

## Prediction of Property Value in South-South Nigeria Using Key Socio-Economic Factors

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### Abstract

Increasing demand for the correct prediction of property values necessitated this study on the socio-economic factors that affect property value in the South –South region of Nigeria. The study relied primarily on market data covering a period of 10 years from 2016 – 2025 in the six States of the region. The data obtained were analysed using Pearson's moment correlation coefficient, simple and multiple regression analysis. As standalone factors, cost of construction was found to be a significant predictor of property value with  $\beta = .995$ ,  $t(8) = 28.02$ ,  $p < .05$  and accounting for 99% ( $R^2 = .99$ ) of the variance in property value scores. Inflation rate recorded  $\beta = .89$ ,  $t(8) = 5.39$ ,  $p < .05$  and accounting for 78% of the variance while interest rate had  $\beta = .82$ ,  $t(8) = 3.98$ ,  $p < .05$  and accounting for 66% of the variance. As combined factors, the variance was found to be 81.8% while  $p$ -value was  $0.012 < 0.05$  which means that property value to a very appreciable degree is a function of these factors and are correctly predicted from them. The study consequently developed a model:  $\hat{Y}_{prop\ value} = 2563956.494 + 473756.180_{infla} + 355970.176_{GDP} + -82731.482_{inter}$  and recommends its use for prediction of property value.

**Keywords:** *Investment, Prediction, Property value, Socio-economic factors.*

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## **Background to the Study**

Property is a multi-dimensional product and the number and nature of factors that influence its value are equally of different kinds. Property value is a crucial aspect of property market and determining factors that affect it is a significant contribution to the market process (Ge and Du, 2007). Residential property as a commodity is expensive and its availability, to a very large extent, is a function of its value. The value at which a property is offered in the market goes a long way to determine its affordability. Where the value is abnormally high, only a few people are able to afford it while the vast majority is left to put up with degrading structures just to escape from the harsh weather conditions. With the challenge of whether or not the value at which a property is offered will be affordable, comes the problem of changing property values occasioned by factors that are principally socioeconomic in character.

Predicting property values correctly has been a major challenge in the property market over the years owing to lack of sufficient data. The traditional practice of relying solely on cost and sale prices of comparable properties is giving way to new approaches with higher value precision abilities because potential owners, developers, investors, appraisers, tax assessors, and other real estate market stakeholders prefer accurate prediction of real property value. As a result, a prediction model needs to be developed to take into account the impact of various changing factors on property value (Ibrahim *et al.*, 2021).

Property value is an essential aspect of property market worldwide and is determined by a variety of factors. Amit, Sapiri and Yusof (2020) pointed out that researchers measure property value changes based on numerous factors. Ebong, Isong and Udo (2017) on their part opined that real estate property is a multi-dimensional product and the number and nature of factors that influence its value are equally of different kinds. The copious reference made to socioeconomic factors in various property bulletins and other advertising media strongly suggest that if socioeconomic factors that affect property value are carefully studied and analysed, it will be easy to develop a model that will help to correctly predict property value and improve the efficiency of the real estate market. Hence, this study on the socioeconomic factors affecting property value.

## **Materials and Methods**

The data for this study were obtained from the six states making up the South-South Region of Nigeria, one of the six geopolitical zones grouped on the basis of ethnic similarities, linguistic affinity, contiguity, cultural affiliation and some common history for ease of administration. (Ujene and Udoudoh, 2013 and Ekpo, 2021). The focus of the study was on the capital and major cities of the region owing to their popularity, volumes of sale/purchase transactions, availability of data and relative security. It covered data on 2 Bedroom detached bungalow from 2016 to 2025, a period of 10 years. The choice of a 2 Bedroom detached bungalow was informed by the fact that it was the property type mostly traded in the property market.

## **Methodology for Developing a Model for Predicting Property Value**

Standard multiple regression analysis was used to develop the model for predicting property

value. As a preliminary step to establishing the correlation between the dependent and the independent variables, the value of  $R$ , which is the coefficient of correlation was assessed based on Paliant (2007) guidelines such that  $R$  – value of 0.10 to 0.29 was regarded as a small correlation, 0.30 to 0.49 as a medium correlation while  $R$  – value of 0.50 to 1.0 was adjudged to be a high correlation. Secondly, the preliminary step of the analysis was espoused to ensure that there was no violation of the rules of normality, linearity and homoscedasticity and outliers. This was done by inspecting the Histogram of Regression Standardised Residual to ensure that there was no skewness in the data set, the Normal Probability plot (P-P) of Regression Standardised Residual and the Scatterplot. The tolerance values must all be greater than 0.10, variance influence factor (VIF) must be less than 10 and condition index must be less than 30. Maximum cook's distance – not more than 1 as it might suggest an outlier.

In the regression procedure, variables were entered into the regression equation at once. Each independent variable was then assessed in terms of the unique amount of variance it accounted for. Thereafter, the factors that did not significantly improve the regression model were dropped. The criteria used to determine the significance of the factor in the model were the p-value, comparison of the closeness of fit (using mean square error – MSE) and prediction performance of the model with and without the factor (using coefficient of determination –  $R^2$ ). The regression analysis was carried out for each of the independent variables (Inflation, interest rate, GDP, population growth, housing supply, income level and construction cost) obtained from an extensive review of literature.

### **Variables Selected for Model Development**

The selection of the parameters to be used in the model development was based on the significant relationship between the independent variables and the dependent variable. In addition, since the intent of the model was not only for the identification and explanation of the parameters affecting property value, but also for use in predicting property value, the quantitative characteristics and measurability of the values of each of the variables were considered. In the study, the property value was the dependent variable while inflation rate, interest rate, GDP, population growth, housing supply, income level and construction cost were the independent variables. The values of 5 carefully selected properties from each of the States making up the study area, were reserved for the purpose of model validation. These properties added up to make thirty (30) cases.

In using the multiple regression, there was a separate null hypothesis for each predictor (independent) variable. A regression equation was created and the regression weight for each predictor (known as a beta weight) was tested to see whether it was significantly different from zero. A beta weight significantly different from zero indicated that the independent variable was a significant predictor of the dependent variable. The population symbol for the regression coefficient is given by the Greek letter for beta.

The null hypothesis for each of the predictors was that the beta weight was equal to zero:

|                                             |        |                                                                                                            |
|---------------------------------------------|--------|------------------------------------------------------------------------------------------------------------|
| $H_0: \beta_{\text{Inflation}} = 0$         | (H. 1) | (The beta weight of inflation is equal to zero; Inflation does not predict property value)                 |
| $H_0: \beta_{\text{Interest rate}} = 0$     | (H. 2) | (The beta weight of interest rate is equal to zero; Interest rate does not predict property value)         |
| $H_0: \beta_{\text{GDP}} = 0$               | (H. 3) | (The beta weight of GDP is equal to zero; GDP does not predict property value)                             |
| $H_0: \beta_{\text{Population growth}} = 0$ | (H. 4) | (The beta weight of population growth is equal to zero; population growth does not predict property value) |
| $H_0: \beta_{\text{housing supply}} = 0$    | (H. 5) | (The beta weight of housing supply is equal to zero; housing supply does not predict property value)       |
| $H_0: \beta_{\text{Income level}} = 0$      | (H. 6) | (The beta weight of income level is equal to zero; Income level does not predict property value)           |
| $H_0: \beta_{\text{construction cost}} = 0$ | (H. 7) | (The beta weight of construction cost is equal to zero; construction cost does not predict property value) |

Their respective scores sourced from both primary and secondary sources from year 2016 to 2025 (the 10 year period under review) are presented in Table 1

**Table 1:** Variables for Model Development

| Year | Property Value<br>(₦) | Inflation Rate | Interest Rate | GDP   | Population Growth | Housing Supply | Income Level<br>(₦' m) | Construction Cost (₦' m) |
|------|-----------------------|----------------|---------------|-------|-------------------|----------------|------------------------|--------------------------|
| 2016 | 6.5                   | 9.01           | 11.0          | 2.79  | 412,381           | 5,038          | 1.876                  | 6                        |
| 2017 | 6.5                   | 15.68          | 14.0          | -1.51 | 427,346           | 5,328          | 1.876                  | 6                        |
| 2018 | 7.5                   | 16.52          | 14.0          | 0.82  | 441,969           | 5,635          | 1.876                  | 6.8                      |
| 2019 | 7.8                   | 12.09          | 14.0          | 1.91  | 456,996           | 5,960          | 1.876                  | 7                        |
| 2020 | 8.0                   | 11.40          | 13.5          | 2.27  | 472,534           | 6,303          | 2.027                  | 7.5                      |
| 2021 | 9.5                   | 13.25          | 11.50         | -1.92 | 488,600           | 6,666          | 2.027                  | 8.2                      |
| 2022 | 10.0                  | 16.95          | 11.50         | 3.40  | 505,212           | 7,050          | 2.027                  | 9.5                      |
| 2023 | 11.5                  | 17.78          | 16.50         | 3.10  | 522,390           | 7,456          | 2.027                  | 10.5                     |
| 2024 | 15.5                  | 24.08          | 18.75         | 2.74  | 540,151           | 7,886          | 2.027                  | 14                       |
| 2025 | 16.0                  | 32.15          | 27.50         | 3.40  | 558,516           | 8,340          | 11.300                 | 14.5                     |

**Source:** Researcher's Computation (2025)

Table 1 shows the data that were used for developing the model for predicting property value. The data were fed into SPSS for analysis and interpretation.

### Outcome of the Test Conducted

- A regression analysis was conducted with property value as criterion variable and

- inflation rate as the predictor. Inflation rate was found to be a significant predictor of property value,  $\beta = .89$ ,  $t(8) = 5.39$ ,  $p < .05$  and accounted for 78% ( $R^2 = .78$ ) of the variance in property value scores
- b. A regression analysis was conducted with property value as criterion variable and interest rate as the predictor. Interest rate was a significant predictor of property value,  $\beta = .82$ ,  $t(8) = 3.98$ ,  $p < .05$  and accounted for 66% ( $R^2 = .664$ ) of the variance in property value scores
  - c. A regression analysis was conducted with property value as criterion variable and population growth as the predictor. Population growth was a significant predictor of property value,  $\beta = .95$ ,  $t(8) = 8.31$ ,  $p < .05$  and accounted for 90% ( $R^2 = .896$ ) of the variance in property value scores.
  - d. A regression analysis was conducted with property value as criterion variable and housing supply as the predictor. Housing supply was a significant predictor of property value,  $\beta = .95$ ,  $t(8) = 9.00$ ,  $p < .05$  and accounted for 91% ( $R^2 = .910$ ) of the variance in property value scores
  - e. A regression analysis was conducted with property value as criterion variable and annual income level of a grade level 15 public servant as the predictor. Annual income of a grade level 15 public servant was a significant predictor of property value,  $\beta = .63$ ,  $t(8) = 2.32$ ,  $p < .05$  and accounted for 40% ( $R^2 = .402$ ) of the variance in property value scores
  - f. A regression analysis was conducted with property value as criterion variable and GDP growth rate as the predictor. GDP growth rate was found not to be a significant predictor of property value,  $\beta = .46$ ,  $t(8) = 1.45$ ,  $p > .05$  and accounted for 21% ( $R^2 = .207$ ) of the variance in property value scores.
  - g. A regression analysis was conducted with property value as criterion variable and cost of construction as the predictor. Cost of construction was a significant predictor of property value,  $\beta = .995$ ,  $t(8) = 28.02$ ,  $p < .05$  and accounted for 99% ( $R^2 = .99$ ) of the variance in property value scores.

### **Development of Model**

Preliminary analysis was carried out on the seven (7) parametric variables to ensure that the assumptions of normality, linearity, homoscedasticity, independence of residuals were not violated and to mitigate the effect of outliers. The initial result gave unacceptable multicollinearity problems with condition index of housing supply being 83.991 and that of construction cost being 34.893 both being  $> 30$  which suggest unstable estimates and inflated variances (See Table 2).

**Table 2:** Collinearity Diagnostics<sup>a</sup>

| Model Dimension | Eigen value | Condition Index | Variance Proportions |           |          |          |        |             |                |     |
|-----------------|-------------|-----------------|----------------------|-----------|----------|----------|--------|-------------|----------------|-----|
|                 |             |                 | (Constant)           | INFLATION | GDP RATE | INTEREST | INCOME | CONST. COST | Housing SUPPLY |     |
| 1               | 1           | 6.183           | 1.000                | .00       | .00      | .01      | .00    | .00         | .00            | .00 |
|                 | 2           | .427            | 3.805                | .00       | .00      | .65      | .00    | .00         | .00            | .00 |
|                 | 3           | .332            | 4.312                | .00       | .00      | .02      | .00    | .22         | .00            | .00 |
|                 | 4           | .041            | 12.303               | .04       | .06      | .03      | .00    | .24         | .02            | .00 |
|                 | 5           | .011            | 23.735               | .00       | .16      | .08      | .21    | .36         | .06            | .03 |
|                 | 6           | .005            | 34.893               | .06       | .67      | .14      | .65    | .12         | .05            | .00 |
|                 | 7           | .001            | 83.991               | .90       | .11      | .07      | .14    | .05         | .88            | .97 |

a. Dependent Variable: PROP VAL

Population and income were dropped because they did not significantly improve the regression model. The tolerance value of housing supply was 0.065, that of construction cost 0.027 and that of inflation 0.073, each one of them being  $< 0.1$  and their corresponding VIF scores were 15.296 for housing supply, 36.691 for construction cost and 13,708 for inflation, each of them being  $> 10$  (Table 3).

**Table 3:** Coefficients<sup>a</sup>

| Model       | Unstandardized Coefficients |             | Standardized Coefficients | t      | Sig. | 95.0% Confidence Interval for B |             | Correlations |         |       | Collinearity Statistics |        |
|-------------|-----------------------------|-------------|---------------------------|--------|------|---------------------------------|-------------|--------------|---------|-------|-------------------------|--------|
|             | B                           | Std. Error  |                           |        |      | Lower Bound                     | Upper Bound | Zero-order   | Partial | Part  | Tolerance               | VIF    |
| (Constant)  | 306587.946                  | 1111327.588 |                           | .276   | .801 | -3230152.429                    | 3843328.322 |              |         |       |                         |        |
| INFLATION   | -61956.838                  | 40963.165   | -.121                     | -1.513 | .228 | -192319.910                     | 68406.233   | .885         | -.658   | -.033 | .073                    | 13.708 |
| GDP RATE    | 133036.972                  | 49866.516   | -.075                     | -2.668 | .076 | -291734.481                     | 25660.537   | .455         | -.839   | -.058 | .591                    | 1.693  |
| INTEREST    | 34690.270                   | 53434.723   | .049                      | .649   | .562 | -135362.868                     | 204743.408  | .812         | .351    | .014  | .083                    | 12.067 |
| INCOME      | -.116                       | .056        | -.099                     | -2.054 | .132 | -.295                           | .063        | .634         | -.764   | -.044 | .204                    | 4.901  |
| CONST. COST | 1.259                       | .137        | 1.207                     | 9.198  | .003 | .824                            | 1.695       | .995         | .983    | .199  | .027                    | 36.691 |
| H. SUPPLY   | -123.687                    | 264.544     | -.040                     | -.468  | .672 | -965.585                        | 718.210     | .954         | -.261   | -.010 | .065                    | 15.296 |

a. Dependent Variable: PROP VAL

This suggested multicollinearity problem. However, despite this initial detection of the problem of multicollinearity, inflation was retained because its condition index of 3.805 was found to be  $< 30$  while housing supply and construction cost were dropped as a result of their condition index being  $> 30$  (Table 2). This action resolved the multicollinearity problem as indicated by the highest condition index being 21.215 ( $< 30$ ), favourable tolerance values ( $> 0.1$ ) and VIF ( $< 10$ ). Tables 4 and 5 present the outputs of the analysis.

**Table 4:** Coefficients<sup>a</sup>

| Model      | Unstandardized Coefficients |             | Standardized Coefficients | t     | Sig. | 95.0% Confidence Interval for B |             | Correlations |         |       | Collinearity Statistics |       |
|------------|-----------------------------|-------------|---------------------------|-------|------|---------------------------------|-------------|--------------|---------|-------|-------------------------|-------|
|            | B                           | Std. Error  | Beta                      |       |      | Lower Bound                     | Upper Bound | Zero-order   | Partial | Part  | Tolerance               | VIF   |
| (Constant) | 2563956.494                 | 2075871.976 |                           | 1.235 | .263 | -2515519.245                    | 7643432.234 |              |         |       |                         |       |
| INFLA      | 473756.180                  | 224727.612  | .928                      | 2.108 | .080 | -76132.476                      | 1023644.836 | .885         | .652    | .367  | .156                    | 6.393 |
| GDP        | 355970.176                  | 334601.248  | .201                      | 1.064 | .328 | -462769.583                     | 1174709.935 | .455         | .398    | .185  | .847                    | 1.181 |
| INTE       | -82731.482                  | 320325.585  | -.117                     | -.258 | .805 | -866539.953                     | 701076.990  | .812         | -.105   | -.045 | .149                    | 6.720 |

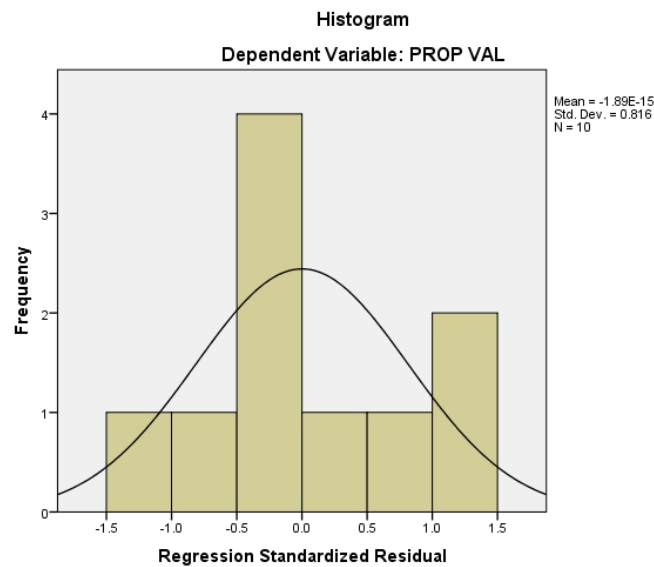
a. Dependent Variable: PROP VAL

**Table 5:** Collinearity Diagnostics<sup>a</sup>

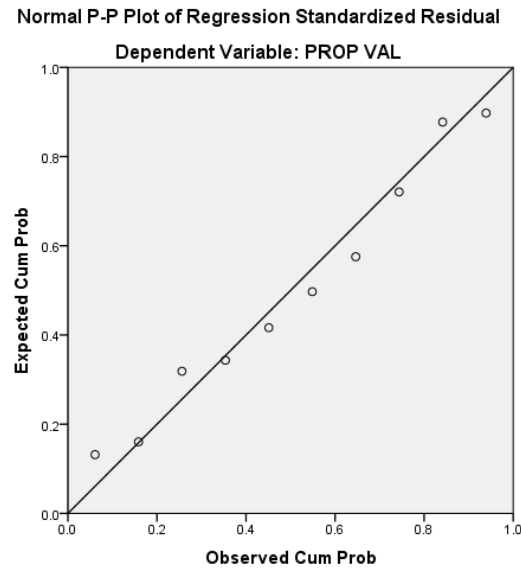
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions |           |          |          |
|-------|-----------|------------|-----------------|----------------------|-----------|----------|----------|
|       |           |            |                 | (Constant)           | INFLATION | GDP RATE | INTEREST |
| 1     | 1         | 3.515      | 1.000           | .01                  | .00       | .03      | .00      |
|       | 2         | .407       | 2.938           | .02                  | .00       | .91      | .00      |
|       | 3         | .070       | 7.088           | .66                  | .09       | .03      | .01      |
|       | 4         | .008       | 21.215          | .31                  | .90       | .03      | .99      |

a. Dependent Variable: PROP VAL

Furthermore, the assumptions of normality, linearity, homoscedasticity were not violated as indicated in the normal probability plots, histogram, and scatter plot.

**Figure 1:** Histogram Showing a Normal Distribution Curve





**Figure 2:** Scatter Plots of the Distribution of the Variables

Maximum Cook's Distance = 0.818 ( $< 1$ ) indicating that the little cases of outliers existing are within acceptable limits that will not influence the regression analysis. The sample size (N) is 120 cases  $> (50+8m)$  as suggested by Tabachnick and Fidell (2007) for a standard multiple regression to be satisfied where m is the number of independent variables involved in the model.

**Table 6:** Residuals Statisticsa

|                                   | Minimum        | Maximum       | Mean          | Std. Deviation | N  |
|-----------------------------------|----------------|---------------|---------------|----------------|----|
| Predicted Value                   | 6882517.5000   | 16730401.0000 | 9880000.0000  | 3136482.16771  | 10 |
| Std. Predicted Value              | -.956          | 2.184         | .000          | 1.000          | 10 |
| Standard Error of Predicted Value | 692336.313     | 1619360.250   | 1105689.933   | 312701.858     | 10 |
| Adjusted Predicted Value          | 4995493.5000   | 19658808.0000 | 10285354.0727 | 4163757.26185  | 10 |
| Residual                          | -2024063.37500 | 2293649.00000 | .00000        | 1477923.33678  | 10 |
| Std. Residual                     | -1.118         | 1.267         | .000          | .816           | 10 |
| Stud. Residual                    | -1.299         | 1.776         | -.063         | 1.078          | 10 |
| Deleted Residual                  | -3658808.25000 | 4504506.50000 | -405354.07268 | 2805068.00592  | 10 |
| Stud. Deleted Residual            | -1.399         | 2.353         | -.007         | 1.230          | 10 |
| Mahal. Distance                   | .417           | 6.303         | 2.700         | 2.032          | 10 |
| Cook's Distance                   | .000           | .818          | .291          | .345           | 10 |
| Centered Leverage Value           | .046           | .700          | .300          | .226           | 10 |

a. Dependent Variable: PROP VAL

The variance as reflected in the Model Summary (Table 7) which has Inflation, GDP and Interest Rate as independent variables is 81.8%. The p-value for the model (Table 8) is  $0.012 <$



0.05, which means that property value can be predicted using the variables. Variables in the model listed with their beta and part correlation values in descending order of their unique contributions to the variance in the dependent variable are: Inflation (beta = 0.928, part = 0.367), GDP Rate (beta = 0.201, part = -0.185) and Interest Rate (beta = -0.117, part = -0.45).

**Table 7: Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .905 <sup>a</sup> | .818     | .727              | 1810079.02703              |

a. Predictors: (Constant), INTEREST, GDP RATE, INFLATION

b. Dependent Variable: PROP VAL

**Table 8: ANOVA<sup>a</sup>**

| Model        | Sum of Squares      | df | Mean Square        | F     | Sig.              |
|--------------|---------------------|----|--------------------|-------|-------------------|
| 1 Regression | 88537683495489.030  | 3  | 29512561165163.010 | 9.008 | .012 <sup>b</sup> |
| Residual     | 19658316504510.980  | 6  | 3276386084085.164  |       |                   |
| Total        | 108196000000000.020 | 9  |                    |       |                   |

a. Dependent Variable: PROP VAL

b. Predictors: (Constant), INTEREST, GDP RATE, INFLATION

**Table 9: Coefficients<sup>a</sup> Table of the Regression Model for Property Value**

| Model   | Unstandardized Coefficients |             | Standardized Coefficients | t     | Sig. | 95.0% Confidence Interval for B |             | Correlations |         |       | Collinearity Statistics |       |
|---------|-----------------------------|-------------|---------------------------|-------|------|---------------------------------|-------------|--------------|---------|-------|-------------------------|-------|
|         | B                           | Std. Error  | Beta                      |       |      | Lower Bound                     | Upper Bound | Zero-order   | Partial | Part  | Tolerance               | VIF   |
| (Const) | 2563956.494                 | 2075871.976 |                           | 1.235 | .263 | 2515519.245                     | 7643432.234 |              |         |       |                         |       |
| INFLA   | 473756.180                  | 224727.612  | .928                      | 2.108 | .080 | -76132.476                      | 1023644.836 | .885         | .652    | .367  | .156                    | 6.393 |
| GDP     | 355970.176                  | 334601.248  | .201                      | 1.064 | .328 | -462769.583                     | 1174709.935 | .455         | .398    | .185  | .847                    | 1.181 |
| INTE    | -82731.482                  | 320325.585  | -.117                     | -.258 | .805 | -866539.953                     | 701076.990  | .812         | -.105   | -.045 | .149                    | 6.720 |

a. Dependent Variable: PROP VAL

INFLA = Inflation, GDP = Gross Development Product Rate and INTE = Interest Rate

### The Regression Equation

$$\hat{Y} = a + b_1X_1 + b_2X_2 + b_3X_3$$

Where;

$\hat{Y}$  = the predicted property value scores.

$a$  = the Y –intercept; the value of  $\hat{Y}$  when all  $X$ s = 0

$b_i$  = the regression coefficient for the  $i$ th predictor. In this work,  $i$  takes on the values of 1, 2, or 3 for the first (inflation), second (GDP) and third (interest rate) predictors respectively.  $X_i$  = the score on the  $i$ th predictor (independent variable) for the participants. In this study,  $i$  takes on the values of 1, 2 and 3 for the first, second, and third predictors respectively.

The values in the regression equation,  $a$  (the Y-intercept; called “constant” in SPSS) and  $b_1$ ,  $b_2$ , and  $b_3$  (the regression coefficients for each of the predictors), are found in the Coefficients table in the *Unstandardized Coefficients* column heading labeled “B” (Table 9). In the Coefficients table, the value of the Y-intercept is 2563956.494 and the coefficients of inflation, GDP and interest rate are: 473756.180, 355970.176 and -82731.482 respectively. Substituting these values into the regression equation formula produces the following equation for predicting property value scores:

$$\hat{Y}_{prop\ value} = 2563956.494 + 473756.180_{inflation} + 355970.176_{GDP} + -82731.482_{interest} \dots \dots \dots \text{Eq. 1}$$

### Validating the Developed Model

A major requirement in developing a regression model is to test its accuracy and validity (Adewuyi and Idoro, 2017). This process is also referred to as Model Validation and it involves the testing and evaluating of the developed model with some test or validation data. The validation data were some representative data from the target population. These data are not used in the model development, but are used specifically for testing the developed model. For this study, the validation data were made up of the values of the 5 properties from each of the States of the study area reserved for this purpose.

**Prediction Process:** To use the model to calculate/predict property value involves merely the substitution of the new parameter values into the equation. An example of this computation can be seen in the use of the derived model in Equation 1. The predicted property value is thereafter compared with the actual recorded property value. The results of the computations are presented in Table 10.

$$\hat{Y}_{prop\ value} = 2563956.494 + 473756.180_{inflation} + 355970.176_{GDP} + -82731.482_{interest}$$

Substituting the values of the independent variables for the first case gives:

$$\begin{aligned} \hat{Y}_{prop\ value} &= 2563956.494 + 473756.180(9.00) + 355970.176(2.72) + -82731.482(11.0) \\ &= 2563956.494 + 4263805.62 + 968238.87872 - 910046.302 \\ &= \text{N}6,885,954.69 \text{ (approximately).} \end{aligned}$$

**Table 10:** Comparison Between the Predicted and the Actual Property Values

| Case | a           | Infla<br>(%) | GDP<br>(%) | Inte<br>(%) | PVa<br>(₹'000,000) | PVp<br>(₹'000,000) |
|------|-------------|--------------|------------|-------------|--------------------|--------------------|
| 1    | 2563956.494 | 9.00         | 2.72       | 11.0        | 7.0                | 6.89               |
| 2    | 2563956.494 | 8.87         | 2.73       | 11.0        | 7.2                | 6.83               |
| 3    | 2563956.494 | 9.01         | 2.79       | 11.0        | 6.5                | 6.92               |
| 4    | 2563956.494 | 15.05        | -1.47      | 14.0        | 7.5                | 8.01               |
| 5    | 2563956.494 | 15.20        | -1.51      | 14.0        | 7.8                | 8.07               |
| 6    | 2563956.494 | 15.68        | -1.51      | 14.0        | 8.0                | 8.29               |
| 7    | 2563956.494 | 16.27        | 0.79       | 14.0        | 8.8                | 9.39               |
| 8    | 2563956.494 | 16.32        | 0.80       | 14.0        | 9.0                | 9.43               |
| 9    | 2563956.494 | 16.52        | 0.82       | 14.0        | 10.5               | 9.52               |
| 10   | 2563956.494 | 12.05        | 1.90       | 14.0        | 8.5                | 7.46               |
| 11   | 2563956.494 | 12.03        | 1.91       | 14.0        | 8.5                | 7.78               |
| 12   | 2563956.494 | 12.09        | 1.91       | 14.0        | 7.5                | 7.81               |
| 13   | 2563956.494 | 11.40        | 2.23       | 13.5        | 6.5                | 7.64               |
| 14   | 2563956.494 | 11.40        | 2.27       | 13.5        | 8.5                | 7.65               |
| 15   | 2563956.494 | 11.40        | 2.27       | 13.5        | 8.0                | 7.65               |
| 16   | 2563956.494 | 13.25        | -1.92      | 11.5        | 7.5                | 7.20               |
| 17   | 2563956.494 | 13.08        | -1.92      | 11.5        | 8.2                | 7.12               |
| 18   | 2563956.494 | 13.25        | -1.92      | 11.5        | 7.8                | 7.20               |
| 19   | 2563956.494 | 16.95        | 3.40       | 11.5        | 9.2                | 10.85              |
| 20   | 2563956.494 | 16.95        | 3.40       | 11.5        | 9.8                | 10.85              |
| 21   | 2563956.494 | 16.95        | 3.40       | 11.5        | 9.5                | 10.44              |
| 22   | 2563956.494 | 17.70        | 3.10       | 16.5        | 9.5                | 10.68              |
| 23   | 2563956.494 | 17.75        | 3.10       | 16.5        | 11.0               | 10.71              |
| 24   | 2563956.494 | 17.78        | 3.10       | 16.5        | 12.8               | 13.36              |
| 25   | 2563956.494 | 24.00        | 2.74       | 18.75       | 13.5               | 13.39              |
| 26   | 2563956.494 | 24.08        | 2.74       | 18.75       | 13.0               | 13.39              |
| 27   | 2563956.494 | 24.08        | 2.74       | 18.75       | 15.5               | 16.72              |
| 28   | 2563956.494 | 32.15        | 3.40       | 27.50       | 16.5               | 16.771             |
| 29   | 2563956.494 | 32.11        | 3.40       | 27.50       | 17.0               | 16.72              |
| 30   | 2563956.494 | 32.15        | 3.40       | 27.50       | 17.2               | 16.72              |

**Source:** Researcher's Computation (2024)

Where PVa= Actual Property Value, PVp = Predicted Property Value; a = constant = 2563956.494, infla = inflation, GDP= Gross Development Product, Inte = interest rate

#### **Test of Null Hypothesis (Statistical test for Model Validation)**

To explain further the accuracy and validity of the developed model, the proposed null hypothesis ( $H_0$ ) was tested using paired sample t-test to find out whether there was any significant difference between the actual property value and the predicted property value. To validate the models, paired T-test was used at  $p \geq 0.05$  (95% level of significance). The rule for the rejection of the hypothesis is that when the p-value  $> 0.05$ , the test fails to reject the

hypothesis, however, when the  $p$  value  $\leq 0.05$ , the test rejects the hypothesis. The test was carried out on the developed model. The result is presented in Table 11.

**Table 11:** Result of Paired t-Test for Test of Significant Difference Between Actual and Predicted Property Values

|        |                                                  | Paired Differences |                |                 |                                           |        | t      | df | Sig. (2-tailed) |
|--------|--------------------------------------------------|--------------------|----------------|-----------------|-------------------------------------------|--------|--------|----|-----------------|
|        |                                                  | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference |        |        |    |                 |
|        |                                                  |                    |                |                 | Lower                                     | Upper  |        |    |                 |
| Pair 1 | ACTUAL PROPERTY VALUE - PREDICTED PROPERTY VALUE | -.23133            | .98755         | .18030          | -.60009                                   | .13742 | -1.283 | 29 | .210            |

The results of the test of significant difference between the actual property value and the predicted property value as seen in Table 11 shows that the  $p$ -values of 0.210 is greater than the critical  $p$ -value (0.05), therefore the test accepted the null hypothesis and concluded that there is no significant difference between the actual property value and the predicted property value.

### Conclusion and Recommendation

Predicting property value has never been an easy task partly because of the unstable economic climate and partly because of the poor record keeping attitude of Nigerians. Findings from the study lend credence to the fact that property value is not static and that predicting it correctly helps individuals and governments in making informed decisions within their budgets and priorities. The model developed from the study is simple, logical and fills an important information gap which has to do with the impact of socio-economic factors on property value. Consequently, it is hereby recommended for use by Estate Surveyors and Valuers.

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