Analysis of Selected Macroeconomic Variables and Property Development in Kwara State, Nigeria: Implications on Investment Decisions

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Review Article

ABSTRACT

The widening gap between housing need and supply has created a void for private developers to fill in housing delivery in Nigeria. However, the uncertainty and instability of the economy across countries of the world as indicated by macroeconomic variables appears very important to be considered. Thus, the study's objective was to evaluate the effect of macroeconomic variables on private residential property development in Ilorin, Kwara state, Nigeria, for investment decision making. This study focused on three macroeconomic variables which include GDP, Interest rate and Inflation rate.

The research utilized both primary and secondary data. The primary data were collected via structured questionnaires administered on Real Estate Development Association Practitioners (REDAN) in Ilorin, Kwara State. The secondary data which include GDP, Interest rate and Inflation rate from 2010 to 2020 was also obtained from the Central Bank of Nigeria (CBN) and Nigeria Bureau of Statistics (NBS). The information obtained were analyzed using Trend analysis and

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multiple regressions. Trend analysis aimed at projecting macroeconomic movement from 2010 to 2030, while the multiple regressions was used to investigate the effects of macroeconomic variables on private housing development in Ilorin Metropolis.

The result of the analysis revealed among others that macroeconomic variables affect property development as they show significant effect on private residential property development with GDP producing positive significant effect on residential property development, while interest rate and inflation rate have negative significant effect on property development.

Therefore, this study recommends that real estate investors in Ilorin metropolis should consider the macroeconomic environment, and evaluate their risk exposure to make informed investment decisions.

1. INTRODUCTION

Housing as an investment has a significant impact on the local, state, and national economies [1]. It represents, in the majority of cases, the first significant capital investment and life goal of individuals [2]. As a major necessity of existence, housing has become the most important investment for all individuals. However, deciding to invest in real estate is one of the most difficult and crucial decisions an investor can make. This is the case not only because of the substantial capital expenditure and lengthy gestation period, but also because once a decision has been made, any resulting error cannot be readily corrected [1].

In Nigeria, either the government (public sector) or the private sector provides housing. Public housing development in Nigeria refers to the construction of housing units by government, often at the federal, state, or local levels, across all income groups [3,4]. Public housing development is frequently seen as a crucial component of poverty alleviation and economic growth [5]. While the Private housing developments are houses developed in a given location, which are owned and managed by private individuals. In most economies and nation, private housing development account for 80 percent of the existing housing stock in the nation [6].

Unavailability of sufficient housing for a nation's growing urban population is one of the greatest challenges facing cities throughout the globe [7]. Despite government access to housing production variables, such as land and capital, the country can only fulfill 4.2 percent of annual demand for housing [8,9,10]. This has created an opportunity for private investors to invest in provision of housing for the citizens. However, this is not without risk. The private sector, which is the primary provider of housing in Nigeria, faces a number of obstacles that prevent it from reaching the rising demand [5]. One of such is the galloping nature of the Nigeria economy. A variety of macroeconomic variables, such as interest rates, GDP and inflation rate, which are the major economy indices of a country influence the creation of private housing development in particular [11].

Housing development whether public or private is affected by exogenous and endogenous factors. One of the exogenous factors is macroeconomic issues which also serve as indicators or major signposts for the economy's present trends [12,13]. These variables consist of the Gross domestic product, the nature of foreign money exchange rates, the banking interest rates, the supply of money, and the levels of inflation rates. They serve as important ingredients to any nation's economy, in which the government, like other professional and economic experts, must study, analyze and comprehend [14,15,16]. These macroeconomic factors often have a positive relationship with one another, and they are interconnected in the short and long run [17].

According to Giussani et al. [18], housing investment as a component of a portfolio is interdependent with the economy and inseparable from global investment decisions. Studies have reported macroeconomic variables as having effect on every sector of the economy [6], however, limited works have been done in the area of determining its effects on residential property developments. In Nigeria, Arimoro [19] examined the impact of a selection of macroeconomic variables on public property development in Lagos Metropolis and concluded that macroeconomic variables had a significant impact on public property development. A cursory look at all these works show that the studies largely concentrated on macroeconomic

and public property development leaving out the effect of macroeconomic variables on private housing development as the largest supplier of housing in the economy. It is worthy of note that a regular investigation of the state of macroeconomic variables is needed for a guide in real estate investment decision making [20,21].

With this context, this study investigates macroeconomic variables and private housing with a view to determining the relationship between them for investment decision making. The rest of the paper concentrates on literature review, methodology, findings, discussion, conclusion, and policy implications.

2. LITERATURE REVIEW

2.1 Housing Development

Real estate is essential to the economic development of any nation. Real estate which comprises of natural resources, land and building is a stimulus to national economy and integral part of national wealth [22]. Gumel [23] also stated that real estate encompass the physical structure in addition to the immediate surrounding environment. Its development is among the major problems confronting both the developed and developing countries in the world [23].

Housing development lays the groundwork for the nation's economic growth and stimulates additional sectors of the economy through its multiplier effect. Muktar et al [24] stated that the nation's economic market includes the real estate sector as a crucial component. Since the real estate market and the economy are so closely entwined, the health of the economy as a whole has a big impact on how the real estate market performs. Since the property market and the macro economy are inversely correlated, anything that impacts the economy will also likely have an impact on the property market and vice versa.

Housing is a basic need of man and it is considered a "sine qua non" of human existence [25] and [26]. According to Nubi [27], livable accommodation benefits people's health, productivity, social behaviour, and overall well-being. It also serves as one of the best predictors of a person's standard of life and social standing [27]. Microsoft [28] argued that House is a dwelling space for human occupation and a centre of daily life. Housing is one of man's most basic requirements, ranking third after food and clothing. Hence, its development is non-negotiable.

2.2 Macroeconomic Variables

Strong correlation exists between the housing market and real estate prices and general economic cycles. (Wang, 2013; Quigley, 2019).The housing supply is determined by the decisions of land developers and actual homeowners. The effects of inflation on the housing industry are crucial to the developer. The residential real estate developer must have a thorough understanding of the economic changes and their consequences. This knowledge is essential for making sound business decisions and planning future projects. Numerous studies conducted domestically and internationally focused primarily on macroeconomic variables that influence the real estate industry and house prices.

Apergis [29] investigated the dynamic effects of certain macroeconomic variables (housing loan rates, inflation, and employment) on the cost of newly built homes sold in Greece using an error correction vector autoregressive (ECVAR) model. According to the study, the mortgage rate has greatest effect on real estate development the most, followed by inflation and employment. Renigier-Bilozor and Wisniewski [30] investigated the effect of macroeconomic factors on residential property and price indices in Europe. The material for testing and empirical results was quarterly time series data. According to the developed models, residential property markets are influenced by the economic and financial state of European countries.

The macroeconomic effects on the securitized real estate markets in Sweden and Switzerland were compared by Rodenholm and Dominique [31,32] and the research looked into how macroeconomic issues influenced real estate stock values before and during the financial crisis in 2007. The findings revealed that macroeconomic influences on property development vary by economy and were never consistent before and during the financial crisis. Between 1995 and 2014, Akinsomi et al [33] looked into the impact of macroeconomic factors on direct real estate returns in South Africa.

Regression analysis was used in the study, and it was discovered that the GDP, unemployment

rate, and interest rate all had an explanatory impact on real estate returns. The influence of population growth on real estate investment was statistically insignificant. Real estate investment was positively correlated with GDP, whereas interest rates and inflation rates were negatively correlated with real estate expansion.

Similarly, in Nairobi, Kenya, Kangongo (2013) examined the link between inflation rates and real estate development. The nature of the relationship was determined using a simple linear regression model. The Kenya National Bureau of Statistics provided data on property values, and the Ministry of Lands, Housing, and Urban Development provided data on inflation rates. The study's findings showed that there is no meaningful correlation between inflation rates and real estate prices. On the other hand, Karoki (2013) discovered strong relationships between residential real estate prices and Kenya's GDP, interest rates, and money supply using descriptive and multivariate regression models and concluded that property values are most influenced by interest rates, followed by the GDP and the amount of money in circulation. Hence, macroeconomic variables adequately explain the rise in property values. Although the results showed a correlation between residential real estate prices and inflation rates, it was deemed to be insignificant.

3. METHODOLOGY

3.1 Study Area

The research was carried out in Ilorin, Kwara State, Nigeria. Ilorin has the coordinates 8° 30N 4° 33E/8.500°N 4.550°E; 306km inland from coastal city of Lagos and 500km from the Federal Capital territory, Abuja, with population total of 777, 667 and a projected population of 1.9 million people come year 2026 (National Population Commission of Nigeria, 2006), and a population density of 1,188/km2 (3,080/sq miles). It covers a land area of 765km2 (295 sq miles). The Shehu Alimi (Descendant of Shehu Usman Dan-Fodio Dynasty) seized control of the propagation of Islam, and it later became the Northern Nigeria Protectorate. It was the provincial military headquarters of the old Oyo Empire. Christianity is extensively practiced by a sizable part of other Nigerians from other states, despite the city still having a strong Islamic influence from the Northern assaults. The major

city and capital of Kwara State is Ilorin. This study is only focused on private housing developers and developments that are all situated within the city of Ilorin.

3.2 Data Collection and Variable Description

The research design for this research is a survey research due to its descriptive nature. The descriptive approach was used in collecting the data to provide answers to the research questions and to test the effect of selected macroeconomic variables on property development in Ilorin Kwara State. Primary and secondary data were used for this analysis. The primary data of the total number of housing unit developed between 2010 and 2020 in Ilorin was obtained from private developers registered with Real Estate Development Association of Nigeria (REDAN) in Ilorin, Kwara State. According to the Directory of REDAN (2019), there are Forty-four (44) private developers and investors in Kwara State. A self- administered structured questionnaire as an instrument of data collection. While the secondary data on Gross Domestic Product (GDP), Interest Rate (INTR), and Inflation Rate (INF) were obtained from CBN statistical bulletins and NBS data portal spanning between 2010Q1 and 2020Q4.

The data gotten was analyzed using frequency distribution, trend analysis and multiple regression. The multiple regression analysis was adopted to investigate the effects of macroeconomic variables on private housing development in the study area. The multiple regression analysis employed is given as:

$$PD_t = B_0 + B_1 GDP_t + B_2 INFR_t + B_3 INTR_t + U_t \quad \text{Eq. (1)}$$

Where;

PD = Property Development GDP = Gross Domestic Product INFR = Inflation Rate
INTR = Interest Rate
B_0 = Constant term
B_1-B_3 = Coefficient of the explanatory variables
ut = 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.
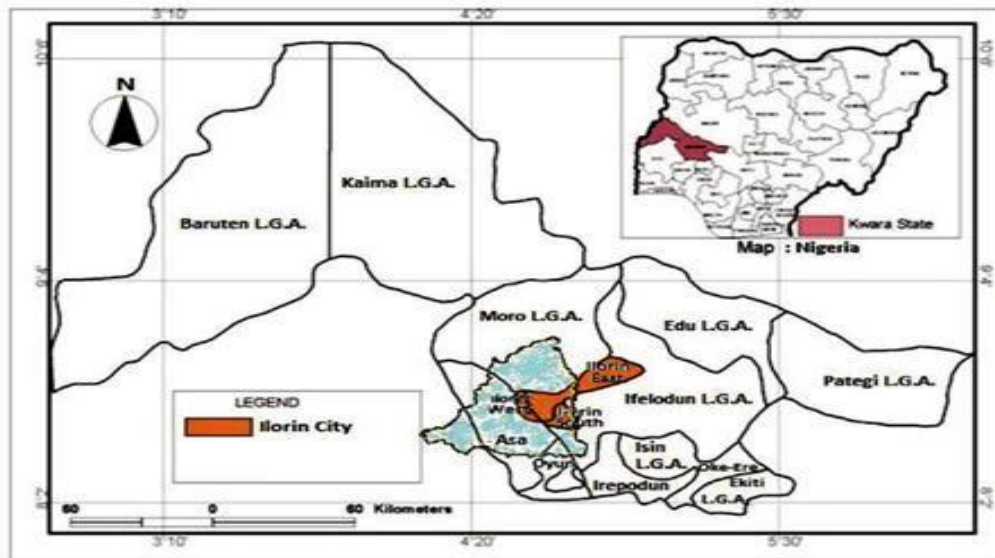
Fig. 1. Map of Kwara state showing Ilorin Metropolis
Source: The department of Geography, Federal University of Technology Minna, Niger State 2015

Table 1. Variables definition and measurement for multiple regressions

Definition of Variables	Variable Code	Measurement
	Dependent Variable	
Property Development	PD	Actual in number
	Independent Variable	
Gross Domestic Product	GDP	Actual in number
Average Interest Rate	INTR	Actual in percentage
Inflation Rate	INFR	Actual in percentage

Source: Author's compilation, 2022

4. RESULTS AND DISCUSSION

The number of questionnaires administered and retrieved is shown in the Table 2.

Forty-four (44) questionnaires administered on the respondents in Ilorin, which constituted the population of private housing developers in Ilorin, Kwara, Forty-one (41) were returned and 3 were not returned. The percentage of the returned questionnaire analyzed is 93.2%. According to Moser and Kalton [28], if the response rate is not less than 30–40%, the outcome of a survey can be deemed significant. Accordingly, the percentage of the questionnaires that were returned is sufficient for the analysis.

4.1 Trend of Private Housing Development between 2010 and 2020

This section presents data on the particular number of housing delivered by the developers at specific period and type. The result of this enquiry is presented in Table 3 and Fig. 2.

Fig. 2 reveals the trend of various types of housing development in Ilorin between 2010 and 2020. The trend of property development in Ilorin Metropolis from 2010 to 2020 reveals a parabolic shape in the development of all housing types. The trend indicated a peak in property development from 2010 to 2014, followed by a decline from 2015 to 2017 due to the economic recession. However, the property market showed signs of growth from 2018 to 2019, with a subsequent decline in 2020 due to the corona virus pandemic.

Macroeconomic indicators are economic statistics that are frequently released at a specific time by governmental entities, charitable organizations, and the private sector and show the situation of the economy of a state in a specific area (industry, labour market, trade, etc.). The trend of a few key microeconomic indicators, including the rate of inflation, the interest rate, and the gross domestic product, is shown in Fig. 3.

Table 2. Distribution and return of the instrument

Questionnaire	Number	Percentage
Total number of Questionnaire Administered	44	100
Total number of Questionnaire retrieved	41	93.2
Number not Returned	3	6.8

Source: Field Survey, 2022

Table 3. Trend of private housing development between 2010 and 2020

Type/Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Flats	98	106	111	83	83	50	35	31	49	55	49
Luxury Flats	17	19	20	27	30	13	11	7	15	18	16
Duplex	9	14	17	19	15	4	4	3	5	12	11
Detached	24	27	29	32	33	10	7	4	19	22	21
Semi Detached	30	37	47	50	62	11	9	11	29	35	31
Terrance	30	35	40	45	47	10	9	9	20	25	22
Total	208	238	264	265	270	98	75	65	137	167	150

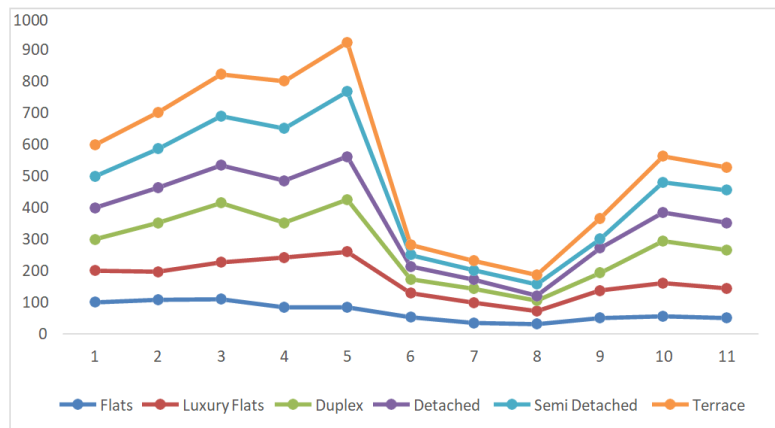*Source; Field survey, 2022*

Fig. 2. Trend of private housing development between 2010-2020
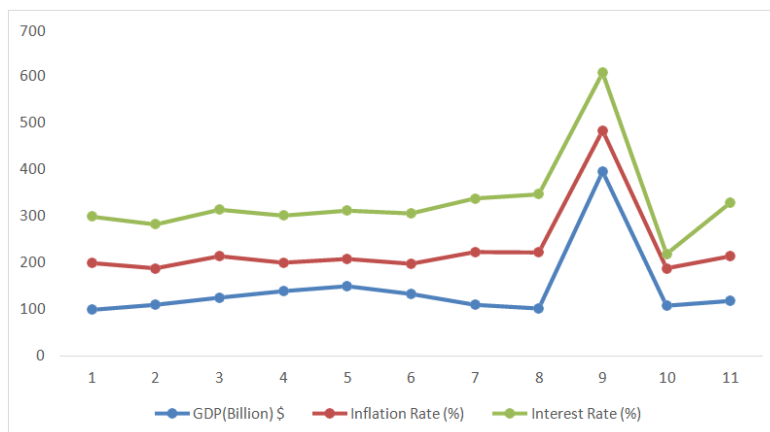

Fig. 3. Trends of selected microeconomic variables between 2010-2020
Source; Nigerian Bureau of statistics (NBC, 2022)

Fig. 3 reveals the trend of data of Gross Domestic Product (GDP), Inflation rate (INFR), and Interest Rate (INTR)) respectively. The observed trends suggest that macroeconomic variables exhibit cyclical patterns. Specifically, the gross domestic product (GDP) of the country under consideration grew from $361.46 billion in 2010 to $404.99 billion in 2011, representing a growth rate of 5.3%. This positive trend continued from 2011 to 2014. However, GDP declined in 2015, 2016, and 2017 due to a decrease in the production of goods and services, which was caused by an increase in inflation rates. Notably, GDP rose again from $397.19 billion in 2018 to $448.12 billion in 2019. Unfortunately, the GDP reduced to $432.29 billion in 2020 due to the adverse impact of the COVID-19 pandemic. In 2010, the inflation rate in Nigeria had already reached double digits, standing at 13.72%. However, it dropped to 10.84% in 2011, with an annual change of - 2.88%. Subsequently, the rate increased to 12.22% in 2012, with an annual change of 1.38%. From 2013 to 2014, the inflation rate declined from 8.48% to 8.06%, respectively. However, the rate rose sharply from 9.01% in 2015 to 15.68% in 2016, contributing to the recession that Nigeria experienced in 2016. Furthermore, the inflation rates increased from 11.40% in 2019 to 13.25% in 2020, which can be attributed to the global COVID-19 pandemic.

Likewise for interest rate, in 2010, the interest rate in Nigeria was 24.61%, which decreased slightly to 23.21% in 2011. The rate remained steady between 24.61% and 24.91% in 2012 and 2013, respectively. The rate then steadily increased to 25.91% in 2014 and 26.84% in 2015. The rate jumped to 28.55% in 2016 and continued to rise to 30.99%, 30.52%, and 30.72% in 2017, 2018, and 2019, respectively. However, the rate dropped to 28.31% in 2020. The increase in the interest rate from 2016 to 2017 was due to the high inflation rate during that period. Low production output in those years also contributed to the increase. The rise in dollar rates, high-interest rates, and the COVID-19 pandemic in 2020 further affected companies and industries in Nigeria.

The finding of this research corroborated Afimia [34] and Olarewaju et. al. [35], which also reported that Nigeria experienced economic recession in 2016. Typically, during recessions, the macroeconomic indicators of employment, capacity utilisation, GDP, business income, investment spending, and household income decrease while the unemployment rate rises sharply. Given that it also causes construction projects to be abandoned, it can be concluded that the economic downturn has a significant impact on the Nigerian building construction business [35].

Furthermore, in 2020, Nigeria suffered another economic recession due to corona virus. The GDP of Nigeria slumped form $448.12 to $432.29 in 2020. Following a second quarter contraction of 6.1%, the GDP fell 3.6% in the third quarter of 2020, bringing about Nigeria's second recession in five years [36]. The pandemic made growing inflation, unemployment, a shrinking fiscal buffer, and a currency in decline even worse realities. According to Farayibi and Asongu [37], the Covid-19 pandemic has a large negative impact on fundamental macroeconomic variables in Nigeria, including GDP growth, interest rates, and inflation.

4.2 Effect of macroeconomic variables on private housing development in Ilorin Metropolis

To determine the impact of macroeconomic variables on privately developed housing in Ilorin Metropolis, the study used a multiple regression model. The coefficient of determination measures the percentage of variation in the dependent variable (number of properties developed) that can be accounted for by each of the three independent variables (GDP, interest rate, and inflation rate). It also measures the extent to which changes in the dependent variable can be explained by changes in the independent variables.

According to the findings in Table 4, the three macroeconomic variables mentioned above changed in a way that represented an equivalent of 73.4% of a change in the amount of property developed, as indicated by the R-Square value of 0.734. The coefficient of determination (R) value of 0.934 in the results also demonstrated that there was a significant association between the macroeconomic variables and property development.

This was in tandem with Olarewaju [35] who opined that macroeconomic variables have a relationship with construction industry.

The probability value of 0.021, which was less than $\alpha=0.05$, was determined from the ANOVA results, indicating that the regression model was

Table 4. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.934a	0.734	0.523	78.83321

a. Predictors: (Constant), GDP, Exchange Rate (Naira/USD), Inflation Rate, b. Dependent Variable: Property Developed
Source: Field Survey, 2022.

Table 5. ANOVA Analysis Result

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	34194.211	6	5699.035	4.917	.021b
Residual	24858.698	4	6214.674		
Total	59052.909	10			

Predictors: (Constant), GDP, Exchange Rate (Naira/USD), Inflation Rate, b. Dependent Variable: Property Developed.
Source: Field Survey, 2022

Table 6. Regression of Macroeconomic Variables on Property Development

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig. (p value)
	B	Std.Error	Beta		
1 (Constant)	1480.636	740.549		1.999	.116
GDP	1.148	1.209	.861	.950	**.039***
INTR	-28.496	20.624	-1.031	-1.382	**.024***
INF	-10.258	19.778	-.371	-.519	**.031***

a. Dependent Variable: Property Developed
Source: Field Survey, 2022

significant in predicting the link between Property Development and the predictor variables.F was estimated at 5%. The significance level was 4.917. This indicates that the overall model was significant, i.e., there is a substantial association between macro-economic variables and the development of housing, because the estimated F is more than the F critical (value = 3.77).

From the regression model obtained in equation one and presented in table four above, with other things being equal, growth in property development would be 1480.636. According to the coefficients associated with each predictor variable as shown in the model above, a unit change in any one of the predictor variables would result in a change in the rate at which property development grows. All of the GDP (0.039), interest (0.024), and inflation (0.031) variables were considered significant by the model because their P values were less than 0.05. The sign of a regression coefficient denotes the degree of correlation between each independent variable and the dependent

variable. A positive coefficient indicates that the mean of the dependent variable tends to increase when the value of the independent variable increases. A negative coefficient means that when the independent variable increases, the dependent variable tends to decrease.

The results also demonstrate that, if all other independent variables are held constant at zero, a unit increase in interest rates will result in a 28.496 decrease in the number of properties developed; a unit increase in inflation rates will result in a 10.258 decrease in the number of properties developed; and a unit increase in GDP will result in a 1.148 increase in the number of properties developed. This suggests that the GDP has an absolutely positive significant impact, on the development of housing in the city of Ilorin. According to the findings of the regression analysis, the following regression equation can be used to express the link between the growth of property development and the predictor variables.

$$PD = 1480.636 + 1.148GDP - 28.496INTR - 10.258INF + \mu e \quad \text{...............................} \quad (2)$$

i.e

$$Y = 1480.636 + 1.148X1 - 28.496X2 - 10.258X3 + \mu e \quad \text{...} \quad (3)$$

Accordingly, it may be inferred that when macroeconomic conditions change over time, property development changes along with GDP. The amount of constructed property will, however, decrease when interest rates and unit inflation rates rise. The finding in this research is in tandem with the study of Akumu [38], Juma and Kisanyanya [39]. All researches agree that macroeconomic variable can be used to establish the changes in property development in any environment or economy.

According to Muktar et. al. [25], a considerable explanatory influence on property return across markets was found to be exerted by GDP, exchange rate, inflation, and interest rates with GDP leading the pack. The results concur with Leisanka [40] where it was discovered that the number of housing units created in Kenya has a negative correlation with the coefficient for inflation rates. The majority of economic items will see price increases during an inflationary period, and the cost of the raw materials needed to construct a home will also rise. Also, the research finds that interest rate is negatively correlated with property development. The negative relationship of interest rate on property development is not surprising, interest rate is the cost of borrowing, and hence, high interest rate will discourage private investors from borrowing. This also corroborates Leisanka [40] that interest rate has a negative effect on property development.

5. CONCLUSION AND RECOMMENDATION

From the study, it was discovered that macroeconomic variables have significant effect on property development. The three macroeconomic variables correlated with property development shows that GDP contributes positively to property development while inflation rate and interest rate contribute negatively to property development. Also, the research shows that property development increases when GDP increases and reduces with reduction in GDP. This shows that property development contribute positively to GDP.

Real estate investors in Ilorin metropolis should consider the macroeconomic environment, evaluate their risk exposure, carry out feasibility and viability studies to make informed investment decisions, stay up to date on market trends, diversify their portfolio, and partner with local experts. These practical steps can help investors make informed investment decisions that maximize their returns while minimizing their risks. Specifically, investors should keep an eye on changes in GDP, inflation rates, and interest rates, as the variables have potential impact on property development growth. They should also be mindful of their exposure to risks associated with inflation and interest rates, and consider investing in properties with long-term leases or stable income streams to mitigate these risks. By staying up to date on market trends, diversifying their portfolio, and partnering with local experts, investors can make informed investment decisions that maximize their returns and help them succeed in the dynamic real estate market in Ilorin metropolis.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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