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Analysis of the Determinants of Consumption in Nigeria: An Autoregressive Distributed Lag Approach

Joseph M. Ibbih [α] & Siyan, Peter [σ]

Abstract- The need for economic theory to address the problem of unsustainable consumption patterns in a developing economy, Nigeria cannot be overemphasized. The literature suggests that present consumption patterns which use up economic resources beyond the capacity of the environment to replenish may make development unsustainable. This study analyzed consumption behavior vis-à-vis the factors that weakly or strongly influence consumption decisions. This key objective of this study is to establish the determinants of consumption among individual households in Agyaragu community of Nasarawa and by inference Nigeria. The study also investigated the extent to which consumption behavior of individuals supported the predictions of conventional models of consumption. A sample of 500 households was drawn from the community population of 22,750, with a response rate of 97%. The model employed alongside others is the Autoregressive Distributed Lagged (ADL) model. The results and findings revealed that individuals do not behave according to the baseline models of consumption. Consumption patterns favored non-durable consumption and necessities. The study recommended the model used in this study as a model of consumption that should incorporate the additional factors revealed by this study. The study, therefore, called for an economic policy and programme that will switch consumption away from non-durables to durables. This recommendation would enhance wealth creation, savings, investment and economic growth and development.

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I. Introduction

There are virtually no aspects of economic theory and policy that do not require some knowledge of household or individual consumer behavior (Blundell, 1988). The increased availability of diverse types of information on the subject of consumer behavior makes this problem an attractive area of study. Empirical evidence on consumer behavior is very much needed. One of the questions that attract attention is the issue of optimality and the impact of personal disposable incomes, past consumption, past income, wealth, family size, etc. on consumption behavior. Also, what should be the appropriate cost of living indices to choose for the individuals to maximize welfare?

The study of consumption and its change over time has been one of the pillars of Economics. It is one of the critical variables that determine individuals' welfare and quality of life. Since the time of John Stuart Mills and the classical economists of the 18th and 19th centuries, consumption has dominated much of the microeconomic debate and discussion. Similarly, it is one of the basic components of Gross National Product (GNP). The GNP and Gross Domestic Product (GDP) themselves are the important variables for measuring economic growth, consumer expenditure and the nature of the consumption function. GNP and GDP vis-a-vis consumption have provided the desired direction for the macroeconomic debate of the 20th century.

The marginalist revolution produced the marginal utility theory which was proposed in the 19th century by the marginalist economists. They studied the impact of small changes in economic quantities. Thus, individual's demand for a product is determined not by the total utility but by its marginal utility. The higher the total supply of a good, the smaller its marginal utility. The marginalist rejected the labor theory of value which has been central to classical economics. The theory of choice and consumer is the basic tenets of the Neoclassical economics. In this, the concept of marginality played a crucial role in the marginalist revolution. This revolution led to the replacement of the labor theory of value by the neoclassical value theory, whereby relative prices of goods and services are determined simultaneously by marginal rates of substitution (MRS) in consumption and marginal rates of transformation in production. Changes are assumed to begin from the total resources (endowment) available for utilization individuals. The marginal approach provided a dividing line between classical theory and modern economics. This revolution focused on the conditions under which the amount of resources (capital and labor) tend to be allocated among competing uses with optimal results. The optimality is in the sense of maximizing consumers' satisfaction. The marginal revolution resulted from the works of three men, namely Stanly Jevons, Karl Menger and Leon Walras.

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The objective of this study is to establish the determinants of consumption in a developing Economy. Therefore, the testable hypotheses are as follows:

H0: Consumption cannot be predicted from personal disposable income and consumption lagged by one period.

H0: Consumption cannot be predicted from only its lagged values.

H0: Consumption cannot be predicted from its lagged values and lagged values of income.

The study report is divided into five parts. Part I is the introduction, Part II is the literature review, Part III is the methodology, Part IV is the data analysis and discussion of findings while Part V is the conclusion and recommendations.

II. Literature Review

One of the empirical works is that of Hall (1978) which was work on time series consumption function. According to him, lagged consumption is controllable. Once this is done, under rational expectations, only permanent income affects current consumption. He used distributed lag models and data from the US economy. According to him, consumption is too sensitive to current income for it to conform to the LC-PI principle. He accepted that some measures of wealth have a strong influence on consumption, therefore lagged wealth is recommended as a variable to test (Davidson, 1978; Mankiw, 1982). Gali (1990) Haug (1991) proposed an aggregate life cycle model. The model assumes finite horizons and declining labor income for the individuals.

O' Donoghue and Rabin (2000) applied formal behavioral – economic models to theoretical and empirical research on youthful behavior. Their goal, apart from providing an economic analysis of risky behavior among youths, was to provide an understanding of the welfare consequences of their consumption behaviors. Whereas young people are also competent decision makers, they are very often overly pessimistic about their future, which greatly influences their inter-temporal perspective and future expectations. The youths' perceptions of consequences, a likelihood of effects and the importance of consequences of the consumption decisions predict their consumption behavior.

Relying on the work of Flavin (1981), Kankaanrata (2006) showed that if consumption were treated on a micro basis, then rational expectations permanent income hypothesis should be able to deal with what he discovered to be the excess sensitivity of consumption and excess smoothness of it. The excess sensitivity of consumption is the notion that it is excessively influenced by consumer's income rather than lag income (Yt-1) in period t-1 and consumption in period t-1 (i.e., Ct-1). The test suggested by Kankaanrata (2006) is to test the empirical validity that consumption follows a "martingale property." That is, an individual exploits any information that may be available about his future labor income.

The test for excess sensitivity of consumption to income is based on an equation, which was extended to include lagged income change: The null hypothesis is that the PIH is accepted if the coefficient of lagged income is equal to zero. The null hypothesis is rejected because the anticipated change in income positively predicts changes in consumption. This finding contradicts the PIH. That is, the parameter estimates of lagged income were statistically significantly positive. The estimation and testing procedure is based on the autoregressive specification for labor income. Thus, an excess sensitivity of consumption to income was seen to be a feature of aggregate time series data in the United States, and this may also be applicable elsewhere.

According to the PIH, consumption was smooth because permanent income (Yp) was smoother than normal income. The theory is aimed at explaining why consumption is smoother than income (Brown and Crossley, 2001). Thus, change in consumption should be equal to the amount warranted by revisions in expectations concerning future labor income. Using a time series model, aggregate earnings is created by a general ARMA process of order (p,q). Thus, the change in consumption is given by

$$\triangle C_t = r/1+r\ 1+ \frac{\sum_{i=1}^{\infty}(1+r)^{-i}\,\theta_i}{1-\sum_{i=1}^{\infty}(1+r)^{-i}\,\psi_i}\,\varepsilon_t \quad \text{----} \quad (1)$$

Where, θi = the moving average (MA), ψi = the autoregressive coefficient of the ARMA, and εt = multiplier of income in innovation. Equation (1) is said to be valid for both stationary process and non-stationary process.

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The estimated AR (1) models in first differences showed positive autoregressive parameters. Hence, the et ought to be greater than one (1). Thus, the prediction of the PIH is that change in consumption should be more than the innovation to income. If income obeys a random walk, disturbances to income process could be more persistent than expected (Palley, 2005; lloyd, 2006; Romer, 2001)

III. Methodology

The research design, population of study and the method of data collection are explained in this section. It sets the parameters for the data collected as well as described the mode for data analysis. The blueprint for collecting and analyzing data relates to the problem of investigating consumption pattern in Agyaragu community, Nigeria. Due consideration is given to the models used, the population of the study and the type of data. (Creswell, 1998 and 2003)

a) Autoregressive Lag Model

The ADL is necessary for the study because the habit or behavior of the consumer is involved in consumption decisions. The increase in incomes, wealth and other variables may not attract an immediate reaction from the households. However, over time they will change their habits and lifestyles in line with the change in their fortunes. Besides, the variation in their incomes may be permanent or transitory. Where such is transitory, households may resort to savings.
The ADL take the following forms:

$$Y_t = \alpha_0+\alpha_1X_t+\alpha_2X_{t-1}+\alpha_3X_{t-2}+e_t. \quad (2)$$

and

$$Y_t =\beta_0+\beta_1X_t+\beta_2Y_{t-1}+e_t. \quad (3)$$

Whereas the former (i) is a distributed-lag model, the later (ii) is the autoregressive distributed lag model.

The coefficients in the model are called the short-run or impact multipliers. They gave or measure the change in the mean value of consumption resulting from the unit change in the explanatory variables. They are the partial derivatives of consumption concerning the respective explanatory variables. What is finally obtained is called the long run or total distributed lag multiplier(s) given the total sum for all the coefficients (βi). The partial sums of the standardized parameter give the proportion of the overall impact felt. The ADL model addressed objectives (ii) to (v) and also the hypothesis of the study.

b) Model Specification

In formulating a model for this study, we relied on and borrowed from the works of Hall (1978), Ahumada and Garegnani (2003), Baker et al. (2006), Bonne et al. (1998), and Davidson et al. (1978). Modifications are made to arrive at the model that fit our purpose, expectations and the data used. We adapted the unrestricted autoregressive distributed lag model also called dynamic model. We chose to use the autoregressive distributed lag model because the study of consumption involves time series data. The regression equation includes not only the current values but also the lagged (past) values of the explanatory variables. In some cases, the model has one or more lagged values of the dependent variable (i.e., consumption) included as an explanatory variable.

Our model, therefore, took the linear log approximations with six (6) model equations as follows:

i. *Model 1 Equation 1:* Consumption predicted from current income and consumption lagged by one period

$$\ln C_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln C_{t-1} + U_t \quad (4)$$

The autoregressive distributed lag is our basic model.

Where, C_t = consumption in the present period, Y_t = current disposable income, C_{t-1} = consumption in the previous period t – 1, β_0 = coefficient for the constant term, β_1 and β_2 = the coefficients for Y_t and C_{t-1} respectively. The parameter estimates show the elasticities of C_t to Y_t and C_t to C_{t-1} respectively, U_t = Error term or white noise.

ii. *Model 1 Equation 2:* Consumption predicted from its own lagged values

$$\ln C_t = \propto_0 + \propto_1 \ln C_{t-1} + \propto_2 \ln C_{t-2} + U_t \quad (5)$$

iii. *Model 1 Equation 3:* Consumption predicted from its lagged values and lagged values of income of the individuals

$$\ln C_t = \lambda_0 + \lambda_1 \ln C_{t-1} + \lambda_2 \ln C_{t-2} + \lambda_3 \ln y_{t-1} + \lambda_4 \ln y_{t-2} + U_t \quad (6)$$

iv. *Model 1 Equation 4:* Predicting consumption based on expected future income

$$\ln C_t = \delta_0 + \delta_1 \ln y_t + \delta_2 \ln y_{t+1} + U_t \quad (7)$$

y_{t+1} = income expected in period t+1 (in the future).

v. *Model 1 Equation 5:* predicting consumption from wealth (assets)

$$\ln C_t = \phi_0 + \phi_1 \ln S_t + \phi_2 \ln N_t + \phi_3 \ln L_{t-1} + \phi_4 \ln I_t + U_t \quad (8)$$

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where, S_t= Stock market wealth in period t, N_t= Non – stock market wealth in period t, L_{t-1} = Wealth in period t-1 (period in the past), It = Saving or investment period t.

vi. *Model 1 Equation 6:* Predicting consumption from consumer durable goods and family size.

$$\ln C_t = a_0 + a_1 \ln X_t + a_2 \ln X_{t-1} + a_3 F_t + a_4 D_{1t} + a_5 D_{2t} + U_t \quad (9)$$

where, X_t = Consumption in period t of the non-durable items defined as recreation, social parties, smoking, expenses on recharge cards, etc, X_{t-1} = Consumption of non-durable in t-1, F_t = a vector for family size, education (represented by level of schooling attained) and age of the individual, D_{1t} = dummy variable for sex with 1 = male and 0 = female.

D_{2t} = Dummy for marital status (married = 1 and single = 0).

In addition to the linear log forms above, we also used the linear approximation in order to compare our results.

c) Study Geographical Area

Agyaragu is in Lafia Local government area of Nasarawa state. The town is located at a latitude of 80 25` 00`` and a longitude of 80 31` 00``. It has a land mass (area) of 21 square kilometers. The community shares boundary with Lafia in the North, Doma LGA in the South – West and Obi LGA in the South (Field survey, 2009). The Population of Agyaragu is estimated to be 22,750 people (NPC, 2008).

Different economic activities are found in the community: farmers, traders, artisans, civil servants, among others. Farming activities predominate other activities. It is famous for the production of yam, groundnut, maize, guinea corn, millet, cassava, rice, beans, melon, etc.

The data used in this study is the primary data generated from the chosen community, Agyaragu. It is a cross-sectional data series, which comprised of large sample units of individual households. In the survey conducted in Agyaragu, we had 484 cross-sectional observations out of a population of 22,750 and for each; we have data on consumption, income, wealth and non-durable consumption. These were in addition to other variables on expected income, savings, a vector for family size, education and age; sex and marital status – a total of fifteen variables. The SPSS, Eview and Stata Computer packages were employed in this study to routinely calculate the slope and intercept parameters and others estimates such as the F-statistic, t-statistic, z-statistic values along with the usual regression output.

IV. Data Analysis And Discussion Of Findings

a) Demographic Characteristics of Respondents

i. *Gender Statistics*

Table 4.1: Gender Data

Category	Absolute Frequency	Relative Frequency %
Male	364	75
Female	120	25
Total	484	100

Source: Field Survey, Feb. 2009.

Table 4.2: Marital Status

Category	Absolute Frequency	Relative Frequency %
Married	249	51.4
Unmarried	235	48.6
Total	484	100.00

Source: Field Survey, Feb. 2009.

From the 484 households that responded, 75% were males while 25% were females. Similarly, 51.4% were married while 48.6% were unmarried. No widow or widower and divorced responded.

Table 4.3: Work Participation Data: Frequency Distribution

S/No.	Category	Absolute Frequency	Relative Frequency	Cumulative Frequency %
1.	Missing Cases	16	3.2	3.2
2.	Civil Servants	147	29.4	32.6
3.	Farmers	125	25.0	57.6
4.	Businessmen/Women	133	26.6	84.2
5.	Artisan	44	8.8	93.0
6.	Others	35	7.0	100.0
	Total	500	100.0	

Source: Field Survey, Feb. 2009.

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The response rate from the sampled units of 500 people was 97% while the non-response rate stood at 3%. From the sample survey, 25% are farmers while 28.2% are Businessmen/Women and 9% are Artisans. Thus, 60.4% of the people are self-employed while 29.4% are engaged in paid jobs.

Table 4.4: Distribution of Respondents Education Attainment

Category	Absolute Frequency	Relative Frequency %
Primary School	66	13.6
Secondary	157	32.4
Tertiary/University	215	44.4
None	46	9.6
Total	484	100.0

Source: Field Survey, Feb. 2009.

From the survey, 44.4 percent of the households in the community are either polytechnics, college of education or university graduates, 32.4 percentages have attained secondary education while 9.6 percent have not attended any schooling.

Table 4.5: Demographic Data of Respondents

Category	Absolute Frequency	Relative Frequency %
Head of Family	199	41.1
Non -Head of family	263	54.3
Nil Response	22	4.6
Total	484	100.0
Family Size	134	
1 – 4	157	27.7
5 - 8	130	32.4
9 – above	63	26.9
Nil Response		13.0
Total	484	100.0

Source: Field Survey, Feb. 2009.

Whether or not individuals spent so much on family upkeep, the survey revealed the following:

		No.	%
Yes	=	305	63.0
No	=	133	27.5
Nil	=	46	9.5
Total	=	484	100

Family heads constitute 41.1 percent of the households covered in the survey while non-family heads are 54.3 percent. Regarding family size, 27.7 percent of the individuals in the community has a family size 1 – 4 persons while 32.4 percent has 5 – 8 persons. Those with a family of above nine persons constitute 26.9 percent. The implication is that family size influence consumption positively that add little to wealth for the future. From the survey, 63 percent households affirmed that they spend so much on consumption expenditure. This expenditure pattern is supported by the evidence in the table. This is further explained by the fact that 18.4 percent of the households are unable to save because of high consumption expenses on family upkeep.

b) Results and Interpretations

i. *Autoregressive Distributed Lag Model*

Our analyses are based on the data collected from the field (Appendix 8). The results are presented as follows:

Model 1 Equation1: Predicting consumption from personal disposable

Income and past consumption lagged by one period.

Table 4.6: Analyzed Result of model equation 1

Dependent Variable: LOG(CT)
Method: Least Squares
Date: 03/15/09 Time: 13:23
Sample: 1 484
Included observations: 479
Excluded observations: 5
LOG(CT)=C(1)+C(2)*LOG(CT -1)+C(3)*LOG(YT)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.976718	0.125878	7.759249	0.0000
C(2)	0.374948	0.030331	12.36197	0.0000
C(3)	0.436343	0.033818	12.90260	0.0000

R-squared	0.702174	Mean dependent var	4.992145
Adjusted R -squared	0.700879	S.D. dependent var	0.853379
S.E. of regression	0.466729	Akaike info criterion	1.320323
Sum squared resid	100.2046	Schwarz criterion	1.347134
Log -likelihood	-302.6548	F-statistic	542.2639
Durbin -Watson stat	1.667343	Prob abilit (F-statistic)	0.000000

Source: Author's Computation, 2009

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Note: $\beta_0 = C_{(1)}$, $\beta_1 = C_2$, $\beta_2 = C_{(3)}$

$$\text{Therefore, } InC_t = 0.98 + 0.38InY_t + 0.44InC_{t-1} \quad (10)$$

The signs of the estimated coefficients for Log income and past consumption (t-1) were expectedly positive showing a positive relationship between consumption in period t and income in period t and consumption in t-1. Both coefficients of income (Yt) and consumption lagged by one period were statistically significant as indicated by the high t values and the low probability values. The regression coefficient of log income was 0.44 showing that one percent increase in income leads to increase in consumption by 44% per annum, all things being equal. The coefficient of consumption lagged by one year was statistically significant, i.e., 0.38 showing the presence of significant lag in the adjustment of consumer behavior to its desired level. The value of partial adjustment or spread of adjustment (i.e., 1-0.38) is 0.63. This spread implies that about 63% of the disequilibrium between actual change and desired change in consumption eliminated in a year, all things remaining constant. The variables of income (Yt) and past consumption lagged by one period explained 70% of the variation in consumption behavior and decision in period t. However, income had a greater influence on consumption behavior than past consumption. Most consumption present habits termed over the years. We assume the absence of positive or negative first-order autocorrelation because the DW statistic was towards 2 (=1.67).

Hypothesis: we hypothesized as follows:

H0: $\beta1=\beta2 = 0$ (Consumption cannot be predicted from income and its past value lagged by one period).

H1: $\beta1=\beta2 = 0$ (Consumption can be predicted from income and its past value lagged by one period).

If all the slope coefficients are all simultaneously zero, which means the computed value of the F-statistic (Fc) is greater than the critical value of F-statistic (Ft) at 5% significant level, then we can accept H0 but if otherwise, we reject H0 and accept H1. From the result in table 4.6, the Fc > Ft, hence we accepted H1. That consumption can be predicted from the income and past value of consumption lagged by one year.

Model 1 Equation2: Predicting Consumption from only its values lagged by two periods.

Table 4.7: Analyzed Result of model equation2

Dependent Variable: LOG(CT)
Method: Least Squares
Date: 03/15/09 Time: 11:11
Sample: 1 484
Included observations: 442
Excluded observations: 42
LOG(CT)=C(1)+C(2)*LOG(CT-1)+C(3)*LOG(CT-2)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.607511	0.130459	12.32194	0.0000
C(2)	0.319840	0.064491	4.959469	0.0000
C(3)	0.377781	0.069044	5.471596	0.0000

R-squared	0.626906	Mean dependent var	5.004511
Adjusted R -squared	0.625206	S.D. dependent var	0.857986
S.E. of regression	0.525263	Akaike info criterion	1.556928
Sum squared resid	121.1205	Schwarz criterion	1.584697
Log -likelihood	-341.0810	F-statistic	368.8229
Durbin -Watson stat	1.861052	Probability (F-statistic)	0.000000

Source: Author's Computation, 2009

Note: $\alpha_0 = C_{(1)}$, $\alpha_1 = C_2$, $\alpha_2 = C_{(3)}$

$$\text{Therefore, } InC_t = 0.61 + 0.32InC_{t-1} + 0.38InC_{t-2} \quad (11)$$

The coefficients of log past values of consumption lagged by two periods, i.e., Ct-1 and Ct-2 were significantly positive, but their values were low. The coefficients for the two variables were 0.32 and 0.38

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respectively. Thus, a 1% increase in consumption lagged by two periods increased current consumption by 32% while a 1% increase in consumption lagged by one period increased consumption now by 38%. This positive relationship still points to the fact that there is the presence of significant lags in the adjustment of consumption decisions but the significant lags were lower for two-period lags. The spread of adjustment for the two variables were (1-0.32) 0.68 and (1-0.38) 0.62 respectively. The spread was higher in the remote period (year) than in the immediate past period. Thus, the immediate past period's consumption has a stronger influence on current consumption than the remote period. The variables were not positively or negatively auto correlated because the Durbin – Watson statistic of 1.86 tends towards 2.

Hypothesis:

H0: $\square_1 = \square_2 = 0$ (Consumption cannot be predicted from its past values)

$\square_1 =/ \square_2 =/ 0$ (Consumption can be predicted from its past values)

By the F-Statistic and test, we reject H0 and accept H1, that consumption can be predicted by its past values. However, the immediate past year consumption has a stronger impact on current consumption. Judging from the acceptance of H1, we can say that habits formation also played a role in consumption decision of the households in the current period.

Model 1 Equation3: Predicting consumption from its lagged values and lagged values of Income

Table 4.8: Analyzed Result of model 1 equation 3

Dependent Variable: LOG(CT)
Method: Least Squares
Date: 03/15/09 Time: 13:25
Sample: 1 484
Included observations: 392
Excluded observations: 92
LOG(CT)=C(1)+C(2)*LOG(CT-1)+C(3)*LOG(CT-2)+C(4)*LOG(YT-1)+C(5) * LOG(YT-2)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.292606	0.153994	8.399880	0.0000
C(2)	0.344450	0.082129	4.194033	0.0000
C(3)	0.207021	0.087455	2.367163	0.0184
C(4)	-0.016144	0.060923	-0.264997	0.7912
C(5)	0.219006	0.065220	3.357951	0.0009

R-squared	0.625595	Mean dependent var	5.061179
Adjusted R-squared	0.621725	S.D. dependent var	0.839198
S.E. of regression	0.516141	Akaike info criterion	1.527798
Sum squared resid	103.0973	Schwarz criterion	1.578452
Log-likelihood	-294.4484	F-statistic	161.6598
Durbin-Watson stat	1.885178	Probability (F-statistic)	0.000000

Source: Author's Computation, 2009

Note: $\lambda_0 = C_{(1)}, \lambda_1 = C_{(2)}, \lambda_2 = C_{(3)}, \lambda_3 = C_{(4)}, \lambda_4 = C_{(5)}$

Therefore,

$$InC_t = 1.29 + 0.34InC_{t-1} + 0.21InC_{t-2} - 0.021InY_{t-1} + 0.221InY_{t-2} \quad (12)$$

The slope coefficients of the variables were individually statistically significant judging by their significant t values which were high. The only exception was income lagged by one period (Yt-1) i.e., income in the remotest year. Income in year t-1 was not only statistically insignificant, but it has a wrong sign (a negative sign) which defeats our a priori expectation. Of the four variables tested in this equation, consumption

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lagged by one year has the strongest influence on current consumption, followed by personal income in period t-2 i.e., the immediate past disposable income. This result shows that only past income lagged by one period (t-2) had a positive and a significant impact on consumption decision while the remote year (t-1) had a negative impact.

Thus, a 1% increase in income will lead to increase in consumption in periods Ct-1 and Ct-2 by 34.4% and 21% respectively. Similarly, a 1% unit increase in income in periods t-1 and t-2 increased consumption by 22%. All these changes showed the presence of significant lags in the adjustment of consumption decision to its desired level. The value of coefficient or the spread of adjustment for the three important variables are as follows: Consumption lagged by one period (Ct-1) is (1 - 0.34) 0.66. Consumption lagged by two periods (Ct-2) is (1-0.21) 0.79 and income lagged by two periods (Yt-2) is (1-0.22) 0.78. This result means it takes a longer time to remove the disequilibrium between actual change and desired change in consumption that is caused by changes in its past level and past income. As expected, the variables in this particular model equation accounted for 63% changes in consumption behavior (R2). And because we are dealing with autoregressive distributed lagged models, the R2 will continue to deteriorate, as more variables are added.

Based on the DW statistic of 1.885, we can assert that there was an absence of the first-order autocorrelation between the variables.

Hypothesis:

H0: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ (Consumption cannot be predicted from its lagged values and lagged values of income)

H_1: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ (Consumption can be predicted from its lagged values and lagged values of income)

We tested the above hypothesis simultaneously and individually. Using F-test, we reject H0. This reject implies that consumption can be predicted from the past values of income lagged by two periods. Also, it can be predicted from its previous values lagged by two periods, Ct-1 and Ct-2. Thus, habits formed have great influence on current consumption.

Model 1 Equation 4: Predicting Consumption from expected future income (t+1

Table 4.9: Analyzed Result of model equation 4

Dependent Variable: LOG(CT)
Method: Least Squares
Date: 03/15/09 Time: 13:29
Sample: 1 484
Included observations: 479
Excluded observations: 5 after adjusting endpoints
LOG(CT)=C(1)+C(2)*LOG(YT)+C(3)*LOG(YT+1)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.532055	0.164592	9.308192	0.0000
C(2)	0.621918	0.035282	17.62686	0.0000
C(3)	6.473540	0.022499	4.072525	0.0001

R-squared	0.575805	Mean dependent var	5.086906
Adjusted R-squared	0.573461	S.D. dependent var	0.793903
S.E. of regression	0.518497	Akaike info criterion	1.532422
Sum squared resid	97.31995	Schwarz criterion	1.532422
Log -likelihood	-276.6670	F-statistic	245.6903
Durbin -Watson stat	1.570946	Probability (F-statistic)	0.000000

Source: Author's Computation, 2009

Note: $\delta_0 = C_{(1)}$, $\delta_1 = C_{(2)}$, $\delta_2 = C_{(3)}$

$$\text{Therefore, } InC_t = 1.53 + 0.62InY_t + 6.47Iny_{t+1} \quad (13)$$

The variables investigated in this equation were individually statistically significant based on their high t-values and zero probabilities. All of them had positive signs which confirmed our a priori expectation, though expected income has a higher coefficient value than current disposable income. As noted in model one and as we shall see ahead, current disposable income has a great influence on consumption decisions of the sampled units. In this model equation, expected income has the greatest predictive power on consumption. We

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infer that consumption by the sampled units is influenced by expectation. An increase of N1.00 in disposable income in the current period increases consumption by only 62% or N0.62, whereas the same increase in expected income increased consumption by 647% or N6.47. Since the expected income in the future lagged by one period (t+1) is statistically significant, the presence of significant lag in the adjustment of consumption to the desired level is necessary. The coefficient of adjustment for expected income is 0.353, meaning that it will take less than one year to eliminate a disequilibrium of 11% from the system. Thus, expectation plays a great role in influencing consumption decision.

We tested the hypothesis (H0) for $\delta 1 = \delta 2 = 0$ against an alternate hypothesis of $\delta 1 = \delta 2 = 0$ at 5% level of significance. Based on the F-test, we rejected H0 for H1 implying that consumption can be predicted from future (expected) income. If it is regressed on expected income alone, the significance will improve. For now, the variable (t+1) is a strong determinant of consumption.

Model 1 Equation 5: Predicting Consumption from wealth (Assets

Table 4.10: Analyzed Result of model equation5

Dependent Variable: LOG(CT)
Method: Least Squares
Date: 03/15/09 Time: 13:31
Sample(adjusted): 13 453
Included observations: 26
Excluded observations: 415 after adjusting endpoints
LOG(CT)=C(1)+C(2)*LOG(ST)+C(3)*LOG(NT)+C(4)*LOG(LT_1)+C(5)*LOG(IT)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	4.434085	0.816265	5.432163	0.0000
C(2)	0.136987	0.144342	0.949042	0.3534
C(3)	0.203430	0.219863	0.925258	0.3653
C(4)	0.009086	0.225191	0.040350	0.9682
C(5)	-0.114510	0.110353	-1.037671	0.3112
R-squared	0.165153	Mean dependent var		5.686149
Adjusted R-squared	0.006135	S.D. dependent var		0.623369
S.E. of regression	0.621454	Akaike info criterion		2.057531
Sum squared resid	8.110301	Schwarz criterion		2.299472
Log-likelihood	-21.74790	F-statistic		1.038578
Durbin-Watson stat	0.480259	Probability(F-statistic)		0.410854

Source: Author's Computation, 2009

$$\text{Therefore, } InC_t = 4.43 + 0.14InS_{t-1} + 0.20InN_{t-2} + 0.01InI_t \quad (14)$$

Regarding signs, all the slope coefficients fulfilled the a priori signs. Log stock market wealth (St), Non-Stock market wealth (Nt) and Past-wealth (Nt-1) were positively related to consumption (Ct), whereas, Savings as negatively related to consumption. Though the variables individually have a marginal influence on consumption; they were individually statistically significant except for past wealth which was insignificant based on the low t-values. Based on even the critical values at 10% significance level, the computed t-values were less.

Regarding magnitudes, non-stock market wealth influences consumption more, followed by stock market wealth. Past wealth did not change consumption much. Savings influences the behavior of the households because an increase of one unit, say N1.00, in savings reduced consumption by 11% or N11.45. This result implies by inference that there is a low saving culture in the community. This marginal impact on consumption could be taken to mean that past wealth as a variable also influenced consumption but very weakly. The basis of our position is that at periods of low income, these individuals fall back on their non-stock market wealth such as plots of lands, buildings, etc. and the stock market assets (shares) to maintain previous consumption habits.

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Hypothesis

H0: $\varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 \quad 0$ (Consumption cannot be predicted from wealth)

H1: $\varphi_1 = \not\varphi_2 = \not\phi_3 = \not\varphi_4 \quad = \not 0$ (Consumption can be predicted from wealth)

Where; $\varphi_0 = C_{(1)}, \varphi_1 = C_{(2)}, \varphi_2 = C_{(3)}, \varphi_3 = C_{(4)}, \varphi_4 = C_{(5)}$

Based on the F-statistic of 1.0386 we accepted H0 and concluded that consumption cannot be predicted from wealth. This is despite the marginal influence of wealth on consumption decision and behavior. Thus, computed F-Statistic of 1.0386 was less than the critical F-Statistic at both the 5% and 1% levels of significance (= 5.64).

Model 1 Equation 6: Predicting Consumption from Non-durable consumption: (a vector for family size, age, and educational attainment), sex and marital status. This model is a consumption switching model.

Table 4.11: Analyzed Result of model 1 Equation 6

Dependent Variable: LOG(CT)
Method: Least Squares
Date: 03/15/09 Time: 13:44
Sample(adjusted): 1 483
Included observations: 467
Excluded observations: 16 after adjusting endpoints
LOG(CT)=C(1)+C(2)*LOG(XT)+C(3)*LOG(XT-1)+C(4)*LOG(FT)+C(5)*D1T+C(6)*D2T

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	2.651816	0.282544	9.385500	0.0000
C(2)	0.246815	0.055552	4.442931	0.0000
C(3)	0.238242	0.043436	5.484852	0.0000
C(4)	0.153717	0.076413	2.011658	0.0450
C(5)	-0.024614	0.082510	-0.298318	0.7656
C(6)	0.139885	0.069796	2.033336	0.0428
R-squared	0.298377	Mean dependent var		5.129101
Adjusted R-squared	0.288119	S.D. dependent var		0.746393
S.E. of regression	0.629754	Akaike info criterion		1.930117
Sum squared resid	135.6340	Schwarz criterion		1.996534
Log-likelihood	-329.8404	F-statistic		29.08819
Durbin-Watson stat	1.747786	Probability(F-statistic)		0.000000

Source: Author's Computation, 2009

Note: $a_0 = C_{(1)}, a_1 = C_{(2)}, a_2 = C_{(3)}, a_3 = C_{(4)}, a_4 = C_{(5)}$ and $a_5 = C_{(6)}$

Therefore,

$$\ln C_t = 2.65 + 0.25\ln X_t + 0.24\ln X_{t-1} - 0.15\ln F_{t-1} - 0.031\ln D_{1t} + 0.14\ln D_{2t} \quad \ldots \quad (15)$$

This model contains two dummy variables, for sex and marital status. It is a mixture of quantitative and qualitative variables which belong to the realm of models known as the Analysis of Covariance (ANCOVA). ANCOVA is an extension of the ANOVA models. ANCOVA models provide a means of statistically controlling the effects of quantitative variables called covariates. Again, the use of ANCOVA is our modest contribution to knowledge in this area of research in a developing economy.

The regression (slope) coefficients were positive and individually statistically significant with good t-values, except the estimate for the dummy variable of sex. Though Sex had a wrong sign from the a priori, it has its implication when applied to interpret consumption behavior. All the variables affected consumption and changed it though at different magnitudes. Non-durable consumption has the most impact followed by lagged non-durable consumption lagged by one period, i.e., last year's position. Family size and marital status followed in that order with sex being the least.

When non-durable consumption increased by one unit, N1.00, consumption increased by 25% or

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N25.00. The same increase in non-durable pruducts lagged by one period (t-1), family size, increased consumption by 24% or N24.00, 15% or N15.00 and 14% or N14.00 respectively.

Our regression results showed that the sex dummy variable had a negative sign since male were 1 and female were 0. This dummy implies that the yearly average consumption by males was lower than that of females by N2.46 or 2% - a marginal impact.

Similarly, the result for marital status was positive and since the married was 1 and unmarried was 0, this means that yearly consumption among the married was higher than that of the unmarried by N14.00 or 14%. The low R2 in this model and others before it is a typical case with cross-sectional data where the R2 is always low due to the diversity of individual economic units used in the sample.

In our hypothesis formulation, we have:

H0: $a_1 = a_2 = a_3 = a_4 = a_5 = 0$ (Consumption cannot be predicted from the
Variables involved, i.e., consumption does not exhibit switching behavior)

H1: $a_1 = a_2 = a_3 = a_4 = a_5 = 0$ (Consumption can be predicted from the Variables involved, i.e., consumption exhibits switching behavior)

We tested this hypothesis individually and simultaneously. Based on the F-Statistic, we rejected H0 while accepting H1. We concluded that consumption decision by individual households in the community exhibited consumption switching behavior.

ii. *Discussion of Results and Findings*

Previous works such as Duesenberry (1949) and Brown (1952) treated current income as exogenous because it was regarded as the major independent factor in the consumption function. Thus, consumption was too sensitive to current income (Yt). The LC-PI baseline model posited that no other variables observed in period t-1 or earlier could predict the residuals in the consumption regression model or equations; except income. In this work, we added value to empirical research by treating current earnings as an endogenous variable. The model we used adequately accounted for the endogeneity of current income for the reason that it is one of the main independent determinants of consumption but not the only key determinant.

From our findings, consumption is always smoothening over fluctuations in income. That is, consumers were able to smooth consumption over their transitory fluctuations in earnings even though they face liquidity constraints and other practical considerations. By smoothness of consumption, we mean the pace of the response of consumption to changes in income and other variables. Thus, it responds to predictable changes in income and other variables, but the reaction is slow or weak as opposed to the robust response identified by the LC-PI hypothesis. That is, consumers are not too sensitive to current income. This sensitivity is evident from the predictive power of income of 0.44 in our model one equation (1) result.

Besides, the individuals in our sample do not merely behave in line with the baseline models of consumption because consumption is not modeled on income alone but other variables as well. Our chosen model did not reject the other variables used except only one, precisely the wealth variable based on statistical significance criterion. Even the variable statistically excluded has been shown to have a level of marginal impact on consumption decision and behavior of the individuals. The interesting aspect to note is that the received theories modeled consumption on income alone. Also, their studies were centered on the developed economies where these models worked well with expected outcome. Now that a study based on a developing economy, with data evidence from Nigeria, abound, the work suggests that a new model of consumption should to be formulated. The new model takes into consideration other variables – expected income, lagged consumption, wealth, particularly non-stock market wealth, savings, conspicuous consumption, family size, educational level, age, sex and marital status of the consumers; which could cause disequilibrium in consumption. Saving was meant to capture the modest liquidity constrained aspects of the consumers' decision pattern. These factors other than income reflect the particularities and the contemporaneous feature of the consumption function and the consumers and their consumption pattern in a developing economy.

A point of agreement between this study and the previous works is the constant elasticity of consumption, otherwise known as the marginal propensity to consume (MPC). As expected, the MPC, in all the model equations where current income was modeled in this study, shows that it is less than unity (i.e., $0 < MPC < 1$). The positive intercept, as in model equations 1 and 3 shows that individuals in the community consume even out of zero income, thereby borrowing or drawing on past savings and selling part of their properties (assets) such as the plot of land to sustain current consumption.

Thus, based on the log-linear distributed lag autoregressive model, the following factors have a stronger influence on consumption: current income, lagged consumption in 2 periods, immediate lagged income, expected income, conspicuous consumption, non-stock market wealth.

V. Conclusion and Recommendations

The cross-sectional data series were used to establish the long run relationships between current

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consumption and disposable income, lagged incomes and other variables that were considered as useful for modeling their effects on consumption behaviors. Thus, not only current earnings determined consumption, but other variables also influenced consumption. Not only the first lagged value of consumption but both the first and second lagged values of consumption predicted consumption significantly. In fact, lagged consumption was also established and had a bigger predictive influence on consumption decisions than lagged incomes. That is, consumers do not depend much on past earnings. This conclusion demonstrates that individuals always try to maintain and sustain habits formed in the past.

Conspicuous consumption habits and behaviors in the community were high. Also, consumption patterns of the respondents favored non-durable goods and necessities.

a) Recommendations

Policy actions tailored towards increasing the output and incomes of the residents of the community on the one hand and those aimed at changing their consumption patterns are imperatives. Policy makers had not focused enough attention on the issues of consumer behavior. If properly formulated and implemented, such policy actions required should include looking at consumer behaviors and patterns that hindered sustainable development. Henceforth, policies should focus both on economic variables and behavior related social policies.

The empirical results from this study confirmed our apriori expectation for the model which included lagged consumption, lagged incomes, conspicuous consumption and marital status. The regression results demonstrated a robust predictive power for changes in consumption. The study worked on the assumption that the consumers maximized their expected utility and that they were able to borrow freely to sustain consumption. The Agyaragu community consumers did not behave absolutely or strictly as the Lifecycle – Permanent Income models predicted. Besides, various tests conducted showed that the variables cointegrate. Hence there exists a long-run relationship between consumption and the selected variables. Furthermore, our model is stable and reliable.

On this basis, we recommend the autoregressive distributed lag model, as the model of consumption for our economy. The model as modified, with the additional variables included, is adequate. It reflects our contribution to knowledge. Both the probit and logit analyses confirmed the results and findings of the ADL model. Both the linear and log-linear approximations should be applied to the model. Similarly, cross-sectional, panel and time series data should be applied to the model appropriately.

References Références Referencias

1. Ahumada, H. A. and Garegnani, M. L. (2003). Wealth Effects in the Consumption Function of Argentina: 1980-2000. UTDT & UNKP – BCRA, Central Bank of Argentina.
2. Baker, M., Nagel, S., and Wurgler, J. (2006). The Effects of Dividends on Consumption. Division of Research, Harvard Business School.
3. Bhatia, H.L. (2006). History of Economic Thought, 4th Edition, New Delhi: Vikas Publishing House PVT Blundell, R. (1988).
4. "Consumer Behaviour: Theory and Empirical Evidence: A Survey". The Economic Journal. Vol. 98 No. 389, March, pp. 16 – 65.
5. Bother, M.E. (1989). "Theory of Development in Perspective. The Role of Conceptual Framework and Models in Theory Development". Journal of Advanced Nursing. Vol.14 No.1, pp.49 – 55
6. Boone, L., Gierno, C. and Richardson, P. (1998). "Stock Market Fluctuations and Consumption Behaviour: Some Recent Evidence." Economics Department Working Papers. No. 208, OECD, Paris.
7. Branson, W. (1979). Microeconomics Theory and Policy. New York: Harper & Raw Publishers. Brown, T.M. (1952). "Habit Persistence and Lags in Consumer Behaviour". Econometrica Vol.20, pp 355 – 371.
8. Brown, W.S. (1988). Macroeconomics. New Jersey: Preatice – Hall International. Browning, M. and Crossley, T. F. (2001).
9. "The Life Cycle Model of Consumption and Saving." Journal of Economic Perspective. vol.15, No.3, pp. 3 – 22. Creswell, J. (1998).
10. Qualitative Inquiry and Research Design: Choosing Among Five Traditions. California: Sage Publications Creswell, J. (2003).
11. Research Design: Qualitative, Quantitative and Mixed Methods Approaches. California: Sage Publications Davidson, J.E.H., Hendry, D.F., Srba, F. and Yeo, S. (1978).
12. "Econometric Modelling of the Aggregate Time-Series Relationship Between Consumers' Expenditure and Income in the U.K." Economic Journal. Vol. 88, No. 352, Dec, pp. 661 – 692. Fine, B. (1980).
13. Economic Theory and Ideology. London: Edward Arnold Publishers Flavin, M. (1981). "The Adjustment of Consumption to Change Expectations about Future Income." Journal of Political Economy. vol. 89, No.5, pp. 974 – 1009.
14. Gali, J., (1990). "Finite horizons, life cycle Savings and Time Series Evidence on Consumption." Journal of Monetary Economics. Vol. 26, pp. 433 – 452

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15. Hall, R.E. (1978). "Stochastic Implications of the Life-Cycle – Permanent Income Hypothesis: Theory and Evidence." Journal of Political Economy. Dec, vol. 86, No. 6, pp. 971 – 987.
16. Hall, R. E. (1981). Intertemporal Substitution in Consumption. Working Paper No. 720, NBER Working Paper Series. Haug, A.A., (1991).
17. "The Random Work Hypothesis of Consumption and Time Aggregation." Journal of Macroeconomics. Vol. 13, pp 691 – 700. ILoyd-PDF (2006).
18. Dynamic Theories of Consumption Behaviour. ged.econ.queensu.ca/pub/faculty/icoyd. Reyrieved on 27/12/2006.
19. Kankaanranta, P. (2006). Consumption Over the Life Cycle: Theory and Empirical Regularities. Research Reports, No. 118. Turku: Department of Economics, University of Turku, Finland. Mankiw, N.G. (1982).
20. "Hall's Consumption Hypothesis on Durable Goods." Journal of Monetary Economics. Vol. 10, pp 417 – 425.
21. O' Donoghue, T. and Rabin, M. (2000). Risky Behaviour Among Youths: Some Issues from Behavioural Economics. NBER Project on Risky Behavour Among Youths. New York: Department of Economics, Cornell University, pp. 1-40.
22. Palley, T.I. (2005). Relative, Permanent Income and Consumption: A Synthesis of Keynes, Duesenberry, Friedman and Modigliani and Brumberg. Washington, DC, 20010, pp.1-23
23. Quirk, R. (1991). Longman Dictionary of Contemporary English, New Edition. England: Clays, St. Ives Romer, D. (2001). Advanced Macroeconomics (2nd edition). New York: McGraw Hill Higher Education.

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