then a robust result will be necessary to check the consistency of the findings of this study.

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Industrial Policy and Structural Change: Some Policy Perspectives

Michael Mbate

Abstract Development thinking in most African countries is gradually shifting in favor of industrial policy. This paper examines the dynamics of industrial policy, with a special focus on West African countries. The paper then presents a comprehensive macroeconomic framework which can guide policy makers in designing and implanting effective industrial policies. Taking into account country and sector specificities, the paper concludes by examining the various industrial policy tools which can be implemented to accelerate industrial development on the continent.

Keywords Industrial policy • Structural change • Institutions

JEL Classification L52 • L67 • O55

1 Introduction

The necessity of African countries to add value to their natural resource endowment remains a crucial component of promoting and sustaining growth and development. Designing and implementing sound industrial policies can promote structural change and address constraints related to social-economic challenges. African policymakers thus need to ensure that industrial policies accelerate resource movement from low, traditional and subsistence sectors to high productive and value added sectors. Recent evidence, especially from the fast growing Asian countries, underscore the importance of commodity based industrialization as a viable and feasible channel of addressing poverty and unemployment. Countries which add value to their natural resources and promote labour movement to productive sectors are associated with increase in per capita income and technology accumulation (UNCTAD and UNIDO 2011).

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Theoretically, several propositions have been advanced to support the importance of promoting industrial development through industrial policy. For instance, there is abundance evidence of market and coordination failures, as well as externality effects (Stiglitz et al. 2013). However, implementing industrial policies in most countries has not been successful. Several reasons have been proposed to explain this phenomenon. This include the inability of the State to design and implement sound industrial policies, as well as the incapacity to identify productive sectors to which policy should target. As a consequence, industrial policy has been neglected by most countries despite its central role in promoting economic growth and development.

Industrialization efforts by African countries in the past were largely ineffective and most countries either engage in resource extraction and exportation, or are mainly agricultural driven. Exports are largely unprocessed and exhibit limited value addition and technological content. This has been the case, for instance, in Nigeria where oil constitutes a large proportion of exports, or in Cote d'Ivore where cocoa production dominates exports. Some of the main reasons for this phenomenon include inefficient industrial policies, structural bottleneck such as human capital, physical infrastructure, lack of complementary policies (monetary, fiscal and trade policies) and political economy issues.

Irrespective of these challenges, most African countries have rejuvenated their interest in industrial policy and promoting labour intensive industrial development. Value addition initiatives and integration of domestic firms into value chains has expanded in most countries, especially in the agri-business sector. For countries which have successful done this, industrial policy has been an important tool. A core component of industrial policy has been strengthening the collaboration between the State and the private sector, instituting incentive mechanisms that attract entrepreneurship, accelerating technological upgrading, boosting skilled human capital as well as providing infrastructure (ECA and AUC 2014).

The objective of this paper is to examine the rationale for industrial policy and the policy lessons to be distilled from past industrialization attempts on the continent. In addition, the paper presents insights on policy elements of an effective and coherent industrial policy framework. The rest of the paper is organized as follows. Section 2 examines the rationale for industrial policy, the importance of the manufacturing sector and Africa's prior industrialization experience. Sections 3 and 4 provides some stylized facts on structural change in the West African region and discusses key elements of an industrial policy framework. Section 5 concludes with policy implications.

2 Related Literature

2.1 The Justification for Industrial Policy

The justification for industrial policy lies on the fact that the government has a central and pivotal role in fostering structural change in an economy. By accelerating the transfer of resources (capital, labour and knowledge) from low to high productive sectors, industrial policy has the potential to promote and sustain inclusive economic growth. Given this proposition, both theoretical and empirical literature underscores the importance of industrial policy in addressing distortions that constrain structural change and socially efficient outcomes. The first distortion relates to the presence of market failures; the second to coordination failures, the third to knowledge spillover and externality problems, and the fourth to technological accumulation and acquisition of knowledge.

Conventional development theories postulated that markets are efficient in the allocation of resources across different sectors and State interventions are not required to accelerate structural change. However, it is increasingly becoming evident that market forces do not necessarily lead to efficient outcomes and State intercessions are key in correcting this. Both theoretical and empirical evidence shows that, especially in the context of developing countries, there exist substantive market failures, especially in regards to information and cost discovery externalities (UNCTAD and UNIDO 2011).

According to Hausmann and Rodrik (2003), due to information externalities about the profitable goods which a country can produce, the first firm to invest in cost discovery bears all the costs, while rival firms learn from the outcome of the first entrant. Due to this free riding problem, investment is sub-optimal as no firm is willing to make any investment in the discovery of new products. In this case, industrial policy can be used to promote entrepreneurial entry and investment, for instance, through subsidies and compensation for innovation (Lin and Chang 2009).

Another type of market failure relates to environmental externalities. This arises as firms, motivated by profits, do not incorporate pollution and environmental degradation costs in their investment decisions. Industrial policy can be relied to correct this, by supporting the development of green technologies, and production process which are environmental friendly, resource efficient and low carbon intensity (Hallegatte et al. 2013).

The second rationale for industrial policy arises due to the presence of coordination failures (Pack and Saggi 2006). Coordination failures arise as the feasibility and profitability of most economy activities is contingent on the existence of complementary investments. This implies that a firm is willing to invest in a particular sector if there are complementary firms which support its production process. In the absence of such environment, entrepreneurial and domestic production may be adversely affected. Therefore, the State has a role to play in promoting and coordinating collective investment decisions from independent actors.

Industrial policy thus emerges as a tool for pooling investment ventures which would otherwise deter investment and the entry of entrepreneurial firms (Altenburg 2011).

Besides the need to address market and coordination failures, industrial policy can affect a country's technological accumulation and learning among firms. In developing countries, domestic firms rely on existing technologies to boost their technological capabilities. However, adopting technology is usually costly and time consuming, as firms do not have information on existing global technologies. In addition, inter-firm spillovers may deter firms from investing in technology or knowledge accumulation as workers are able to move from one firm to another. Given that knowledge is a public good whose usage is non-rivalrous, the market becomes an inefficient provider, necessitating government intervention (Stiglitz et al. 2013). Empirical evidence tends to underpin that income convergence of East Asian countries towards that of developed countries was accelerated by industrial policies which promoted constant learning and knowledge accumulation among firms (Rodrik 2009).

A final justification for industrial policy is its role in fostering structural change by addressing social development challenges such as job creation, and income distribution. By addressing regional disparities and promoting labour intensive production, industrial policy can have a significant impact on social welfare, inclusive growth and improved standards of living through increased income generation.

2.2 The Importance of the Manufacturing Sector

Several theoretical justifications have underscored the importance of structural change through promotion of the manufacturing sector. First, income elasticity of demand is higher for manufactured than primary products, providing opportunities for. Second, compared to traditional exports, manufactured goods are less vulnerable to price volatility and external shocks. Prices for manufactured products rise faster than those of primary commodities. Third, productivity gains emanating from backward and forward linkages between the manufacturing sectors and other sectors of the economy are more pronounced, increasing the scope for technology transfer and diffusion as well as managerial and technological spillovers (ECA and AUC 2013). Besides this linkage channel, the manufacturing sector can act as an engine of economic growth through capital accumulation, knowledge and managerial skills transfer, increasing economies of scale and learning by doing effects. Finally, a well-developed manufactured sector creates high quality employment opportunities with higher income effects in the manufacturing sector as well as in other sectors of the economy through input output linkages and vertical integration.

2.3 Lessons from Past Industrialization Efforts in Africa

Industrial policy in most African countries is not a new phenomenon. During the 1970s countries attempted to spur industrial development by implementing the import substitution policies (ISI). A decade later, the structural adjustment programme (SAPs) were carried out, and so were the poverty reduction strategies (PRS) in the 1990s. Although different governments implemented various industrial policy strategies and interventions, there is a consensus that industrialization and structural change did not occur, and in fact the industrial base in some countries was eroded (ECA and AUC 2013; UNCTAD and UNIDO 2011). Nonetheless, an analysis and examination of these three industrialization phases provide crucial policy lessons which African countries can learn from in the formulation of their own industrial policies.

(a) Local ownership and leadership of industrial development is vital

The experiences of early industrialization in Africa underscore local ownership of the process as an important factor which can determine its success or failure. Although policy advice from external, and usually foreign sources is useful in terms of capacity building, effective policy design requires African countries to take charge and leadership of the process. Policy space is important, and without it, countries are unlikely to follow the path which will lead to structural change and improved standards of living. The design and implementation of the ISI, SAPs and PRS was often done without any consultation with national governments. As a result, the imposition of these development policies contributed to their failures. It is therefore important for African countries to be proactive in aligning foreign advocated policies which their own development plans and industrial strategies.

(b) Addressing Structural impediments is of the essence

One of the key reasons attributed to the failed strategies regards the neglect of structural factors in the design and implementation stages of the industrial development processes. Promoting successful industrial development requires policies which address deficiency in soft and hard infrastructure. Most African countries are marked with poor transport, communication and energy infrastructure, inadequate human skills, technological constrains and low levels of public and private investment. Neglecting these structural factors can result in a weak industrial base and contribute to inefficient policies. This was often the case as these strategies were not targeted at improving structural weakness inherent in most economies. It therefore emerges that designing efficient industrial policy necessitates addressing infrastructural deficit which lay the platform to support high productive investments.

(c) Promoting technological accumulation and innovation of domestic firms is crucial

Past industrialization attempts in most countries did not focus on building the capacity of domestic firms through technology advancement. As a consequence, most firms were not competitive and exhibited low productivity. As a

result, fierce competition, even in the presence of protectionist policies, led to the collapse of domestic industries. It is increasingly becoming evident that promoting technology and innovation is key in boosting competitiveness of manufactured products and building capability in domestic firms. To this end, policies which foster innovation, technology diffusion and upgrading constitute a key ingredient in the design of any coherent industrial policy framework.

(d) Export oriented industrialization is decisive

Promoting structural change through industrialization also necessitates sound trade policies. Inward oriented industrialization policies, such as those early implemented, are unlikely to be sustainable in the medium to long run. Domestic markets in the continent are small, and the demand generated for industrial products is inadequate to trigger investment in high productive sectors. Early industrialization policies neglected the role of trade, especially in the context of intra-African. It was believed that African countries were similar in their export products and could therefore not trade with each other. There were no initiatives aimed at facilitating trade amongst countries in the region through the removal of tariff and non-tariff barriers. As a result, low purchasing power in most countries led to reduced effective demand for manufactured products. It is now increasingly becoming clear that expanding end markets for industrial products presents opportunities for firms to enjoy increasing economies of scale, learn by doing and join regional value chains which are less demanding compared to global chains. Therefore, it is important to ensure that trade policies are a central ingredient of any industrialization plans and strategies.

(e) Consultation with the private sector is central

Designing coherent industrial development strategies necessitates consultations with key stakeholders in the economy, especially the private sector. Past experiences show that most governments adopted a top-down approach to industrialization. The government was the main actor, with little or no involvement of other players in the design and implementation stages of industrial policy. Recent experiences show that the private sector is a key engine of economic growth. It is associated with investments in high productive and capital intensive sectors of the economy. This was one of the aspects lacking from early industrialization strategies implemented in most countries. It is therefore key to ensure that policy design and implementation encompasses the involvement of the private sector. This is normally important as the government does not have all the information regarding the industrial market. Therefore, working with the private sector can provide crucial information regarding opportunities and challenges which can aid decision making by policy makers.

3 Stylized Facts on Structural Change

One of the key approaches of analysing a country's structural change involves examining the structure and evolution of high productive sectors such as manufacturing and industry. Table 1 presents the share of industry and manufacturing in five African sub-regions as classified by United Nations Conference for Trade and Development (UNCTAD).

The table highlights that in general, the contribution of industry to aggregate economic activity on the continent has increased more than threefold from 13.1 % in 1970 to 40.7 % in 2008. However, the share of manufacturing has only increased marginally from 6.3 % in 1970 to 10.5 %. With respect to the different sub-regions, Western Africa region has experienced an increase in the growth of its manufacturing sector, estimated at 29.6 % of GDP in 2008, compared to 18.8 % of GDP in 1990 and 13.3 % in 1970. Figure 1 ranks the performance of West Africa countries in terms of their magnitude in manufacturing. Due to data availability, some countries such as Nigeria are dropped from the analysis. The analysis shows that manufacturing as a share of GDP is high in countries such as Cote d'Ivoire, Senegal and Burkina Faso. On the contrary, Gambia, Liberia and Sierra Leone are marked with low levels of structural change.

Figure 2 presents the evolution of the Herfindahl-Hirschmann index (HHI), disaggregated into the five sub-regions. The HHI is measure of the degree of exports concentration. It is normalized to obtain values ranking from 0 (maximum diversification) to 1 (maximum concentration). The trend analysis shows that structural change has not occurred in most regions, as countries still continue to export raw and unprocessed commodities. The Southern and Eastern regions have the highest levels of export diversification, as most countries have expanded their export baskets. On the contrary, Middle, Western and Northern African countries have consistently been characterized by limited export diversification. Exports are

Table 1 Contribution of manufacturing and industry (% of GDP)

		1970	1980	1990	2000	2005	2008
Africa	Industry	13.1	35.6	35.2	35.5	38.8	40.7
	Manufacturing	6.3	11.9	15.3	12.8	11.6	10.5
Eastern Africa	Industry	3.1	7.8	20.6	18.6	20.6	20.3
	Manufacturing	1.7	4.9	13.4	10.4	10.3	9.7
Middle Africa	Industry	34.2	38.4	34.1	50.4	57.9	59.8
	Manufacturing	10.3	11.8	11.2	8.2	7.3	6.4
Northern Africa	Industry	34.2	50.0	37.4	37.8	45.0	46.0
	Manufacturing	13.6	9.7	13.4	12.8	11.3	10.7
Southern Africa	Industry	38.2	48.2	40.6	32.7	31.7	34.5
	Manufacturing	22.0	20.9	22.9	18.4	17.9	18.2
Western Africa	Industry	26.7	43.3	34.5	39.8	36.7	37.4
	Manufacturing	13.3	21.3	18.8	29.3	27.7	29.6

Source: UNCTADstat, accessed May 2014

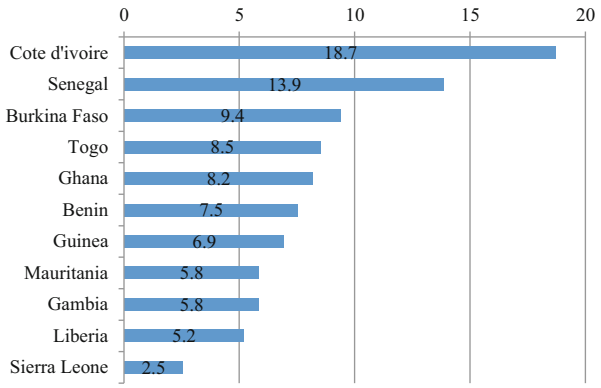

Fig. 1 Manufacturing as a % of GDP in West Africa, 2005–2013 (average % of GDP). *Source*: African Development Indicators, accessed May 2014

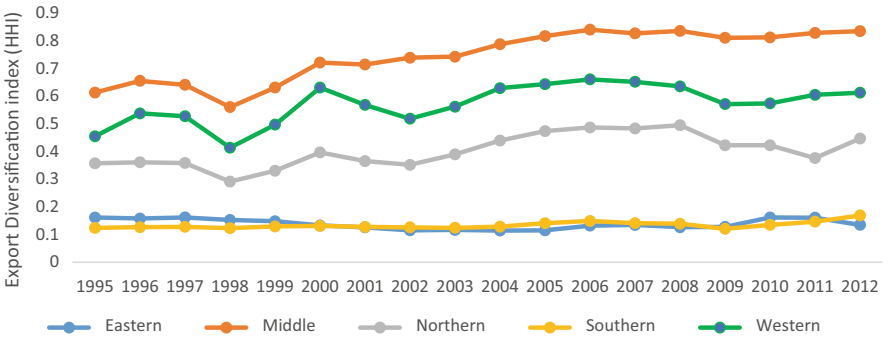

Fig. 2 Export diversification (1995–2012). *Source*: UNCTADstat, accessed May 2014

highly concentrated on primary commodities such as agricultural products and natural resources.

Explaining the reasons behind the limited structural change in terms of export diversification necessitates disaggregating the HHI index at the country level. Table 2 presents the evolution of the HHI index for countries categorized as Western Africa. Four key facts emerge from the data. First, there are countries which are characterized by reserve structural change. In countries such as Cape Verde, Ghana and Guinea-Bissau, the HHI index has consistently increased since 1995. Secondly, countries such as Nigeria and Guinea Bissau have persistently exhibited export concentrated baskets, which tend to the maximum HHI value of 1. Third, there are countries which have stagnated over the period. These include Cote d'Ivoire, Mauritania and Senegal. Finally, there are countries which have recorded a remarkable progress in accelerating export diversification. These include Benin, Gambia, Guinea, Liberia and Togo.

Table 2 Export concentration index (HHI)

	1995	1998	2001	2004	2007	2008	2009	2010	2011	2012
Reverse structural change										
Cape Verde	0.37	0.39	0.30	0.27	0.31	0.34	0.35	0.41	0.46	0.40
Guinea-Bissau	0.50	0.44	0.76	0.72	0.89	0.89	0.89	0.89	0.89	0.89
Ghana	0.35	0.35	0.31	0.45	0.43	0.42	0.47	0.49	0.39	0.41
Sierra Leone	0.28	0.62	0.35	0.48	0.30	0.27	0.24	0.27	0.27	0.31
Limited structural change										
Nigeria	0.85	0.86	0.88	0.88	0.85	0.83	0.83	0.79	0.78	0.78
Guinea-Bissau	0.50	0.44	0.76	0.72	0.89	0.89	0.89	0.89	0.89	0.89
Stagnated structural change										
Côte d'Ivoire	0.34	0.36	0.35	0.33	0.32	0.34	0.36	0.34	0.35	0.31
Mauritania	0.53	0.54	0.50	0.53	0.48	0.47	0.45	0.50	0.48	0.51
Senegal	0.22	0.22	0.22	0.22	0.20	0.35	0.24	0.27	0.23	0.23
Burkina Faso	0.56	0.62	0.54	0.71	0.69	0.49	0.51	0.51	0.55	0.53
Increased structural change										
Benin	0.67	0.59	0.63	0.50	0.32	0.31	0.29	0.28	0.28	0.26
Gambia	0.60	0.57	0.27	0.25	0.28	0.43	0.35	0.26	0.25	0.25
Guinea	0.62	0.56	0.59	0.58	0.53	0.59	0.61	0.45	0.47	0.50
Liberia	0.80	0.68	0.78	0.76	0.65	0.50	0.69	0.40	0.42	0.38
Mali	0.57	0.68	0.49	0.65	0.57	0.58	0.57	0.63	0.51	0.50
Niger	0.42	0.36	0.32	0.32	0.47	0.41	0.43	0.38	0.38	0.36
Togo	0.36	0.40	0.24	0.24	0.22	0.23	0.26	0.23	0.24	0.20

Source: UNCTADstat, accessed May 2014

4 Industrial Policy and Financing Industrial Development

4.1 Elements of an Effective and Coherent Industrial Policy Framework

(a) Supporting and Promoting Private Sector Development

The State has a vital role in supporting the private sector to channel its investment resources to specific sectors or activities which have a significant effect on structural change. Government support can address constrains to entrepreneurial activities, such as infrastructural deficits in technology, skills, transport or energy. In addition, the State should ensure an investment friendly atmosphere where firms can thrive in. Recent empirical analysis on industrial policy accords the government even a more challenging role in supporting domestic firms. The State has a crucial responsibility in challenging domestic firms to increase their production output and export performance. Government support, in terms of competitive incentives and subsidies should therefore be

made conditional on achieving certain conditions which will promote productivity and international competitiveness in domestic firms. Therefore, promoting the private sector necessitates instituting 'discipline' and ensuring that firms achieve set targets in order to enjoy government support.

(b) Recognizing country and sector specific conditions

In the design and implementation of industrial policy, it is vital to take into account country heterogeneity and specific sectoral conditions. Industrial policy instruments should be tailored to fit the needs and challenges of each country, and governments should not adopt a one size fits all approach. Policy makers need to take into account differences in country endowments, comparative and competitive advantage, initial conditions, political climate and infrastructural requirements in determining the form of industrial policy to implement. Therefore, recognizing the importance of country specific and context specific policies is important in avoiding industrial policy failure. Duplication of policies from other countries without adapting them to local conditions can lead to adverse effects. Effective industrial policy should therefore be country and context specific.

(c) Visionary and strategic leadership as well as re-orientation of development perceptions

An important aspect of sound industrial policy is political support from the highest State organs and government officials. Successful experiences of industrialization in both developed and developing countries highlight the need for visionary and strategic leadership in promoting productive economic sectors through selective policy interventions. A smart bureaucratic leadership is a necessary condition in promoting industrial development. In addition, ensuring coordination of industrial policies across government ministries, departments and industrial policy institutions is key in avoiding duplication of responsibilities and contrasting of policy objectives and targets. Therefore governments should ensure clear and well-spelled out framework across government institutions. To this end, the formation of an autonomous institution which overseas industrial policy in a country is key in facilitating coordination of policies and ensuring transparency and accountability among the different institutions involved in implementing industrial policy.

(d) Implementing both horizontal and vertical policies

In order to spur industrial development, there is need to simultaneously implement horizontal and vertical industrial policies. Horizontal policies are generally those which promote industrial development across all sectors. They consist mainly of addressing infrastructural deficits, promoting a stable macroeconomic and political atmosphere which supports both domestic and foreign investments, human capital formation and technology upgrading. Vertical policies, on the other hand, include those policies which are targeted to specific sectors/firms or products in the economy. African policymakers should ensure an appropriate mix of horizontal and vertical policies, and gradually ensure that as domestic firms upgrade, the type of policies implemented are adjusted accordingly to reflect the need of the industry.

(e) Designing and implementing achievable industrial policy targets

Past industrialization experiences in most African countries highlight the adverse effects of formulating ambitious and unattainable industrial policies. Neglecting a country's resource limit can result to unsustainable subsidies and undesirable outcomes. In addition, disregarding a country's comparative and competitive advantage in designing and implementing industrial policy can lead to policy failure. Most African countries have in the past defied their comparative and competitive advantage, promoting capital intensive sectors. It is thus crucial for countries to take into account their endowments such as natural resources and abundant labour in the designing industrial policies. This will ensure that economies capitalize on readily available resources to add value and upgrade up the production structures. This in turn would result to increased competitiveness and productivity in the industry.

(f) Promoting transparency and accountability

Given that industrial policy necessitates selecting specific sectors, products or firms, it is crucial to ensure that the risk of political capture and rent seeking is mitigated. Industrial policy decisions should be made in a transparent manner, and should encompass wide consultations with key stakeholders, especially the private sector. In addition, there should be clear benchmarks on how to channel support to certain sectors or firms, and the criteria for judging success or failure should be well spelled out. Evidence from the East Asian countries show that export performance can be used as an indicator of performance. Sunset clauses which terminate support to non-performing firms should also be enacted, and frequent monitoring and evaluation should be conducted to ensure that government support is channelled to support feasible and viable sectors or firms which meet the set indicators.

(g) Adopting appropriate monetary and fiscal policies

Promoting efficient industrial development outcomes also depends on the degree to which monetary and fiscal policies are aligned with industrial development. High inflation, for instance, has a negative impact on investment, as it signals risks and uncertainty in the economy. Exchange rate policies also have an impact on providing incentives to investors to engage in the production of manufactured goods. It is therefore important for countries to link their monetary, fiscal and industrial policies in order to promote synergies. Promoting competitive exchange rate policies can boost export competitiveness and providing incentives to firms to re-allocate their production structures to high productive sectors such as manufacturing and industry. Avoiding overvalued exchange rates as well as exchange rate volatility can also have a significant impact on manufacturing. In addition, monetary and fiscal policies should also be targeted to promoting financial sector development. There is need to improve access to credit, especially for small and medium enterprises by ensuring that interest rates and collateral requirements do not deter investments in high productive economic sectors.

(h) Promoting regional integration and intra-African trade

Regional integration provides numerous opportunities for Africa countries to promote industrial development. Through the harmonization of national

policies across countries, regional integration can lead to a reduction in direct and indirect trade costs and enhance competitiveness of domestically manufactured goods. In addition, pooling financial resources at the regional level can address infrastructural deficits, especially in the transport and energy sectors, leading to reduced production costs. Given the continent's growing population, as well as high income growth, the continent provides a huge end-market for manufactured exports. Therefore, the region can be a significant source of consumer demand and labour for manufactured goods. Recent studies show that trade among African countries is less restrictive, and highly diversified. Unlike Africa's exports to traditional and emerging markets, exports to African markets are tilted towards manufactured and high value added products. According to ECA and AUC (2014), around 40 % of intra-African trade comprised manufactured exports between 2010 and 2012. This implies that facilitating trade among African countries by addressing the prevailing high trading costs and barriers can lay the foundation for industrial development on the continent.

(i) Boosting entrepreneurial ventures and investment

Policies which are designed and implemented to boost entrepreneurial investments constitute a key ingredient of any industrial policy framework. It is therefore important to ensure that government interventions promote the acquisition of managerial and technical skill, especially to small and medium enterprises. A key policy instruments comprises the provision of competitive incentives to firms to enable them channel their investment resources to the industrial sector. The design and implementation of incentives should however be conducted in a manner that does not attract rent seeking and corruption. Incentives should also encompass a sunset clause, and should be based on measurable targets and achievement indicators.

(j) Promoting innovation and technology upgrading

Most African countries are characterized by low levels of technology advancement and production techniques. Policies to accelerate technological progress and upgrading remain a vital component of industrial policy. Experiences of successful industrial policy in both developed and developing countries show that promoting the acquisition of modern technology and promoting science and technology is key in fostering industrial development. Therefore, the design of industrial policy should take into account channels which promote technology knowledge and accumulation. Local content policies, subsidies for technological imports and attracting FDI are seen to be a useful policy instruments in this regard.

(k) Policies to promote education and skills formation

Supplementing policies geared at accelerating innovation and technology is the need for human capital formation and skills development. Human capital and technology advancement are two key inputs in the industrialization process. Promoting skills upgrade will ensure that domestic firm have a high quality labour force which can engage in the production of competitive products. Therefore policies which align education curriculum with the

needs of the industrial sector are vital. Configuring and re-orienting education system towards scientific and engineering courses can be instrumental in the development of appropriate human capital. In this regards, establishing training institutions and providing incentives for firms to engage in on the job training are key in accelerating skill formation.

4.2 Financing Industrial Development

Designing and implementing industrial policies is necessitates huge financial implications. Industrialization is a costly venture, and African countries need to mobilize sufficient resources to finance industrialization. Governments therefore have a key role to mobilize public investments and channel them to key strategic areas such as improving infrastructural deficits, improving education and skills and promoting innovation as well as technology diffusion. Therefore, the efficiency and extent to which African countries will successfully achieve their industrialization goals greatly hinges on the efficacy of their resource mobilization strategies. Given the heterogeneity of African countries and their different levels of industrial development, various sources of finance provide opportunities to mobilize resources. These include mobilizing domestic resources, borrowing from financial institutions, FDI, official development assistance and central bank reserves.

(a) Mobilizing domestic resources for industrialization

Successful industrial development necessitates local ownership of the process and outcomes. Countries are more likely to align their industrial strategies with their long term development plans if there is government policy space. Therefore, mobilizing domestic resources, especially taxes and remittances can constitute key avenues of financing industrialization. Apart from most resource-rich countries, African countries are characterized by low domestic resources mobilization. Domestic savings and taxes constitute a small share of the government's total revenue, constraining the capacity of the government to finance productive investment. Several factors have been advanced to explain the low levels of domestic resource mobilization in the continent. They include low income per capita, narrow tax bases, inefficient tax administrative systems, the hefty reliance on a narrow set of taxes and illicit capital flows. Therefore, there is need for African governments to institute sound policies which promote resource mobilization by addressing the above factors. Developing sound fiscal policies, deepening financial sector development and curbing illicit capital flows are some of the measures which can enhance revenue collection.

(b) Borrowing from financial institutions

Industrial development can also be financed through borrowing from both domestic and international financial institutions. Borrowing from international markets is usually daunting for most African countries, as these funding is normally focused on short-term lending. In addition, due to high risk premium

and lack of credibility, raising money in international markets has resulted to undesirable outcomes. Therefore, one of the key sources of financing industrialization are development finance institutions and national development banks. Experiences from the rapidly industrialization experiences of the East Asian countries underscores the role of national development banks in providing long term finance for industrial development. As a result, African policymakers should establish or strengthen existing development banks in order to provide entrepreneurial funding for investment, especially to small and medium enterprises.

(c) Promoting Foreign Direct Investment

Investment resources for industrialization can also be obtained from attracting foreign direct investment. FDI is one of the channels which can foster technological innovation and diffusion from developed to developing countries. It can also boost local production capabilities through positive spillover effects of managerial and technical skills. However, FDI flows into African countries have exhibited a pattern which is not conducive for structural change. There is mounting evidence which shows that FDI inflows are channelled to countries which are resource-rich. Extractive sectors such as oil and mineral resources consist the bulk of FDI destinations in most African countries. As a result, FDI has not had a profound impact on promoting industrial development, rather, it has been a catalyst in promoting the exportation of raw commodities. In this regards, there is need for policymakers to craft policies which channel FDI to priority sectors. Promoting joint investment ventures between domestic and foreign investors is one of the key ways of establishing linkage development in the domestic economy.

(d) Official Development Assistance

Official development assistance constitutes a potential source of finance for industrialization. This is especially important for African countries whose ability to raise resources in international financial institutions remains limited. ODA can therefore provide the much needed resources to finance infrastructure development which is fundamental for any industrialization strategy. However, ODA flows to most African countries are not targeted for this purpose. A significant portion of ODA is channelled to financing social sectors such as education and health. To capitalize on these resources, it is crucial for policy makers to ensure that industrial development constitutes one of the goals and targets of ODA. Ensuring that donor priorities are aligned with industrialization and promotion of high growth sectors is a priority policy imperative for most African countries.

5 Conclusion and Policy Recommendations

In order to address the prevailing social economic challenges facing the continent, it is imperative for African countries to achieve and sustain broad based economic growth. Experiences of the rapidly growing East Asian economies underscore the fact that achieving this growth requires structural change. Policymakers need to design and implement policies that foster the shift of economic resources to high productive and labour intensive sectors such as manufacturing. To this end, industrial policy emerges as a vital policy option which, if well designed and implemented, can be instrumental in achieving this target.

This paper has summarized some of the key elements and ingredients of an effective industrial policy framework. It has emerged that the State has a key role to play in accelerating re-allocation of resources to high productive economic sectors. Past industrialization attempts in most African countries provide policy lessons which can guide policymakers in the design and implementation of industrial policy. This paper has underscored that industrial policies should (i) foster private sector development (ii) boost entrepreneurial ventures and investments (iii) promote coordination of industrial policy among different institutions in a transparent and accountable manner (iv) accelerate scientific and technology innovation (v) boost regional integration and intra-African trade, and (vi) lay emphasize on mobilizing resources for financing industrial development.

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Basic Infrastructure, Growth and Convergence in WAEMU

Béké Tite Ehuitché

Abstract The objective of this study is to analyze the role played by basic infrastructure in the growth and convergence of the economies of the West African Economic and Monetary Union (WAEMU). After a description of the dynamics of the basic infrastructure of WAEMU and a literature review on theories of integration, we will discuss the model of convergence used for this analysis. Data for this study consists of panel data for the eight member countries of WAEMU gathered between 1980 and 2012. Statistical data was retrieved from the World Bank. The conditional convergence model is estimated by GMM in dynamic panel of Arellano and Bond. The results show a phenomenon of conditional convergence in the Union. Moreover, they demonstrate that an improvement in economic and social infrastructure in the region would result from significant gains in per capita income growth.

Keywords Infrastructure • Convergence • Growth • Dynamic panel • Economic integration

JEL Classification O43 • O47 • C23

1 Introduction

Infrastructure development is a key driver for progress across the African continent and a critical facilitator of productivity and sustainable economic growth (Commission for Africa 2008). Accelerating integration and growth in Africa requires strengthening of infrastructure services (Guillaumont et al. 2012). NEPAD (New Partnership for Africa's Development), for example, under the aegis of the African Union, focuses largely on regional programs designed to address infrastructure deficit by better integrating transportation networks, energy, and ICT (Information and Communication Technologies).

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WAEMU (The West African Economic and Monetary Union) is one of the most striking regional initiatives on strengthening infrastructure. The primary purpose of the Regional Economic Programme (REP) of WAEMU is to accelerate growth and reduce poverty through the implementation of regional integration projects and economic infrastructure development. Priority is given to projects related to electric power, transportation infrastructure, and ICT.

The Regional Economic Programme, designed for a period of 5 years (2006–2010), included 63 projects of integration. Member States of the Union have viewed this programme as a crucial investment in the economic development of the region.

The vision of this Regional Programme is to contribute to the expansion of the integration process in order to stimulate sustainable and pro-poor growth. To this end, five key strategic areas were identified, namely: (i) the strengthening of economic governance, (ii) the development of economic infrastructure (roads, energy infrastructure, and telecommunication infrastructure) to facilitate the movement of people, goods and services, and improve interconnection across borders, (iii) the construction of a regional production system, (iv) the development of human resource (v) the establishment of partnerships for resource mobilization.

Among these strategies, the development of economic infrastructure has been identified as a priority on the basis of its impact on integration and its strong contribution to the achievement of the Union's development objectives. According to WAEMU, the choice to invest in basic infrastructure is relevant in that it is expected to accelerate growth through the emergence of a network of small and medium enterprises and the increase in regional exchanges (WAEMU 2006). WAEMU has prioritized basic infrastructure by allocating more than 70 % of its resources to development (See Table 1).

However, regional infrastructure development could lead to the spatial concentration of economic activities in relatively advanced countries of the Union. In this context, Ivory Coast and Senegal, which have a historical advantage over other WAEMU countries, could experience rapid growth with a subsequent increase in disparities between countries. The arguments in favor of this view are similar to those of traditional trade and integration theories that suggest economic unions between poor countries lead to inequalities between relatively the most developed countries in the union and the least developed countries (Venables 2000).

Table 1 Regional economic program of WAEMU (2006–2010)

	Cost (million F CFA)	%
Axis 1: Governance and economic integration	58,212	1
Axis 2: Economic infrastructure development	4,988,754	87
Axis 3: Construction of an integrated production system	635,102	11
Axis 4: Human resources development	77,980	1
Axis 5: Resources mobilization	3,000	–
Global cost	5,763,048	100

Source: WAEMU (2006)

On the other hand, several authors based their views on the positive externalities associated with infrastructure, and have reconsidered the question of economic integration. Indeed, investments in basic infrastructure are essential to the competitiveness of the private sector and critical for growth and integration among developing countries (Holtz-Eakin and Schwartz 1995).

So there is a controversy over the role of infrastructure in the process of economic integration. Do infrastructure investments contribute to the phenomenon of convergence or divergence between WAEMU countries? How do we improve the contribution of infrastructure to the growth of GDP per capita in WAEMU?

2 Objectives of the Study

The overall objective of this study is to analyze the relationship between infrastructure services, growth, and convergence in WAEMU.

Specific objectives are:

- To identify growth factors within WAEMU;
- To analyze the dynamics of convergence between countries;
- To assess the impact of infrastructure services on growth and convergence in the Union.

3 Literature Review

The first literature regarding optimal monetary unions dates back to the 1960s. However, literature from this time period brought to light certain issues, primarily concerning the European economic and monetary union and the economic and monetary union of the Franc zone in West and Central Africa (UEMOA and CEMAC). For more than two decades, the analysis of the process of economic convergence served as the subject of a lot of work. This literature is central to the debate on integration.

The origin of the current discussion involves the notion of absolute convergence, the idea that national incomes per capita converge toward each other in the long-term, regardless of the initial conditions. However, given the importance and the role of countries' structural characteristics in determining long-term equilibrium, the assumption of absolute convergence was rejected by econometric regressions based on cross-sectional data (Barro 1991) and by changes in the distribution of income between countries (Quah 1996).

Thus, as noted by Barro (1991), Mankiw et al. (1992) and Barro and Sala-I-Martin (1991), the neoclassical growth model implies conditional rather than absolute convergence, so that the rejection of the hypothesis of absolute convergence does not necessarily imply the rejection of neoclassical growth model.

The hypothesis of conditional convergence suggests that among all similar countries, in terms of preference, technology, population growth, public policy, etc., the growth rate is a decreasing function of the level of output per head. As a result, per capita incomes, in similar countries, converge to the same long-term level regardless of their initial position.

Following the work of Barro and Sala-I-Martin (1991), Ondo-Ossa (1999) confirmed the robustness of the hypothesis of conditional convergence. In fact, results have shown a convergence in per capita GDP in the long-run by using the method of ordinary least squares in Franc Zone member-countries.

The evaluation of the two hypotheses (absolute convergence and conditional convergence) is therefore intended to examine the plausibility of the existence of a long-term equilibrium and global stability rather than the existence of multiple, stable equilibria.

Most recently, the work of Berthelemy and Varoudakis (1996) and Berthelemy (2006) confirmed the multiplicity of growth regimes. The accumulation of overarching factors (demographics, savings, and human capital accumulation behaviors) and aspects related to political institutions, could appear or influence different stages of economic development, and thus we have "multiple equilibria". These contributions are too few compared to all the work trying to test the convergence hypothesis.

In summary, work on economic convergence rejected the hypothesis of absolute convergence in favor of the conditional convergence hypothesis.

4 Evolution of Macroeconomic Indicators and Economic Convergence in WAEMU

The economic and financial situation of the Member States of the Union during the 1980s and early 1990s was distinguished by a worrying slowdown in economic growth, persistently high fiscal imbalances, and strong pressure on the currency.

The implementation of a comprehensive strategy focusing on changing the parity of the CFA franc, and the accompanying Treaty of WAEMU in 1994, provided a new impetus for the adjustment process, and allowed the Union, over the period 1994–1998, to reconnect with economic growth, with better control of inflationary pressures and reduced fiscal imbalances.

Thus, economic activity has picked up significantly, with an average annual growth of 5.1 % per year. This recovery in activity has slowed since 1999, following the amplification of exogenous shocks, the deterioration of the socio-political climate in some countries (the case of Ivory Coast), and the implementation of inappropriate economic policies, reducing the rate of economic expansion from 2 to 3 % per year on average from 2000 to 2006. During this period, the level of growth remained below the population growth rate, estimated at 3 %, and well

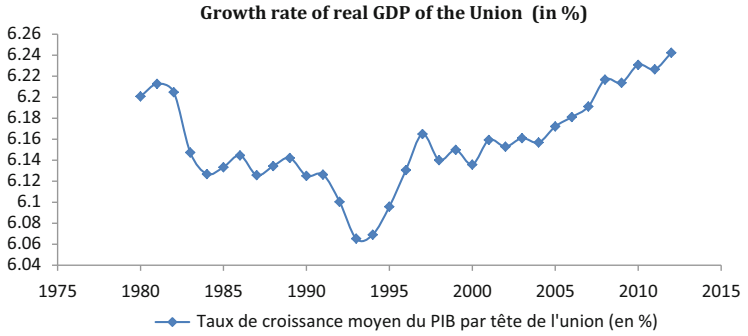

Fig. 1 The dynamics of the economic growth of the Union. *Source*: Author from World Development Indicators (WDI 2014)

below the economic growth rate of 7 % required to effectively fight against poverty (WAEMU 2006).

It appears from Fig. 1 that the average per capita income growth in WAEMU economies experienced two distinct phases: (i) The phase of structural adjustment programs, from 1980 to the late 1990s, along with a decline in GDP per capita; (ii) A recovery phase after the 1994 devaluation.

However, due to insufficient budgetary resources and a significant decline in foreign aid, investments in basic infrastructure have registered a decline of 1 % per year since 1999.

5 Evolution of Basic Infrastructure in WAEMU

This section provides an overview of basic infrastructure in WAEMU with emphasis on roads, energy, telecommunications and access to new information technologies. The dynamics of each of these basic infrastructure components are presented in Figs. 1, 2, and 3.

5.1 Dynamics of Basic Infrastructure in WAEMU from 2000 to 2010

During the 2000s, the growth of investments in road and energy infrastructure has largely been lower than the population growth, as shown in Figs. 3 and 4. Apart from the telecommunications sector, which recorded significant growth, all sectors declined in the 2000s. The most significant improvements were observed in the sector of information and communication technologies sectors which experienced true expansion from 2005 onwards (Fig. 5).

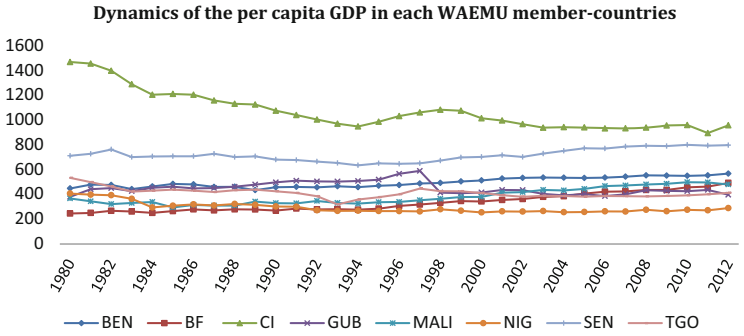

Fig. 2 The dynamics of the per capita GDP in each WAEMU member-countries. *Source*: Author from World Development Indicators (WDI 2014)

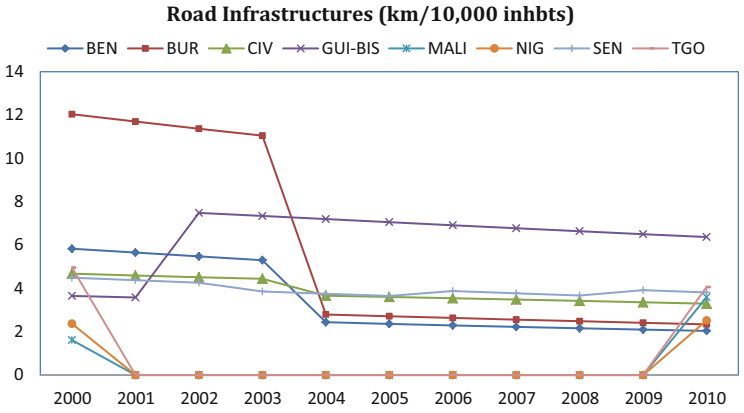

Fig. 3 Dynamics of road infrastructure in WAEMU members-countries from 2000 to 2010. *Source*: Author from Africa Infrastructure Development Index (AIDI 2013)

However, the inversion of the yield curve indicators on access to electricity and ICT from 2009 onwards shows that significant investments were made in these types of infrastructure by most countries of the Union (Figs. 4 and 5).

5.2 *Regional Policies and Prospects of Basic Infrastructure in WAEMU*

- Road Infrastructure

  The common transport policy in WAEMU focuses on the network of interconnecting roads through transit corridors that determine the production and international trade of landlocked countries such as Mali, Burkina Faso, and Niger.

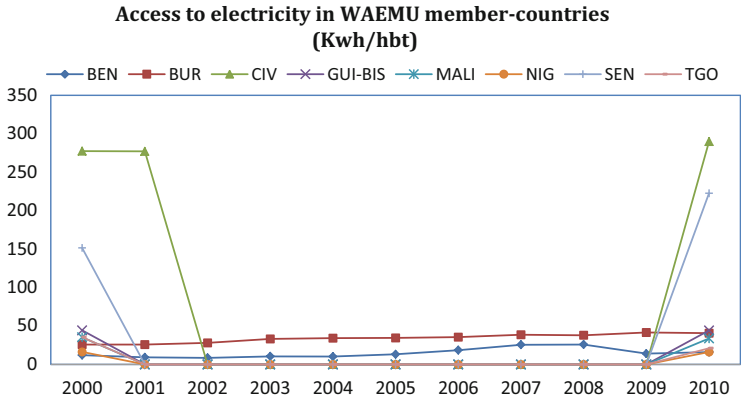

Fig. 4 Access to electricity in WAEMU member-countries 2000–2010. *Source*: Author from Africa Infrastructure Development Index (AIDI 2013)

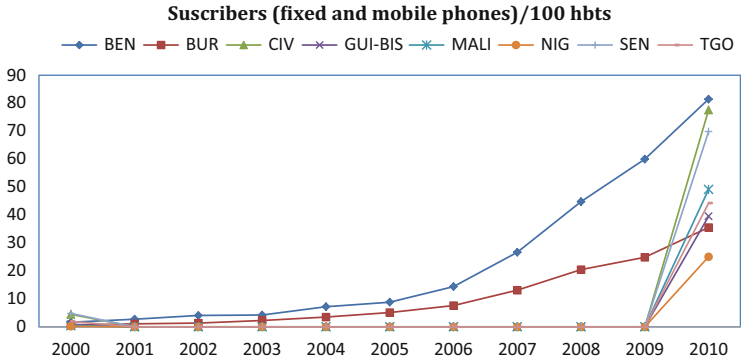

Fig. 5 Access to phone services (fixed and mobile) in WAEMU member-countries. *Source*: Author from Africa Infrastructure Development Index (AIDI 2013)

The hinterland of West Africa (Burkina Faso, Mali, and Niger) is connected to the sea through several corridors including ports in Abidjan, Dakar, Lomé, and Cotonou. The most significant constraints to the development of the international exchange of goods relates to the cumbersome procedures for customs control and police.

WAEMU common policy aims to improve the efficiency and fluidity of road transit corridors in order to reduce transaction costs and improve the economic performance of the Union. The physical existence of road infrastructure is not viewed as the main obstacle, although it is still necessary to maintain the quality and the fluidity of existing roads through effective implementation of institutional reform for roads.

- Energy Infrastructure

  The common energy policy of WAEMU countries should help to ensure that in 2030, the entire population of the Union has access to cheap energy, in a broad market exchange integrated across West African countries. The interconnection between Côte d'Ivoire and Mali will deliver power to Senegal for which demand is structurally unsatisfied. Côte d'Ivoire is, moreover, already interconnected with Ghana, who, in turn, is already connected with Togo and Benin, the latter of which is connected to Nigeria.

  The rate of access to electricity is forecast to increase from 17 % in 2007 to 80 % in 2020 and 100 % in 2030, thus achieving the goal of universal access to electricity (Guillaumont et al. 2012).
- Information and Communication Technologies (ICT)

  The telecommunications sector has undergone significant institutional changes in recent years, namely the privatization of phone services (Plane 2001a, b). An increase in competition resulting from these privatizations accelerated the decline in the cost of phone service and the subscriber rate.

  With a focus on the regional integration of services, the Union provides regionalized regulation to promote competition and fair treatment of operators. Access to the internet is also a problem within the major regional integration projects. The continually high cost of internet is explained by the price of international connectivity, which is determined by access to the submarine fiber optic cable, but also by the inability to create competition within the industry.

  Greater openness to competition from operators and new infrastructure services could significantly improve internet access in the medium term.

6 Methods of Analysis

There are two main concepts of convergence. The first, called a sigma convergence, refers to the downward trend in the relative differences in per capita income. The second, called a beta convergence, means a negative influence on the initial level of per capita income in a regression of growth. When this regression takes into account exogenous growth factors other than the initial level of the GDP per capita, the beta convergence is called conditional.

6.1 Sigma Convergence

An analysis of sigma convergence will be used to determine if the real income per head in WAEMU countries converges or diverges over the period of analysis. This analysis will be based on the calculation of the dispersion σ of GDP per capita according to the following formula:

$$\sigma_t = \left[\frac{1}{n}\sum_{i=1}^{n}(y_{it} - \overline{y}_{.t})^2\right]^{1/2}$$

Where y_{it} and $\overline{y}_{.t}$ denote the logarithm of per capita GDP of country i at time t and its average level and n is the number of countries. We conclude convergence when the dispersion decreases over time and divergence otherwise.

6.2 Beta Convergence

The beta convergence model is used to test the phenomena of convergence or divergence between countries in accordance with the work of Barro and Sala-I-Martin (1991, 1992). The general formulation is as follows:

$$[\log(X_{it}/X_{it-n})]/n = \alpha + \beta\log(X_{it-n}) + \gamma\log(Z_{it}) \quad (1)$$

where X_{it} is the level of per capita wealth achieved by the country i in period t and Z_{it} a set of structural explanatory variables. The convergence process will cover a period of n years (from the initial year $t - n$ to the final year t).

Depending on whether or not the model includes structural variables Z_{it}, we have conditional or absolute convergence (unconditional). This study adopts the hypothesis of conditional convergence in WAEMU due to the existence of different countries in the Union. This assumption goes beyond absolute convergence, which suggests similarities among the economic and social structures of member-countries who only differ in their level of initial per capita GDP.

Thus, for better test quality, explanatory variables, characteristics of different countries (conditional convergence), are introduced into the basic model.

6.3 The Empirical Model of Conditional Convergence

As previously announced, the regional convergence has been addressed by introducing intrinsic characteristics of each member country.

The model takes into account the impact on growth and convergence of a set of control variables representing traditional growth factors. These variables with the expected sign of the corresponding coefficient (in parentheses) are:

- The average growth rate of GDP per capita of the previous year (+);
- Population growth (−);
- Health measured by life expectancy at birth (+);
- The level of education measured by the primary and secondary enrollment ratio (+);

– Investments in transport infrastructure measured by the density of the road network (+);
– Investments in electric power measured by the rate of electrification (+);
– Investments in telecommunications infrastructure measured by the rate of connection to mobile or fixed telephony (+).

The convergence rate will be calculated from the equation according to the model of neoclassical convergence. The coefficient $\beta = -(1-\exp(-\lambda n))n$, where λ is defined as the rate of convergence to steady state.

Empirically, the conditional convergence model to estimate is written as follows:

$$G(X_{it}) = \alpha + \beta \log(X_{i0}) + \sum \gamma_k Z_{kit} + u_i + \lambda_t + \varepsilon_{it} \quad (2)$$

$G(X_{it}) = \frac{\log(X_{it}/X_{i0})}{t}$ is the growth of per capita GDP of country i at time t;

X_{it} is per capita GDP of country i at time t;

X_{i0} is per capita GDP of country i at the initial year (traditional convergence factor);

Z_{kit} is a vector of growth factors that takes into account the basic infrastructure (transport, electricity, telecommunications);

u_i incorporates unobserved national characteristics that may influence the average growth rate of per capita GDP; λ_t is time specific effects and ε_{it} is a random error term.

6.4 Data and Estimation Method

- Data

  The empirical study will be conducted using panel data from the eight member-countries of WAEMU (Côte d'Ivoire, Benin, Burkina Faso, Guinea Bissau, Mali, Niger, Senegal, and Togo) from 1980 to 2012. This statistical data is from the World Bank (WDI 2013) and the African Development Bank, "the Africa Infrastructure Development Index, AIDI, 2013" (see Table 2).
- The GMM dynamic panel

  The econometric methodology for estimating equation (2) is the GMM (General Method of Moment) method in dynamic panel. Standard econometric techniques, such as OLS, do not provide efficient estimates of such a model, because of the presence of the lagged dependent variable among the explanatory variables. In fact, the unobserved individual effects are structurally correlated with the lagged dependent variable, causing non robust estimators.

  The Arellano and Bond GMM estimator (Arellano and Bond 1991) provides solutions to the problems of simultaneity bias and omitted variables. The method consists of taking the first difference of the equation to eliminate country-

Table 2 Description of variables and source of data

Variables	Description	Source
GDP per capita	Gross domestic product per capita	Africa Development Indicators, 2013, The World Bank
Pop growth	Population growth	Africa Development Indicators, 2013, The World Bank
Roads	Density of the road network (in km/10,000 inhabitants)	The Africa Infrastructure Development Index, AIDI, 2013
ICT	Access rate to mobile and fixed phone services (subscribers/100 inhabitants)	The Africa Infrastructure Development Index, AIDI, 2013
Electrical energy	Electrification rate (in kwh/inhabitant)	The Africa Infrastructure Development Index, AIDI, 2013
Primary education	Primary enrollment rate (%)	Africa Development Indicators, 2013, The World Bank
Secondary education	Secondary enrollment rate (%)	Africa Development Indicators, 2013, The World Bank
Life expectancy	Life expectancy at birth	Africa Development Indicators, 2013, The World Bank
Investment	Gross capital formation	Africa Development Indicators, 2013, The World Bank

Source: Author

specific effects and then using the lagged value of the explanatory variables as an instrumental variable in the first difference equation.

7 Empirical Results

7.1 The Statistical Results of Convergence: Sigma Convergence

Figure 6 shows the evolution of the standard deviation of the logarithm of per capita income for the WAEMU zone. A trend towards convergence in the WAEMU is clearly drawn on this graph with the decline over time of the gap in per capita income growth (see Table 3). This convergence trend is partly explained by the slow-down of economic growth in Côte d'Ivoire which was initially the most advanced country of the Union.

The obvious impact of exogenous factors on growth, other than the initial GDP, calls for an analysis of the beta convergence.

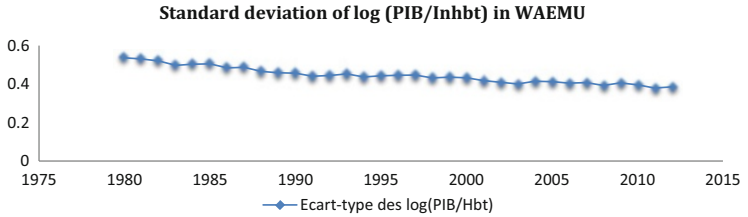

Fig. 6 Sigma convergence: dynamics of the standard deviation of log (PIB/INHABITANT). *Source*: Author from World Development Indicators (WDI 2014)

Table 3 The dynamics of standard deviation of GDP per capita in WAEMU (sigma convergence)

Year	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*
Stand-dev log(pib/hbt) in %	53.66	53.02	52.01	49.73	50.34	50.50	48.44
Year	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*
Stand-dev log(pib/hbt) in %	48.71	46.59	45.87	45.67	44.08	44.44	45.26
Year	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Stand-dev log(pib/hbt) in %	43.68	44.29	44.57	44.66	43.21	43.58	43.26
Year	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*
Stand-dev log(pib/hbt) in %	41.78	40.92	40.06	41.48	41.24	40.49	40.75
Year	*2008*	*2009*	*2010*	*2011*	*2012*		
Stand-dev log(pib/hbt) in %	39.32	40.61	39.64	37.94	38.55		

Source: Author from World Development Indicators (WDI 2014)

7.2 The Econometric Results

Table 4 reports the results of the growth and beta or conditional convergence model in the WAEMU. Stationarity of the variables of the model were first examined. This common approach in the analysis of time series is relatively new in panel data analysis.

The Im and Shin Pesaran test which is one of the most common tests, has been used for the analysis of stationarity. The test results show that the series of the model are not affected by a unit root (See Table 5).

Table 4 confirms the conditional convergence among countries of the WAEMU. The coefficient of the initial level of GDP per capita is negative and significant at 1 %. The value of the coefficient of this traditional convergence factor is −0.0601, which corresponds to an average convergence rate of 0.24 % point.

The past growth of GDP per capita has a positive and significant impact on the current growth rate. In fact, an improvement in the per capita GDP of 1 % leads to an increase in the average growth rate for the next year of 0.34 % point.

The results of the Union were also examined in relation to factors other than the growth of GDP per capita. These factors included infrastructure services, health, education, private investment, and the population growth.

Table 4 Conditional convergence and determinants of the economic growth in the WAEMU[a]

	Dependent variable: GDP per capita growth		
	Coef.	Std. Err.	P > |z|
Log (gdp_{i0}) initial gdp/capita	−0.0601351***	0.0067859	0.000
Lag gdp per capita growth	0.3413356***	0.0174823	0.000
Log (life expectancy)	0.0637631***	0.0098955	0.000
Log (roads)	0.0027284***	0.0003998	0.000
Log (electricity)	−0.0004631	0.000549	0.399
Log (ict)	0.0000446**	0.0000206	0.031
Education (primary)	0.000024	0.0000465	0.605
Education (secondary)	0.0002336***	0.0000734	0.001
Population growth	−0.0093897***	0.0012232	0.000
Log (investment)	0.0073644***	0.0010867	0.000

Notes: Number of observations = 248; Prob > χ^2 = 0.0000
***Significant at 1 %, **significant at 5 %
[a]Instruments for differenced equation: GMM-type: L(2/.). GDP per capita growth; first differenced explanatory variables are standard instruments for differenced equation
Source: Author

Table 5 Unit root test: IPS test

	Im-Pesaran-Shin test		
	t-bar test; N,T = (8,33); Obs = 248		
Variables	T-bar	W[t-bar]	P-value
Log (GDP per capita)	−3.105	−5.003	0.000
Log (life expectancy)	−6.597	−16.025	0.000
Log (roads)	−3.772	−7.107	0.000
Log (electricity)	−4.372	−9.002	0.000
Log (ict)	−5.670	−13.100	0.000
Education (primary)	−2.737	−3.840	0.000
Education (secondary)	−5.114	−11.344	0.000
Population growth	−4.772	−8.857	0.000
Log (investment)	−3.644	−6.704	0.000

Source: Author

The results obtained in terms of infrastructure services shows that better access to road infrastructure and ICT has a significant effect on the growth of the GDP per capita. Indeed, an additional investment in road infrastructure and ICT leads to a significant increase in the long-run trend rate of economic growth.

These results confirm the fact that infrastructure acts as a catalyst for the long-run economic growth. In particular, recent studies indicate that the road infrastructure is crucial both for agriculture, trade, and poverty reduction (Anyanwu and Erhijakpor 2009). The work by Ben Youssef and M'henni (2004) also showed that ICT is essential to stimulate entrepreneurship, innovation, and to accelerate growth in developing countries.

The strong contribution of electricity to manufacturing competitiveness and economic growth is undeniable. However, the results obtained indicate non-significant impact of consumption of electric energy on growth. This result could be explained by the low quality of energy infrastructure in the WAEMU zone. Indeed, interruptions and irregularity in the provision of electricity is considered a major obstacle to private sector development.

The determining role of training and education in the growth and development process is confirmed by the results. The additional growth points associated with education are significant from secondary education. This result is mainly due to the positive externalities generated by the investment in human capital (education and training).

The estimates also show the significant impact of health measured by life expectancy on growth. Thus, a 1 % improvement in life expectancy at birth results in increased growth of GDP per capita of 0.06 % point. Improved health significantly enhances economic and productivity growth in the Union.

Three main channels explain this result. First, greater life expectancy results in increased savings that enhance the growth of the capital stock and thus that of GDP (Zhang et al. 2003). Higher life expectancy encourages increasing investments in education, causing a positive effect on growth. Finally, healthy people are more productive, better able to adapt to new technologies and to sustainably increase GDP (Aghion et al. 2010).

Population growth would have a negative impact on the growth rate of the GDP per capita. This negative effect can be explained by the rapid population growth that puts pressure on the ability of states to meet universal access to education, health, and infrastructure services.

The positive and significant coefficient of investment confirms the accumulation of physical capital as a growth factor. The impact of the accumulation of physical capital is estimated at 0.007 additional point of growth. This result implies that investments in the WAEMU zone have a long run effect on the economic growth.

8 Conclusion

This paper analyzed the impact of infrastructure on regional economic growth. Our focus was also on the convergence of per capita GDP in the WAEMU. The analysis was based on the descriptive statistics of the eight WAEMU member-countries observed during the period 1980–2012. These statistical results show a downward trend in the relative difference in per capita GDP in the Union. A conditional convergence model was then estimated using the Arellano and Bond GMM dynamic panel (Arellano and Bond 1991).

The results show that road infrastructure and ICT are key factors for sustainable growth in the WAEMU. These results highlight the critical importance of infrastructure for both structural transformation and regional trade. In this way, infrastructure plays a role in the dynamics of regional integration.

In addition, improvement in other indicators, namely access to education, life expectancy, and physical capital accumulation induce significant gains in growth in the Union. The results of this study suggest an improvement in economic and social infrastructure in the WAEMU otherwise impede progress towards sustainable regional growth. However, the physical infrastructure is only part of the solution; infrastructure services should also be improved in terms of quality and price. These intangible dimensions of infrastructure could be improved only through effective regulation at national and regional levels.

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