Influence of Macroeconomic Factors on Residential Property Returns in Abuja, Nigeria

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Abstract

An attempt was made in this study to bridge the existing gap in the knowledge of the influence exerted by macroeconomic factors on residential property returns in Abuja. The backward and forward relationship between property market and the economy has influenced a rise and fall in future of property returns in Abuja market. The methodology employed primary data for returns and secondary data for macro-economic variables, time-series data for annual macroeconomic indices and total returns index spanning between 2001 and 2015. The populations of study consist of transactions of sales (429) and lettings (1213) during the stated period; the respective sample sizes of 286 and 436were quantitatively determined using Frankfort-Nachmias model. The result of Augmented Dicker Fuller (ADF) test showed that all the variables were stationary after first and second differencing order. The result of eagle granger cointegration test further suggests the existence of long run relationship between macroeconomic factors and residential property returns. The result of further cointegration regression suggests that between 18.2%-83.6% and 16.2%-79% variation in 3-Bedroom (3B/R) and 4-Bedroom (4B/R) property returns respectively across seven out of twelve residential markets were significantly influenced by macroeconomic indicators. The study concludes that positive economic policies are meant to energize the property market, and vice versa. The study therefore recommends that policy-makers should painstakingly study the future implications of any macroeconomic policy as they could adversely affect property returns, and by extension, the contribution of real estate sector to national economic development.

Introduction

Results from empirical studies linking macroeconomic factors with property investment market all over the world have shown that macroeconomic factors have influence on property return. In Europe (Giussani, Hsai and Tsolacos, 1992; Lizieri & Satchell,1997; Brooks & Tsolacos,1999; Sinbad & Mhlanga, 2009), in America (Abraham & Hendershott,1996; Ling & Naranjo, 1997; Eldelstein & Tsang, 2007), in Asia (Peng&Hudsin-wilson, 2002; Peng,

Tan and Yiu, 2005,Joshi 2006) and in Africa as a developing continent (Clark & Daniel, 2006;Kwangware, 2010; Bouchouicha & Ftiti, 2012; Ojetunde, Popoola and Kemiki, 2011; Ojetunde, 2013; Udoekanem, Ighalo & Nuhu, 2014; Udoekanem, Ighalo, Sanusi & Nuhu,2015) researches have tried to establish both short and long run relationships between macroeconomic factors and property return, and the influence of these economic factors on property return. The interaction between macro economy and residential property market indicated that GDP, inflation, interest and exchange rates are the major macroeconomic factors that influence property returns, and the existence of long run relationship between macroeconomic factors and property market has always been found (Eldelstein & Tsang, 2007; Sinbad & Mhlang, 2009; Kwangware, 2010; Gutpa et al., 2010; Ojetunde, 2013). Therefore since real property market is an aspect of global investment market, global

macroeconomic determinants have become a focal point of study. Real property investment as an aspect of investment portfolio has therefore expressed interdependency with economy, and inseparable in making global investment decisions (Giussani et al., 1992).

Property returns as a measure of property investment performance is a key in property market (Hoesli & MacGregor, 2000; Kalu, 2001). Property investment cycles are related to the periods of excess demand and excess supply in real estate market, which are described as tight and soft markets respectively within the property market, and they are primarily affected by macroeconomic policy of national, regional and local economies (Born & Pyhrr, 1994; Apergis, 2003). Therefore, property investment market and the economy are interrelated such that economy majorly influences the property market which in turn affects the contribution of real estate sector to national economic development. This interdependence has led to forward and backward relationships between the economy and the property market, creating rises and falls in the future of property returns in Abuja property market. The aftermath of rise and fall in property return has therefore been the major source of contention among real estate investors.

This study aims at measuring the influence of macroeconomic factors on residential property returns in Abuja, Nigeria. The study is justified

on the ground that, over the years, residential property investment performance has been anchored to non-economic factors such as locational, neighborhood and physical factors (Wilhelinsson, 2000; Yusof & Ismail, 2012; Samy, 2015;) with little or no attention on economic factors. The growing need of institutional investors, companies, banks to relate property investment market as part of country's economic market has underscored the need to study economic factors and how they affect residential property investment. Also the pressing need for improvement in property investment performance has required more than non-economic factors.

Property Market and the National Economy: The Conceptual Framework

Property market and macro economy are interlinked and intertwined. They are positively related to each other and they are interrelated in both short and long run as well as influence each other. Belo and Agbatekwe (2002) submitted that the quality and quantities of the country's housing stock is a measure of the country's economic growth and prosperity. Also real estate sector has become a focal point of government fiscal and monetary policies and used as yardstick for realizing low level inflation, high level of employment, low level of unemployment and balanced economic growth (Apergi 2003). Fraser (1993) has related property market as an integral part of nation's economy, therefore there is reverse implication on one another. This indicates there is a reverse linkage between property market and the macro economy, which implies that, whatever affects the property market also affect the economy, vise versa. In the period of economy instability or macroeconomic fluctuation, disequilibrium in the property market is as a result of exogenous factors originated from government structural and deregulations in the country's economy (Dehesh & Pugh 1998). Property market cycles are affected by shocks of macroeconomic factors and resulted into either tight or soft market, in that, in the period of economic stability and growth, the property market cycles is expected to exhibit excess supply, vise versa (Born & Pyhrr, 1994).

Therefore property market are linked to macro economy, such that macro economic factors such as GDP, money supply, inflation, interest etc. influence the performance of property market, such that, inflation acts as disincentives to real estate purchaser but acts an incentive to real estate investors. Invariably, increase in the property price reduces the demand, and increase in level of employment increases inflation and thus property price, therefore macro economy parameters significantly influence the investor decisions and also determine property return (Giussani et al., 1992).

Literature Review

Sequel to the findings from the existing studies linking macro economic factors to property market from different localities, it has been

established that macroeconomic factors influenced property market, therefore different macroeconomic indicators have been identified to have major explanatory influence on property return. Brooks and Tsolacos (1999) adopted multi-equation regression analysis in examining the impact of economic and financial factors on property return in U.K using quarterly data between 1985 and 1998, the result showed that lagged effect of unexpected inflation on property return with a noticeable negative influence and negative shock of short term interest rates negatively impact on property return. Brooks and Tsolacos (2001) used multi-equation regression method, the result showed interest spread is not feasible over a short period and the magnitude of influence is not proportional over a long run to establish the linkage in U.K market. Apergis (2003) objectively analyzed the dynamic effect of macroeconomic on real estate pricing in Greece between 1981-1999 and adopting multi-equation regression model. The result variance decomposition showed that mortgage rate has explanatory power and positive influence of employment and inflation rates increase property return.

Joshi (2006) adopted multi-equation regression to model the impact of monetary shocks on residential property market in India using quarterly data between 2001 and 2005, the result multi-equation regression analysis showed that the major variation in residential housing market is described by innovation in

interest rate and the shock of interest rate permanently influence the return from residential housing market. This result is consistent with Brook and Tsolacos (1999). Eldelstine and Tsang (2007) studied the influence of macroeconomic factors on housing market in U.S using quarterly data between 1988 and 2003. The result showed that employment and interest rate has strong positive significant influence on property market; this finding on positive influence of employment rate on property returns is consistent with that of Apergi (2003).

Sari *et al.* (2007) studied the relationship between macroeconomic and housing market in Turkey between 1961 and 2000. The study adopted multi-equation regression and the result indicated that interest rate has a relative substantial effect on housing investment market than employment rate; this finding is consistent with previous studies (Apergi, 2003; Eldelstine & Tsang, 2007). Schalck and Antipa (2009) empirically studied the impact of fiscal policy on property returns in France, using multi-equation regression analysis, the result showed interest rate positively influence property investment. It is therefore concluded that interest rate subsidy is the most efficient measure of influence, the finding is consistent with that of previous studies (Eldelstine & Tsang, 2007; Sari *et al.*, 2007). Ge (2009) has empirically adopted multiple regressions to examine the determinants of property price return in New Zealand (1980-2007), and

having employed time series quarterly data, the result that unemployment and mortgage rate majorly explained the variation in property price return, the finding on the explanatory influence of mortgage rate on property returns is consistent with Apergis (2003).

Feng *et al.* (2010) analyzed the relationship between macroeconomic factors and property price return in Hong Kong. The result of multi-equation regression showed the existence of significant and stable long run relationship. The research found out that error correction mechanism can affect the deviation of house price return in the long run through slow adjustment. Ojetunde *et al.,* (2011) examined the interaction between macro economy and residential property market using annual data between 1984 and 2009. The result revealed that influence of real GDP and exchange rate explained 28% variation in rent. Wei and Morley (2012) empirically examined the interaction between macro economy and property return in the U.S. The study utilized multi-equation regression analysis to model the bi-causal relationships between the variables, and the result showed that interest rate explained the major variation in property return; thereby the shock of interest rate has contemporaneous effect on house price. These findings are consistent with that of previous studies (Apergi, 2003; Eldelstine & Tsang, 2007; Schalck and Antipa 2009, Siband and Mhlanga, (2013).

Having empirically examined the interaction between property return and the macro economy in UK, the multi-equation regression model was applied on quarterly data between 1994-2011 to establish the interaction, the result showed that the shock of inflation positively impact on property return after six quarters and shock of short term interest negatively impact on property return; this finding is consistent with that of Brooks and Tsolacos (1999). Ojetunde (2013) adopted multi-equation regression to examine the existence of long run relationship and influence of macro economy on residential rental performance in Nigeria using annual data from 1984 to 2011, the result showed that real GDP and exchange rate forecasted 31.4% of variation and positively influenced residential market and at the same time have positive shock influence on residential rent. This study is consistent with that of Ojetunde *et al.,* (2011). Udoekanem *et al.,* (2014) studied the determinants of commercial property rental growth in Minna, Nigeria between 2001 and 2012.

The study adopted both granger causality test and single equation regression causal linkage and the influence of the determinants on rent, the result revealed that real GDP and vacancy rate account for 83% in variation, the finding of this on explanatory influence of GDP on property rents is consistent with that of previous studies (Ojetunde *et al.,* 2011; Ojetunde, 2013). Miregi and Obere (2014)

studied the effect of market fundamental variables on property price in Kenya between 2001 and 2014; the result of multi-equation regression employed revealed that inflation and interest rates had significant lagged positive and negative influence on property price.

Udoekanem *et al.,* (2015) examined the determinants of commercial property rental value in Wuse commercial district of Abuja, Nigeria between 2001 and 2012. Single equation regression was adopted; the result revealed that real GDP and vacancy rates respectively account for 74% and 83% of variation in office rent, therefore the study concludes that real GDP and vacancy rate are the major drivers of rental change in Wuse market. This finding is consistent with that of previous studies in Nigeria (Ojetunde *et al.,* 2011; Ojetunde, 2013; Udoekanem *et al.,* 2014).

Most of the existing studies carried out outside Nigeria have succeeded in establishing the influence of macro economy on property returns and price without the use of nominal rent as commonly used in most Nigerian studies. Therefore the existing studies in Nigeria have not been able to establish the influence of macroeconomic factors on residential investment returns but have only succeeded in examining the influence of macroeconomic factors on rental value. The pressing need for institutional investors to measure the influence of macro economy on the performance of real investment has therefore created the vacuum or gap which the study intends to fill.

Study Area

Abuja is the capital city of Nigeria. Abuja is selected for the study on the basis of the existence of relatively high frequency of property market transactions and due to presence of high level housing infrastructural services provision and development which cannot be compared with any city within the country. Abuja, the Federal Capital Territory (FCT) is within longitude $6^{\circ} 44'$ to $7^{\circ} 37'$ E and latitude $8^{\circ} 23'$ to $9^{\circ} 28'$ N as shown in Figure 1, it occupies an approximate geographic center of Nigeria.

Figure 1: Map of Nigeria showing FCT
Source: Abuja Geographic information System, 2016

The Federal Capital City (FCC) is embedded in Abuja Municipal Area Council (AMAC) having four phases of development. Figure 2 shows the exact location of the FCC on the map of FCT.
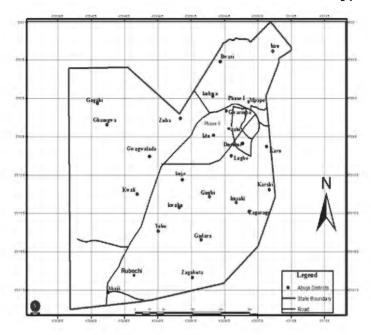
Figure 2: Map of FCT showing FCC
Source: Abuja Geographic information System, 2016

The four phases of physical development of the FCC are distinctively identified in Figure 3 as Phases 1, 2, 3 and 4, respectively.

Figure 3: Map of FCC, Federal Capital City
Source: Abuja Geographic information System, 2016

Methodology

The study employed both primary and secondary data. The primary data for the study comprised rent and actual sale data between 2001-2015 which were collected through structured questionnaires from registered estate surveying and valuation firms in Abuja. The secondary data comprised of macroeconomic indices from Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) between 2001-2015. The macroeconomic indices employed for the study were identified from the literature which includes real gross domestic product (RGDP), inflation rate, interest rate, exchange rate, employment and unemployment rates. The sample size adopted for each residential area of the city was quantitatively determined using Frankfort-Nachmias (1996) model for sample size determination described as follows:

Where N = population size (in column 1 of Table 1)
n = sample size (in column 3 of Table 1)
p = 95% confidence level of the target population
q = 1-p
e = Acceptable error Z = 1.96 (the standard normal deviation at 95% confidence level)

For various residential neighborhoods, the number of residential transaction and the sampled properties are presented in table 1.

Table 1: Total number of residential transactions Sampled Abuja.

Residential Markets	No. of Residential Letting Transaction (N)	No of Residential Lettings Sampled (n)	No of Residential Sale Transactions (N)	No. of Residential Sales Sampled (n)
Maitama (3B/R)	87	40	50	30
Maitama (4B/R)	10	44	50	30
Wuse II (3B/R)	63	34	42	27
Wuse II (4B/R)	453	63	42	27
Gwarinpa (3B/R)	157	50	50	30
Gwarinpa (4B/R)	66	35	40	26
Utako (3B/R)	47	29	25	19
Utako (4B/R)	45	28	27	20
Area1 (3B/R)	63	34	24	18
Area1 (4B/R)	47	29	27	20
Area 10 (3B/R)	47	29	27	20
Area 10 (4B/R)	29	21	25	19
Total	**1,213**	**436**	**429**	**286**

The study utilized both descriptive and inferential methods of data analysis. Descriptive analysis involves determination of annual return index of residential property investment upon which the influence of macroeconomic factors is established. To determine the total return, holding period of total return model employed is described as follows:

Where CV_t is capital value at end of the year, CV_{t-1} is the capital value beginning of the year and NI represents net income or rental value.

The inferential method required the use

stationerity test using Augmented Dicker fuller (ADF), eager granger conintegration test and conintegration regression analysis. The model for Augmented Dicker fuller is described as follows:

Where Y_t represents vector of time series, t represent time, U_t represents the error terms and □ represents the coefficient matrix of the variables, □ represents differences in variables.

Results and Discussion

The result of ADF unit root test presented in Table 2 shows that real GDP, inflation rate, interest rate and unemployment rate are stationary at first-order difference, only exchange rate is stationary at second-order difference; employment rate is stationary at level, while property returns from different markets are stationary at level. The implication of this test is that the time series data employed for this study is suitable and appropriate for further analysis.

Table 2: Stationary or Unit Root Test of Macroeconomic Factors and Property Returns

Variables	Computed t-statistic	ADF Critical @0.05	Prob.*	Order of integration
ΔReal GPD	- 5.003512	-3.144920	0.0025	I(1)
Δ Inflation Rate	- 4.296966	-3.144920	0.0075	I(1)
Δ Interest Rate	- 7.446427	-3.144920	0.0001	I(1)
Δ Unemployment Rate	- 4.444466	-3.144920	0.0059	I(1)
ΔΔ Exchange Rate	- 3.604032	-3.175352	0.0255	I(2)
ΔEmployment Rate	- 6.405753	-3.119910	0.0002	I(1)
Maitama 3B/R(Rt)	-3.483968	-3.119910	0.0066	I(0)
Maitama 4B/R(Rt)	-3.866170	-3.119910	0.0139	I(0)
Wuse 3B/R(Rt)	- 3.872870	-3.175352	0.0167	I(0)
Wuse 4B/R(Rt)	- 3.993629	-3.175352	0.0138	I(0)
Gwarinpa 3B/R(Rt)	-4.299031	-3.119910	0.0066	I(0)
Gwarinpa 4B/R(Rt)	-3.919592	-3.119910	0.0127	I(0)
Utako 3B/R(Rt)	- 7.402952	-3.144920	0.0001	I(0)
Utako 4B/R(Rt)	-3.692435	-3.212696	0.0244	I(0)
Area 1 3B/R(Rt)	-4.907100	-3.144920	0.0029	I(0)
Area 1 4B/R(Rt)	-4.208528	-3.175352	0.0099	I(0)
Area 10 3B/R(Rt)	- 5.667033	-3.144920	0.0009	I(0)
Area 10 4B/R(Rt)	-4.578586	-3.144920	0.0048	I(0)

In order to establish long run relationship between the variables, eagle granger cointegration test is employed in Table 3 and 4. The test reveals that at least two or more cointegrating equations, this suggests that macroeconomic variables come together to have a significant long run relationship with property returns, this finding is consistent (Fenget al.,2010; Ojetunde, 2013; Siband and Mhlanga 2013).

Table 3: Eagle Granger Cointegration Test (Three-Bedroom, 3B/R)

3B/R Markets	Dependent	tau-statistic	Prob. *	z-statistic	Prob. *
Maitama	RETURN	-6.437713	0.0960	30.3755	0.0001
	REAL_GDP	-3.988168	0.6533	-14.3378	0.6396
	INTE_RATE	-4.66968	0.4549	30.52579	0.0001
	EXCH_RATE	-6.201303	0.0194	-19.9269	1.0000
	INFLATION	-7.252933	0.0440	-21.0986	1.0000
	EMPLOY_RATE	-4.32209	0.5582	36.69313	0.0003
	UNEMPL_RATE	-3.902365	0.6821	-14.7895	0.5266
Wuse	RETURN	-3.908583	0.6893	47.80655	0.0001
	REAL_GDP	-4.181423	0.5878	-15.1815	0.4206
	INTE_RATE	-5.871743	0.1614	-18.5896	1.0000
	EXCH_RATE	-3.781787	0.7210	-15.7335	0.3030
	INFLATION	-5.564236	0.0255	-82.7079	0.0000
	EMPLOY_RATE	-5.104092	0.0103	-17.7841	0.8904
	UNEMPL_RATE	-3.367483	0.8420	-36.7424	0.0000
Gwarinpa	RETURN	-4.686353	0.4371	-57.5731	0.0000
	REAL_GDP	-5.611742	0.0170	-89.2341	0.0000
	INTE_RATE	-4.21596	0.5913	38.63290	0.0003
	EXCH_RATE	-4.025233	0.6404	-16.3623	0.1650
	INFLATION	-5.585215	0.0275	-18.9995	1.0000
	EMPLOY_RATE	-4.429249	0.5063	-16.6201	0.1847
	UNEMPL_RATE	-3.81292	0.7111	-14.3025	0.6418
Utako	RETURN	-4.914659	0.3720	-16.4743	0.0000
	REAL_GDP	-6.092334	0.0446	-17.8033	0.0000
	INTE_RATE	-6.193358	0.0326	-18.5254	0.0000
	EXCH_RATE	-7.858926	0.0300	-20.1097	0.0000
	INFLATION	-5.917695	0.1681	-17.7679	0.0000
	EMPLOY_RATE	-3.929992	0.6829	-44.0564	1.0000
	UNEMPL_RATE	-3.994415	0.6565	-14.2391	0.1356
Area 1	RETURN	-5.058254	0.3500	-22.8334	0.0001
	REAL_GDP	-6.311626	0.0195	-18.931	0.0000
	INTE_RATE	-6.254197	0.1257	-18.6597	0.0000
	EXCH_RATE	-9.945403	0.0045	-21.6159	0.0000
	INFLATION	-7.922129	0.0283	-20.1145	0.0000
	EMPLOY_RATE	-5.393507	0.2738	-72.3341	1.0000
	UNEMPL_RATE	-3.605305	0.7764	-13.2775	0.6613
Area 10	RETURN	-4.615304	0.4590	-16.0171	0.0000
	REAL_GDP	-6.168125	0.1355	-18.8606	0.0000
	INTE_RATE	-5.91656 4	0.1691	-18.0912	0.0000
	EXCH_RATE	-10.8733	0.0021	-22.0442	0.0000
	INFLATION	-7.822112	0.0310	-20.0177	0.0000
	EMPLOY_RATE	-4.83546	0.4072	-60.8249	1.0000
	UNEMPL_RATE	-3.603988	0.7767	-13.3286	0.6461

Table 4: **Eagle Granger Cointegration Test (Four-Bedroom, 4B/R)**

4B/RMarkets	Dependent	tau-statistic	Prob. *	z-statistic	Prob. *
Maitama	RETURN	-6.437713	0.016 0	-20.3755	1.000 0
	REAL_GDP	-3.988168	0.653 3	-14.3378	0.639 6
	INTE_RATE	-4.66968	0.454 9	30.52579	0.000 1
	EXCH_RATE	-6.201303	0.029 4	-19.9269	1.000 0
	INFLATION	-7.252933	0.044 0	-21.0986	1.000 0
	EMPLOY_RATE	-4.32209	0.558 2	36.69313	0.000 3
	UNEMPL_RATE	-3.902365	0.682 1	-14.7895	0.526 6
Wuse	RETURN	-4.376681	0.032 0	-15.313 6	0.000 0
	REAL_GDP	-4.206898	0.594 4	-44.208 9	1.000 0
	INTE_RATE	-4.334939	0.545 4	-15.048 4	0.000 0
	EXCH_RATE	-4.191168	0.599 3	-40.845 7	1.000 0
	INFLATION	-4.007046	0.657 9	-39.084 4	1.000 0
	EMPLOY_RATE	-5.866694	0.000 4	-81.330 4	1.000 0
	UNEMPL_RATE	-3.2914 48	0.859 5	-34.176 7	1.000 0
Gwarinpa	RETURN	-6.437713	0.026 0	-20.3755	0.000 0
	REAL_GDP	-3.988168	0.653 3	-14.3378	0.639 6
	INTE_RATE	-4.66968	0.454 9	30.52579	0.000 1
	EXCH_RATE	-6.201303	0.009 4	-19.9269	1.000 0
	INFLATION	-7.252933	0.044 0	-21.0986	1.000 0
	EMPLOY_RATE	-4.32209	0.558 2	36.69313	0.000 3
	UNEMPL_RATE	-3.902365	0.682 1	-14.7895	0.526 6
Utako	RETURN	-5.244473	0.290 9	-17.588 4	0.000 0
	REAL_GDP	-4.460399	0.506 1	-16.717 2	0.000 0
	INTE_RATE	-4.919841	0.370 6	-16.407 9	0.000 0
	EXCH_RATE	-5.591198	0.020 5	-18.327	0.000 0
	INFLATION	-7.685843	0.034 9	-20.208 2	0.000 0
	EMPLOY_RATE	-4.727987	0.437 8	-54.209 5	1.000 0
	UNEMPL_RATE	-3.16206	0.889 0	-12.200 5	0.841 7
Area 1	RETURN	-4.615304	0.459 0	-16.017 1	0.000 0
	REAL_GDP	-6.168125	0.035 5	-18.860 6	0.000 0
	INTE_RATE	-5.910564	0.169 1	-18.091 2	0.000 0
	EXCH_RATE	-10.8733	0.002 1	-22.044 2	0.000 0
	INFLATION	-7.822112	0.031 0	-20.017 7	0.000 0
	EMPLOY_RATE	-4.83546	0.407 2	-60.824 9	1.000 0
	UNEMPL_RATE	-3.603988	0.776 7	-13.328 6	0.646 1
Area 10	RETURN	-5.344813	0.268 5	-18.748	0.000 0
	REAL_GDP	-5.97323	0.160 2	-19.370 3	0.000 0
	INTE_RATE	-6.510188	0.100 7	-18.728 9	0.000 0
	EXCH_RATE	-9.288929	0.008 2	-21.573	0.000 0
	INFLATION	-7.258737	0.031 4	-19. 5454	0.000 0
	EMPLOY_RATE	-4.68071	0.451 7	-59.558 9	1.000 0
	UNEMPL_RATE	-3.848966	0.703 5	-13.893 4	0.382 8

Tables 5 and 6 present the results of cointegration regression analysis. Co-integrating regression is considered appropriate, in that, macroeconomic variables are not stationery (at level) in the linear relationship until first and second differencing; only the property return index is stationary at level, therefore macroeconomic variables are said to be co-integrated. It is simply the unit root test applied to the residual of ordinary least square estimation. The regression is therefore non-spurious, and that, R^2<DW the necessary condition to suggest no autocorrelation in the residual is met. The result of Durbin-Watson statistic is within acceptable limit; this suggests no autocorrelation in the residuals.

Table 5: **Results of Co-integration Regression Analysis (3B/R Market)**

Markets	Variables	Coefficients	Std. Error	t-statistic	Prob	R	D W
Maitama	REAL_GDP	0.2509	0.2597	0.9664	0.3782	0.535	2.0 2
	EXCH_RATE	0.0856	0.0228	3.7478	0.0133		
	INTE_RATE	0.4609	0.2279	2.0229	0.099		
	INFLATION	0.1425	0.0505	2.8218	0.037		
	EMPLOY_RATE	0.0781	0.0253	3.0899	0.0272		
	UNEMPL_RATE	- 0.050 0	0.0489	- 1.0229	0.3532		
	C	19.728	9.0664	2.1759	0.0815		
Wuse	REAL_GDP	0.9434	0.212 8	4.4334	0.0068	0.836	2.1 2
	EXCH_RATE	0.0674	0.018 7	3.6015	0.0155		
	INTE_RATE	0.7535	0.186 7	4.0354	0.01		
	INFLATION	0. 1627	0.041 4	3.9319	0.011		
	EMPLOY_RATE	0.1372	0.020 7	6.6269	0.0012		
	UNEMPL_RATE	- 0.1359	0.040 1	- 3.3912	0.0194		
	C	- 32.6039	7.429 4	- 4.3885	0.0071		
Gwarinpa	REAL_GDP	0.1936	0.88 9	4.5919	0.002	0.552	2.0 1
	EXCH_RATE	0.3394	0.469 5	1.383	0.043		
	INTE_RATE	0.271	0.32 6	1.2029	0.224		
	INFLATION	0.4473	0.5521	0.818	0.423		
	EMPLOY_RATE	0.2806	0.2194	1.2	0.21		
	UNEMPL_RATE	- 0.5437	0.3709	- 1.4658	0.041		
	C	- 15.434	5.472	- 2.82	0.008		
Utako	REAL_GDP	0.8743	0.2679	3.2642	0.0223	0.474	1.7 8
	EXCH_RATE	0.0171	0.0235	0.7254	0.5007		
	INTE_RATE	0.6062	0.2351	2.5790	0.0495		
	INFLATION	0.1629	0.0521	3.1291	0.02 6		
	EMPLOY_RATE	0.0391	0.0261	1.5008	0.1937		
	UNEMPL_RATE	0.1189	0.0504	2.3573	0.06 5		
	C	- 15.4537	9.3522	- 1.6524	0.1594		
Area 1	REAL_GDP	0.1655	0.1532	1.0802	0.3294	0.385	2.0 1
	EXCH_RATE	0.0081	0.0135	0.5969	0.5765		
	INTE_RATE	0.0267	0.1344	0.1987	0.8503		
	INFLATION	0.0368	0.0298	1.2345	0.2719		
	EMPLOY_RATE	0.0547	0.0149	3.6688	0.0145		
	UNEMPL_RATE	0.0051	0.0288	0.1753	0.8677		
	C	- 3.6832	5.3480	- 0.689	0.5217		
Area 10	REAL_GDP	0.1010	0.211 4	0.4778	0.65 3	0.182	1.7 7
	EXCH_RATE	- 0.0089	0.018 6	- 0.4808	0.65 1		
	INTE_RATE	0.1514	0.185 5	0.8159	0.4516		
	INFLATION	- 0.0233	0.041 1	- 0.5671	0.5952		
	EMPLOY_RATE	0.0063	0.020 6	0.3079	0.7706		
	UNEMPL_RATE	0.0737	0.039 8	1.8515	0.1233		
	C	- 3.3106	7.3824	- 0.4485	0.6726		

Fully Modified Least Squares (FMOLS)

Table 6: **Results of Co-integration Regression Analysis (4B/R Market)**

Market s	Variable	Coefficients		Std. Error	t-statistic	Prob	R	D W
Maitama	REAL_GDP	0.196	7	0.2702	0.7279	0.4993	0.6096	1.8 2
	EXCH_RATE	0.070	5	0.0238	2.9667	0.0313		
	INTE_RATE	0.624	8	0.2371	2.6346	0.0463		
	INFLATION	0.216	5	0.0525	4.1214	0.0092		
	EMPLOY_RATE	0.120	3	0.0263	4.5734	0.00 6		
	UNEMPL_RATE	- 0.086	9	0.0509	- 1.7093	0.1481		
	C	20.412	9	9.4349	2.1635	0.0828		
Wuse	REAL_GDP	0.1150		0.02504	4.5952	0.0025	0.7866	1.9 5
	EXCH_RATE	0.102	6	0.0220	4.6613	0.0055		
	INTE_RATE	0.132	5	0.02197	6.0342	0.0018		
	INFLATION	0.314	4	0.0487	6.4579	0.0013		
	EMPLOY_RATE	0.085	2	0.0244	3.4953	0.0174		
	UNEMPL_RATE	- 0.151	2	0.0472	- 3.2064	0.0238		
	C	- 50.398	9	8.7432	- 5.7644	0.0022		
Gwarinpa	REAL_GDP	0.253	5	0.1563	1.6217	0.15 6	0.1434	2.0 4
	EXCH_RATE	0.010	9	0.0126	0.8638	0.4209		
	INTE_RATE	0.112	2	0.0899	1.2469	0.2589		
	INFLATION	- 0.01	8	0.0169	- 1.0560	0.3316		
	EMPLOY_RATE	0.046	4	0.0316	1.4697	0.19 2		
	UNEMPL_RATE	- 6.703	6	4.3732	- 1.5329	0.1762		
	C	- 6.703	6	4.3732	- 1.5328	0.1762		
Utako	REAL_GDP	0.157	2	0.02397	6.5595	0.0012	0.7996	1.7 1
	EXCH_RATE	0.129	3	0.0211	6.1347	0.0017		
	INTE_RATE	0.345	1	0.0211	6.3938	0.0014		
	INFLATION	0.237	9	0.0466	5.1055	0.0038		
	EMPLOY_RATE	0.121	9	0.0233	5.2274	0.0034		
	UNEMPL_RATE	- 0.210	1	0.0451	- 4.6539	0.0056		
	C	- 58.843	2	8.3703	- 7.0300	0.0009		
Area 1	REAL_GDP	0.158 8		0.2298	0.6911	0.5203	0.1623	2.1 2
	EXCH_RATE	0.02 9		0.0202	1.4428	0.2087		
	INTE_RATE	0.03 8		0.2017	0.1905	0.8564		
	INFLATION	0.000 7		0.0447	0.0158	0.98 8		
	EMPLOY_RATE	0.029 6		0.0224	1.3244	0.2427		
	UNEMPL_RATE	- 0.0059		0.0433	- 0.1368	0.8965		
	C	4.393 8		8.0256	0.5475	0.6076		
Area 10	REAL_GDP	0.262 6		0.3422	0.7675	0.4774	0.2625	1.9 8
	EXCH_RATE	0.031 9		0.0301	1.0612	0.3371		
	INTE_RATE	0.398 9		0.3003	1.3286	0.2414		
	INFLATION	0.151 8		0.0665	2.2817	0.0074		
	EMPLOY_RATE	0.017 6		0.0333	0.5281	0.6201		
	UNEMPL_RATE	- 0.048 2		0.0644	- 0.7475	0.4884		
	C	11.221 4		11.9472	0.9392	0.3907		

Fully Modified Least Squares (FMOLS)

The result of cointegration regression in Table 5 shows that 53.5%, 83.6%, 55.2% and 47.4% variations in 3B/R property return are significantly influenced by macroeconomic variables in Maitama, Wuse, Gwarinpa and Utako markets respectively. This further implies that four markets out of six residential markets for 3B/R were significantly influenced by macroeconomic indicators, and the significance of cointegration regression model is presented in Table 7. While 38.5% and 18.2% variations in property return in Area 1 and Area 10 respectively, are insignificantly influenced by macroeconomic variables, Table 6 shows that 60.9%, 78.6%, and 79.9% variations in 4B/R property return is significantly influenced by macroeconomic variables in Maitama, Wuse and Utako markets respectively, while 14.3%, 16.2% and 26.2% variations in property return in Gwarinpa, Area 1 and Area 10 respectively, are insignificantly influenced by macroeconomic variables. This further implies that three markets out of six residential markets for 4B/R were significantly influenced by macroeconomic indicators, and the significance of cointegration regression model is presented in Table 8. This finding is consistent with Apergis (2003); Joshi (2006); Eldelstine and Tsang (2007); and Kwangware (2010).

Table 7 : Wald Test of Significance of the Cointegrating Regression Model

3B/R Markets	T statistic	Value	D F	Prob
Maitama	F-statistic	5.516434	(8, 5)	0.0391
Wuse	F-statistic	15.10564	(8, 5)	0.0043
Gwarinpa	F-statistic	5.915467	(8, 5)	0.0331
Utako	F-statistic	5.806467	(8, 5)	0.0352
Area 1	F-statistic	3.688136	(8, 5)	0.0849
Area 10	F-statistic	0.849408	(8, 5)	0.5935

Table 8: Wald Test of Significance of the Co-integrating Regression Model

4B/R Markets	T statistic	Value	DF	Prob
Maitama	F-statistic	5.970942	(8, 5)	0.0333
Wuse	F-statistic	9.047895	(8, 5)	0.0138
Gwarinpa	F-statistic	1.108410	(8, 6)	0.4581
Utako	F-statistic	12.61281	(8, 5)	0.0066
Area 1	F-statistic	1.185575	(8, 5)	0.4407
Area 10	F-statistic	1.612272	(8, 5)	0.3096

Conclusion and Recommendation

The study of the influence of macroeconomic variables on Abuja residential property market showed that the real GDP, exchange rate, inflation, interest rate and employment rate have a significant influence on property return across the nine markets. The implication of this outcome is that property investors tend to have an increase in property returns whenever positive macroeconomic policy is made to secure the economy. This could be by improving GDP base, increasing exchange rate to encourage local demand, increasing employment rate and purchasing power in housing market, increasing interest and inflation rates, increasing housing rent and prices thereby positively influencing the investor's return.

Property return is negatively influenced by negative policy-action that results in increase in unemployment in the economy; therefore any development in the economy must be continuously monitored to determine how such development affect property return. It is on this basis that the study recommends that policy-makers should painstakingly study the past and present economic policies before instituting new policies because such policies could adversely affect the property market. Conversely, this could affect the contribution of real estate sector to national economic development.

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