



The Relationship between the Economy and Property Foreclosure Outcome in Lagos Metropolis, Nigeria

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Date of Submission: 01-06-2024

Date of Acceptance: 10-06-2024

Abstract

The challenge of recovering outstanding loan through foreclosure have been linked to the state of the economy, however, only few researches have been carried out with largest concentration in the developed countries. This study examines the relationship between the economy as proxy by Gross Domestic Product (a major economy index) and property foreclosure outcome in Lagos metropolis, Nigeria. Relevant data were collected on the profiles of 154 borrowers using census approach with the use of structured questionnaire administered on the 19 Commercial bank's head offices and 18 Primary Mortgage Institutions in Lagos Metropolis respectively, out of which 22 were retrieved and found relevant for the analysis. Granger causality was used in the analysis of the data obtained from the respondents. The Granger causality test showed that the number of the property foreclosed does not granger cause the GDP as a proxy to the economy, however the study detected that GDP granger causes foreclosure outcomes at $p \leq 0.1$. The paper provides decision input framework for leaders, policy makers and general public on the nature of connection between the economy and real estate foreclosure. To the best of authors' knowledge, the paper is one of the few foremost papers in this area in Nigeria.

Keywords: Borrower, default, Foreclosure,
Paper type - Research paper

I. Introduction

Credit accessibility is very critical in the economy of any nation (Fowowe, 2017; Ukwuaba and Owutuamor, 2020). It is the barometer that indicates the growth and the development of the economy (Bello and Adewusi, 2009; Somoye, 2010; Fowowe, 2017; Bariko&Olawumi, 2023). These credits when advanced to the borrower are often secured by collateral which includes mostly

real estate assets and non-real estate to realize the outstanding loan in case of default. Where such a loan is realized, it increases the surplus funds for reinvestment in other sectors of the economy which in the long run will affect the economic growth of such a country (Ukwuaba et al, 2020; Bariko&Awolusi, 2023).

However, greater number of the properties that are used as collateral for a loan with which outstanding loan is expected to be recovered are not performing (Accornero, Alessandri, Carpinelli and Sorrentino, 2017; Awolusi, 2021). They are either difficult to sell or are selling below the expected figure (Merhbene, 2021). The majority of the unrecovered debts are locked up in the difficulty associated with disposing of the collateral with which such loan was collected (Ashamu et al, 2011).

Bello et al (2009), opined that foreclosure is usually the last resort among the debt recovery strategies for bad debt available to lenders which involves outright dispose of collateral to repay the defaulted loan. But several concerns have been raised to understanding the problem of recovering loan outstanding through foreclosure, some have linked the challenge to the state of the economy (Chow et al. 2011; AMCON, 2023) while others have associated it to other factors (Chan et al., 2016). There is growing evidence that the expected variations in property sale prices are related to the state of the economy as reflected in key macroeconomic variables in which the GDP is used as a proxy to measure the overall level of economic activities (Wang, 2024). Research findings aimed at establishing the relationship between the economy and property foreclosure has been mixed and largely inconclusive. It is against this backdrop that this study aims at examining the relationship between the economy (GDP).



The remainder of the paper is structured to include, brief review of literature, research method, empirical analysis and conclusion.

II. Literature Review

Several academics, policymakers, and regulators emphasize the role of foreclosure in the great recession and subsequent global crisis (Atif, Trebbi, and Amir 2011). Using micro-level data from all the US states, Atif et al (2011) show that foreclosure had a significant negative effect on house prices, residential investment, durable consumption- and consequently the real economy. A negative shock to the economy gets amplified into a severe and long-lasting economic slump by house price decline (Atif et al 2011). An extensive body of theoretical research shows that the forced sale of durable goods — in many cases a house — can have two undesirable consequences. First, the price of the good is driven down. Second, these negative price effects can lead to a significant decline in real economic activities (Kiyotaki & Moore 1997; Lorenzoni 2008 and Shleifer & Vishny 2010). Leamer (2007) opined that foreclosure is one of the important factors in determining major macroeconomic fluctuations as it has an obvious negative causal effect on house prices and therefore the real economic activity. According to Atif et al (2011), isolating a causal effect of foreclosures on house prices is a significant challenge because house price declines or other negative economic shocks will lead to a rise in foreclosures.

The economic links between house prices and economic activity are complex. Whatever affects house price will invariably affect the real economic activities in a nation (Aoki, Proudman, & Vlieghe; 2002; Mian, Sufi & Trebbi, 2015). House prices in the United Kingdom, and more recently in the United States have received a great deal of attention from policy-makers and economic commentators. It is often assumed that if house prices are growing rapidly, consumption growth will be strong too (James & Christos, 2023). Recent minutes of the Monetary Policy Committee meetings in the United Kingdom support this view: the continuing strength in house prices would tend to underpin consumption (Wang, 2024). Similarly, the Fed Chairman Alan Greenspan stated and thus far this year, consumer spending has indeed risen further, presumably assisted in part by a continued rapid growth in the market value of homes (Monetary Policy Report to Congress, 18 July 2001).

It is widely documented that mortgage default hurts house prices as it might lead to actual foreclosure (Wang, 2024). According to Wang (2024) citing Calomiris et al. (2013) which estimate a vector autoregressive model in which state-level macroeconomic variables such as employment, building permits, and home sales interact with house prices and foreclosures. The study find that the effect of house price shocks on foreclosures is substantially greater than that of foreclosure shocks on house prices. That is, the relationship between house prices and mortgage defaults is predominantly based on the endogenous reaction of foreclosures to prices rather than on the downward pressure that foreclosures exert on house prices (Calomiris et al., 2013). According to Wang (2024) these findings support the conjecture that mortgage defaults might occur for strategic reasons, yet the analysis is not sufficiently disaggregated to shed further light on this hypothesis.

Campbell et al. (2011) estimate a foreclosure discount as high as 27 percent of the average value of a house due to possible damage to the home and the lender's incentive to accept a lower price to sell the house quickly (Campbell et al., 2011; Wang, 2024). Mian et al. (2015) use statejudicial requirements as an instrument to account for the endogeneity between foreclosures and house prices and find that foreclosures are responsible for about 33% of the decline in house prices during the 2007-2009 period. This in other way round has a way of affecting the general economy (Mian et al., 2015). Only a few attempts have been undertaken in the literature to model the dynamic interdependence between house prices and foreclosures in a system that accounts for the broader macroeconomic environment (Mian et al., 2015). Most closely related to the present analysis is the study by Calomiris et al. (2013), who show that the negative impact of prices on foreclosure dominates the impact of foreclosure on house prices. These findings highlight the importance of the strategic choices of homeowners and lenders in shaping these bi-directional dynamics (Calomiris et al., 2013).

III. Methodology

Survey research design was adopted in this study. Data was obtained from the target population through the use of interview questions, structured questionnaires, and field surveys. The structured questionnaire was administered on the target population so as to extract the required data for the study. The target population comprises of



only the Commercial bank’s head offices and Primary Mortgage Institutions in Lagos Metropolis respectively. This is because the head offices alone possess and have the authorization to make the confidential information required available. Based on a total population of 37 clients and employing census sampling technique, 37 questionnaires were administered out of which 22 were returned and found adequate for the analysis. Transaction on a total number of 154 default properties gotten from the retrieved questionnaires were therefore examined in the analysis. The data obtained from the respondents was analysed using Granger Causality.

3.1 Granger Causality Test:

The Granger causality test is a statistical method used to determine if one time series may be considered a cause of another time series. In time series analysis, the investigation of causal links between variables continues to be a topic of considerable scholarly inquiry. The Granger causality test, originally proposed by Granger in 1969, presents a solution that deviates from the conventional notion of causality in a distinctive manner. In contrast to conventional causal relationships, characterized by a direct influence of one variable on another, Granger causality focuses on the predictive capacity of one time series with respect to another. Specifically, if a variable X_t can better predict another variable Y_t compared to Y_t 's own past values, X_t is said to "Granger-cause" Y_t (Granger, 1969).

Prior to implementing the Granger causality test, it is essential to establish the stationarity of the relevant time series. The presence of non-stationary data might give rise to spurious regressions, which can subsequently lead to incorrect conclusions (Phillips, 1986). The Augmented Dickey-Fuller (ADF) test is commonly utilized for the purpose of assessing stationarity. The fundamental principle underlying the ADF test is its utilization of hypothesis testing. Specifically, the null hypothesis asserts the existence of a unit root, which signifies non-stationarity. Conversely,

$$Y_t = a_0 + a_1Y_{t-1} + \dots + a_pY_{t-p} + b_1X_{t-1} + \dots + b_pX_{t-p} + u_t \dots\dots\dots \text{(ii)}$$

$$X_t = c_0 + c_1X_{t-1} + \dots + c_pX_{t-p} + d_1Y_{t-1} + \dots + d_pY_{t-p} + v_t \dots\dots\dots \text{(iii)}$$

Then, testing $H_0: b_1 = b_2 = \dots = b_p = 0$, against $H_A: \text{'Not } H_0\text{'}$, is a test that X does not Granger-cause Y . Similarly, testing $H_0: d_1 = d_2 = \dots = d_p = 0$, against $H_A: \text{'Not } H_0\text{'}$, is a test that Y does not Granger-cause X . In each case, a rejection of the null implies there is Granger causality.

To test the unit root hypothesis, the following form of the Augmented Dickey- Fuller test is used on each of the variables.

the alternative hypothesis refutes this notion (Dickey & Fuller, 1979). If the test statistic is more negative than the crucial value, the null hypothesis is rejected, indicating that the series is stationary. When a series is found to be non-stationary, typical approaches to address this issue involve employing differencing techniques or performing modifications such as logarithmic scaling.

After confirming stationarity, it is necessary to calculate the suitable lag length for doing the Granger test (Schwarz, 1978; Akaike, 1974). The selection of the appropriate lag time is a crucial factor in determining the precision and reliability of the Granger causality test. The selection of criteria, such as the Akaike Information Criterion (AIC) or the Bayesian Information Criterion (BIC), is frequently guided by established methodologies (Schwarz, 1978; Akaike, 1974).

The Granger causality test can be undertaken when a stationary series and an appropriate lag are available (Granger, 1969). The test aims to evaluate the relative forecasting ability of lagged values from the two series being examined. The rejection of the null hypothesis indicates that there is evidence to support the assertion that one series does indeed have a Granger-causal relationship with the other (Granger, 1969). Nevertheless, it is imperative for researchers to apply prudence when interpreting the outcomes. The presence of statistical significance does not inherently imply a causal relationship in the traditional sense. Instead, it signifies a predictive relationship, wherein previous values of one series (X) provide information about current values of another series (Y) that goes beyond what the past values of Y alone can provide (Granger, 1969).

In the case of two time-series variables, X and Y : " X is said to Granger cause Y if Y can be better predicted using the histories of both X and Y than it can by using the history of Y alone." We can test for the absence of Granger causality by estimating the following VAR model:



$$\Delta X = \alpha + \beta T + \rho X_{t-1} + \sum_{i=1}^k \lambda_i \Delta X_{t-1+i} + \varepsilon_t \dots \dots \dots (iv)$$

Where ΔX = the longrun logarithms of the variables in period t,
 T = time trend, $\Delta X_{t-1} = X_{t-1} - X_{t-2}$, ε_t = the disturbance with mean 0 and
 variance σ^2 , α , β , ρ , λ = coefficients.

In unit root test, the null hypothesis to be tested is that the coefficient of x with one lag is equal to zero ($H_0: \rho = 0$). If unit root test rejects the null hypothesis that the series has unit root, it means that the series is stationary but, if the unit root test accept the null hypothesis, it means that the series are not stationary and we need to apply difference operator to make the series stationary (Dickey et al., 1981).

In summary, the Granger causality test provides a reliable method for examining the predictive relationship between time series datasets. Although it does not establish a causal relationship in the conventional sense, it functions as a highly helpful tool for finding potential leading indicators in the context of forecasting and econometric research.

Testing of Hypothesis: Two null hypothesis were set in the study, first, this was accepted between p value of 0.89 which fail to fall within the 3

confidence level (1%, 5% and 10%) while the second was rejected between p value of 0.10 that fall at confidence level of 10%. The Granger causality test showed that the number of the property foreclosed does not granger cause the GDP as a proxy to the economy, however the study detected that GDP granger cause foreclosure outcome at $p \leq 0.1$.

IV. Result and discussion

The results of the analysis in the study are presented in this section. This section presented the arithmetic calculation of retrieved data in table (1) and the result of the unit root test conducted on each of the variables at level and others to test for stationary in table (2). Table 2 is a granger causality showing unit root test results and causal relationship between the economy and property foreclosure outcome.

Table 1: Questionnaire Distribution and Retrieval

	Questionnaire	
	Distribution	Retrieval
Commercial Banks Respondents	19 (51.4%)	14 (37.9%)
Mortgage Institution Respondents	18 (48.6%)	8 (21.6%)
Total	37 (100.00%)	22 (59.5%)

Table 1 shows that out of the thirty seven questionnaires administered to the Commercial Banks and the Primary Mortgage Institutions in Lagos metropolis 59.5% was retrieved. According to Babbie (2007) any return rate that is over 50% can be reported, over 60% response rate is good, and that over 70% is excellent. This implied that the percentage of questionnaires retrieved from the surveyed respondents is statistically adequate to represent the whole population from which inference can be made for this study; hence the results of the findings can be relied on.

4.1 Relationship between GDP and foreclosure outcome

The table 2 presents the Augmented Dickey-Fuller (ADF) unit root test results for two

distinct variables: No of properties foreclosed and GDP. The ADF test's primary objective is to discern the existence of a unit root in a time series, which can signal non-stationarity.

As earlier discussed, prior to implementing the Granger causality test, it is essential to establish the stationarity of the relevant time series. The presence of non-stationary data might give rise to spurious regressions, which can subsequently lead to incorrect conclusions (Phillips, 1986). The Augmented Dickey-Fuller (ADF) test is commonly utilized for the purpose of assessing stationarity. The fundamental principle underlying the ADF test is its utilization of hypothesis testing. Specifically, the null hypothesis asserts the existence of a unit root, which signifies non-stationarity. Conversely, the alternative



hypothesis refutes this notion (Dickey & Fuller, 1979). If the test statistic is more negative than the crucial value, the null hypothesis is rejected, indicating that the series is stationary.

So, the table 2 evaluates each variable under three unique specifications: with a constant, with both a constant and trend, and without either. For the number of properties foreclosed variable, when tested with only a constant, it produces a t-statistic of -1.7465 and a p-value of 0.3666. When incorporating both a constant and trend, the t-statistic rises to 3.1050, accompanied by a p-value of 0.9999. Without the inclusion of a constant and trend, the t-statistic becomes -0.2724, with a p-value of 0.5512.

In the case of the GDP variable, with the inclusion of only a constant, the t-statistic is -2.2827, yielding a p-value of 0.2016. When both a constant and trend are factored in, the t-statistic is -0.6474, associated with a p-value of 0.9243. Finally, in the absence of a constant and trend, the t-statistic registers at -0.5329, offering a p-value of 0.4449.

The significant level for this study includes 1%, 5% and 10% respectively. Two Null hypothesis were set for the study. Firstly, the number of property foreclosed does not granger cause GDP. This was accepted because p value of 0.89 fails to fall within the three confidence levels of 1%, 5% and 10% respectively. While the second

hypothesis, the null hypothesis was rejected on the ground that p value falls within 0.1% which shows that GDP granger causes the outcome of property foreclosure at $p \leq 0.1$

In that wise, for number of property foreclosed, we accept the Null hypothesis because the p value is greater than any of the confidence levels which include 1%, 5% and 10% respectively. The hypothesis is accepted on that basis because none falls within the confidence levels. That means the volume of property foreclosed does not really make a major contribution to the GDP of the economy. This is in line with the obvious while the contribution of property to GDP has been very significant (Ngoc et al., 2022), however, foreclosure is expected not to make major contribution because foreclosure is always the last resort in loan recovery strategy (Bello et al, 2009).

It is pertinent to note that GDP controls every sector of the economy, the hypothesis set is rejected on the basis of the fact that the p value falls within the three categories of 1%, 5% and 10% respectively. In this regard, the GDP significantly granger causes the number of property foreclosed at $p \leq 0.1$ which indicates that a good GDP would have positively influenced the foreclosure market (Ngoc et al., 2023). But if GDP is bad it will also affect the foreclosure which has been depressed already (Ngoc et al., 2022).

Table 2: Ganger causality showing unit root test results and causal relationship between the economy and property foreclosure outcome

UNIT ROOT TEST RESULTS TABLE (ADF)

Null Hypothesis: the variable has a unit root

At Level			
		NO_OF_PROPERTY Y_FORECLOSED	GDP
With Constant	t-Statistic	-1.7465	-2.2827
	Prob.	0.3666	0.2016
With Constant & Trend	t-Statistic	3.1050	-0.6474
	Prob.	0.9999	0.9243
Without Constant & Trend	t-Statistic	-0.2724	-0.5329
	Prob.	0.5512	0.4449
Pairwise Granger Causality Tests			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
NO_OF_PROPERTY_FORECLOSED does not			
Granger Cause GDP	6	0.12752	0.8926
GDP does not Granger Cause NO_OF_PROPERTY_FORECLOSED		42.6694	0.1076



Notes:

a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant

b: Lag Length based on SIC

c: Probability-based on MacKinnon (1996) one-sided p-values.

However, the result of Ali, Maryam, and Malile (2011) was in line to the findings of the study. The author opined that there is an evidence of a significant multidirectional link between house prices and macroeconomic factors.

V. Conclusion and Recommendations

This study examines the relationship between the economy (GDP) and property foreclosure outcome in Lagos, Nigeria. Transaction on a total number of 154 defaulted residential properties gotten from the retrieved 22 questionnaires out of the 37 participating commercial banks heads offices and financial institutions in Lagos metropolis were therefore examined in the analysis. The result of the Granger causality test shows that the number of the property foreclosed between the year 2010 to 2017 does not granger cause the economy (GDP) as the p value does not fall within any of the confidence levels which include 1%, 5% and 10% respectively. Meanwhile the GDP significantly granger cause the number of property foreclosed at $p \leq 0.1$ which indicates that the GDP has positively influenced the foreclosure market. This relationship will provide framework for decision making for policy makers, investors and professionals. It will provide decision input for them on how to invest and how to improve the economy. If GDP increases, then all other things will have positive effect.

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