

EFFECT OF MORTGAGE FINANCE ON HOUSING DELIVERY IN NIGERIA: THE PRIMARY MORTGAGE INSTITUTION (PMI) PERSPECTIVE

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Abstract

This paper examined effect of mortgage finance on housing delivery in Nigeria. One of the major goals of PMIs is to boost investments and engender increased housing growth among 36 States of Nigeria and the Federal Capital Territory. In this study, we investigated how primary mortgage institutions had impacted on investments in housing sector in Nigerian using annualized data from 1992 to 2016. We employed the ordinary least square (OLS) estimation in analyzing a modified finance model. The Johansen co-integration test was also utilized. From the unit root test, evidence of long-run relationship was found to exist between mortgage finance and housing delivery over the period studied - both at the instances of the Trace statistic and the Max-Eigen test statistic. The results of the OLS found that mortgage deposit had a positive and significant impact on housing delivery in Nigeria, while mortgage loan exerted negative and non-significant influence on housing provision in Nigeria. This study concludes that while housing is an important sector that can drive the Nigeria economy, inadequate supply of mortgage finance to the sector stifles its growth and overall economic impact. We therefore, recommend that the government and monetary authorities should make crucial policies to improve activities of PMIs for optimal performance; access to PMI mortgage loans should be made easier and at lower interest rate.

Keywords: Mortgage financing, Mortgage banker, Housing, Regression analysis, Nigeria

1. Introduction

Housing is globally acknowledged as one of the fundamentally important requirements for existence and survival of human race, as well as a critical component of a country's economy. Okidi and Ellah (2013 citing Abraham Maslow's hierarchy of needs) regard housing as one of the three primary necessities of humanity, and is the most essential requirement for physical survival of people together with food and clothing. A robust housing programme creates the enablement for stable rural and urban communities in combination with social inclusiveness (Amao and Odunjo, 2014). In that regard, the right to occupy a decent shelter is paramount and the availability of decent and affordable housing should be one of the distinguishing marks of a developed economy. On the contrary, significant growth in the housing sector in developing countries including Nigeria seems one of the "knotty issues" hampering human and national development.

Since there is no “free lunch” anywhere, economic agents (individual, household, firm and government) usually obtain loan to acquire assets like real estate. They depend on informal financial institutions such as age-grades or formal institutions like mortgage bankers for financial support. In most cases, loan recovery strategies are put in place by lending institutions to guard against default. As a precautionary measure, properties are mortgaged and the lender enjoys the lien (legal claim on borrower’s property) to keep or sell the property as security for the debt (Microsoft Encarta Dictionary, (2009, DVD). Nwankwo (2014) sees mortgage financing model as a panacea for solving housing related problems in Nigeria.

In compliance with the position of housing in the very well-known Abraham Maslow’s hierarchy of needs hypothesis, the government of Nigeria ostensibly created the National Housing Fund (NHF) Scheme in 1991. In order to actively drive this financing model for greater efficiency, FGN established the Primary Mortgage Institution (PMI) so as to deepen liquidity of housing business (Acha, 2007). Sanusi (2003) and Nwankwo (2014) clearly substantiate the essence of housing thus:

“... it is one of the three most important basic needs of mankind, the others being food and clothing. Second, housing is a very important durable consumer item, which impacts positively on productivity, as decent housing significantly increases workers’ health and well-being, and consequently, growth. Third, it is one of the indices for measuring the standard of living of people across societies.”

PMIs gather long-term funds for the development of housing (Onoh, 2004 cited in Acha, 2012). For this reason, the National Housing Policy (NHP) launched by the government in 1992 was intended to further improve activities in this sector. Workers in public and private service, banks and non-bank institutions were required to contribute to housing development. These funds were to be lent to PMIs by the Federal Mortgage Bank of Nigeria (FMBN) for on lending. The PMIs besides gathering their own deposits also grant borrowers access to loans in line with NHP. However, the performance profile of PMIs so far towards desirable housing delivery in Nigeria is below expectation (Amao and Odunjo, 2014). Acha (2012 citing Umoh, 1997) ascribes the cause partly to weak corporate governance, for example lending for non-housing purposes. Similarly, Okonjo-Iweala (2013) observes that in spite of the various reforms introduced in the mortgage institutions in Nigeria by government, the sector has remained inactive and irrelevant owing to inability of the market to lend considerable financial support to potential house owners. Moreover, Sanusi (2003) opines that the perception that PMIs mandate to intermediate funds for adequate housing delivery has been satisfactorily accomplished to date is arguable. It is against that backdrop that our paper intended to examine the extent PMI activities had promoted the housing sector in Nigeria for the period 1992 – 2016.

The problem associated with our research topic is not far-fetched. Mortgage financial institutions in most circumstances play a unique role in every economy in order to satisfy a psychological need. It is worthy of note that in developed economies such as the United States of America, United Kingdom, Canada, France, Denmark, among others, the common practice of owning a house is by means of an established mortgage system. It is likely therefore that their mortgage scheme is not being ineffectively and inefficiently managed. In contrast to the near perfect mortgage system of developed world, there is yet to be consensus on issues relating to housing in Nigeria among scholars, policymakers, administrators and the public (Sule, 2006 cited in Udoka and Owor, 2017). Besides, fewness of scholarly works on influence of primary mortgage institution on housing delivery in Nigeria has seemingly created a gap in knowledge. Against that backdrop this paper sought to contribute to the existing literature in order to at least ascertain both direction and magnitude of the relevant

dependent and independent variables that make up the model of this study over 1992 – 2016 sampled periods.

Apart from the already stated broad objective of this paper, the specific objectives that provided directions to this study were to: (i) examine the effect of PMIs' deposits on mortgage investments in Nigeria, and (ii) ascertain the influence of PMIs' loans on mortgage investments in housing sector in Nigeria

In conformity with our research objectives, the following hypotheses were tested: (i) deposits collected by PMIs did not positively and significantly affect mortgage investments in Nigeria over the sampled period, and (ii) loans granted by PMIs did not positively and significantly influence mortgage investments in Nigeria over the sampled period.

2. REVIEW OF RELATED LITERATURE

2.1 Concept of Mortgage Finance

First and foremost, a mortgage is a pledge of property as collateral for a loan; the mortgage becomes a lien on the property's title or the title is held in trust until the loan is repaid. Simply, a mortgage is an agreement by which a borrower offers his/her legal right to possess or dispose of property (title) as security for a loan. Usually, the borrower pays off the loan by monthly installments of both principal and interest. If the borrower is found wanting, the lender can terminate the mortgage, put up the property for sale in order to repay the money lent.

Taking above explanation into consideration, mortgage finance is money lent to a borrower by a mortgage institution on the security of a house or other property owned by the borrower, usually in order to enable the borrower to buy the property with detailed payment schedule and interest (Colaniran, 2003 cited in Okidim and Ellah, 2013). In other words, Ezimuo, Onyejiaka and Emoh (2014) explain that any time a loan is granted and committed for housing, the property in turn serves as collateral for the debt. The mortgage institution's claim on the property comes to an end as soon as the borrower fully repays the said loan. In a mortgage agreement, the lending institution is also called mortgagee, while the borrower is also called mortgagor.

Mortgage financing commenced with the setting up of Nigeria Building Society (NBS) by the colonial master in 1957. This initiative was designed to gather funds required to deal with housing and related needs. Housing Corporation with focus on living accommodations was established shortly thereafter. In order to advance course of ameliorating consequences of housing problems in Nigeria together with the NHP, mortgage institutions were required to source funds from mortgage banks for on-lending to potential house owners. Examples of mortgage financial institutions in Nigeria includes the Federal Mortgage Bank of Nigeria (FMBN) and the many primary mortgage institutions (PMIs) – the focus of this paper. The specific functions of PMIs involve savings mobilization, mortgage financing and investments.

Deposit taking from the public into different accounts such as house ownership savings account; personal/general savings account; education endowment savings accounts; joints savings account; target savings account, etc. is the core mandate of PMIs. These various deposit accounts catalyze high deposit accumulation for PMIs, thereby constituting their primary source of capital formation. For the purpose of boosting deposit gathering, most

PMIs create appealing products in addition to the National Housing Fund (NHF) loans like estate development loan, etc. (Adebamowo, Oduwaye and Oduwaye, 2012). Lending from savings deposit to businesses stimulate economic activities especially in the housing sector. Agbada and Ekakitie-Emonena, (2016) citing (Quijano and Quijano, 2003) argue that the amount of capital, *ceteris paribus*, determines the amount of output that is produced; and in like manner, the amount of output determines the amount of savings and investments and so the amount of capital accumulated. The amount of domestic savings is a measure of a robust mortgage market. Perhaps, the higher the amount of savings collected, the higher the amount of loanable funds available for mortgage and for investments in the other segments of the economy.

Mortgage finance is another important business of PMIs pursuant to the legislations that anchor their existence. Mortgage finance is credit facility given for erecting living accommodations and other housing needs. Sanusi (2003) assert that owing to high value government place on provision of decent and affordable accommodations for the citizenry, the CBN through its credit policies enabled commercial and merchants banks to allocate a stipulated minimum quantum of their credit to fiancé the housing programmes of the government. It is stipulated that “*Where banks failed to meet the stipulated target, such shortfalls were deducted at source from the defaulting bank’s deposit with the CBN and passed on to the housing/construction sector through the Federal Mortgage Bank of Nigeria*” (Sanusi, 2003). The author also posits that other non-bank financial institutions like insurance companies possess core competencies required for overall housing development for reason of their expertise, stable funds as well as long-term nature of their liabilities. For instance, funds from life insurance policies supply suitable finances that can be harnessed to meet the housing sector needs.

Investment is the third important business of PMIs. It denotes a commitment of something such as money, effort and time to an activity, project or undertaking for a profit, and appears the most volatile (unpredictable) activity. Investment is viewed as one of the key determinants of state of economy of a country. Agbada and Ekakitie-Emonena (2016) see investment from two perspectives with regard to PMIs’ operations: housing investment that relate to the activity of developing physical infrastructure, superstructure and associated facilities of buildings, and investment in assets and securities that PMIs may engage in with their surplus funds.

2.2 Concept of Housing

Housing may not command a consensus definition among scholars. This implies that housing cannot stand alone; it interfaces with other segments of a country’s economy, which include the financial institution, environment and business (private), sectors (Popoola and Alamu, 2016). On that account, Popoola and Alamu (2016) citing Agbola (1998) observes that housing is a combination of service-oriented undertakings.

Bourne (2007) defines “housing” in these differing opinions: (1) a sellable commodity (economic good) for which there is market demand, and for which a monetary value can be determined as an investment; (2) a physical facility, unit of structure or building designed to provide shelter, and (3) an instrument for wealth creation and a mechanism for promoting economic growth. Those definitions are closely linked, and three important realities are conveyed. First, as a structure or dwelling, housing provides cover from weather or

protection against vulnerability, and so fulfils health and safety needs for continuity of humanity. Secondly, housing is also an article of ostentation. In Nigeria, especially among the political class, housing is designed for conspicuous or vulgar display of wealth and success, and to impress people. The house a person occupies remains a determinant of his social status, achievement and a sign of self-expression (Agbola, 1995). It therefore satisfies a social need. Thirdly, as a tradable asset, housing is synonymous with investment – a stock of capital, item of product; money is invested in it with the goal of making a profit for an individual, firm or government. Popoola and Alamu (2016) reveal that in United Kingdom, Canada, United States, among others, housing contributes between 30 percent and 70 percent to their GDP, whereas the sector represents merely 0.38 percent of GDP in Nigeria. In that regard, housing meets economic need of economic agents (individual, firm and government).

2.3 Theoretical Review

The influence of mortgage finance on volume of activity in real estate could be explainable when juxtaposed with the theory of general finance in which through financial intermediation funds are transferred from banks and even non-bank institutions to create employment, output and prices in the critical sectors of the economy (Nwankwo, 2014). The connection between economic variable and economic activity is regarded as transmission mechanism (Microsoft Encarta Dictionary, 2009). In other words, transmission mechanism may imply the manner in which a change in mortgage finance leads to a change in the housing sector. In this regard, two theories have gained the interest of this study, namely: lien and title theories. In the course of purchasing a property, it is sufficiently rewarding for the parties involved to agree on the particular theory that shall bind them.

2.3.1 Lien Theory of Mortgage

According to Nwankwo (2014), lien theory was authored by Hester in 1975. Lien theory is a financing principle that withholds title deed from lending banker (Mortgagee) via a mortgage contract. In other words, the mortgagor (or buyer) keeps the property deed (document indicating who the owner of a property is) throughout the tenure of the loan. The buyer promises to make all payments to the lender and the mortgage becomes a lien on the property, but title remains with the borrower (or buyer). The lender's right of ownership ceases as soon as all outstanding loans are paid off by the borrower. In most cases, removal of right to redeem mortgage loan for the mortgage institution (lender) may be hard to do in this regard because the buyer and not the lender is having title to the property.

2.3.2 Title Theory of Mortgage

According to Gilbert (1968) the basic assumption of title theory of mortgage is that the deed of property does not stay with the mortgagor (borrower or buyer) until the mortgage loan is fully repaid (Nwankwo, 2014). Under this arrangement, the title deed would be placed in custody of a trustee, and the borrower would enter into a deed of trust agreement rather than a mortgage contract. A deed of trust is a document that contains the agreement between a lender and borrower to transfer the title in the borrower's property to an unbiased third party (known as trustee) who ensures repayment of a loan by the borrower. The borrower risks losing title to his/her property through litigation or foreclosing actions of the trustee in case outstanding mortgage obligations remain unfulfilled. The trustee derives authority from the

deed (a signed document that specifies a change in ownership of a property) to sell the property and pay the lender his/her due. By and large, foreclosure proceeding is enforceable under title theory unlike the lien theory since right of ownership to property does not reside with the buyer or borrower before full payment is made.

2.4 Previous Studies

This study focused on effect of mortgage finance on housing delivery in Nigeria. In order to gain insight into our study objective, various relevant empirical works were reviewed. Among the scholarly works that gained attention of our study were Udoka and Owor (2017) who examined the impact of mortgage financing on housing development in Nigeria. Data sourced from CBN Statistical Bulletin and National Bureau of Statistics spanning 1990 – 2014 were used for analysis. Stationarity traits of the series were affirmed using Augmented Dickey-Fuller (ADF) unit root test. A long-run relationship was established among the variables using co-integration tests. The Error Correction Model (ECM) indicated causal links and dynamic interactions between variables by Granger causality test. The study discovered that mortgage financing had a positive and significant effect on housing development in Nigeria. Specifically, variables like mortgage loan and interest rate affected housing development positively and significantly, whereas cost of building influenced housing development negatively. Moreover, mortgage deposit impacted positively on mortgage investment, while inflation rate impacted negatively on mortgage investment. This study showed that mortgage loan had significant and positive impact on the development of housing in Nigeria. Also, the analyses of the result revealed that increase in other factors such as population growth, interest rates and mortgage bank deposits had significant and positive impact on housing stock, while cost of building material and inflation rates affected housing investment negatively.

Agbada and Ekakitie-Emonena (2016) studied primary mortgage institutions' fundamentals and gross domestic product increase in Nigeria. The underlying principles guiding PMI operations were made up of deposit acceptance, mortgage finance and investments. In view of that, PMIs deposit, PMIs loan and PMIs investment constituted the independent variables, while GDP became the dependent variable. Relevant data used for analysis were obtained from the Statistical Bulletin of CBN, and analyzed employing multiple regression method. The findings revealed that coefficients of the t-test parameters were low showing that the impact of independent variables on GDP was of very little importance, implying that their contributions to GDP were non-significant during the sampled period.

Hamza and Mohd (2016) assessed the constraints of owning living accommodations in Nigeria via mortgage loan by focusing on determinants of intention of using mortgage in financing home ownership in Nigeria. The study employed quantitative survey design by randomly administering questionnaires to 300 prospective homeowners who formed sample size of the study. The technique of analysis was done using partial least squares-structural equation modeling. The results showed that religious perception on mortgage was the most significant factor that upheld the aim to use mortgage to buy residential homes. Personal opinions and feelings (rather than facts) equally had significant impact on intention of

applying mortgage financing. Attitude and knowledge of mortgage, however, had a non-significant impact on intention of using mortgage financing.

Popoola and Alamu (2016) assessed the house financing programme of government and the problems connected to it. Desk research methodology was adopted for the study. It was discovered that government financing approach had not yielded expected results on account of politicization of its modus operandi.

Adetiloye and Eke (2016) investigated the relationship between financial architecture, real estate market and economic development in Nigeria. It was discovered that the Nigerian financial system had hampered development of Nigerian real estate sector; thereby aggravating poverty rate of the country.

Eni and Danson (2014) assessed the factors that influenced supply of private sector housing in Calabar. Survey and systematic sampling method was used to enumerate houses along the street of the city. The findings revealed that factors such as cost of land, construction, population growth, inflation rate and income per capita contributed to housing delivery in Calabar. Also adopted for analysis were percentiles, t-test and Pearson product moment of correlation. The result showed that inadequate number of mortgage institutions in Nigeria contributed to inadequate supplies of housing.

Nwankwo (2014) evaluated the effect of mortgage financing on housing for all in Nigeria by year 2020. The paper used quantitative data and regression analysis to test the hypotheses. Results of the study indicated that mortgage loan, commercial bank loan and private sector investment had significant and positive impact on housing for all in Nigeria by the year 2020. Put differently, the study concluded that mortgage financing had a positive and significant impact on supply of housing for all in Nigeria by year 2020. This implies that mortgage financing is yet to accomplish the goal of general housing for the populace.

Makinde (2014) examined present and past housing pricing policies of both private and public sectors of Nigerian economy, as well as issues associated with demand and supply of accommodations. The paper specifically investigated factors that make housing unaffordable to residents. The study relied on primary data obtained through interviews and questionnaire administration. Investment in real estate was found to need enormous spending of money, which can be sourced from different means such as personal savings, equity or self-financing, commercial and merchant banks, insurance companies, mortgage institutions, etc. Recommendations were made on how best to sustain housing delivery in Nigeria in line with global best practices.

Amao and Ilesanmi (2013) studied effect of housing delivery on housing affordability in Nigeria. Specifically, the study examined the various housing policies over time, as well as the factors responsible for poor housing delivery. The paper adopted desk research design utilizing secondary data in form of journal articles, books, periodicals, seminar papers. The study concluded that socio-cultural based models should be developed to tackle enormous housing inadequacies in Nigeria rather than copying foreign based models.

Oyedokun, Adewusi, Oletubo and Thomas (2013) adopted survey research employing questionnaire, weighted mean score and correlation analysis to examine mortgage financing in Nigeria. The finding showed that statistical based credit models were rarely applied by mortgage institutions in Nigeria. The study also revealed that operations of lending institutions were yet to be fully information and communication technology (ICT) compliant.

Adetiloye (2013) investigated the effect of National Housing Fund (NHF), a government agency on capital formation in Nigeria. The study applied the two stage least square (2SLS) techniques to estimate the variables, which included capital formation, lending rate, capital

expenditure and the totality of mortgage loans in the economy as explanatory variables, while housing units formed the response (dependent) variable. The empirical results indicated that mortgage finance was significant; insurance companies' advances for mortgage were also significant, while NHF was non-significant on account of various challenges facing the Fund. Ozurumba (2011) used correlation analysis to assess urban housing financing in the South-Eastern states of Nigeria. The result of the empirical study indicated that badly established organizing system and insufficient funding had been the bane of mortgage institutions in realizing the country's housing objectives.

Pollio and Obuobie (2010) in a study on mortgage financing and loan repayment in Ghana employed quantitative data of about 1000 randomly selected credit facilities granted between 2002 and 2007. The result indicated that loan monitoring activities amazingly aggravated the probability of default by 48 percent. In other words, the finding showed that repayments were affected mostly by frequency of loan monitoring among Ghanaian profit-oriented microfinance banks. This was due to extreme pressure from the microfinance banks' agents who encouraged borrowers to invest in high-risk projects in order to generate higher cash flows to defray cost of the loan.

Mortgage finance has been reviewed theoretically and empirically. Theoretically, our study reviewed the lien and title theories of mortgage. In view of that, the lien theory formed the foundation for this study.

Empirically, this study reviewed various works in relation to the topic under investigation, sampled period, jurisdiction, methodology, as well as research findings. Following differing results, it appears the debate relating to our study objective is essentially inconclusive. Moreover, the fewness of literature in this area remains a knowledge gap to be filled.

3. DATA AND METHODOLOGY

This study made use of annualized data that covered years 1992 – 2016, which were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin. *Ex-post facto* research design was adopted because the independent and dependent variables were examined in retrospect for probable variations in independent variables produced on the dependent variable. The independent variables were mortgage loan, interest on loan and inflation rate, while the dependent variable was housing stock.

3.1 Model of Specification

The baseline model in this work is patterned after the model used by Udoka and Owor (2017) in a study that examined the effect of mortgage financing on housing development in Nigeria. The authors' regressed housing stock against the variables that proxied mortgage financing. The model is presented in this form:

$$\begin{aligned}
 & \text{HOS} = f(\text{MOL}, \text{COB}, \text{INT}) \\
 & \text{HOS} = \beta_0 + \beta_1\text{MOL} + \beta_2\text{COB} + \beta_3\text{INT} + \mu_t
 \end{aligned}
 \tag{1}$$

HOS means housing stock, MOL is mortgage loan, and COB denotes cost of building, while INT is interest on loan. β_0 is constant, $\beta_1 - \beta_3$ denote coefficients of mortgage loan, cost of building and interest rate, and μ_t is error term. Following from the foregoing, we modified equation (1) to arrive at our primary model which provides basis of our study. The baseline model is represented mathematically thus:

$$MIV_t = \beta_0 + \beta_1 MDEP_t + \beta_2 MLN_t + \beta_3 MLR_t + \mu_t \quad (2)$$

Where t denotes time period, β_0 = intercept, β_1 to β_3 = coefficient parameters, $MDEP$ = mortgage deposit, MLN = mortgage loan, MLR = mortgage lending rate, and μ is error term. MIV = mortgage investment, which is a dependent variable.

3.2 Techniques of Analysis

The techniques of data analysis employed by this study include the unit root test, descriptive and Ordinary Least Square (OLS) as econometric method for estimating the variables. The Augmented Dickey-Fuller (ADF) test was used to ascertain stationarity of the variables in this study. The descriptive

Statistics (normality test was applied to determine how well distributed the variables were, while the Johansen co-integration test ascertained long-run relationship among variables in the model.

4. RESULTS AND ANALYSIS

4.1 Unit Root Test

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test Result

Variable	ADF-Statistic	5% Critical Value	P-value	Order of Int.	D.W. Stat.
MIV	-8.789	-2.998	0.0000	I(1)	2.06
MDEP	-4.932	-2.998	0.0007	I(1)	1.78
MLN	-12.73	-2.998	0.0000	I(1)	2.07
MLR	-9.238	-2.998	0.0000	I(1)	2.40

Source: Author's, 2018

Unit root (stationarity) test results presented in Table 1 reveal that all the series: MIV, MDEP, MLN and MLR are stationary after first differencing. The inference is based on the fact that the calculated values are more negative than the critical values for each of the variables tested. Therefore, all the variables attained stationarity at 5% critical values or integrated of same order one; hence there is no suspicion of unit root. Moreover, the Durbin Watson statistic for all series approximate to 2.00, which indicate no trace of autocorrelation. Note that model estimation relating to time series that are not stationary is likely to produce spurious regress results.

4.2 Descriptive Statistics

Table 2: Descriptive Statistics Result

	MIV(₦'B)	MDEP(₦'B)	MLN(₦'B)	MLR(%)
Mean	38688.85	79682.60	1874.475	17.54840
Median	14909.50	64581.00	1228.120	17.60000
Maximum	89697.50	186946.0	7560.000	24.40000
Minimum	611.8000	1044.000	334.7000	3.610000
Std. Dev.	39029.43	76400.23	1936.804	3.642021
Observations	25	25	25	25

Source: Author's, 2018

Table 2 describes individual characteristics of the proxied variables. Mortgage investments (MIV) averaged ₦38,688.85 between 1992 and 2016. The highest mortgage investment was in 2009 at ₦89697.50, while it recorded lowest in 2007 at ₦611.80. Mortgage deposits

(MDEP), mortgage loans (MLN) and mortgage lending rate (MLR) averaged ₦79,682.60, ₦1,874.45 and 17.5 percent respectively over the 25-year period.

4.3 Co-integration Test

Table 3: Johansen Co-integration Test Result

Date: 03/05/18 Time: 17:24
 Sample (adjusted): 1994 2016
 Included observations: 23 after adjustments

Trend assumption: Linear deterministic trend
 Series: MIV MDEP MLN MLR
 Lags interval (in first differences): 1 to 1
 Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.758335	61.73434	47.85613	0.0015
At most 1	0.586882	29.06969	29.79707	0.0605
At most 2	0.255766	8.737183	15.49471	0.3903
At most 3	0.081008	1.942985	3.841466	0.1633

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.758335	32.66465	27.58434	0.0102
At most 1	0.586882	20.33251	21.13162	0.0644
At most 2	0.255766	6.794198	14.26460	0.5138
At most 3	0.081008	1.942985	3.841466	0.1633

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level

Source:

Author's, 2018

Table 3 confirms co-integration (long-run relationship) among our variables. The Johansen co-integration result presented in Table 3 indicates that there is one co-integrating equation among the variables. Therefore, the null hypothesis of no co-integration was not accepted in both the trace statistic and the Max-Eingen statistic as the p-value of “None” is less than 5% level of significance.

4.4. Model Estimation

Since our series are I (1) order of integration and the confirmation of co-integrating equations in Table 3, we employ ordinary least square method in processing our model.

Table 4: Regression Result

Dependent Variable: LOG(MIV)
 Method: Least Squares
 Date: 03/07/18 Time: 09:19
 Sample: 1992 2016
 Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.953743	1.393701	0.684323	0.5013
LOG(MDEP)	0.909022	0.086140	10.55281	0.0000
LOG(MLN)	-0.288653	0.219237	-1.316626	0.2022
MLR	0.077634	0.047037	1.650498	0.1137
R-squared	0.861811	F-statistic	43.65535	
Adjusted R-squared	0.842070	Prob(F-statistic)	0.000000	
S.E. of regression	0.720607	Durbin-Watson stat	1.803496	

Source: Author's, 2018

Model Equation:

$$\text{LogMIV} = 0.953743 + 0.909022\text{logMDEP} - 0.288653\text{logMLN} + 0.077634\text{MLR}$$

4.5 Discussion of Findings

Based on the OLS estimate shown in Table 4, the main regressor, mortgage deposits collected by PMIs (MDEP) reveal positive significant influence on the explained variable, mortgage investments (MIV) made in the housing sector of the Nigerian economy for the period 1992 – 2016. This is explained by the positive coefficient value (0.9537) of the causal variable (MDEP) and the corresponding probability value (p-value) of the t-statistic (0.0000), which is less than 5% critical, value. The second explanatory variable, mortgage loans (MLN) granted by PMIs to prospective house owners have a negative and non-significant influence on mortgage investments recorded in the housing sector for the sampled period. This is described by the negative coefficient value (-0.2887) of the explanatory variable (MLN) and the corresponding p-value of the t-statistic (0.2022), which is greater than 5% significance benchmark. The third independent variable, mortgage lending rate (MLR) has a positive and non-significant influence on mortgage investment (MIV). This outcome is explained by the positive coefficient value (0.0776) of the causal variable (MLN) and the corresponding p-value of the t-statistic (0.1137), which is greater than 5% significance level.

Table 3 further indicates that the regression line has a positive intercept as shown by the constant (c) = 0.9537. This means that if all the variables are held constant (zero), the housing sector (proxied by mortgage investment) would be valued at 0.9537. Thus, since the a-priori expectation is that the intercept could be positive or negative, so it conforms to the theoretical expectation.

Based on our regression result, the **coefficient of determination (R²)** is recorded as 0.861811, which proves that the explanatory power of the variables is very high and/or strong. This implies that 86 percent of the variations in housing delivery (proxied by mortgage investment – MIV) in Nigeria is being accounted for or explained by the variations in MDEP, MLN and MLR, while other determinants of housing delivery not captured in the model explain just 14 percent of the variation in housing delivery growth in Nigeria.

The **adjusted R²** affirms the claims of the R² with a value of 0.842070 implying that 84 percent of the total variation in the explained variable (housing delivery – proxied by MIV is explained by the explanatory variables (the regressors). This lay credence to the statement that the explanatory power of the variables is very high and strong.

A close observation of the **standard error** as presented in Table 3 shows that all the explanatory variables were significant. The low value of the standard error in the result affirms that some level of confidence can be placed on the estimates.

As indicated by the **F-statistic**, the overall effect of the explanatory variables on the explained variable is significant (that is, F-statistic is 43.6554, and the p-value of the F-statistic is 0.000000). Since the p-value of the F-statistic is less than 0.05, we conclude that the independent variables had significant effects on housing sector in Nigeria for the period under consideration. Moreover, the **Durbin-Watson** value shows that our model is free from serial correlation (that is, DW statistic is approximated at 2.00).

4.6 Diagnostic Test

The normality of our series is confirmed in Fig. 1 below; hence the probability value (p-value) of Jarque-Bera statistic is 0.105991, which is significantly greater than 5% level of significance. This indicates that our series are normally distributed.

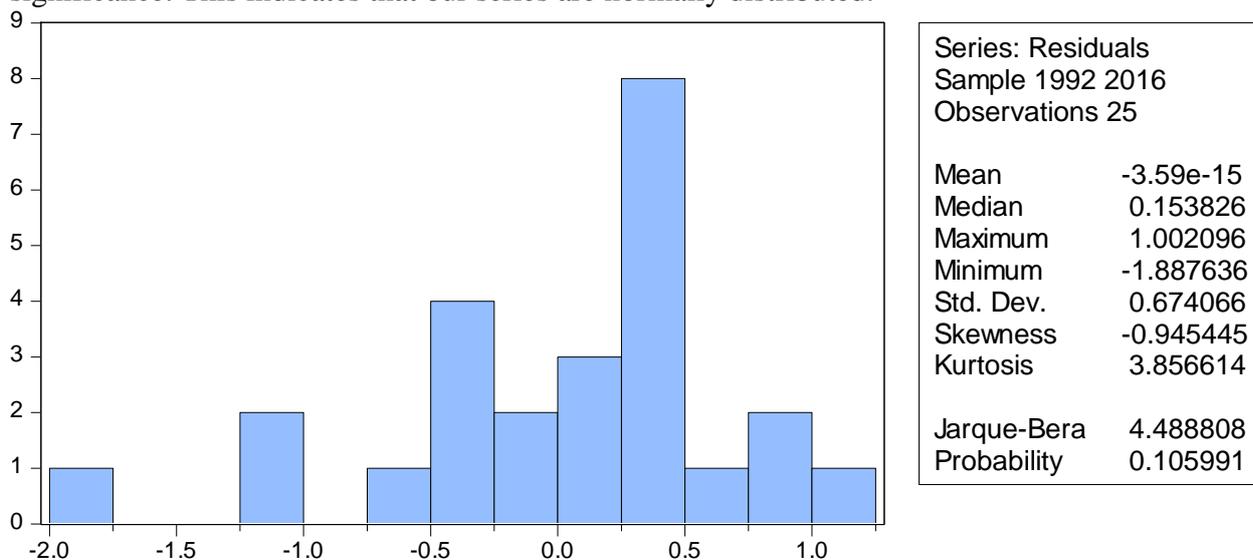


Fig. 1: Histogram – Normality Test

Source: Author's, 2018

4.7. Conclusion and recommendations

Housing has been widely acknowledged as the key driving force for human development in a country. The importance of housing is appreciated by governments and monetary authorities hence require much attention, while funds should be made accessible to the sector at low rate so as to boost and sustain its economic activities. It is against this backdrop that we examine in this study effect of mortgage finance on housing delivery in Nigeria: The primary mortgage institution (PMI) perspective spanning the period 1992 – 2016 using Ordinary Least Square (OLS) technique. All data utilized were secondary in nature and sourced from the Central Bank of Nigeria Statistical Bulletin. The OLS method was used after ascertaining

stationarity of our series using ADF Statistic. Co-integrating relationship was determined using the Johansen approach, which indicated evidence of a long-run relationship between mortgage finance and housing delivery in Nigeria within the sampled period.

The results of the OLS technique reveal that mortgage deposit has exerted positive influence on housing delivery. The finding shows that when deposits to the PMIs increase by 1%, rises by 90.9%. The result also indicates that mortgage lending rate had a negative effect on housing delivery. A unit change in mortgage lending rate led to 7.7% increase in housing delivery. However, a unit change in mortgage financing to the housing sector led to 28.9% fall in housing delivery. This study contradicted the work of Udoka and Owor (2017) and Nwankwo (2014). We therefore conclude that while housing is an important sector that can drive the Nigerian economy, inadequate provision of mortgage finance to the housing sector stifles its growth and overall economic impact. This sector needs further boost; hence the government and monetary authorities should make crucial policies to improve activities of PMIs for optimal performance. Appropriation for the housing market should be increased to promote housing purchase as well as renovation of dilapidating ones. Access to PMI mortgage loans should be made easier and at lower interest rate.

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