Determinants of Households Consumption Expenditures; A Panel Data Analysis of 12 West Africa Countries

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Abstract: Household consumption expenditure consists of all the expenditures incurred by resident households on individual consumption of goods and services, including those sold at prices that are not economically significant. The poor consumption pattern and high poverty rate in developing countries, especially, West-Africa is a global concern. Hence, this study examined the determinants of Households Consumption Expenditures (HCE) in 15 West-Africa countries using fixed and random effects to compare the estimates. Data were obtained from the World Development Indicators (WDI) and FAO STAT and cover the period of 1995-2015. Results showed that Guinea Bissau have the highest mean consumption expenditure with Gabon the lowest, while Nigeria have the highest Gross Domestic Product (GDP) with Gambia the lowest. Estimates from the analysis indicated that the coefficients of total life expectancy and Gross national expenditure were significant at 1% ($p>0.001$) while the coefficient of health expenditure was significant at 5% ($p>0.05$) under fixed and random effects. The negative coefficients of Gross Domestic Product (GDP) showed that consumption power of individual households is not influenced or determined by the GDP of the country. The R^2 of 0.7071 signifies that 70.71% of the total variation in consumption expenditure was explained by the variables under consideration. It is therefore recommended that West African countries should create an enabling environment to the citizenry, so as to enhance more productiveness and engaging the idle hands, so as to increase the Gross Domestic Product (GDP).

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INTRODUCTION

The relationship between household consumption expenditure and economic growth has occupied a great deal of interest among policymakers and economists in macroeconomic research in recent times. Household Final Consumption Expenditure (HFCE) consists of the expenditure incurred by resident households on individual consumption of goods and services, including those sold at prices that are not economically significant. It also includes various kinds of imputed expenditure of which the imputed rent for services of owner-occupied housing (imputed rents) is generally the most important one. The households sector covers not only those living in traditional households but also those people living in communal establishments such as retirement homes, boarding houses and prisons. Household Consumption Expenditure (HCE) is measured at purchaser's prices which is the price the purchaser actually pays at the time of the purchase. It includes non-deductible value added tax and other taxes on products, transport and marketing costs and tips paid over and above/stated prices (Srinivasan, 2013).

Although, different researchers take differs on their views of Household Consumption Expenditures (HCE) based on their theoretical motivations. The Keynesian economists considered consumption expenditure as a dependable function of income and on the other side, there are substantial numbers of economists who believe that higher consumption can stimulate economic growth

(Nworji *et al.*, 2012). The simple Keynesian consumption theory was disapproved by economist like Friedman (2008), he opined in his own theory of growth that savings is the main motivation for economic growth. Output is the main concern of any macroeconomic policy and government needs some steering mechanisms for it, so as to bring out the prime relationship between consumption. According to Wagner's law which states that "there is a long-run tendency for public expenditure to grow relative to some national income aggregates such as the Gross Domestic Product (GDP), i.e., the causality of the link between public expenditure and national income runs from national income to public expenditure" (Kasidi and Mwakanemela, 2013).

On the other hand, to Keynes, public expenditure is an exogenous factor and a policy instrument for increasing national income. Thus, they believed that the causality of the relationship between public expenditure and national income runs from expenditure to income (Chimobi, 2009). No society can confidently be prosperous and happy, of which by far the greater part of the numbers are poor and miserable unable to afford a meal per day. The poverty status of a nation can be echoed by the expenditure capacity and what is spending on households' consumption expenditure (Adam Smith, 1776). Poverty and malnutrition is a great problem in West Africa countries where the standard of living is extremely low with poor Gross Domestic Product (GDP) and gross domestic saving (UNDP., 2008). These extreme poverty conditions have made West African countries a cynosure of humanitarian concern for international aid agencies and bodies. Despite the fact that Nigeria economy is the biggest in the zone, even almost bigger than the whole of West Africa countries together, households' consumption expenditure in Nigeria is still very poor (Sami, 2003). Larger percentages of the population are still living below one dollar per day. The few that can afford two-square meal per day are taking unbalanced diets (lacking the essential elements) (FAO., 2007). These statistics depict the odds of poor values on households' consumption expenditure in the zone in general. Migration from other countries to Nigeria justifies the poor standard of living in the region and ultimately low values on households' consumption expenditure.

The determinants of household's consumption expenditure and economic growth need to be study, so as to know the drivers of the growth in the country. There are two points of views when considering the relationship between household's consumption expenditures and economic growth (Nworji *et al.*, 2012). Some agreed that the consumption is a function of household income while, others affirmed that the consumption accelerate the Gross Domestic Product (GDP). So, there is a need to know what determines household consumption expenditures among West Africa countries. The study will also buttress

the basis by Prasanna and Gopakumar (2013) that should someone who is well endowed with some wealth attributes to be poor if s/he is unable to attain the minimum requirements for one basic need like feeding? Likewise, the Nigeria Bureau of statistic maintained the need to investigate household consumption expenditure patterns effects by stating that "expenditure shares actually show the direction of the country's expenditure profile and other areas that requires interventions in the case of low bulk spending (Kolapo *et al.*, 2012). In order to achieve the objectives of the study, the following sub-sections, namely, introduction, review of literature, methodology, results and discussion, conclusion and policy recommendation are deemed.

Literature reviews: Households consumption expenditures are greatly affected by the inflation rate. This makes inflation a great concern to government and policy makers. There is the need to keep the inflation rate checked by overseers of monetary policy, so as to ensure it doesn't oscillate across economic activities. Some literatures on household consumption expenditure and economic growth across the world are discussed in the section.

Wagner's law was used in examining the long-run relationship between public expenditure and GDP for the Turkish case over the period of 1965-2000 by Bagdigen and Cetintas (2003), they stated that "the relationship is expected to have public expenditure as an outcome, not cause, of growth in GDP". The result of co-integration test and the Granger Causality test showed that there was no causality in both directions implying that neither Wagner's law nor Keynes' hypothesis was valid for the Turkish case. Bose *et al.* (2007) examined the growth effect of government expenditure on a disaggregated panel of 30 developing countries. The findings were that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth. However, it was found also that current expenditure was insignificant. Also, Bick (2010) examined the relation between inflation and economic growth and found that the omitted variable bias of standard panel threshold models can be statistically and economically significant. Also, in a research to studied a sample of 15 European union member states.

Jha and Dang (2011), found a significant evidence suggesting that when the rate of inflation exceeds 10%, inflation variability has a negative effect on economic growth in developing countries when examining the effects of inflation variability and economic growth using annual data on developed and developing nations, However, there was no significant sign suggesting that inflation negatively impacted on economic growth in developed countries. Martins and Veiga (2014), studied the effect of public expenditure on economic growth in

Nigeria for the period 1970-2009, they used an OLS multiple regression model specified on perceived causal relationship between government expenditure and economic growth. The results revealed that capital and recurrent expenditure on economic services had insignificant negative effect on economic growth. Gangal and Gupta (2013) studied whether or not there is a unidirectional relationship between public expenditure and economic growth in India using the Granger Causality test. They found out that there was a linear stationarity in both the variables, indicative of a long-run equilibrium and there is a positive impact of public expenditure on economic growth. They further confirmed the presence of a unidirectional relationship running from total public expenditure to GDP and vice versa. Co-integration and error correction model was used to examined the causal relationship between public expenditure and economic growth in India, Sakib-Bin-Amin (2012) found that there was a presence of a long-run equilibrium relationship between public expenditure and economic growth while the Error Correction Model (ECM) results indicated a one-way causality that ran from economic growth to public expenditure in both the short- and long-run, this is in support of Wagner's law of public expenditure. Still in India, co-integration and Error Correction Models (ECM) was used to examine the nexus between inflation and economic growth, making use of annual data (NBS., 2014) concluded that there was a long-run negative relationship between inflation and GDP growth rate. In a study of data from 100 countries to assess the effect of inflation on economic performance (Barro, 2013) found out that average increases in inflation by 10% points per year reduced the growth rate of real per capita GDP and the ratio of investment to GDP. Statistically significant results were however, only observed when high-inflation experiences were included in the sample.

Wikimedia (2017) examined the effect of government expenditure on economic growth using panel data in Sub-Saharan Africa countries. He found that government expenditure, trade, private investment all have positive effects on economic growth. All these reviews showed that household's final consumption expenditure is an integral part of economic growth and development which cannot be taking with levity. Kasidi and Mwakanemela (2013) used co-integration techniques to examine the impact of inflation on economic growth in Tanzania for the periods of 1990-2011. The results indicated that inflation has a negative impact on economic growth and there was no co-integration between inflation and economic growth during the period of study. The study also revealed that there was no long-run relation between inflation and economic growth in Tanzania. Chude and Chude (2013) accessed the effects of public expenditure in education on economic growth in Nigeria using the Error Correction Model (ECM) and applying time series econometrics techniques. The long- and short-run effects of public expenditure on economic growth was examined and found out that the total expenditure on education is highly and statistically significant and has a positive long-run effect on economic growth in Nigeria. Also, Gangal and Gupta (2013) examined the long and short-run relationship between public expenditure and economic growth. They used the bounds testing (ARDL) approach on annual time series data covering the period of 1970-2010. The result showed that the variables of interest in the framework were bound together in the long-run and the associated equilibrium correction was significant which implies an existence of a long-run relationship and the impact of total public expenditure on economic growth is negative. Alshahrani and Alsadiq (2014) use dannual data over the period of 1969 to 2010 to estimate the short- and long-run effects of different types of government expenditures on economic growth in Saudi Arabia making use of the vector auto regression, co-integration and vector error correction model. They found out that while public investments, private domestic and healthcare expenditure stimulates growth in the long-run, trade openness and spending in the housing sector can also boost short-run production. Martins and Veiga (2014) studied the effects of government size and composition of public expenditure on economic growth, they found out that government size as a percentage of GDP has a quadratic effect on the growth rate of the human development Index in developed and high-income countries of the world.

Judging from the above literatures, there is need to know the determinants of household's consumption expenditures among the West Africa countries going by the high level of poverty that is ravaging the region. Hence, this study will examine the determinants of household's final consumption expenditures in 15 selected West Africa countries using panel data from 2000-2015.

MATERIALS AND METHODS

Data source: Data for this study were obtained from database of the world bank group of world development indicators. The data consist of 16countries from West Africa countries. The data were pooled together to extract the information for this study. The collection was 2000 to 2015, spanned through 16 years. The world development indictors data is a data base that contains all the indices of development across the globe.

Model specification: The panel data analysis used in this study take into account the transversal information and the time period of 16 years, in order to determine whether the variable of interest has an effect on Household's final Consumption Expenditure (HCE). This methodology has

the advantage of being able to take into account the individual characteristics of each country. The basic model of the determinants of HCE which is our dependent variable is the following:

$$HCE_{it} = \beta_0 + \beta_1 GDP + \beta_2 POP + \beta_3 TLE + \beta_4 GNE + \beta_5 HEX + U_{it}$$

(1)

Where:
GDP : Gross Domestic Product (USD)
POP : Population
TLE : Total Life Expectancy (Male and Female)
GNE : Gross National Expenditures
HEX : Health Expenditure
U_{it} : Term of random disturbance

This model has a balanced panel data, in that it enables the observation of all the individual units in all the periods of time ($T_i = T$ for all i) and it is considered short. The error term is undertaken as independent. The individual effects are incorporated into the general model in order to capture the characteristics of each country, this is in line with Gujarati and Porter (2009), Kolapo *et al.* (2012) and Jonathan *et al.* (2012) which are assumed as fixed on the time:

$$HCE_{it} = \beta_{0i} + \beta_1 GDP_{it} + \beta_2 POP_{it} + \beta_3 TLE_{it} + \beta_4 GNE_{it} + \beta_5 HEX_{it} + U_{it}$$

(2)

where, β are the parameters or individual specific effects, t = 1, 2, 3, …, 5 is the time period, i = 1, 2, …, 6 is the cross-sectionalunits and ε is the error term. This study chooses the fixed effects within-group model as observed by Gujarati and Porter (2009).

Fixed effects estimators are consistent where a long panel is involved and are preferred to random effects estimators; if the individual error components and one or more regressors are correlated, then therandom effects estimators are biased whereas those obtained from fixed effects model are unbiased; even if it is assumed that the underlying model is pooled or random, the fixed effects estimators are always consistent.

RESULTS AND DISCUSSION

Descriptive statistics: Table 1 shows the descriptive statistics of the variables used for the study. There are distinct variations among the variables and high degree of heterogeneity. Also, Nigeria is the country with highest mean Gross Domestic Product (GDP) of 231982.7 and Gambia with the lowest mean GDP of 791.2376, while the Guinea Bissau have the highest consumption expenditure of 102.9817 with Gabon the lowest of 48.002619. The standard deviation summary shows that Gambia and Nigeria have the lowest (138.10422) and

highest (178069.07), respectively for the GDP while Chad (16.268056) has the highest and Senegal (1.7890199) the lowest for consumption expenditure, respectively. The high values of the standard deviation shows that the data are well-spread out and estimates obtained from the statistics can be rely upon to make prediction.

Table 2 shows the result of regression analysis when OLS, random and fixed effects model were used to determine the determinants of consumption expenditures (HCE). From the analysis of the results, the coefficients of total life expectancy and gross national expenditure were significant at 1% (p>0.001) in OLS, fixed and random effects, respectively, indicating that the consumption expenditure of a country determine her life expectancies, (both male and female) and the country national expenditure. The coefficient of health expenditure was not significant under OLS but was significant at 5% (p>0.05) under fixed and random effects. The negative coefficients of Gross Domestic Product (GDP) showed that consumption power of individual households is not influenced or determined by the gross domestic product of the country because there are some individuals that have high and healthy consumption powerbut contribute little or less to the Gross domestic product. Also, the coefficients of population were negative, indicating that the household consumption expenditure does not correlate with country population of the West African countries. This is in accordance with AFDB (2012) where they found that the Purchasing Power Parity (PPP) of the country will only increase with increasing population as more people will be in the market, influencing the price and purchasing power of the individual households but this may not reflect on the household consumption power. This is to be noted that the Purchasing Power Parity (PPPs) measure the levels of real GDP and its components and they are not relevant for changes in GDP and related aggregates for individual countries over time. These results are reasonable and concur with those by Kolapo *et al.* (2012) who argued that the rich countries spend less on consumption expenditure and the rich suffer much from inflation but less on food inflation when compared to poor households. The R^2 of 0.7072 in the three regression models signifies that 70.72% of the total variation in consumption expenditure was explained by the variables under consideration. While, Prob (F) = 0.0136<0.05 implies that on the whole, the model is fit and all the coefficients are significantly different from zero. The result of Hausman test indicated that from our hypothesis, b = consistent under H_0 and H_a, B = inconsistent under, efficient H_0 b = consistent under H_0 and H_a; obtained from xtreg. B = inconsistent under Ha, efficient under H_0; obtained from xtreg. H_0: difference in coefficients not systematic. Prob>chi2 = 0.00 (we use fixed effect, since, Prob<0.05).

Table 1: The descriptive statistics of the variables used for the study

	Consumption expenditures		Gross domestic product	
Countries measures	Mean	SD	Mean	SD
Benin	5220.5095	2522.3313	88.278955	2.0939487
Burkina Faso	6301.0187	3620.8025	89.50447	5.7882042
Cameroon	17858.195	7954.9465	83.79418	3.3899401
Chad	6292.3162	4192.2714	84.961115	**16.268056***
Cote d'Ivoire	19277.66	7713.2096	79.382621	2.2695599
Gabon	10104.183	4624.8888	**48.002619***	5.5845566
Gambia	**791.23767***	**138.10422***	96.2259	4.5864469
Ghana	22031.369	12810.908	91.020714	4.8671962
Guinea	5868.2878	1568.8248	91.549426	11.903583
Guinea Bissau	678.15902	256.60866	**102.98197***	4.9288247
Mali	7378.5689	4132.1859	88.558772	3.3656851
Niger	4046.081	2255.1897	91.274394	6.2609362
Nigeria	**231982.7***	**178069.07***	80.439539	8.1273715
Senegal	9303.3097	4124.5262	92.278372	**1.7890199***
Togo	2484.9785	1097.6864	97.986921	4.2424272

Authors computation, 2018; all the variables are measured in \$US

Table 2: Result of the regression analysis

Variables	OLS	Fixed effect	Random effect
GDP	-0.0000	0.0000	-6.14e-06
	(0.0001	(0.0002)	(9.40e-06)
POP	3.91e-08	-1.65e-07	-1.57e-08
	(2.66e-08)	(1.80e-07)	(4.81e-08)
TLE	-0.5670***	-0.7410***	-0.7997***
	(0.0992)	(0.1433)	(0.1041)
GNE	0.8135***	0.5387***	0.5693***
	(0.32981)	(0.3577)	(0.3517)
HEX	0.4731	1.1501**	1.0119**
	(0.3844)	(0.3921)	(0.3835)
N	300	300	300
No. of groups	20	20	20
R^2	0.7446	0.5743	0.7072

Authors computation, 2018; Sig. *** p<0.01, ** p<0.05, * p<0.1; values in parenthesis are standard error

Sensitivity tests:
b : Consistent under H_0 and H_a
B : Inconsistent under H_a, efficient H_0
b : Consistent under H_a and H_0; obtained from xtreg
B : Inconsistent under Ha, efficient under; obtained from xtreg

- Test: H_0 difference in coefficients not systematic
- Chi2(0) = (b-B)'[(V_b-V_B)^(-1)](b-B)
- Prob>chi2 = 0.00 (we use fixed effect since Prob<0.05)
- (V_b-V_B is not positive definite)

The null hypothesis in the LM test is that variances across entities are zero. This isno significant difference across units (i.e., no panel effect) (Table 3 and 4).

- Test: Var(u) = 0
- Chibar (01) = 686.52
- Prob>chibar2 = 0.000 if this value (0.000<0.05, use fixed effect and otherwise. There is no significant difference across the state, hence, we can use OLS regression model)

Table 3: Hausman fixed-random

	(b)	(B)	(b-B)	
Variables	Fixed effect	Random effect	Difference	SE
GDP	-6.14e-06	-6.14e-06	0	0
POP	-1.57e-08	-1.57e-08	0	0
TLE	-0.7972013	-0.7972013	0	0
GNS	0.5693436	0.5693436	0	0
HEX	1.011911	1.011911	0	0

Table 4: Breusch and pagan lagrangian multiplier test for random effects

	Var	Sd = Sqrt (Var)
Consumpt-Ex	192.2251	13.86453
E	19.5987	4.427041
U	23.37929	4.835214

CONCLUSION

Expenditure patterns differ between richer and poorer countries. In the richer countries, expenditure shares are higher for luxury goods and services such as motor vehicles and recreation services and lower fornecessities such as bread and cereals. Real expenditure shares based on the Purchasing Power Parities (PPPs) can be used to estimate income elasticities for particular goods and services. Households Consumption Expenditure (HCE) is an important variable that its roles in household's living standard cannot be over-emphasized. It determines the consumption strength of the country. In West Africa, Household Consumption Expenditures (HCE) is very low, due to poor Gross Domestic Product (GDP),Gross saving too is very poor. In disapproving to Keynes economists, Friedman opined that "Saving is the main motivation for economic growth". The variables used in determining the Household Consumption Expenditures (HCE) in this study are all significant in the analysis. It showed how importance they are in determining the consumption strength of a country. Among all the variables used, net gross saving was not significant in all the models, indicating the poor saving ability in the study area. For this study, population, total life expectancy, Gross

National Expenditure (GNE), gross health expenditure and gross domestic products are all the determinants of household consumption expenditure in West Africa sub-region. Increasing in the household consumption expenditures will definitely reflect on the GDP of the countries in West Africa zone. Also, an increase in household consumption expenditure will lead to increase in the gross national expenditure which is the sum of public and private expenditure excluding imported goods.

RECOMMENDATIONS

As a policy recommendation, it's advocated that west African countries should brace-up on the creating an enabling environment for her citizens, so as to increase the number of hours spend on productive activities, contributing more to the GDP and less to consumption expenditure. Also, saving prowess of the West Africa countries need to be increase, so as to increase the volume of reserve in their Gross Domestic Saving. The amount in hand (personal or disposable) income will go a long way in influencing the taste and consumption pattern of the individual. The quality of food consumed depends mainly on the consumption power which is the amount they will spend on household's consumption expenditure (disposable income).

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