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Abstract

The early 1980s marked the beginning of a new devastating chapter in the global epidemic history when the first case of HIV/AIDS was reported in the United States. In Nigeria, the case of the disease was first reported in 1986, and since then the pandemic has continued to spread, moving from a concentrated epidemic to a generalized one, with its concomitant effects on the economic performance of the country. This study analyzed the impact of the scourge of HIV/AIDS menace on the macroeconomic outcomes in Nigeria. Engle Granger Two-Stage Estimation Procedure was used to determine the long-run relationship between real GDP and the explanatory variables, which included HIV/AIDS. The time series data utilized covered the period 1990 to 2010. Two models were estimated. The first model made use of HIV prevalence while the second model adopted the log of number of persons living with HIV/AIDS in Nigeria. Having found that the variables were cointegrated, OLS estimations were conducted on both models. The result of model one showed that HIV prevalence has negative but statistically insignificant impact on real GDP. Model two?s result revealed that HIV/AIDS has negative and statistically significant impact on the growth of the economy of Nigeria in the long-run. A 100 percent increase in the number of persons living with the pandemic led to a 19 percent reduction in the level of real GDP. The adjusted R2 of 97 percent demonstrated a good fit and a strong explanatory power of the model. The conclusion drawn from the study based on the result of model two was that HIV/AIDS has significant and negative impact on the economic growth of Nigeria. The implication of this is that the macroeconomic impact of the disease in Nigeria will be noticeable and significant as the disease progresses. Therefore, substantial and sincere efforts should be geared towards combating it to avert its negative consequences on the growth of the nation?s economy, mortality and morbidity rates, avera

Index terms— HIV/AIDS, Human Capital, Economic Growth, Infant Mortality, Life Expectancy.

1 INTRODUCTION

he early 1980s opened a new devastating chapter in the global epidemic history occasioned by the did nations of the world realize that the pandemic would exact greater burden on their economies than it began disease with East and Southern African countries such as Kenya, Uganda, Botswana and South Africa greatly overburdened by menace of the pandemic.

Facts presented by UNAIDS (2010) indicate that the status of the disease with respect to the number of persons living with it as well as the prevalence and orphans caused by the epidemic globally are still very much high in spite of the declaration of UNAIDS in its 2010 report that the spread of the AIDS epidemic has been halted and begun to reversed. According to the living with the disease globally was put at 33.4 million in 1998 with 5.8 million new infections same year. 36.1 million people were estimated to be living with it in 2000

The story of the Sub-Saharan Africa (which Nigeria belongs) as regards HIV/AIDS status is very pathetic. Out of the global 33.3 million persons living with the disease in 2009, 22.5 million were living in the SSA with 5

percent prevalence, 1.8 million new infections and 1.3 million deaths due to the disease (UNAIDS, 2010). Nigeria as the most populous African country is not unaffected by the deadly disease. In 2007, the nation ranked third globally in terms of the number of persons living with HIV/AIDS after India and South Africa but as at 2009 up till this moment, the country has overtaken India and is currently the second after South Africa **??**UNGASS, 2008 **??**UNGASS, & 2010))

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2 STYLIZED FACTS

It is pertinent to make bear facts on the system this work is studying to better comprehend the dynamics of the variables employed as well as the nation Nigeria itself. Nigeria has been said to be the most populous Black Country in the world with an estimated population of about 161.605 million people in 2010 according to the data provided by US Global Health Policy. The country is richer in mineral deposits as well as fertile land. In the 60s and early 70s, the nation derived most of her foreign exchange earnings from agriculture and "was among the richest 50 countries of the world and one of the promising economies in Africa" (Dauda, 2011). However, the discovery of crude oil seems to have changed the focus of the economy and today the nation depends on petroleum products for a large part of her foreign exchange earnings and the sector has continued to contribute positively to the growth of the country's GDP the economy of Nigeria has continued to underperform going by the enormous resource endowment available in the country. A summary of the performance of the nation, which is still relevant today, is shown below in table 1.

Economic Growth The Nigerian economy is recovering from two decades of stagnation. Real GDP growth averaged 5.4 percent during the period 2000-2004 and needs to improve further to help reduce the high poverty levels. Poverty Fifty-five percent of the population lives on less than one dollar per day. This is one of the highest poverty rates in sub-Saharan Africa Gender Gender disparities in Nigeria are great and show up in both education and health Fiscal and Monetary Policy New macroeconomic policies have resulted in declining expenditures-to-GDP ratios, a budget surplus in 2004, and an increase in foreign reserves. Inflation remains in the double digits.

3 Business Environment

Corruption is rampant, though recent government efforts had made modest improvements. Rule of law and regulatory quality are weak. The poor business environment is a severe constraint to doing business. Financial Sector Domestic credit to the private sector is strong. The banking system seems to be efficient with interest rate differentials of 6.5 percent.

4 External Sector

Primary indicators conceal important structural problems, including a heavy dependence on oil exports, protectionism, and a distorted foreign exchange market. With the recent approval of debt relief by the Paris club, debt sustainability does not appear to be a problem. Economic Infrastructure Very poor quality infrastructure continues to hamper growth, though recent improvements are impressive. Electricity is the top concern. Health Nigeria's health situation is extremely troubling. Reproductive health indicators and HIV/AIDS are of particular concern. Domestic health spending is woefully inadequate and implementation is poor. Education

The education system needs great improvement in Nigeria as in much of sub-Saharan Africa. Female enrollment is adequate by regional standards, but low in absolute terms. The system is characterized by unqualified teachers, limited pupil-teacher contact, high pupil-teacher ratio, and a lack of materials.

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria and Koning, 2006, reiterated that Nigeria is in the grip of a growing HIV/AIDS epidemic, with a national adult infection rate of 5.8 percent in 2001 and 5.0 percent in 2003, which makes significant regional variations. The foregone called for an empirical research into how the scourge of the pandemic has imparted the economic performance of Nigeria taking cognizance of the prevalence and the number of persons living with the disease.

The choice of Nigeria for this work is predicated on the fact that the number of persons living with the disease together with deaths occasioned by the pandemic and the prevalence are still on the high side and yet the nation continues to experience growth in the level of her real GDP. In addition, majority of HIV/AIDS studies on Nigeria are survey and micro level studies, which employ primary data (see Mahal, Canning, Odumosu, &Okonkwo, 2008 andHilhorst et al, 2006). The only macro study by Abdulsalam, 2010 employed simulation and Computable General Equilibrium (CGE) modeling approach. This study adds to the existing literature by focusing on a time series analysis of how the HIV/AIDS scourge affects the performance of the economy of Nigeria using prevalence and number of people living with the disease. The remaining sections of this work are arranged as follows: Section two presents stylized facts, section three provides information on literature review, section four focuses on theoretical and methodological issues, section five systematizes results while section six gives summary, conclusion and policy recommendations.

6 Employment and Workforce

Women's rate of workforce participation mirrors the gender disparities of other indicators. Growth in non-oil sectors has been volatile, hampering job creation. Unemployment remains high. Labor laws, however, are favorable for job creation.

7 Agriculture

The agriculture sector performs below potential. Growth is not expected to continue in the long term unless productivity-boosting methods and technology are introduced. Poor infrastructure also plays a role in decreasing export potential. The historical maintenance of an overvalued exchange rate related to high oil-export revenues and Dutch Disease have substantially hampered agricultural exports.

Source : Garcia, Kohl, Ruengsorn, and Zislin (2006)

The average growth rates of the nation's real GDP since 1960 according to Sanusi (2010) increased from 5.9 percent between 1960 and 1970 to a record of 8.0 percent between 1971 and 1973; when Agriculture was the main stay of the nation's economy. But from 1976 to 1980, the average growth of the real GDP stood at 3.2 percent and further remained stagnant at 3.2 percent from 1982 to 1990, and then declined to 1.9 percent between 1991 and 1998. It however rose to 8.3 Although, the growth rates look promising, but these are nothing compared with the enormous human and natural resources the country is endowed with. Furthermore, the prevalence of communicable diseases such as HIV/AIDS, malaria and tuberculosis in the economy is an indication that the economy seems not to have gotten its bearing. Table 2 Table 2 shows trade composition of Nigeria in terms of exports and imports of both non-oil and oil commodities from 1960 to 2009. From the figure, it can be seen that non-oil exports outweighed oil exports from 1960 to 1970 before oil exports began to rise higher than non-oil exports. This trend has continued till date, which was due to the neglect of other sectors, and this has been the bane of the country making it a mono-been a blessing to the country, it is now regarded as a curse, because the country, which is the sixth major oil producer in the world and the largest in Africa currently depends on import for her refined petroleum products. As rightly pointed out by Odularu (2008), the coexistence of vast natural resources wealth and extreme poverty in Nigeria is a "resource curse". Furthermore, the growth rates of oil and non-oil exports Source : Computed by the Author from Table 2 The growth rates were computed using the formula Where:

N g = Growth rate of earnings from exports, N t = Earnings from exports in the current year N t-1 = Earnings from exports in the previous year

From the table, while the growth rate of earnings from oil exports remain positive since 1960 till date, growth of non-oil export earnings have been fluctuating between positive and negative. Furthermore, the percentage of oil exports to non-oil exports has been mind bothering as can be seen in table 4 below.

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria From the table, the percentage of oil exports has remained high above 90 percent since 2004. In fact, it was 99 percent in 2008, which is not good for an economy like Nigeria endowed with mammoth human and material resources. economy. In fact, it has been said that rather than the oil are shown in the table below. It was in the year 1986 that the reality of the presence of the disease dawn on Nigeria when the first cases were reported. Ever since this period the pandemic has continued to spread moving from a concentrated epidemic to a generalized one. The World Bank in 1998 had proposed that a 1 percent and above prevalence level of the disease in the general population constitutes a generalized epidemic in any country, and in Nigeria, the prevalence rate is far above 1 percent. Evidences provided by ??NGASS (2007 ??NGASS (& 2010)) reveal an increased in the prevalence from 1. The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria epidemic. One awful thing about the disease is its high rate among the economically active population, which is detrimental to the level of productivity in the economy. For instance in 2008, the prevalence of the disease among age bracket 15 to 19 was 3.3 percent, that of age bracket 20 to 24 stood at 4.6 percent and for the age group 25 to 29, the rate was 5.6, the highest among the age groups. Meanwhile, age bracket 30 to 34 had 4.9 percent, age group 34-39 recorded 4.1 percent while age bracket 40 to 44 had 2.9 percent prevalence. This figures speak volumes about the economy in the future since no cure has yet been discovered for the pandemic, meaning that as the disease progresses, the immune system of the affected people would get weakened thereby leading to less labour hour supply and a complete withdrawal of such services at their demise. infections according to the agency stood at 281,180 in 2010 while the annual HIV positive births the same year was 56,681. In fact, in the UNGAS, (2010) report on the country, it is stated that the nation accounts for about 9 percent of the global HIV burden, with more females affected than males. Below is a table showing HIV/AIDS population in Nigeria from 2003 to 2010 and figure 2 showing a graphical representation of the prevalence of the disease from 1991 to 2008.

9 Status

10 Mode Of Transmission

As in most African countries where the prevalence of the pandemic is high, the channels of transmission are similar. The various and major means through which the disease spreads in Nigeria include: i) heterosexual intercourse, which is the primary mode of transmission in the country, accounting for about 80-95 percent; ii) blood transfusions; iii) mother-to-child transmission; iv) Injecting Drug Users (IDU); and v) homosexuality (UNGASS, 2010 and Avert, 2011). The 2010 UNGASS country report states that about 80 percent to 95 percent of people infected with the virus in Nigeria got infected through heterosexual intercourse. This was underscored by the nation's 2007 IBBSS 6 which indicated that HIV/AIDS prevalence was very high among sex workers and that about 37.4 percent prevalence existed among sex workers based in brothels while non-brothel-based sex workers had 30.2 percent. MSM 7 was 13.5 percent, armed forces, 3.1 percent, police, 3.5 percent, transport workers 3.7 percent and IDU 8 was 5.6 percent. The survey which covered three major cities in the country revealed that Kano and Abuja had 49 percent prevalence while the lowest rate was recorded in Lagos among brothelbased and non-brothel-based sex workers given as 23.5 percent and 12.9 percent, respectively (USAID-Nigeria, 2010). The figure below shows prevalence of the disease among high risk population in Nigeria. 6 Integrated Bio-Behavioural Surveillance Survey 7 Men who have sex with men 8 injecting drug users

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria The above figures notwithstanding, governments at various levels in the country have been proactive together with international agencies and civil society groups including religious bodies in putting in place policy measures and programmes geared towards combating the scourge of the disease in the country. The Federal government established the National AIDS/STD 9 Control Programme (which is currently the HIV/AIDS division of the Federal Ministry of Health) to coordinate national response activities towards fighting the pandemic (NACA, 2008). According to the 2007 IBBSS, one of the key strategies of the Federal government has to do with the continuous monitoring of the HIV epidemic through repeated sentinel surveys, including biennial sentinel surveys among pregnant women attending antenatal clinics in the country. The monitoring task always focuses on groups perceived to be at higher risk, such as: female sex workers (FSW), both brothel-and non-brothel-women in the uniformed services (armed forces and the police). In 2001, the federal government established the Presidential Council on AIDS (PCA) and the National Action Committee on AIDS (NACA) to coordinate and oversee all HIV/AIDS related activities at the federal level while the State Action Committee on AIDS (SACA) and the Local Government Action Committee on AIDS (LACA) were also formed to coordinate and oversee such activities and programmes at the state and local government levels respectively. NACA, which "emphasizes a multisectoral approach to national HIV/AIDS response" (UNGASS, 2010) immediately swung into action and therefore developed the HIV/AIDS Emergency Action Plan (HEAP) in 2001 and in 2009, "a second National Strategic Framework was developed for the 2010-2015 time period and serves as a comprehensive strategic plan covering areas such as prevention, care, and treatment" (USAID, Nigeria, 2010). Most HIV/AIDS response programmes focus on education, prevention, HIV testing, care and support, advocacy, legal issues and human rights, media campaigns and public awareness, monitoring and evaluation as well as research and knowledge management.

Response policies also include funding. As stated in the 2007 UNGASS country report; funds aimed at financing HIV/AIDS activities are sourced from both within and outside the country. According to the report, the federal, state and local governments provide funds

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria for HIV programmes. The report affirms that although, the actual expenditure on HIV/AIDS in Nigeria could not be easily ascertained, the application of the NASA tool for 2006-2007 revealed that a total of about 4.9 billion Naira was spent on HIV/AIDS related activities while a total sum of 5.9 billion naira came from the Global Fund with an unspecified sum from other donors such as: PEPFAR 10 , DFID 11 , CIDA 12 Canada, World Bank MAP and the UN System, which could not be captured using the NASA 13 tool. Citing the Health Foundation of Nigeria (HERFON), 2007, Avert maintained that the World Bank in 2002 awarded a loan of US$90.3 million to Nigeria to support a 5-year HIV/AIDS Programme Development Project while an additional fund totaling US$50 million was also allocated to the country for the same programme in 2007. In addition, it reported that in 2008, PEPFAR donated about US$448 million to the country for the purpose of "HIV/AIDS prevention, treatment and care" while as at the "end of 2008, the Global Fund had disbursed US$95 million in funds for Nigeria to expand treatment, prevention, and prevention of mother-to-child transmission programmes."

The various response programmes have had some positive impact on the status of the disease in the country. Evidence provided by the 2010 UNGASS report revealed that some marginal progress have been made in

combating the menace of HIV/AIDS in the country. According to the report, the percentage of people (both adults and children) with advanced HIV infection receiving antiretroviral therapy increased from 16.7 percent in 2008 to about 34.4 percent in 2010. The percentage of pregnant women who have tested medicines in order to reduce "the risk of mother-to-child transmission increased drastically from 5.

13 III. REVIEW OF RELATED LITERATURE

There are both micro and macro impacts of HIV/AIDS on any economy. Micro impact is always observed at the household and sectoral levels while the macro impact is seen at the national or economy wide level. At the micro level, when a household member gets infected with the virus, its immediate effect is seen in the rate of absenteeism at work as well as diversion of household income to treating the disease. Also, increased absenteeism at work by an infected worker as well as complete loss of labour hour at the advanced stage of the disease or the death of an infected persons act to reduce the level of productivity of the firm. Citing reported that the expenditure of households with a positive to the disease but received antiretroviral –

The menace of the dreaded HIV/AIDS has continued to be foci points of theorization as well as empirical works since the disease was discovered. Although at the early stage of its discovery, most research works focused on the epidemiological and demographic aspects of the disease with little works done on the economic implication of the pandemic (see **??**yers and Henn, 1988; **??**ver and Piot, 1991;Becker, 1990;Chin and Lwanga, 1991;Kambou et al, 1992 and **??**ell et al, 2003). Currently, attention has so far shifted to the micro and macro economic impacts of the disease as it has progressed to the third decades since the 80s when it was first reported. the work of Bechu, (1998), Stover and Bollinger (1999) member infected by the disease is twice as much on medical expenses than households without an HIV/AIDS patient. The United Nations (2004) has maintained that the disease has the tendency to reduce directly the number of workers and that firms could also lose their "institutional memory (the know-how accumulated through many years of experience) if some high level skilled workers that are important become ill or die from the pandemic. At the macro level, the direct burden of the pandemic is obvious on its effect on the population of the country. The disease causes increased morbidity and mortality which indirectly results to reduction in the amount of labour hours supplied by those infected and a complete loss of labour services earlier supplied by a person who dies as a result of the pandemic. In addition, morbidity and mortality caused by the disease tend to shrink a country's population which directly reduces labour force.

The economic burden of HIV/AIDS in this context is viewed from the perspective of decline in the level of output that results from morbidity and mortality rates associated with the pandemic. This is based on the fact that increased morbidity and mortality resulting from the disease would act to reduce the level of productivity in the economy thereby impacting negatively on other sectors of the economy since

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria expenditure would be diverted to handling HIV/AIDS related issues and lower income within the economy would continue to affect the performances of other sectors. Kambou et al (1992) has argued that AIDS epidemic can affect the entire economy by increasing public and private health expenditure as well as destroying human resources. This argument has been

The scourge of HIV/AIDS has significant implications for the level of gross domestic product and per capita income in any economy where the disease is found. Since its discovery in the eighties, its prevalence rate and effect on the economy as a whole have continued to be a major source of apprehension. The reason for this is not farfetched. HIV/AIDS affects majorly the population of those in their productive age through high morbidity and mortality as discussed under the demographic impact above. The results of these are cumulated in overturning and reducing significantly the which invariably have implication for economic growth. Jefferis (2007) maintained that HIV/AIDS can affect output (GDP) relative to the level that would have prevailed without AIDS, by affecting the size, skill structure, experience and productivity of the labour force, and by reducing the rate of investment (gross fixed capital formation) and hence the available capital stock. According to him, because all of the key inputs to production (labour, capital and productivity growth) are likely to be negatively affected, it is highly likely that the rate of GDP growth will be reduced but the impact on average incomes is not clear, a priori, because both GDP growth and population growth are reduced, and the net impact on GDP per capita depends on which one falls further. This argument has been supported by McPherson (2003) who opined that HIV/AIDS burden will lead to a significantly larger economic losses and countries may find it increasingly difficult (when measured in terms of finance, skills, time, and effort) for their economies and societies to recover. Arndt (2003) pointed out that since the AIDS pandemic would last for an extended period of time, "even small impacts on rates of accumulation of key determinants of growth (such as technical progress, physical capital, and human capital) will cumulate over time with potentially substantial implications for economic growth." The prevalence of the disease would inadvertently reduce the levels of savings and investments as well as aggravate the poverty level in Africa which invariably will act to slow down the growth of the gross domestic product. In addition, the concentration of public and private expenditures on treating the disease will be detrimental to the growth and development of other sectors in the economy. The implication of this for the economy as a whole is that

most sectors will perform poorly thereby resulting to decline in growth and the level of standard of living within the economy. Furthermore, as a result of the pandemic, the household may suffer from shortages of fund for children's education as well as consumption of commodities necessary for improvement of the standard of living. The epidemic can also deepen the the developing countries that are already beset with a high level of poverty and this can also lead to decrease in the growth rate of per capita income and by selectively impoverishing the individuals and families that are directly affected (Annim and Dasmani, 2010).

The literature is fraught with plethora of empirical evidences relating how the menace of HIV/AIDS pandemic has affected the economies of countries where the disease is prevalent. Since the productivity of workers determines the economy wide level of output, it is not out of place to opine that the demographic impact of the pandemic has implications not only for the labour force and the world of work but also for the output level, which determines the performance of the economy. An ILO study in 2000 gave estimates based on population data analysis from some countries that the pandemic would reduce the work force appreciably. For instance in Botswana, Cameroon, Ethiopia, Cote D'Ivoire, Haiti, Kenya, Malawi, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Thailand, Uganda and Zimbabwe, the organization estimated that there would be about 24 million fewer workers in those countries alone in the year 2020 as a result of the AIDS epidemic. substantiated by some research findings in the literature, although some have proved otherwise. level of labour force and labour supply in the economy, poverty of the most affected countries, most especially Although, it has been argued in the literature that the labour lost to the HIV/AIDS pandemic could be replaced in countries where there are labour surplus due to strong population growth (UNDP, 2003 and Cuesta, 2008); but the labour surplus hypothesis may not hold in most African countries where both skilled and unskilled workers are affected in large proportion. For instance those who have acquired some skills either through formal education or other means such as on-the-job training who have acquired some critical experiences through the years of doing such jobs are lost to the disease in African countries where the literacy rate is already low and the level of brain drain seems to be higher compare to most advanced economies. In addition, labour replacement has some costs attached which could reduce productivity level as well as the level of per capita income in the economy. As pointed out by Cohen (2002), the reasoning that the 'unskilled' labour lost through epidemic diseases such as HIV can be easily replaced is based on fallacy because even with agricultural skills as well as other economic activities where it may appear as if the skills can be easily replicated and replaced, "family-based producers, who account for most farmers in Sub-Saharan Africa, face critical constraints in replacing labour lost to HIV and

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria AIDS" because "most producers do not have access to labour markets, and are thus generally limited in the degree to which they can hire labour to meet their needs." Bonnel (2000) carried out a cross country study has increased or decreased growth between 1990 and 97 and found that the disease reduced the rate of growth of Africa's per capita income by 0.7 percentage points per year. The finding of the study which covered a relatively earlier stage of the disease is an attestation to the fact that as the pandemic progresses its impact on the economies where it is prevalent would be quite substantial. The above result was also substantiated by a country-level study undertaken by Zerfu (2002) on the macroeconomic impact of the disease in Ethiopia, using a macroeconometric model which was set up in aggregate demand and supply framework with the individual equations in the model estimated in an ECM format using the Johansen approach in view of the time series properties of the macro-time series variables. The outcome of the study shows that the prevalence of HIV/AIDS has a negative impact on the overall economy through lowering the active labour force, which in turn resulted to a direct negative impact on both the output of the agricultural and nonagricultural thereby leading to decline in private consumption, investment, exports and government tax revenue.In the same vein, McPherson (2003) discovered from his study that HIV/AIDS burden would lead to a significantly larger economic losses and countries may find it increasingly difficult (when measured in terms of finance, skills, time, and effort) for their economies and societies to recover. Hilhorst et al (2006) carried out an empirical study on the impact of AIDS on rural livelihoods in Benue State, Nigeria and discovered that about 6 percent of the households covered had experienced illness and death classified as AIDS and reported high costs in terms of expenditures and time spent on care, funerals and mourning. The demands on time affected income and productivity while the diversion of resources had implications for investments and savings.

Although, the discovery of antiretroviral drugs have contributed appreciably to the improvement of the immune system of an HIV infected persons, yet the disease impact on growth and development of the economies of countries where it is prevalent would still be grave since no cure has yet been discovered for the disease; implying that in the nearest future virtually all the people suffering from it would eventually die and their labour supply completely withdrawn, which also has negative implications for the level of productivity and economic growth as a whole. This portends a grave danger not only for Nigeria but also for the economy of Africa being the continent with the highest prevalence and incidence of the disease.

16 IV. METHODOLOGY AND CONCEPTUAL FRAMEWORK

Since the reported cases of HIV/AIDS, different methodologies have been employed in the literature for economic related studies on the disease. According to Jefferis (2007) some of the methodologies include: econometric estimation where HIV/AIDS variable appears as one of the explanatory variables estimated, aggregate macroeconomic equilibrium growth models, where a simple simulation model is constructed and calibrated to a particular economy, and the growth path of the economy is simulated under different scenarios such as "with AIDS" and "no-AIDS" situation, Computable General Equilibrium (CGE) models; these are like aggregate growth models in that they simulate generally the equilibrium behaviour of an economy under different scenarios, but are more disaggregated and can take into account labour, capital and commodity markets; scale macroeconomic models, where an economy is represented by a number of large econometrically estimated equations that can be used to forecast economic trends, and which can incorporate HIV/AIDS-related factors into model-based forecasts; and the Overlapping Generations Model (OLG) used by Bell, Devarajan and Gersbach (2003) to study the impact of HIV/AIDS on long-term human capital formation.

to it and it will be impossible to get them easily replaced, to ascertain whether the presence of HIV/AIDS in Africa This study is based on the neoclassical growth theory (as employed in Barro, 1991;Mankiw, Romer & Weil;, Kirigia, et al, 2002, Asante & Asenso-Okyere, 2003;McDonald & Roberts; **??**andon, 2005) using the production function approach where HIV/AIDS variables are included as one of the explanatory variables. In addition, the econometric analysis follows Engle Granger Two-Stage Procedure since the data point used in the study is less than 30. Given the function) (i D f Y = (1)

Y= output or GDP; and D i = All explanatory variables employed in the study with HIV/AIDS inclusive. Equation (**??**) could be re-specified asi i D Y ? = (2)

Linearizing equation (2) gives i i D Y ln ln ? =**(3)**

Equation (3) can be augmented by introducing more input variables and re-written as? = i i D Y ln ln ? (4)

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The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria Where ? i is a vector of coefficients of the equation/model, D i are various inputs or right hand variables. Econometrically, equation (**??**) can be specified as:? ? + = ? i i D Y ln ln (5)

Where: is a vector coefficients of the model, D i stands as a vector of various explanatory variables and Ñ?" is error term or stochastic disturbance term.

18 Model Specification

The study employed two models. Model one used HIV/AIDS Prevalence while model two employed number of persons living with HIV/AIDS in Nigeria.

19 Model One

Based on the above, model one is specified thus: The slopes of the regression or behavioural parameters. A priori, it is expected that ? 1? ? 4 > 0 while ? 5 and ? 6 < 0. ? ? ? ? ? ? ? ? ? + + + + + + + + = HIV IMT HLTX EDUX GFC LBF RGDP

20 Model

Where all variables except HIV remain as earlier defined. Infant mortality variable is specified in level and HIV prevalence replaced with number of persons living with HIV/AIDS in Nigeria. The a priori expectations remain the same.

V. The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria

21 RESULTS AND DISCUSSIONS

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The descriptive statistic results show that real GDP had an average value of 391,764.2 million naira, which varied between a minimum of 265,379.1 million naira and a maximum of 672,202.6 million naira. Education expenditure averaged 657, 88.42 million naira and varied from a minimum of 2,982.5 million to a maximum of 242,731.0 million naira on the average. During the period under consideration, Gross Fixed Capital Formation stood at an average of 549,611.7 million naira varying between the lowest value of 30,626.80 million naira and the highest average value of 1915349.0 million naira. This pattern is also observed in the average values of HIV

prevalence, Health expenditure, Infant Mortality and Labour force. On the average, 3.55 percent HIV prevalence was observed from 1990 to 2010 in Nigeria, which ranged between a minimum prevalence of 1.30 percent and a maximum prevalence of 4.0 percent. Health expenditure averaged 49,685.71 million naira with a minimum value of 658.10 million naira and a maximum of 348042.9 million naira. Infant mortality within the observed period revealed an average value of 98.89 per 1000 live births with a minimum of 80.0 and a maximum of 113.0 averages per 1000 births. Labour force was 64,850,122 people on the average with a minimum of 49,853,380 and maximum of 81,789,142 people.

24 Engle Granger Two-Stage Cointegration Test

This test involves two procedures of running a static regression of the model and conducting a unit root test on the residual from the regression result. If the unit root is I(0), then cointegration exists among the variables, which also implies the existence of a long-run relationship, which also warrants the conduction of an Ordinary Least Square (OLS) regression on the model.

25 Estimation of Model One

Here, the Phillips-Perron (PP) Unit Root test was carried out on the Residual of the static regression of model one.

26 Hypothesis

Null Hypothesis(H 0): RESID01 has a unit root Alternative Hypothesis(H 1): RESID01 does not have a unit root Source : Author's computation

The result shows that the residual series is stationary at level going by the probability value and the t statistic at both 5 percent and 10 percent levels. Based on this, the alternative hypothesis is accepted. The stationarity of the residual series at level implies that the variables are cointegrated based on Engle Granger two way procedure. The import of this is that there is a long run relationship among the variables this therefore, warranted the estimation of the model using the Ordinary Least Square. The result is shown in table 8 below. From the OLS regression result above, the coefficient of HIV prevalence (the variable of interest) has negative but statistically insignificant impact on the level of gdp in Nigeria in the long run. The negative sign is consistent with the a priori expectation. Gross Fixed Capital Formation, Health Expenditure and Labour force also conform to theoretical expectation of positive sign. Likewise infant mortality has negative sign and conforms to a priori expectation. Infant mortality has negative and significant impact on the level of the real gross domestic product in the country. A 100 percent increase in infant mortality will bring about 162 percent reduction in the level of real gross domestic product. This result, which is consistent with the findings of Akram (2008) and Dauda (2011) is very worrisome but not unexpected because of the poor state of health facilities in Nigeria coupled with prevalence of communicable diseases such as malaria, tuberculosis and HIV/AIDS as well as poor high rate of illiteracy and poor health habit of majority of Nigerians. Education expenditure has a negative and statistically significant effect on the output level, which may not be unconnected with the problem of corruption involving the diversion of the money earmarked for the sector for personal use. The adjusted R 2 value of 98 percent shows that the model has a good fit and its explanatory power is strong explaining 98 percent of variation in gross domestic product with the remaining 2 percent explained by factors included in the stochastic disturbance term.

27 Model Two

For this model, the number of people living with HIV/AIDS in Nigeria as against HIV prevalence was used. Source : Author's computation

From the result, it is obvious that the residual series is stationary at level implying the acceptance of the alternative hypothesis of stationarity. This result shows that the variables are cointegrated and so, a long run relationship exists among the variables, which necessitated the estimation of the model using Ordinary Least Square (OLS) regression. The OLS regression result is interesting. All the variables except education expenditure comply with the a priori expectation. The variable of interest, which is the log of number of people living with HIV/AIDS in Nigeria has a negative coefficient and is statistically significant at 5 percent level. A 100 percent increase in the number of the persons living with the disease in Nigeria will bring about 19 percent fall in the level of real gross domestic product. This implies that in the long run, the disease has the inclination to reduce the level of economic growth in Nigeria. Education expenditure, infant mortality and labour force are statistically significant, which agree with the findings of Dauda (2011). Specifically, the result could be explained by the fact that the Nigerian economy is labour-intensive in nature. The adjusted coefficient of determination showed that 97 percent of the total variations in real gdp was explained by the explanatory variables, implying that the regression line gives a good fit to the observed data while the remaining 3 percent of the total variation in level of real gdp in the country was not accounted for by the regression line and this could be attributed to the factors captured by the stochastic disturbance term or due to chance.

28 VI. SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

This work attempts to determine the impact of the scourge of HIV/AIDS on the economic performance Global Journal of Human Social Science Volume XII Issue I Version I

29 62

The Scourge of Hiv/Aids Pandemic and Economic Performance: The Case of Nigeria 1990 to 2010. Since the data size was less than 30, the study then employed the Engle Granger two-stage procedure, and having discovered that a long run relationship exists between the real gdp and the explanatory variables employed in the model, the OLS was performed on the two models used in the study. The result of the first model used, which used HIV prevalence was insignificant statistically, although the negative sign conformed to the theoretical expectation. The second model employed number of persons living

The conclusion drawn from this study is that with the increase in both prevalence and number of persons living with the disease in Nigeria, HIV/AIDS would have negative and significant impact on the growth of the Nigerian economy in the long-run, the oilrich nature of the country notwithstanding. This then implies that as the disease progresses in the country as more reliable data are readily available the impact on the economy would begin to be felt. Therefore, the Nigerian government must be sincere in putting in place better policies aimed at reducing and preventing the spread of the disease in the country. Specifically, more funds should be allocated to fighting the menace of the disease through intensive counseling and education on preventive measure, particularly abstinence, provision of antiviral drugs, strict monitoring to ensure the use of funds from donor partners on HIV/AIDS related activities, involving local and community people to reach out to those infected and also to educate the citizens on the dangers of unprotected sex as well as engaging religious groups and traditional rulers in educating their subjects.

30 10.

Long-Run Economic Costs of AIDS: Theory and Application to South Africa. World Bank Working Paper 3152. World Bank: Washington DC.

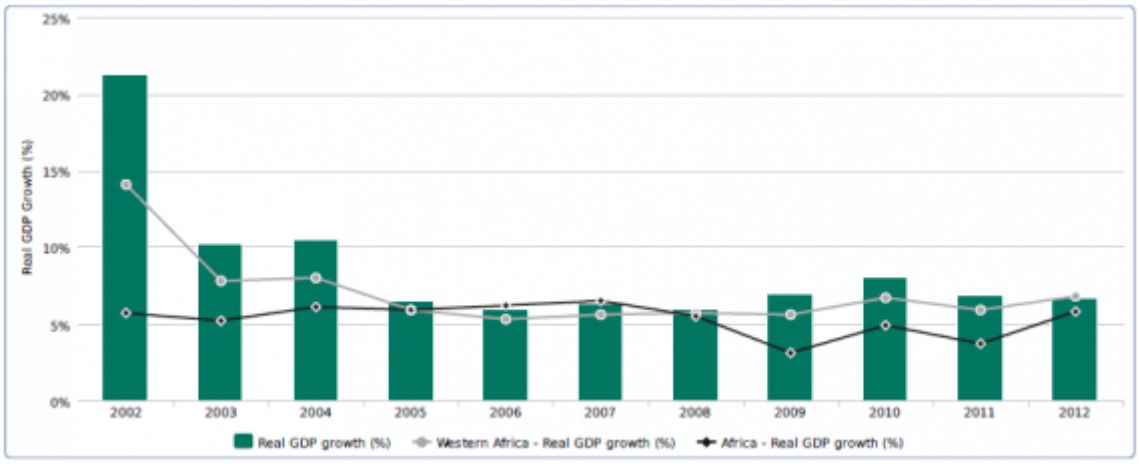
of Nigeria using time series data that cover the period with the disease in the country. The result of this model revealed that, HIV/AIDS has significant and negative impact on the growth of the economy of Nigeria in the long-run, with a 19 percent reduction in the level of gdp due to a 100 percent increase in the number of persons living with the disease. The adjusted coefficient of determination of the model was 97 percent, which showed a good fit.

31 Bell, C., Devarajan, S & Gersbach, H (2003). The

Figure 1:

[1]

[1] © 2012 Global Journals Inc. (US)



1

Figure 2: Figure 1 :

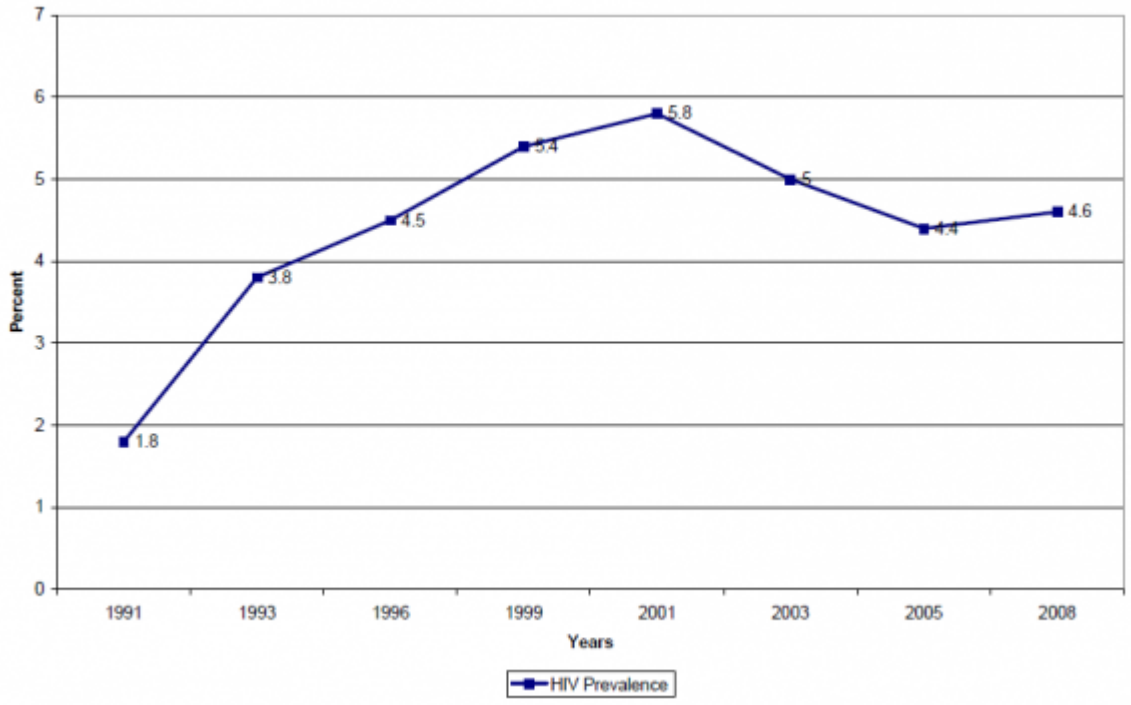
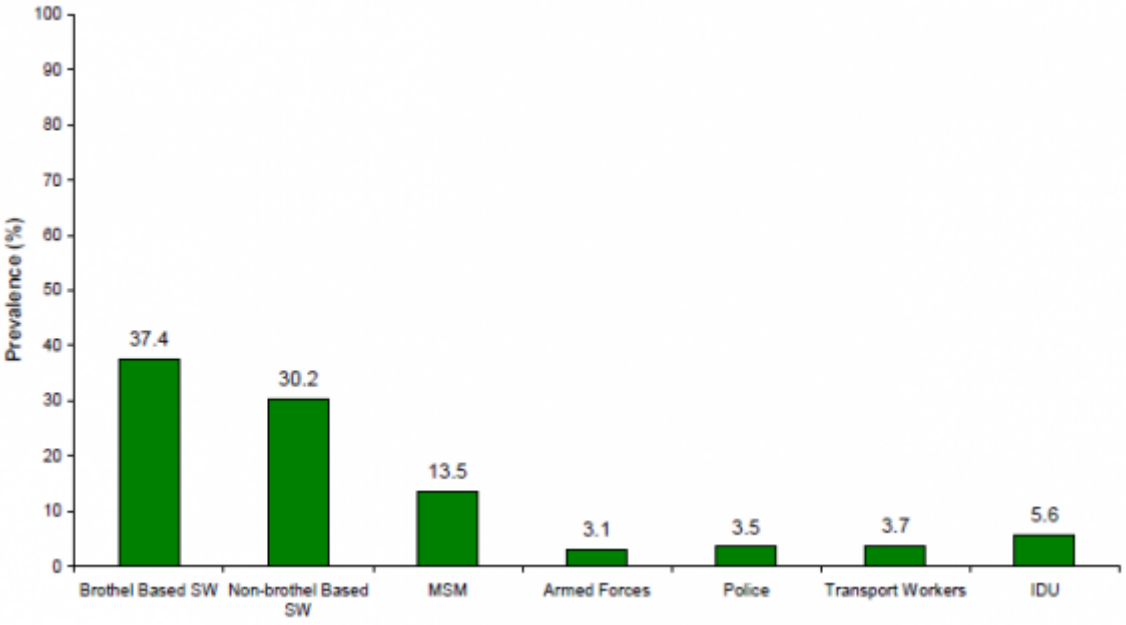


Figure 3:



1

Figure 4: Figure 1

1

Figure 5: Table 1 :

2

	Imports			Exports		
Year	Oil	Non-Oil	Total	Oil	Non-Oil	Total
1960	27.0	404.8	431.8	8.8	330.6	339.4
1965	47.9	502.2	550.1	136.2	400.6	536.8
1970						

Figure 6: Table 2 :

3

Year	Oil (N' Million)	Growth Rate (%) Oil	Non-Oil (N' Million)	Growth Rate (%) Non-Oil
1960	8.8		330.6	
1965	136.2	1447.727	400.6	21.17362
1970	509.6	274.1557	376.0	-6.14079
1975	4,563.1	795.4278	362.4	-3.61702
1980	13,632.3	198.7508	554.4	52.98013
1985	11,223.7	-17.6683	497.1	-10.3355
1990	106,626.5	850.012	3,259.6	555.7232
1995	927,565.3	769.92	23,096.1	608.5563
2000	1,920,900.4	107.0906	24,822.9	7.476587
2005	7,140,578.9	271.7308	105,955.9	326.8474
2009	8,543,261.2	19.64382	289,152.6	172.899

Figure 7: Table 3 :

4

Year/Component	Oil Exports (%)	Non oil Export (%)
2004	97.5	2.5
2005	98.3	1.7
2006	97.8	2.2
2007	97.9	2.1
2008	99.0	1.0
2009	95.8	4.2

Source : Sanusi (2010)

Figure 8: Table 4 :

6

Model One

Figure 9: Table 6 :

7

Variables	PP Statistic at Level	Critical Value (1%)	Critical Value (5%)	Critical Value (10%)	Probability Value	Order of Integration
RESID01	-3.337300	-3.857386	-3.040391	-2.660551	0.0283	I(0)

Figure 10: Table 7 :

8

Dependent Variable: LOG(RGDP)
Method: Least Squares
Date: 09/15/11 Time: 11:55
Sample (adjusted): 1990 2008
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.087512	15.27162	-0.005730	0.9955
LOG(EDUX)	-0.122192	0.059087	-2.068019	0.0609
LOG(GFC)	0.064302	0.054624	1.177188	0.2619
HIV	-0.058717	0.039186	-1.498441	0.1599
LOG(HLTX)	0.026617	0.021845	1.218416	0.2465
LOG(IMT)	-1.619687	0.659863	-2.454582	0.0303
LOG(LBF)	1.154319	0.791985	1.457500	0.1706
R-squared	0.985705	Mean dependent var		12.82309
Adjusted R-squared	0.978557	S.D. dependent var		0.332916
S.E. of regression	0.048750	Akaike info criterion		-2.926909
Sum squared resid	0.028519	Schwarz criterion		-2.578958

Figure 11: Table 8 :

9

	RGDP	EDUX	GFC	HIV	HLTX	IMT	LBF
Mean	391764.2	65788.42	549611.7	2357368.	49685.71	98.89474	64850122
Median	312183.5	31563.80	205553.0	2600000.	18181.80	103.0000	64304516
Maximum	672202.6	242731.0	1915349.	3200000.	348042.9	113.0000	81789142
Minimum	265379.1	2982.500	30626.80	590000.0	658.1000	80.00000	49853380
Std. Dev.	140732.1	70709.56	605676.3	704807.6	80990.52	12.23335	10067379
Skewness	0.814276	1.131685	0.995414	-1.170637	2.831210	-0.336064	0.134011
Kurtosis	2.106529	3.328774	2.528690	3.546063	10.91865	1.451588	1.788870
Jarque-Bera	2.731626	4.141160	3.313541	4.575637	75.02471	2.255724	1.218115
Probability	0.255173	0.126113	0.190754	0.101488	0.000000	0.323725	0.543863
Sum	7443520.	1249980.	10442622	44790000	944028.5	1879.000	1.23E+09
Sum Sq. Dev.	3.56E+11	9.00E+10	6.60E+12	8.94E+12	1.18E+11	2693.789	1.82E+15
Observations	19	19	19	19	19	19	19

Source : Author's computation

Figure 12: Table 9 :

10

Variables PP	Statistic at Level	Critical Value (1%)	Critical Value (5%)	Critical Value (10%)	Probability Value	Order of Integration
RESID01	-3.521984	-3.857386	-3.040391	-2.660551	0.0196	I(0)

Figure 13: Table 10 :

11

Dependent Variable: LOG(RGDP)
Method: Least Squares
Date: 09/15/11 Time: 11:11
Sample (adjusted): 1990 2008
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14.27890	14.77254	-0.966584	0.3528
LOG(EDUX)	-0.154022	0.062527	-2.463272	0.0299
LOG(GFC)	0.073274	0.056483	1.297275	0.2189
LOG(HIV)	-0.187486	0.087279	-2.148121	0.0528
LOG(HLTX)	0.034849	0.023080	1.509889	0.1569
IMT	-0.014354	0.006528	-2.198898	0.0482
LOG(LBF)	1.757888	0.860707	2.042377	0.0637

R-squared	0.983284	Mean dependent var	12.82309
Adjusted R-squared	0.974926	S.D. dependent var	0.332916
S.E. of regression	0.052716	Akaike info criterion	-2.770485
Sum squared resid	0.033348	Schwarz criterion	-2.422534
Log likelihood	33.31961	Hannan-Quinn criter.	-2.711598
F-statistic	117.6478	Durbin-Watson stat	1.710698
Prob(F-statistic)	0.000000		

Source : Author's computation

Figure 14: Table 11 :

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