Consumer Confidence Indicators and Economic Fluctuations in Nigeria

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Consumer confidence indicators(CCI) serve as a veritable tool for providing useful information to policy makers, forecasters and the general public. Recent studies indicated the possibility of a slowdown in output, resulting from the pessimism of consumers in their expectations about the general state of the economy, even if their pessimism were not based on economic fundamentals. This study evaluated the predictive ability of the CCI in forecasting economic fluctuations in Nigeria. The study applied the Granger Causality tests, impulse response functions and forecast error variance decomposition to assess if CCI granger causes output growth as well as ascertain the magnitude of the change in GDP resulting from a change in CCI. Results from granger causality tests indicated a causal relationship between CCI indicators and real GDP growth in Nigeria. Furthermore, the study found that CCI explained the movements in economic activities, even though the magnitude was small. These results have important implications for the usefulness of CCI in planning and forecasting macroeconomic aggregates.

Keywords: Consumer Confidence, expectations, forecasting, economic fluctuation**s**

JEL Classification: E32, O40

1.0 Introduction

Researchers and policy makers today may be inclined to regard the prominence of consumer confidence indicators (CCI) in public discussions of the economy as no more than an illustration of how little the public understand serious economic research. However, there should be more to it than that. Economists who study the decision making of consumers, firms and governments would want to learn how these agents use publicly available economic information. They would, moreover, want to improve the quality of such public information. The importance of CCI in providing useful information for policy makers, forecasters and general public have suddenly become debatable. Katona (1978) noted that the use of consumer attitudes for forecasting is based on the assumption that "attitudes and expectations intervene between stimuli and response and they change before behavior changes". For decades, his work has been replicated in many countries of the

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world, including Nigeria. This made economists and policy makers to re-visit the old statement of Keynes (1936) that emotional factors – 'animal spirits' could influence the decision-making of economic agents.

Rationally, consumers as economic agents base their decisions on assumed expectations of the possible behavior of macroeconomic variables such as gross domestic product (GDP), broad money supply (M2), inflation rate, interest rate, exchange rate, unemployment rate, etc. Consequently, consumer expectations, which is today measured by the consumer confidence indicators, may cause fluctuations in output and other macroeconomic variables in an economy. For instance, increases in consumers' income and decreases in inflation or interest rates, *ceteris paribus*, would result in improved consumer well-being and attitudes.

Economic fluctuations refer to shifts in macroeconomic variables that result to boom or burst in an economy. Therefore, the question is, if consumers are pessimistic about the general state of the economy, could there be a slowdown in output, even if their pessimism were not based on economic fundamentals? Recent macroeconomic models showed that the answer is yes; if there are complementarities and multiple equilibria. A model contains strategic complementarities if each agent's optimal action is positively correlated with the action of other agents (see Matsusaka and Sbordone, 1995). However, Vuchelen (2004) found contrary result. The contention therefore, is whether attitudes of economic agents contain independent predictive information about future changes in real economy; or are just a rational assessment of economic prospects based on economic fundamentals, which have modest or no incremental forecasting power once other predictors are captured.

The Central Bank of Nigeria (CBN) commenced the compilation of consumer confidence indicators in Q2, 2008 from the conduct of consumer expectations survey (CES); as practiced in many economies. The CCI was measured in Nigeria using economic condition index (ECI), family financial situation index (FSI) and family income index (FII). This effort was mainly aimed at gathering qualitative information from the household sector of the economy as auxiliary information for the monetary policy formulation and management. However, much work is yet to be carried out on the predictive ability of the CCI in explaining fluctuations in macroeconomic activities in Nigeria. The

work of Olowofeso and Doguwa (2012) empirically investigated the relationship between CCI and some selected macroeconomic variables in Nigeria.

Consequently, this paper applied a different methodology from that used by Olowofeso and Doguwa (2012), extended the study period to second quarter of 2015 as well as used different set of independent variables. It also evaluated the predictive ability of the CCI in forecasting economic fluctuations in Nigeria. The paper uses the Granger causality test to see if CCI granger causes real GDP growth. Impulse response function and variance decomposition technique are also used to ascertain the magnitude of fluctuations in GDP resulting from change in CCI and other macroeconomic variables. The rest of the paper is structured as follows. Section two reviews related literature and section three discusses the methodology and data sources. Section four presents the results as well as discuss the findings, while section five concludes the paper.

2.0   Review of Related Literature

Olowofeso and Doguwa (2012) studied consumer sentiment and confidence indices in Nigeria and they used Pearson Correlation Analysis, Co-integration Analysis and Vector Error Correction Model (VECM) and quarterly time series data for the period Q2:2008 to Q2:2012. They estimated the consumer confidence regressions in a structured time series framework by using data from the six-geo-political zones. Using the monetary policy rate, they assessed the gap between the observed and the perceived consumer expectations. They found that a unit increases in the GDP growth rate had a positive effect on CCI. They also found that financial market indicators (like exchange rates, all share index, and interest rates), unemployment, petrol prices, government spending, and terrorist attacks among others; were likely to affect CCI in Nigeria.

Matsasuka and Sbordone (1995) explored the possibility that the total output of the economy sometimes differ not in response to a shift in economic fundamentals but in response to a shift in consumer sentiment. They utilized the Vector Autoregression (VAR) model and variance decomposition to diagnose the relationship between consumer sentiments and total output growth. Their results revealed that changes in consumer sentiment led to changes in Gross National Product (GNP), after controlling for movements in

other variables. They estimated the magnitude of the change to be between 13 and 26 per cent of the innovation variance of GNP. Howrey (2001) evaluated the predictive power of the index of consumer sentiment (ICS) considering four recession indicators individually and collectively – the ICS, the spread between long and short term interest rate, the New York Stock Exchange composite price index and the confidence board index of leading indicators. He found that the ICS and/or with one or more indicators significantly predicts the future growth of GDP in the United States (US).

Utaka (2003) studied the Japanese economy using VAR model to investigate whether CCI had any effect on the real economy. He analyzed his model using monthly, quarterly and bi-annual data. His results showed that CCI had significant effect on the GDP when monthly and quarterly dataset were used. In contrast, it had no effect when bi-annual data was used for analysis. He concluded that CCI exert impact on the GDP in the short run. Taylor and McNabb (2007) adopted cross correlation techniques, granger causality test, variance decomposition and the forecast probit test to examine the link between CCI and GDP, thereby, identifying the business cycles. They found evidence of a causal relationship between CCI and GDP, and also found that the CCI had good predictive power of downturns and upturns relative to other leading indicators.

Sergeant *et al.* (2011) reasoned that CCI can be useful in economic forecasting, policymaking and business planning based on the assumption that the index granger-causes aggregate economic conditions. They employed the VAR using CCI, GDP, interest rate and exchange rate to test the model. Remittances were also included due to its importance in the Jamaican economy. The result showed that CCI was significant in predicting GDP in the short run only in Trinidad and Tobago. In Jamaica, it was significant for predicting remittances in the long run. However, in both countries, it was found that a negative shock to CCI equally had a negative impact on GDP. They opined that since CCI was high when the unemployment rate was low and GDP growth was high, then maintaining low unemployment rates via public-private partnership for sustainable employment generation with job security should be the focus of fiscal and monetary policies. They argued that if monetary and fiscal authorities could control inflation and level of taxation

respectively, a colossal erosion of the purchasing power could be avoided and this would go a long way to ensure CCI is optimal. They suggested that adequate regulation and supervision of the financial sector for stability of the banking system should be ensured.

Chopin and Darrat (2000) observed that though several researchers had worked on modeling CCI, most had potentially introduced bias by working with 'bivariate models', imposing a common lag on all the variables and overlooking the possible cointegratedness of the variables. They used a flexible lag structure and a multivariate VEC model to examine the Granger causality among CCI and several macro variables which included retail sales, inflation, stock prices, money supply, interest rates, and personal disposable income using monthly data for 1977 - 1996. Their work showed that the CCI was a good predictor of some macroeconomic variables like interest rates while it was unreliable for others particularly inflation or monetary policy moves. In Turkey, Celik (2010) discovered that the importance of consumer surveys was underestimated because researchers concentrated on its forecasting power rather than on its functional identity. The result of his study showed that movements in CCI depended on changes in exchange rates, manufacturing index, stock exchange index and expectation measured through tendency in the business environment.

Vuchelen (2004) studied the relationship between consumer sentiment and macroeconomic variables, and proposed a direct method of expected economic conditions and uncertainty in order to determine what constitutes the consumer sentiment. He noted that large shifts—especially drops—in consumer sentiment do signal changes in economic growth, but argued that consumer sentiment embodies information from macroeconomic data, and can thus be explained by selected economic variables. He tested the Belgian consumer sentiment, as surveyed by the European Commission, for two variables that may explain consumer sentiment: expected income and the uncertainty about this expected income. He used the average of point forecasts for GDP growth, produced by different institutes, as a measure of expected income, and the dispersion of the point forecasts as a measure of uncertainty on the expected income. He found evidence that consumer confidence can be largely explained by these two variables, and that it is sensitive to growth forecasts.

Li (2010) used the VAR approach to investigate whether China's overall CCI and its component, the Consumer Expectation Index (CEI), caused changes in aggregate output in Granger's sense. He evaluated the predictive power of CCI over discrete economic upturns and downturns, using the monthly survey-based CCI after holding other things constant. He argued that such qualitative measures of the systems of output fluctuations were more meaningful for policymakers and private agents than the quantitative point forecasting. The variables used were stock prices, CEI, total freight volume, sales rate of industrial products, freight volume handled in major coastal ports and broad money (M2).

Using Katona's approach, Fan and Wong (1998) established that CCI did not have much predictive ability for the change in consumption patterns in Hong Kong since they contain information on people's expectation of their future well-being rather than simply their future income. However, both Carroll *et al.* (1994) and Acemoglu and Scott (1994) proved that lagged consumer sentiment had significant explanatory power for current changes in household spending in the US and Britain, respectively. Souleles (2001) tested the rationality of consumer expectations and assessed their usefulness in forecasting expenditures and the results showed the shocks that had hit different types of households over time. The author found expectations to be biased, at least ex-post, and the forecast errors were correlated with their demographic characteristics and/or aggregate shocks, which did not hit all people uniformly.

Holly and Tebbutt (1993) investigated whether the inclusion of consumer survey information into a composite forecast improve predictions on consumer expenditure. They found that the CCI did not significantly improve their forecasts based on structural equations. They pointed out that consumer survey data might have a role as a short-run business cycle indicator due to the frequently published data. Christ and Bremmer (2003) examined the short-run relationship between stock indices and CCI. They found that stock prices were not significantly affected by unexpected changes in CCI, though expected changes in CCI were found to be directly related to changes in stock prices. Thus, the predicted values from their regression results were used to forecast expected changes in CCI, while the residuals served as proxy for unexpected

changes in CCI. They believed that one would have an idea of the health of the economy as markets would fully anticipate expected changes in consumer sentiment.

Dominitz and Manski (2003) opined that the interpretation of movements in consumer confidence be done cautiously. They noted that most studies had covered developed countries as there were no consumer confidence measures available for developing economies until recently; and that consumer confidence should possess some futuristic element, otherwise it would be worthless. They further argued that the economy of most emerging markets were subject to several external or domestic shocks over a short period of time, and as such consumer confidence should be seen more as an indicator that includes current and past information since the future was uncertain.

From the foregoing, there is no consensus on the usefulness of consumer confidence as a leading economic indicator. However, the attitudes of economic agents were found to contain independent predictive information about future changes in real economy. This study seeks to determine whether the attitudes of economic agents as captured in the CES surveys helps in predicting future changes in the real economy in Nigeria.

3.0   Research Methodology

This paper adopted Granger causality tests, impulse response function and forecast error variance decomposition. This is to ascertain the direction of causality between CCI and real GDP fluctuations and determine the effect of a shock in CCI and its impact on real GDP fluctuations and other macroeconomic variables as well as the relative importance of the CCI to real GDP fluctuations. Granger (1969) proposed a time series data-based approach in order to determine causality. Granger causality has the look of true causality and it provides a natural stepping stone for empirical investigation. However, it should be kept in mind that Granger causality is neither a necessary nor sufficient condition for true causality to exist (see Geweke *et al.*, 1983 for more on causality in econometrics).

Our empirical strategy demonstrates that Granger causality exists from CCI to real GDP growth in Nigeria. We followed the standard methodology for testing causality in time series, by first testing each of the series for stationarity using the Augmented Dickey Fuller (ADF) test. We proceeded to

test if the CCI was co-integrated with real GDP growth. We then tested for causality between the variables using the standard Granger causality tests.

The VAR framework allows testing for Granger causality and explicitly includes the possibility of feedback causality. For the two stationary time series, CCI and real GDP growth, a bivariate VAR model of order M is given by:

$$\text{GROWTH}_t = \alpha + \sum_{i=1}^{M} \beta_{1i}(\text{GROWTH})_{t-i} + \sum_{i=1}^{M} \delta_{1i}\,(\text{CCI})_{t-i} + \mu_t \quad (1)$$

$$\text{CCI}_t = \alpha + \sum_{i=1}^{M} \beta_{2i}\,(\text{CCI})_{t-i} + \sum_{i=1}^{M} \delta_{2i}\,(\text{GROWTH})_{t-i} + \eta_t \quad (2)$$

where the error terms μ_t and η_t are assumed to be Gaussian white noise with zero mean and a constant covariance matrix. The series **CCI_t** Granger causes **GROWTH_t** if **δ_1** is significant and **GROWTH_t** Granger causes **CCI_t** if **δ_2** is significant. We compute the impulse responses and variance decomposition of GROWTH to see how much CCI contributed in predicting real GDP growth. Some selected macroeconomic variables were also used as control variables in the VAR models prior to computing the impulse responses and variance decomposition. The CCI and other control variables used in the models are as described in Table 1.

Table 1: Description of the Variables used in the Models

CCI variables	ID	Selected Macroeconomic variables	ID
CCI Current Quarter	CCICQ	Real GDP growth	GROWTH
CCI Next Quarter	CCINQ	Inflation Rate	LCPI
CCI Next 12 months	CCINY	Maximum Lending Rate	MLR

The data utilized for the study span the period Q2, 2009 to Q2, 2015 and were obtained from the CBN Statistics database. Rates of growth in real GDP was used to proxy GROWTH, while inflation rates were derived from Consumer Price Indices.

4.0   Empirical Results

4.1   Unit Root and Cointegration tests

The first step in this analysis concerns the stationarity of all the variables, as time series tests, such as Granger causality test, are usually preceded by unit root tests to identify the order of integration of the variables. Consequently, unit root tests were conducted both at levels and at first difference using the Augmented Dickey Fuller (ADF) test to ascertain the order of integration of the model variables. The ADF tests on the level of the variables indicated that the null hypothesis of a unit root cannot be rejected for all the variables at the 5 per cent level. The test on the first difference of the variables, however, resulted in a strong rejection of the null hypothesis of a unit root for all the variables. (see table 2).

Table 2: Unit Root Test Results

VARIABLE	LEVEL	FIRST DIFFERENCE	5% CRITICAL VALUES	REMARKS
GROWTH	-1.7922	-135.1551***	-3.6584	I(1)
LCPI	-1.8763	-7.0463***	-3.6220	I(1)
MLR	-1.9298	-5.1756***	-3.6220	I(1)
CCICQ	-3.0805	-3.9486**	-3.6220	I(1)
CCINQ	-2.6565	-5.9933***	-3.6220	I(1)
CCINY	-2.0113	-4.2997**	-3.6220	I(1)

Source: Authors' calculations
Note: The ADF tests were carried out with intercept and trend in the equation.
     *** and *** indicate significance at 5 and 1 per cent levels, respectively.*

Thereafter, the Johansen (1988) and Johansen and Juselius (1990) procedure was applied to determine the existence of long-run relationship and the number of cointegrating equations among the CCI variables and other macroeconomic variables. Three models were formulated with each of the model consisting of all the macroeconomic variables and one of the CCI indicators. Lag lengths were determined in line with Akaike and Hannan-

Quinn information criteria. Results from the cointegration analysis indicated that all the three models exhibited long-run relationships[2].

4.2   **Granger Causality Tests**

Since Granger causality test is very sensitive to the number of lags included in the regression, we used the Akaike (AIC), Schwarz (SC) and Hannan – Quinn (HQ) Information Criteria to determine the appropriate lag lengths. Bivariate causality models using the variables GROWTH and each of the CCI indicators were estimated. The results of the granger causality tests of the models in table 3 showed that all the three CCI indicators granger cause real GDP growth since the p-values were less than 0.05 (5% level of significance) with a high F-statistics. This implied that CCICQ, CCINQ and CCINY help in predicting changes in GROWTH.

Table 3: Granger Causality Test Results

	F-statistic	Prob.
CCICQ does not granger cause GROWTH	4.6370	0.0188**
GROWTH does not granger cause CCICQ	0.9234	0.4551
CCINQ does not granger cause GROWTH	3.6204	0.0401**
GROWTH does not granger cause CCINQ	2.7587	0.0814*
CCINY does not granger cause GROWTH	3.6676	0.0387**
GROWTH does not granger cause CCINY	0.2102	0.8877

[**]5% and [*]10% indicate level of significance
Source: Authors' calculations

Meanwhile, real GDP growth was found to granger-cause CCINQ only at the 10 per cent levels, indicating bidirectional causality between CCINQ and real GDP growth. It therefore, appears that there is causal relationship between CCI indicators and real GDP growth in Nigeria, implying that increases in real GDP growth were accompanied by optimistic expectations about the future growth of the economy, which inturns leads to further rise in GDP growth.

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[2] Results of the Johansen cointegration analysis were not included in the paper but are available on request

4.3 Impulse Response Functions (IRF) andVariance Decomposition Analysis (VDC)

Three different VAR models were estimated from which the accumulated impulse response functions and forecast error variance decomposition were calculated. The impulse response function traced the effect of a shock resulting from an endogenous variable to other variables in the model, while variance decomposition provided information about the relative importance of each random innovation in affecting the variables in the model. The first model included such variables as real GDP growth, inflation rates, maximum lending rates, and the CCICQ. The second and third models replaced CCICQ with the CCINQ and CCINY, respectively.

Table 4: Impulse Response Functions between CCI and GDP

PERIOD	CCICQ	CCINQ	CCINY
2 quarters	-0.0051	-0.0231	0.0162
4 quarters	0.0137	0.0255	0.0071
6 quarters	0.0001	-0.0029	0.0248
8 quarters	0.0136	0.0175	0.0124

Source: Authors' calculations

Results from the IRF in model 1 as shown in table 4 indicated that 4 quarters ahead CCICQ to growth recorded 0.0137 while 8 quarters ahead was 0.0136, indicating that a 1 per cent change in CCICQ resulted to a 1.37 and 1.36 per cent change in economic growth, respectively. Similarly, 4-quarters and 8-quarters ahead CCINQ to growth in model 2 were 0.0255 and 0.0175, showing that a 1 per cent change in CCINQ leads to a 2.55 and 1.75 per cent change in economic growth. Furthermore, 6-quarters ahead CCINY to growth in model 3 recorded 0.0248, implying that a 1 per cent change in CCINY result to a 2.48 per cent change in growth.

Table 5: Results of Variance Decomposition: How much does CCICQ Explain Growth?

	2 quarters	4 quarters	6 quarters	8 quarters
GROWTH	97.16	94.52	94.31	94.07
LCPI	2.70	3.74	3.79	3.97
MLR	0.04	0.79	0.90	0.92
CCICQ	0.10	0.94	1.00	1.04

Source: Authors' calculations

Results from the forecast error variance decomposition of the first model indicated that the variance in CCICQ only marginally explained the forecast variance in real GDP growth, as the percentage contribution remained marginal even after changing the ordering of the variables in the equation. The real GDP growth decomposition showed that the variance of the CCICQ explained only 0.10 per cent of the two quarters ahead forecast variance of growth, increasing to 1.00 and 1.04 per cent, respectively, in the next six and eight quarters. Meanwhile, real GDP growth, which accounted for 100 per cent of its variance in the first quarter, declined to 94.07 per cent in eight quarters. Inflation growth accounted for the largest contribution in the forecast variance of real GDP growth, with 3.97 per cent in the next 12 months. This was not surprising given the impact of inflation on economic growth as established in previous empirical studies on the matter (See Bawa and Abdullahi, 2012).

Table 6: Results of Variance Decomposition: How much does CCINQ Explain Growth?

	2 quarters	4 quarters	6 quarters	8 quarters
GROWTH	93.20	86.42	85.41	84.55
LCPI	4.58	8.19	8.76	9.25
MLR	0.05	0.18	0.19	0.20
CCINQ	2.16	5.21	5.64	6.00

Source: Authors' calculations

Results of the variance decomposition from the second model were, however, found to be different to that of the first model. The results showed that CCINQ explain the forecast variance in real GDP growth more than the first model, as it explained 2.16 per cent of the two quarters ahead forecast variance of growth, but increased to 5.64 and 6.00 per cent in the next six and eight quarters, respectively. Inflation accounted for the highest contribution with 9.25 per cent in eight quarters, as real GDP growth contribution declined to 84.55 per cent in during the period.

The third model, which was found to be similar to the first, indicated that CCINY accounted for 0.99 per cent of forecast variance of GDP growth in the

first 2 quarters, but increased to 1.05 and 1.06 per cent in six and eight quarters, respectively. Therefore, it seems reasonable to conclude that movements in CCI helps in explaining real GDP growth fluctuations in the country, even though the magnitude of the relationship was found to be small, judging by the magnitude of the percentage accounted for by changes in CCI to changes in GDP growth in all the three models.

Table 7: Results of Variance Decomposition: How much does CCINY Explain Growth?

	2 quarters	4 quarters	6 quarters	8 quarters
GROWTH	94.16	93.34	93.30	93.05
LCPI	4.69	4.73	4.60	4.73
MLR	0.15	0.99	1.05	1.16
CCINY	0.99	0.95	1.05	1.06

Source: Authors' calculations

4.4 Stability Tests

We employed the AR root tests to check for the stability of the VAR models. This was to ensure the reliability of the impulse response functions and the forecast error variance decomposition estimates. An estimated VAR is stable if all roots have modulus less than one and lie inside the unit circle. Results from the AR root tests presented in table 8 indicated that the VAR models satisfy the stability condition.

Table 8: VAR Stability Tests

Model 1		Model 2		Model 3	
Root	Modulus	Root	Modulus	Root	Modulus
0.976842	0.976842	0.978748	0.978748	0.982736	0.982736
-0.140532 - 0.892564i	0.903559	-0.101873 - 0.887458i	0.893286	-0.131143 - 0.900315i	0.909816
-0.140532 + 0.892564i	0.903559	-0.101873 + 0.887458i	0.893286	-0.131143 + 0.900315i	0.909816
0.707268 - 0.271875i	0.757723	0.733762	0.733762	0.766113 - 0.211363i	0.794735
0.707268 + 0.271875i	0.757723	-0.600579	0.600579	0.766113 + 0.211363i	0.794735
-0.306417	0.306417	0.522282	0.522282	-0.549539	0.549539
-0.200362	0.200362	-0.366383	0.366383	0.068365 - 0.259355i	0.268214
-0.100005	0.100005	0.121495	0.121495	0.068365 + 0.259355i	0.268214
No root lies outside the unit circle.		No root lies outside the unit circle.		No root lies outside the unit circle.	
VAR satisfies the stability condition.		VAR satisfies the stability condition.		VAR satisfies the stability condition.	

5.0   Concluding Remarks

Consumers, as economic agents, provide expectations of the possible behavior of macroeconomic variables when filling the consumer expectations survey instruments. If consumers are pessimistic about the general state of the economy, could there be a slowdown in national output resulting from such pessimism, even if they were not based on economic fundamentals? This study evaluated the predictive ability of the CCI in forecasting economic fluctuations in Nigeria. The paper applied the Granger Causality tests to see if CCI granger causes real GDP growth, as well as impulse response and variance decomposition to ascertain the magnitude of change in real GDP growth resulting from a change in CCI. Overall, it suffices to say from the above analysis that CCI granger causes real GDP growth in Nigeria. However, results from the impulse responses and variance decomposition analysis showed that CCI explained the movements in economic activities, even though the magnitude was insignificant, as it explained less than 10 per cent of the movements in real GDP growth in all the equations. This paper therefore identifies that CCI is a useful policy tool in planning and forecasting macroeconomic aggregates.

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