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Macroeconomic determinants of Household Consumption in selected West African Countries [1]

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Abstract

This study investigates the macroeconomic determinants of household consumption in selected West African countries. The study employed the panel augmented mean group procedure which accounts for heterogeneity and cross sectional dependence in the modelling exercise for the period 1989 to 2018. Empirical results reveal that "gross domestic product per capita" and "domestic credit to the private sector" significantly improve household consumption in the selected West African countries as a whole. However, country-specific results show differences in terms of the magnitude of the coefficients, the significance and even the signs of the regressors. Policy recommendations based on these findings are discussed.

Keywords: Household consumption; West Africa

JEL Classification: E21; O10

1. Introduction

This study intends to model the determinants of household consumption in selected West African countries. This is premised on the important role consumption play in an economy and also the essential role it plays on the well-being of individuals. In economic literature, it is acknowledged that household consumption drive economic activities as it contributes substantially to aggregate demand, which ultimately transmit to economic growth and unemployment reduction with possible spillover benefits to the reduction in poverty.

Household consumption has contributed primarily to Gross Domestic Product (GDP) in virtually every economy across the world and also in West Africa. In Nigeria for instance, household consumption has contributed 59% to GDP on the average between 1990 and 2017 based on data from the World Development Indicators, WDI (2019). In Senegal, household consumption contributed 78% to GDP over the same period. In other West African countries like Burkina Faso, Mali and Togo, household consumption has contributed 67.3%, 76.4% and 79.3% to GDP respectively. This reveal the significant contribution consumption play in these West African economies. As revealed by Signe (2018), Africa is one of fastest growing consumer market in the world, with household consumption increasing faster than GDP in recent years. Signe added that consumer expenditure in Africa has grown at an annual compound rate of 3.9% since 2010 reaching $1.4 trillion in 2015 and expected to reach $2.1 trillion by 2025. The growth rate of other key economic indicators such as GDP and investment has been distinct across West African countries but remain positive. For example, in Nigeria, the growth rate of GDP averaged 4.72% between 1990 and 2017. In Senegal, within the same period, GDP grew at an average of 3.81%. GDP grew at an average of 5.42%, 4.52% and 3.36% respectively in Burkina Faso, Mali and Togo. Investment as measured by the gross fixed capital formation grew in Nigeria by 4.72% on the average between 1990 and 2017. In Senegal, it grew by 5.59% on the average, within the same period. Investment in Burkina Faso grew at an average of 5.42%, while in Mali and Togo, investment grew at an average of 6.08% and 6.06% respectively. In general, there have been improvements in economic growth and investment across various countries in West Africa.

According to Lie et al. (2018), boosting household consumption is an effective way of retaining economic growth. Keho (2019) note that household consumption has a key role to play in the determination of welfare and the dynamic effect of economic shocks. It is also pointed out by Keho (2019) that understanding the drivers of household consumption provide important information which can guide policies on poverty reduction and economic growth.

Theoretically, Keynes (1936) laid the foundation of modern theories of consumption. According to Keynes, income level determines an individual's consumption as well as that of the society. However, Duesenberry (1948) challenged the key assumption of the Keynesian theory of consumption which assumed independence of the consumption of individuals. Duesenberry (1948) in the Relative Income Hypothesis point out that consumption patterns are interdependent among individuals. The theory states that an individual's satisfaction from a given level of consumption is a function of its relative magnitude in the society. The theory according to Palley (2008) was however displaced by Modigliani and Brumberg (1954) Life Cycle Hypothesis (LCH) as well as Friedman (1957) Permanent Income Hypothesis (PIH). Both of these theories proved the insignificance of social interdependence in consumption. The LCH argued that a given consumption level is maintained throughout an individual's lifetime by taking on debt or liquidating assets early and late in life which is a period when income levels are low, and saving in period of prime earning years when income is high. On the other hand, the PIH stressed that consumption is influenced by long term expected income rather than the current level of income (Arapova, 2018).

According to Ezeji and Ajudua (2015), economists in the neoclassical circle consider consumption to be a final product of economic activities. This means that the level of consumption in an economy is a central measure of productivity success in that economy. Chai (2018) also acknowledges that consumption has key implications to the growth of industries. Given the important role consumption plays in the economy, understanding the factors that influences household consumption becomes imperative. The study employs the panel data procedure of Eberhardt and Teal (2010) known as the Augmented Mean Group (AMG) for 5 West African countries based on data availability constraint from 1989 to 2018. The AMG estimation procedure has the advantage of accounting for cross sectional dependence and heterogeneity and as such, the estimation technique is able to produce country specific estimates in a panel data environment. The remainder of this study includes the data, model specification and methodology section, presentation and analysis of results as well as conclusion with relevant policy recommendations.

2. Data, Model Specification and Methodology

2.1 Data and Model Specification

This study focuses on the West African sub region. Due to data availability constraint, the study relies on five West African countries. The data were sourced from the World

Development Indicators, WDI (2019). The selection of WDI data is due to the comprehensiveness of the data set and comprises of different economic indicators. The dependent variable to be utilised in the study is household and Non Profit Institutions Serving Households (NPISHs) final consumption expenditure per capita in constant US$ which proxy household consumption. The regressors utilised in the model includes Inflation (%), Gross Domestic Product (GDP) per capita in constant US$, Personal Remittances received in current US$, the Official exchange rate of the countries individual currencies to the US$ and Domestic Credit to the Private Sector (% of GDP). Studies by Keho (2019), Ramcharran (2019), Muzindutsi and Mjero (2018), Corsett et al. (2018), Mondal and Khanam (2018), Mwangi and Atieno (2018), Bonsu and Muzindutsi (2017), D'Acuto, Hoang and Weber (2015), Bouyon (2015), Ezeji and Ajudua (2015), Mian et al. (2013), Taylor (2013), Heim (2010), Benigno and Thoenissen (2008), Choi and Devereux (2006) have adopted some of these variables in their study. The data set for the study span the period 1989 to 2018 and includes the following countries: Burkina Faso, Mali, Nigeria, Senegal and Togo.

The study presents an econometric model where;

$$HCE_{it} = \gamma_1 INF_{it} + \gamma_2 GDP_{it} + \gamma_3 REM_{it} + \gamma_4 EXR_{it} + \gamma_5 DC_{it} + \mu_{it} \quad (1)$$

$$\mu_{it} = \tau_{1i} + \varphi_i f_t + v_{it} \quad (2)$$

γ_1, γ_2, γ_3, γ_4, γ_5 represents country specific slope parameters. μ_{it} encompasses the unobservables and the error terms v_{it}. These unobservables are made up of group fixed effects τ_{1i} which captures the time invariant heterogeneity across groups and the unobserved common factors f_t with heterogeneous factor loadings φ_i which accounts for time invariant heterogeneity and cross sectional dependence.HCE is Household and NPISHs final consumption expenditure, INF is Inflation rate (%), GDP is GDP per capita, REM is Personal remittances, EXR is the official exchange rate and DC is domestic credit.i is the cross sectional index and t represents the time index. For ease of interpretation, household consumption, GDP per capita, personal remittances and exchange rate are converted to their natural logarithm.

2.2 Methodology

The study employs the Augmented Mean Group (AMG) estimation procedure proposed by Eberhadt and Teal (2010) which is a cointegrating estimator that takes into consideration country specific heterogeneity and cross sectional dependence (Bayar, 2016; Nathaniel and

Iheonu, 2019). The AMG also has the advantage of producing country specific results in the modelling exercise which helps in providing robust policy options which may be heterogeneous across countries. The AMG procedure includes a Common Dynamic Process (CDP) which eliminates the effect of cross sectional dependence in the modelling exercise. According to Oikarinen et al. (2018), the aim of incorporating the CDP is to remove cross sectional correlation from the model via the identification of common trends caused by unobservable factors.

Prior to estimating our econometric model, the study firstly ascertains the presence of cross sectional dependence. The study as well examines the stationarity properties of the data and examines whether a long run relationship exist among the variables. According to Iheonu (2019), Iheonu et al. (2019), cross sectional dependence denotes the interrelationship among the error terms of each cross section. Ignoring cross sectional dependence can result to estimator inefficiency and invalid test statistics. The general null hypothesis of the test can be given as:

$$H_0: \varepsilon_{ij} = corr(\varepsilon_{it}, \varepsilon_{jt}) = 0 \quad \forall\, i \neq j \tag{3}$$

The study applies three cross sectional dependence test procedure. They include the Breusch-Pagan (1980) Langragian Multiplier (LM) test, the Pesaran (2004) Scaled LM test, and the Bias-corrected LM test proposed by Baltagi, Feng and Kao (2012). According to De Hoyos and Sarafidis (2006), when the number of time period is larger than the number of cross section, the LM test statistic is desirable because it does not exhibit any substantial size distortion. However, more emphasis will be placed on the Breusch-Pagan LM test because the asymptotic χ^2 distribution is derived for fixed cross section (N) at $T_{ij} \to \infty\ \forall\ (i,j)$, and follows from the assumption of normality on the error. Both the Pesaran Scaled LM test and the Bias-corrected scaled LM test are more appropriate for a larger number of cross sections.

In understanding the stationarity properties of the variables in our econometric model, we employ the Pesaran (2007) Cross-sectional Im, Pesaran and Shin (CIPS) unit root test which accounts for cross sectional dependence. The study evaluates the long run relationship among the variables utilising the Pedroni (2004) and the Kao (1999) cointegration tests. According the Osabuohien, Efobi and Gitau (2014), the Pedroni cointegration test employs specific parameters which are allowed to vary across the samples in order to take the issue of heterogeneity into consideration in the model. According to Agbugba, Iheonu and Onyeaka (2018), Iheonu, Ihedimma and Omenihu (2017) and Adusah-Poku (2016), both the Pedroni

and Kao cointegration test are constructed on residuals resulting from the estimation of a static long run regression. The Pedroni test is based on seven test which includes the panel v-statistic, panel rho-statistic, panel PP-statistic, panel ADF-statistic, the group rho statistic, group PP-statistic and group ADF-statistic.

3. Presentation and Analysis of Results

This section begins by evaluating the results of the cross sectional dependence test. Table 3.1 presents the result of three cross-sectional dependence test. They include the Breusch-Pagan Lagrange Multiplier (LM) test, the Pesaran scaled LM test and the Bias-corrected LM test.

Table 3.1: Cross sectional dependence tests.

Test	**Statistic**	**Probability**
Breusch-Pagan LM	54.2855	0.0000
Pesaran scaled LM	9.9025	0.0000
Bias-corrected scaled LM	9.8163	0.0000

Source: Author's computation.

Note: Null Hypothesis: No cross-section dependence in residuals.

Table 3.2: CIPS Unit Root Test

Variables	Intercept		Intercept with Trend	
	Levels	First Difference	Levels	First Difference
HCE	-2.354**	-5.220*	-2.135	-5.208*
INF	-5.157*	-6.190*	-5.294*	-6.420*
GDP	-2.043	-5.259*	-2.280	-5.272*
REM	-1.709	-4.109*	-1.941	-4.412*
EXR	-1.840	-5.160*	-2.642	-5.095*
DC	-2.091	-5.272*	-2.556	-5.238*

Source: Author's computation.

Note: CIPS Dynamics: lags criterion decision Portmanteau (Q) test. * and ** represents statistical significance at 1 and 5% respectively.

The results from the three tests show that the null hypothesis of no cross sectional dependence is rejected at conventional levels of statistical significance. This concludes that the errors across the countries in the model are correlated with each other. In the presence of cross sectional dependence, the second generation unit root test of Pesaran (2007) is employed.

Table 3.2 present the result of the CIPS unit root test in both intercept as well as intercept with trend specification. The result reveals stationarity for all the variables in their first difference, and thus making it econometrically intuitive to conduct a cointegration test for the variables in the model.

The results in table 3.3 provide evidence of cointegration among the variables in the model. The result shows that in the panel within-dimension, both the statistics and weighted statistics values of the PP and ADF statistic are significant at 1 percent.

Table 3.3: Pedroni and Kao Cointegration Test

Pedroni			
Statistics	Within-dimension (panel)		Between-dimension (group)
	Statistics	Weighted statistics	Statistics
V-statistic	0.5736	1.0485	
Rho-statistic	1.4668	0.9558	1.7853
PP-statistic	-3.4433*	-3.5572*	-5.0018*
ADF-statistic	-2.6086*	-3.0961*	-3.3792*
Kao			
ADF t-Statistic			Probability
-4.1230*			0.0000

Source: Author's computation.

Note: * represents statistical significance at 1%.

The group between dimension results also shows that the PP and ADF statistic value are as well significant at 1 percent. The result shows that a greater number of the statistic value is

significant which thus reflects the presence of cointegration among the variables in the model. The result is complemented by the Kao cointegration test result as revealed also in table 3.3. The Kao test result denotes the presence of cointegration among the variables in the model at 1 percent level of statistical significance. These cointegrating results mean that we can estimate a long run relationship among the variables in the model.

Table 3.4: Augmented Mean Group Result

Variables	Full Panel	Burkina Faso	Mali	Nigeria	Senegal	Togo
INF	-0.0007	-0.0045*	0.0027	-0.0001	0.0003	-0.0016
	(0.596)	(0.003)	(0.277)	(0.927)	(0.671)	(0.266)
GDP	1.0726*	1.7510*	0.1522	1.5626*	0.3844*	1.5124*
	(0.001)	(0.000)	(0.505)	(0.000)	(0.007)	(0.000)
REM	0.0305	-0.0365***	0.0667	0.0078	0.1031*	0.0115
	(0.212)	(0.066)	(0.228)	(0.655)	(0.000)	(0.712)
EXR	0.0352	0.0057	-0.0667	0.0319	0.0262	0.1743***
	(0.360)	(0.866)	(0.504)	(0.504)	(0.553)	(0.078)
DC	0.0049*	0.0039	0.0089***	0.0036	0.0014	0.0069**
	(0.000)	(0.130)	(0.054)	(0.491)	(0.437)	(0.024)
CDP	0.9667***	0.3950**	-0.1981	2.5216*	0.0064	2.1088*
	(0.086)	(0.041)	(0.368)	(0.000)	(0.956)	(0.000)
Constant	14.6874*	11.8901*	19.9975*	13.2955*	17.7497*	10.5142*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Source: Author's computation.

Note: Dependent variable: HCE. *,** and *** represents statistical significance at 1,5 and 10% respectively. Trend included as additional regressors. CDP denotes Common Dynamic Process.

As acknowledged in the methodology section, the study employs the AMG estimation procedure which accounts for cross sectional dependence and heterogeneity in the modelling exercise. Empirical results from table 3.4 reveal that for the panel of countries inflation has a negative impact on household consumption. A percentage point increase in inflation leads to a 0.0007 percentage point decline in household consumption. This provides a plausible

conclusion that higher price level reduces the consumption of the household. However, this impact is not significant for the panel of countries under observation. The results also show that GDP per capita positively and significantly increases household consumption by 1.0726 percent while domestic credit to the private sector have a positive and significant impact on household consumption by 0.0049 percentage point. Further result shows that remittances and exchange rate positively but insignificantly influences household consumption in the panel of West African countries.

Country specific result shows that in Burkina Faso, inflation significantly reduces household consumption while no significant relationship exists for the other countries. Across the countries, GDP per capita positively and significantly influences household consumption apart from Mali where GDP per capita do not influence household consumption significantly. While personal remittances reduce household consumption significantly in Burkina Faso, there is a positive and significant influence of personal remittances on household consumption in Senegal. In Togo, currency depreciation significantly improves household consumption by 0.1743 percent while domestic credit to the private sector increases household consumption in Mali and Togo by 0.0089 and 0.0069 percentage points respectively. It isalso be observed that even when Burkina Faso, Mali, Senegal and Togo have identical exchange rate, there is substantial disparity on its effect on household consumption.

Result from the CDP show that the unobserved common factors exert a differential impact on household consumption across the countries as can be revealed from their coefficient values. While the impact of the unobserved common factors is significant for Burkina Faso, Nigeria and Togo, these factors were not significant for Mali and Senegal. Furthermore, these unobservable common factors positively influence household consumption in all the countries under observation apart from Mali. In conclusion, observations show that similar factors influences household consumption in the selected West African countries but at different magnitude.

The panel AMG result is complemented with the result of the panel Dynamic Ordinary Least Square (DOLS) proposed by Kao and Chiang (2001). The panel DOLS is a cointegrating estimator which accounts for serial correlation and endogeneity in the modelling exercise. Empirical result from the technique as shown in table 3.5 reveal similar result to that of the AMG in terms of the signs of the coefficients, thus providing empirical support to the

conclusions of the AMG. GDP and Domestic Credit is also observed to be statistically significant as it is with the AMG.

Table 3.5: Panel Dynamic Ordinary Least Squares

Variables	Coefficients	Probability
INF	-0.0082*	0.0015
GDP	0.5241*	0.0078
REM	0.0371***	0.0988
EXR	0.2965*	0.0000
DC	0.0157*	0.0001

Source: Author's computation.

Note: * and *** denotes statistical significance at 1 and 10% respectively. Leads and Lags=1.

4. Conclusion

This study has empirically examined the determinants of household consumption in selected West Africa employing the AMG estimation procedure for the period 1989 to 2018. The study analysed the stationary properties of the variables in the model as well as the cointegrating properties in order to justify the utilisation of a long run cointegrating estimator. Empirical results from the analysis has shown that inflation negatively influences household consumption in West Africa while GDP per capita, personal remittances, exchange rate and domestic credit to the private sector positively influences household consumption in West Africa. Country specific result also showed disparity of results among the countries under observation in terms of the signs of the coefficients, the magnitude of the coefficient and the significance of the variables. This study therefore recommends general to country specific policies in order to improve household consumption in West Africa. A general policy option for the selected West African countries is providing long term plans for education as acknowledged by the endogenous growth model in order to improve economic growth in the sub region which transmits to higher household consumption level. A second general policy option which favours the sub region is improving domestic credit to the private sector in order to improve household consumption. There is need for monetary authorities in these countries to provide additional funds to financial institutions aimed at increasing the credit base of these institutions.

In Burkina Faso, policy makers should employ measures to reduce price level. A measure that improves aggregate supply should be taking into consideration to reduce the rate of inflation. Also, remittances should be channelled to productive ventures against consumption while in Senegal, policy measures should be provided to increase remittances flow to households. In Togo, currency devaluation should be encouraged by policy makers in order to improve household consumption in the country.

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