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Influence of the Nigerian Macro-Economy on the Development of Private Housing in Ilorin

ASHAOLU THOMAS A.[1], OLATUNJI OLANREWAJU S.[2], ADEWUSI AMOS O.[3]
[1]*Department of Estate Management & Valuation, Federal University of Technology), Ilaro, Nigeria*
[2,3]*Department of Estate Management, Federal University of Technology, Akure, Nigeria*

Abstract- ***A lot of research have been done in examining Nigerian macroeconomic variables but those focusing on their nexus with property development are still scanty. In this study, an investigation has been carried out on the relationship between selected variables of the macro-economy of Nigeria and the development of private housing in Ilorin (a North-central city), from 2010 to 2040 using historical and forecast data. Specifically, three macroeconomic variables—Exchange Rate (EXR), Unemployment Rate (UNEMPR), and Money Supply (MS)—were obtained from the statistical bulletin of the Central Bank of Nigeria (CBN) as well as the online portal of the Nigerian Bureau of Statistics (NBS). The collected data were analyzed using both descriptive and trend analysis as well as the multiple regression. The study revealed some fluctuations in macroeconomic variables over the past, though they were relatively stable between 2010 and 2014. In particular, money supply depicted a significant positive relationship with housing developments, while both the exchange rates and level of unemployment indicated significant negative effects. Trend analysis also indicated that the development or supply of all housing types will decrease through to 2040 with macroeconomic variables exhibiting upward growth over the period. Understanding this relationship between housing development and macroeconomic variables is crucial in providing decision frameworks for private developers and professionals in the housing market. Invariably, there would be need to diversify investments and keep a close eye on macroeconomic indicators as keys to managing the risks and opportunities in the housing sector.***

Index Terms- ***Exchange Rate, Money Supply, Nexus, Private Housing, Unemployment***

I. INTRODUCTION

Housing has been recognized worldwide as one of the basic necessities of life and a prerequisite for human survival (United Nations, 2012 and Onibokun, 2013). In Nigeria, housing delivery is either by the government (public sector) or the private sector. According to Nubi (2016), private housing developments in Nigeria are mostly 'owned and managed by private individuals. In many economies, private housing developments were also found to have constituted the majority, accounting 'for 80 percent of the existing housing stock' (Johns, 2010).

Gbakeji and Magnus (2007) as well as Hanhörster et al. (2023) observed that private housing involves three major groups - consumers, producers, and the providers of infrastructure with the production aspect of private housing being influenced by both exogenous and endogenous factors. One significant exogenous factor is macroeconomic condition which include indicators like foreign exchange rates, money supply, and unemployment rates (Okey-Obiegbu & Offor, 2023). As posited by Bernharden (2009), an understanding of these variables is essential to effectively manage the macro-economy. Also, Mallach (2017) revealed that macroeconomic factors themselves are often correlated and interconnected in both the short and long run, thereby significantly impacting each other.

Studies in many nations have established a long-term relationship between macroeconomic variables and private housing development (Edelstein & Tsang, 2007; Kwangware, 2010; Gupta & Modise, 2011; Ojetunde, 2013; Sinbad & Mhlang, 2013; Useni et al. 2024). It has been observed that private housing investment, as part of an investment portfolio, is 'interdependent with the economy and inseparable from global investment decisions' (Terzi & Bolen, 2008). Thus, it is expected to be affected by macroeconomic shocks such that in periods of economic stability and growth for instance, housing development could exhibit excess supply and vice versa (Mukiri, 2020). In other words, the trend of housing production would be related to the various macroeconomic variables, as they exert influence on

its performance and in turn, the investment decision on it (Terzi & Bolen, 2008). Nevertheless, the literature on the link between private housing development and macroeconomic variables have often resulted in mixed conclusions. This study therefore, examines the trends of the macroeconomic variables and their influence on private housing development in Nigeria, using the ancient city of Ilorin as a case.

II. LITERATURE REVIEW

According to Shutt (2015), a house can be described as a product of human creativity, materials, and technology, making it a barometer of progress. Housing as a product includes services such as the house structure and the built-in amenities with the natural environment and surroundings. Ural (2018) also considered housing as a vital factor in determining the prosperity of any society. His study emphasized that housing is the foundation of a prosperous, healthy, and socially stable society and that 'social and economic wealth can only coexist with proper housing'. Housing establishes the physical foundation and atmosphere of a community, impacting people's quality of life, community stability, and national economic health (Bala, Kado & Kehinde, 2019). After food and clothing, housing ranks third in importance. It is regarded as a fundamental right by the United Nations in Article 25 (1) of the Universal Declaration of Human Rights (United Nations, 2015). In other words, housing is a product that must be provided for everyone.

Nigeria has made considerable attempts at meeting its housing demands through various policies and programs, ranging from direct construction to creating an enabling environment. The private housing industry comprises private developers, co-operative societies, and individuals or groups (Shemin, 2012). Over a 36-year period (1976-2012), the Nigerian capital city of Abuja had been growing substantially, through government direct efforts, on a 250-square-kilometer expanse of land with four development stages, and as divided into districts and settlements (Jibrin & Garba, 2012). However, upon realizing that the government could not meet the city's housing demands alone, the private sector was involved with some 184 private real estate developers given land to build residential estates in six different localities (Jibrin & Garba, 2012).

2.1 Real Estate trends and macroeconomic influence

Trend in real estate describes the observable consistent patterns or changes in the real estate industry over time, causing statistically noticeable changes (Mueller, 2019). These often result from any or combination of changes in the economy, rates of mortgage, consumer speculations, or some other factors - fundamental or otherwise. Also, a trend can be downward or upward and could be horizontal or vertical. Invariably, real estate market, like many others, move in cycles, experiencing times of boom, followed by market correction and downturn before the next boom arrives. Hence, property developers would usually factor in the cyclical performance of the property market for successful development (Reed and Wu, 2010). Investors are often conscious that neither growth nor downturn periods do last forever. Thus, the recent global economic downturn from 2009 had been notably hard on many property investors, real estate agencies, and property developers (Property24, 2017). Property market cycles can significantly affect the success of any property development, and developers need to be aware of the market's status (D'Amato, 2022).

Traditionally, there is interlink between real estate investments (especially in the housing sector of it) and a nation's macroeconomic variables. In fact, Bello (2012) posited that the quality and quantity of a country's housing stock is a measure of its economic growth and prosperity. Another author believed that the housing sector has become a focal point of government fiscal and monetary policies, used as part of the yardsticks for achieving low inflation, high employment, low unemployment, and balanced economic growth (Apergi, 2003). Contessi and Li (2013) related the property market to a nation's economy, indicating a reverse linkage where property market changes affect the economy and vice versa. According to Dehesh & Pugh (2000), economic instability or macroeconomic fluctuations result in property market disequilibrium due to exogenous factors from government regulations.

2.2 Macroeconomic variables and their impact

2.2.1 Exchange Rate

The ruling rate of foreign exchange becomes an influencing factor for housing and indeed, property development especially in developing economies like Nigeria where significant aspects of the development process involve foreign inputs, directly or indirectly. According to O'Sullivan & Sheffrin (2013), exchange rate is the value at which one currency (domestic) is converted to another (the foreign), either quoted directly or indirectly. A high fluctuation in exchange rates tend to lead to high volatility in market return. Otwoma (2013) found that there is a strong relationship between the movements in exchange rates and level of volatility in interest rates. Interestingly, the level of stability of the foreign currency adopted as reference/base currency by a country also matters. Like Nigeria, many economies adopt the US dollar as their base currency, with the euro being common in some Commonwealth countries (Mongeri, 2011).

Boamah (2009) demonstrated how a successful mortgage market depends partly, on a stable exchange rate of currency, with mortgage constituting a common source of fund for housing development. Unstable exchange rates however, discourages long-term foreign capital. Oyateru (2019) noted that 'the demand for housing in Sub-Saharan Africa has surpassed supply', leading to the involvement of International Housing Finance Institutions like Shelter Afrique and the East African Development Bank.

2.2.2 Unemployment rate

Unemployment is a global issue affecting both emerging and developed countries. It impacts the real estate market significantly with the housing market remaining unreliable when unemployment rates are high (Birz & Lott, 2011). Bandyopadhyay and Saha (2009) found that over 90 percent of bank borrowers were gainfully employed, indicating high premium laid on good and regular source of income for loan approval. Also, lenders were found to be favoring younger borrowers, invariably for having long working lives ahead. Caspi, Eshel and Segev (2024) revealed that mortgage lending probability decreases with increased interest rate burden on household income. On the other hand, IDB (2005) revealed that cheap homes are common among low-income households in Latin America due to prevalence of self-build homes and limited access to borrowing from financial institutions. Invariably, the practice, which often include 'instalment housing development' is also becoming the trend in peripheral regions of many sub-Sahara African cities, especially Akure and Lagos in Nigeria (Adeyemi et al, 2023). Demir, Kurt, and Cagdas (2003) argued that the level of employment influences demand for housing loans. Where the unemployment level is low, there is tendency for an increase in house buyers' engagement with the housing finance market. The findings from Mistrulli et al. (2023) equally confirmed that job security and formal employment play significant roles in the ability to access housing loans.

2.2.3 Money supply

Money supply refers to the total amount of money in circulation in a country at a given time (Jhingan, 2012; Abdullahi, 2019). Increase in money supply has been established to contribute to inflation and rising house prices, among others (Modigliani, 2019). Also, it is known that the quantity of money in circulation exerts influence on economic activities, making its control a primary function of central monetary authorities (Osamwonyi, 2013).

A study by Zhou, Cheng and Chen (2014) indicated that money supply significantly influences the real estate prices in China. Specifically, it was discovered that M0 – or base money, which refers to currency in circulation plus bank reserves - has a larger long-term influence than others (M1 or 'narrow money' and M2 otherwise known as 'broad money'). They concluded that the control of money supply lacks relative independence, and that a "one size fits all" policy is ineffective for regulating the real estate market**.** Increasing money supply lowers interest rates, which stimulates spending by encouraging more investment. When money supply increases, there is tendency to experience a boost in the real estate market as more money is available to invest, especially in the housing segment. When the fundamentals of the economy, such as income levels, remain unchanged, rising real estate prices often indicate a bubble. When this bubble bursts, prices drop temporarily. However, due to the nature of real estate investments, they tend to support money supply in the long run, creating a self-reinforcing and amplifying cycle.

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III. METHODOLOGY

Data on Money Supply Rate (MSR), Unemployment Rate (UNEMPR), and Exchange Rate (EXR) were sourced from both the CBN statistical bulletins of the various years and the online portal of NBS covering the period of the first quarter of 2010 (2010Q1) to the last quarter of 2020 (2020Q4). These variables have been described in Table 1. Data analysis was carried out using frequency distribution, trend analysis, and multiple regressions. Trend analysis aimed to project both current and future movements of events using time series data. The study further adopted multiple regression analysis to examine the effects of macroeconomic variables on private housing development in the study area, as per equation 1;

$PD_t = B0 + B_1 MSR_t + B_2 UNEMPR_t + B_3 EXR_t + Ut$ ---------- Equation (1)

PD = Property Development
EXR = Exchange Rate
MSR = Money Supply Rate
UNEMPR = Unemployment Rate
B_0 = Constant term
B_1-B_3 = Coefficient of the explanatory variables
U_t = Error term

A priori Expectation: It is expected that the elasticity parameters (B_1, B_2, *and* B_3) > 0 as all predictors are expected to have positive relationship with the criterion variable.

Table 1: Definition of variables and measurement for Multiple Regressions

Definition of Variables	Variable Code	Measurement
	Dependent Variable	
Property Development	PD	Number
	Independent Variable	
Money Supply	MS	Number
Unemployment Rate	UNEMPR	Percentage
Exchange Rate	INFR	Percentage

Source: Field Survey, 2024

IV. RESULTS AND DISCUSSIONS

The descriptive statistics for the independent and dependent variables from the study over the 11-year period (2010 – 2020) are presented in Table 2.

Table 2: Summary of Descriptive Statistics of the Variables

	PD	MSR	UNEMPR	EXR
Mean	157.9091	288.6600	6.0082	234.9055
Median	150.0000	260.6200	4.5600	196.9900
Maximum	265.00	466.80	9.78	381.00
Minimum	65.00	138.10	3.70	150.22
Std.Dev	76.84589	105.86831	2.42427	86.20363
Skewness	0.212	.343	.386	.394
Kurtosis	2.537	2.800	-1.887	-1.654
Jarque-Bera	7.5464	7.0432	8.0342	76.3421
Probability	0.016453	0.0321	0.01567	0.0110
Sum	1737.00	3175.26	66.09	2583.96
Observations	11	11	11	11

Source: Analyzed data from CBN and NBS archives, 2024

From Table 2 the skewness of the variables seems to fall in the same direction. Property Development (PD), MSR, UNEMPR and EXR have skewness value close to zero. This means that the variables are normal distribution, which is platykurtic (Flat surface). It also means that the variables will have values below their sample mean.

The Jarque Bera is a test statistic for assessing whether a series is normally distributed. As stated by Thadewald and

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Buning (2007), the test statistic compares the skewness and Kurtosis of the series to those of the normal distribution. As already stated Probability is the likelihood that a Jarque-Bera statistic will exceed the observed value under the null hypothesis; a low probability value leads to the rejection of a normal distribution's null hypothesis. As a result, the closer a variable's probability statistic is to zero, the lower the value of its Jarque Bera statistic and the more regularly distributed it is. If each variable is statistically significant, the series is not normally distributed, so the null hypothesis is rejected and the alternative, that the error in the sample is not normally distributed, is accepted (Imoisi, Amba & Okon, 2017). Jarque Bera statistics test the goodness of fit of the sample data by checking the skewness and kurtosis of the data for normal distribution. The null hypothesis for the Jarque Bera test is that the distribution is normal. From the result above, the Jarque Bera test illustrates that P-value of PD, MSR, UNEMPR and EXR are below 0.05, hence we cannot reject the null hypothesis, as this is a normally distributed curve.

The trend and forecast of private housing developments between 2010 and 2040

The graph in Figure 1 displays the historical data and forecasts for different types of real estate, including flats, duplexes, detached houses, semi-detached houses, and terraces.

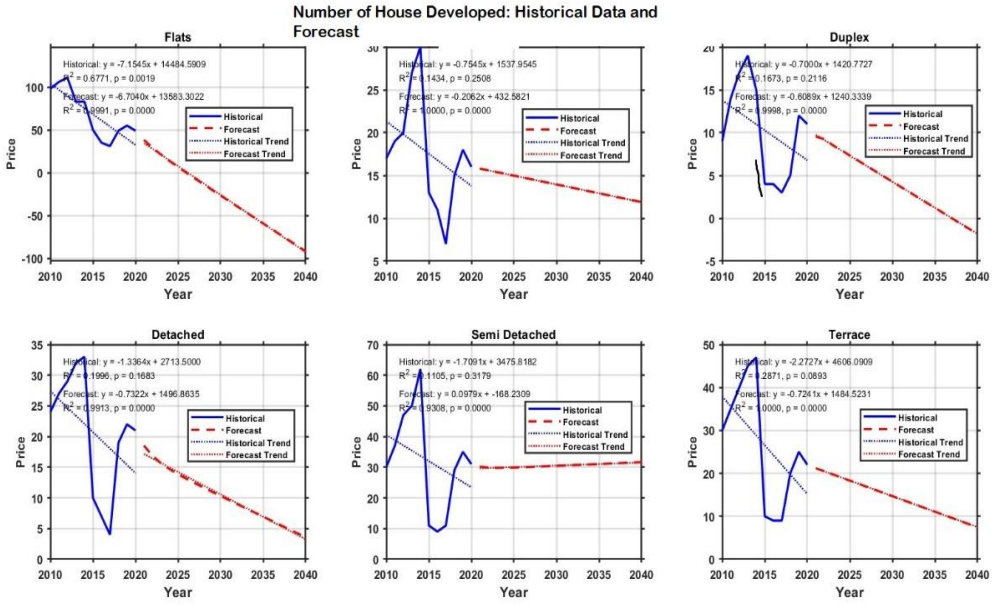

Figure 1: Trends of Private Housing Development between 2010 and 2040
Source: Analyzed data from CBN and NBS archives, 2024

The data available indicated an undulating movement across various types of property developments. Generally, however, development of private housing in Ilorin Metropolis from 2010 to 2020 depicts a parabolic pattern. There was a peak in development from 2010 to 2014, followed by a decline from 2015 to 2017. However, the market resumed growth from 2018 to 2019 but thereafter, declined in 2020, perhaps, due to the effects of global meltdown in that coronavirus-pandemic year.

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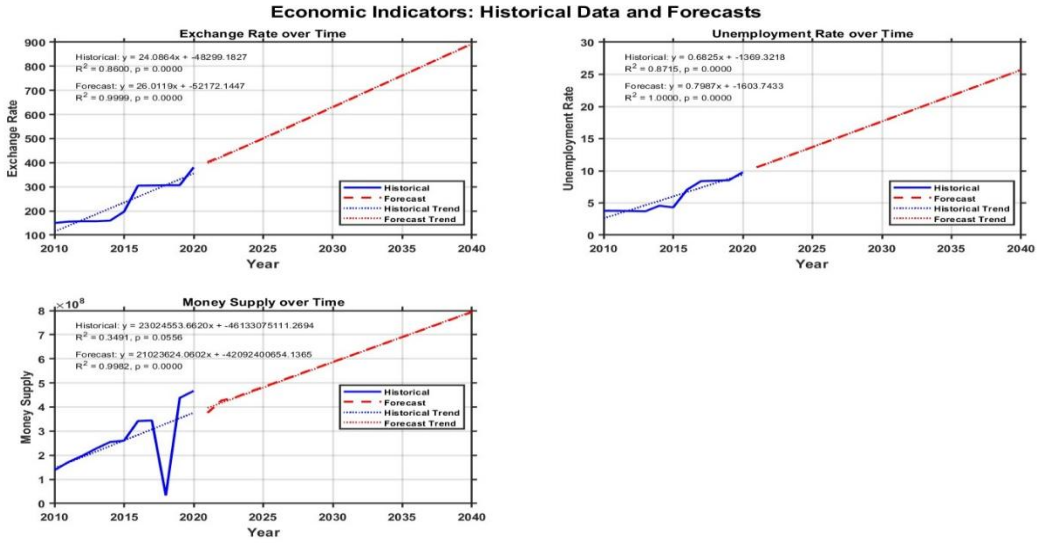

Figure 2: Trends of selected Macroeconomics variables between 2010 and 2040

Figure 2 reveals the trend of data of Exchange Rate (EXR), Unemployment rate (UNEMPR) and Money supply (MSR) respectively. The micro-economic variables were not stable but undulating especially between 2010 and 2020. For instance, the naira to dollar exchange rate in 2010 was ₦150.22/$1 and then increased to ₦155.71 in 2011 and through to ₦157.72, ₦160 and ₦196.99 in years 2012, 2013, 2014 and 2015 respectively. However, naira was officially devalued in 2016 to ₦305.18 by the CBN to combat the high inflation rate during this period. It should be noted that the exchange rate used in this study is that on the CBN exchange window, which is regulated to achieve measured stability of the local currency.

Also, in 2010, the unemployment rate was 3.78%. The rate began a downward movement to 3.77% in 2011, 3.74% in 2012 and 3.70% in 2013. However, the unemployment worsened in 2014 to 4.56% but to 4.31% in 2015. Unfortunately, however, the unemployment rate spiraled thereafter, increasing steadily from 7.06%, 8.39%, 8.46% and 8.53% to 9.78% in 2016, 2017, 2018, 2019 and 2020

respectively. This could be attributed to low production output in these years as companies and industries in Nigeria were affected by the increase in dollar rates and the high lending rate, which dovetailed into the corona-virus pandemic of 2020. The finding of this study corroborated the earlier findings of Afimia (2017) and Olanrewaju et.al. (2018).

Effect of macro-economic variables on private housing development

The study used multiple regression model to determine the effect of macroeconomic variables on private housing development in the study area. The coefficient of determination describes how much variation in the dependent variable (number of properties developed) can be explained by all three independent variables being analyzed (money supply, unemployment rate, and exchange rate).

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.901[a]	0.712	0.523	78.83321

a. Predictors: (Constant), Money supply, Exchange Rate (Naira/USD), Unemployment Rate, b. Dependent Variable: Property Developed

The analysis in Table 2 demonstrates that changes in the three macroeconomic variables mentioned above contributed to an equivalent of 71.2% of a change in the number of properties developed, as indicated by

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the R-Square of 0.712. Furthermore, the results demonstrated a high relationship between macroeconomic variables and property development, as evidenced by a coefficient of determination (R) of 0.901. This corroborates the findings of Olanrewaju and Oyebiyi (2016), that macroeconomic variables have an impact on the property development.

The regression model shows a strong fit with high R and R Square values, indicating significant predictive power of the independent variables. However, the gap between R Square and adjusted R Square suggests potential over-fitting or the need for model refinement. The standard error of the estimate should be contextualized within the scale of the dependent variable to fully assess the model's precision, invariably, that the model could benefit from further optimization and validation with a larger dataset.

Table 4: ANOVA Analysis Result

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	34194.211	6	5699.035	5.011	.029[b]
Residual	24858.698	4	6214.674		
Total	59052.909	10			

Predictors: (Constant), money supply, exchange Rate (Naira/USD), and unemployment Rate, b. Dependent Variable: Property Developed.

The probability value of 0.029 (which is less than α=0.05) obtained from ANOVA in Table 4 shows that the regression model was significant in predicting the relationship between Property Development and the predictor variables. The F-calculated at 5% significance level was 5.011 which is greater than the F-critical (value = 3.77), reinforcing the fact that the overall model was significant. Hence, the study has established the existence of a significant relationship between macro-economic variables and the development of housing in Ilorin.

Table 5: Regression of Macroeconomic Variables on Property Development

Model	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig. (p-value)
	B	Std Error			
1 (Constant)	1480.636	740.549		1.999	.116
MSR	.938	1.462	1.292	.642	**.046***
UMEMPR	-11.196	66.016	.353	-.170	.874
EXR	-1.108	2.010	-1.243	-.551	**.011***

a. Dependent Variable: Property Developed

From the regression model obtained in equation one and presented in Table 5, holding all the other factors constant, growth in property development would be 1480.636. A unit change in each of the predictor variables would cause a change in the property development growth by an amount corresponding to the coefficient related with each variable as indicated in the model above. Thus, according to the model, 2 out of the 3 variables - Money Supply (0.046) and Exchange rate (0.011) - were significant with values

less than 0.05 while unemployment rate (0.874) was not significant.

The sign of a regression coefficient pinpoints positive or negative correlation between the independent and dependent variables. Two variables in the study (interest rate (-28.496) and inflation rates (-10.258) were negatively correlated with the number of properties developed while GDP (1.148) was positively correlated. Also, exchange rate (-1.108) and unemployment rate (-11.196) were negatively correlated with the number of properties developed while Money Supply (0.938) had a positive correlation. The findings also show that taking all other independent variables at zero, a unit increase in money supply will lead to a 0.938 increase in the number of properties developed. Thus, money supply has the greatest positive effect on the development of housing in Ilorin. The regression results indicated that the relationship between property development and the predictor variables can be expressed using the equation:

PD = 1480.636 + 9.38MS -11.196UNEMPR - 1.108EXR + μe
i.e
$Y = 1480.636 + 9.38X_4 - 11.196X_5 - 1.108X_6 + \mu e$

This indicates that as money supply (MS) increases, so would the quantity of property development. Conversely, increase in the unit exchange rate or that of unemployment rate often results in decline in the units of property developed.

This finding aligns with some previous authors that the activities of property developers increase as money supply rises (Ogunmuyiwa and Ekone, 2010), (Taiwo, 2012), (Makena, 2012) and (Karoki, 2013). Makena (2012) found that the level of money in supply does affect the real estate market and it influences real estate prices. However, the finding contradicts Suleiman (2010) and Arimoro (2020) that money supply has negative impact on economic growth vis-a-vis property development.

The study indicates that exchange rate has an adverse significant impact on property development, with the negative correlation whereby increases in exchange rate of naira to dollar meant decrease in the number of housing development. This is because many construction inputs are imported from overseas, directly or indirectly. This Nigerian finding is nevertheless, at variance with the conclusion of Juma and Kisanyanya (2020) who established a positive relationship between real estate investment and the exchange rates in Kenya.

Unemployment on its own, exhibits adverse but insignificant relationship with property development. This implies that as unemployment increases, the pace of housing construction may slow down but often resulting in relatively insignificant reduction in supply of housing. Perhaps, this is slightly in alignment with the result of Ogueze & Odim, (2015) - the existence of a negative relationship between unemployment and economic growth.

V. CONCLUSION

This study has striven to evaluate the extent influence exerted by macroeconomic variables on the development of private housing in Ilorin, Nigeria. It established the critical role of market share (MSR) and the management of exchange rate (EXR) in driving the performance of real estate investments, especially housing. With the indicated decline in property development given the rise in exchange rate, unemployment rate, and money supply, there is need for concerted efforts on the part of both government and investors alike. Strategic actions must be explored to mitigate the negative impacts of these macroeconomic variables on the housing market. Ultimately however, diversifying investments and keeping a close eye on macroeconomic indicators will be key to managing risks and capitalizing on opportunities towards making the real estate market more resilient and sustainable. Of course, the findings from this study may be location-specific, thereby providing opportunities for its replication by researchers in other cities within and outside Nigeria. Also, as pointed out earlier, the regression model utilized could benefit from further optimization and validation through a larger dataset.

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