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EFFECTS OF ECONOMIC RECESSION ON THE CURRENT  
PRICES OF SELECTED BUILDING MATERIALS ON THE RATE OF  
HOUSING DEVELOPMENT IN KOGI STATE FROM (2008 – 2017)

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**ABSTRACT**

*This study focused on filling the wide gap between the income and housing cost in Nigeria which has almost eliminated the low-income earners from the housing market. To solve this problem, this research studied the relationship between the prices of eight building materials (cement, gravel, sharp sand, reinforcement bars, emulsion, textcote, and gloss paints and roofing sheet) and the rate of housing development with a view to suggesting strategies that assist in the provision of housing to low-income earners by the government of Kogi State. Both, descriptive and inferential statistics were used for data analysis. It was established that the trend of the rate of housing development significantly differs from the ones observed for the building materials but the Rate of Housing development could roughly be estimated by employing the price of sharp sand and the price of textcote paint respectively because these materials correlated significantly and positively with the rate of Housing development. A major recommendation from the research findings was that policy makers should use the changes from the price of sharp sand and textcote paint to infer the solution to the problem of annual decrease in the rate of Housing development.*

**Keywords:** *Building Materials, Housing Development, Economic Recession, Regression, Correlation.*

**INTRODUCTION**

Housing is paramount to human existence as it rank among the top three needs of man and its provision has always been of great necessity to man. As a unit of the environment, housing has profound influence on the Health, efficiency social behavior, satisfaction and General welfare of the community. It is a reflection of the cultural social and economic value of a society and one of the best historical evidences of the civilization of a country (Olotuah, 2000). In Nigeria, like in many other developing nations of the world, housing problems are multi-dimensional and the problems of population explosion, continuous influx of people from rural to urban centres and lack of basic infrastructure required for good standard of living have compounded housing problems over the years. Ogleto (1987) has observed that the disparity between the price and quantity on one land and the number of households and the money available to them to pay these prices on the other, constitutes the central problem of housing. According to Okupe and Windapo (2000) the gap between income and shelter cost in Nigeria is very wide. This has almost eliminated the low-income earners from the housing market. A panacea to the problem is the persistent increase in the prices of building materials. This study focuses on facilitating improved accessibility level to housing finance by low-income earners in Nigeria by studying the impact of

increase in the price of building materials on the rate of housing development. In order to study the identified problems this study aim to determine the effect of price of building materials on the rate of housing development with a view of suggesting strategies of improving the provision of housing efficiency and development control in Kogi State. To achieve the aim, the following objectives are pursued:

1. To present a trend analysis of the effect of economic recession on price of each of the selected building materials over the study period.
2. To present a trend analysis of the effect of recession on rate of housing development over the study period.
3. To determine the relationship between the price of building materials and the rate of housing development.

The following null hypotheses were postulated for this research work based on the third objective and literature findings and study of Olakotan (2006).

**Ho: 1:** there is no significant relationship between the price of each of the building materials and the rate of housing development.

**Ho: 2:** there is no significant relationship between the price of all the building materials combined together and the rate of housing development.

**Ho: 3:** there is no significant relationship between the prices of all the concrete materials combined together and the rate of housing development,

**Ho: 4:** there is no significant relationship between the prices of all the painting materials combined together and the rate of housing development.

The study covers Lokoja, Kogi State between the period of 2008 and 2017. The selected building materials are 50kg port land cement, sharp sand, coarse aggregate (gravel). 12mm high tensile reinforcement bar, corrugated iron roofing sheet, 20 litres gallon of emulsion paint, 10 litres gallon of texcote paint and 4 litres gallon of gloss paint. The officially compiled statistics of houses constructed annually kept by Kogi State Ministry of works, housing and urban development Board were employed in lieu of actual field data on rate of housing development due to time constrain.

## **REVIEW OF LITERATURE**

### **Concept of Housing**

Achuenu and Achuenu (2006; 2008) opined that social housing is government – supported accommodation for people with low to moderate incomes. Social housing could also be rental housing owned and managed either by the state or not for profit organizations or a combination of the two. It is also include affordable housing, community housing our cooperative housing. Most social housing providers are non-profit oriented. It was reported in [www.manufacturingtoday.nigeria](http://www.manufacturingtoday.nigeria) (2012) that the official estimate shows a

shortage of 16 million housing units in Nigeria with 80% of the population living in informal housing. These are structures of varying degrees of degeneration on land which they have no ownership or title rights. Ibimilua (2013) reported that the challenges of housing in terms of quality and quantity appear to be the same all over the world. The needy have less access to housing while the less needy have greater chances of accessing housing.

In Nigeria, housing is generally inadequate in the rural areas in terms of quality, while the major problem in urban areas is more of quality is also an issue. The shortage of housing is one of the factors responsible for the poor environmental quality across in Nigeria. In 1991, the national housing policy was promulgated in order to propose possible solutions to the housing problems in Nigeria. Twenty five years back, millions of Nigerians are still homeless while many others are living in decent houses. Ibimilua (2013) therefore identified the major challenges to be due to poor implementation, corruption, bureaucracy and political instability. He then recommended that housing finance, co-operatives use of local building materials, development of infrastructure, policy implementation and review of the housing policy are the possible solutions to the housing problem in Nigeria.

#### **Rising Cost of Building and Effect of Materials Price Increase on Construction Cost**

Building cost has been on the increase in our contemporary society and this attracts a great deal of concern to both private and public bodies. The rapid increase in the cost of construction is observed to be influenced by Economic Recession. Onibokun (1985), observed that although Nigeria is potentially endowed with natural resources to produce most materials needed for their construction industry vast of the resources still lies fallow and local production of building materials had never matched demand at any time. Onibokun (1985), noted further that 20% paint and a reasonable percentage of the cement consumed in 1974 were imported. Omole (1988) is of similar view that essential materials like cement, finishing materials are sometimes scarce to come by in Nigeria, Oladapo (1988) in the same vein agreed that most building materials with the exception of wood could be said to be imported. Jackson (1988) reported that the basic cost of a building is determined by the design. A large house will cost more than a small one and equally finished large windows cost more than smaller one. Jackson (1988) added that about 50% of building cost goes into materials and the remaining 50% is used up a labour and profit cost in buildings. Therefore, market force that is interplay of demand and supply, are one of the major factors affecting cost of building materials. Osoba (1992) observed with dismay the upward trend in the cost of basic building materials which according to him began after the civil war and other increases in cost of building materials coincide with Udoji award and the mismanagement of the economy, others causes of upward trend in building materials cost according to Osoba (1992) are:

- i. Inefficient distribution system aggravated by middlemen and high transportation cost
- ii. Insufficient building material
- iii. Massive intervention of government in direct housing construction.

In addition to the above, Olusola Obasa (2012) reported that key players in cement industry says there will soon be an end to the annual increase in the price of cement in Nigeria going by recent information.

### **Effect of Economic Recession in Nigeria Construction Industry**

There are many implications of economic recession as witnessed in the country; one of such implication is the rising level of prices of goods and services. This increase in prices affect both capital and construction materials, such that they are not affordable especially to the common man. According to Kehinde and Ogunaike (2011), opined that economic recession has generated much controversy in modern literature that most global economics have renewed and sustained recession resulting to inflation, unemployment and decline in business activities. Tunike (2012), also noted that economic recession has affected the economy, corruption cum social – political variables of the nation as well as the overall global economy. The Gross Domestic Product of the nation has been drastically affected (CBN, 2016). This also accounts for closures of construction industries, job loss, job cut, budget deficits, sky rocketed increase in the prices of products, etc. (National Bureau of Statistics, 2017), people could not afford the basic needs thus, reducing their productivity. In addition, Nigeria's balance of payment problem increased. It made the country unable to import capital goods needed for economic growth and development.

### **RESEARCH METHODS**

The source of data collection for this research work was the secondary source of data collection that is, from the archives of building materials and Kogi State Ministry of works, housing and Urban Development Board on the rate of housing development from already compiled records. The study employed the use of both descriptive and inferential methods of analysis to analyse the collected data. The use of tables was employed to present data collected for the study while bar charts and line graph were employed to present trend analysis on the prices of building materials and rate of housing development respectively. The use of simple linear regression was employed to determine the statistical relationship existing between the price of each of the selected building materials and the rate of housing development, while the multiple regression was employed to determine the statistical relationship existing between the price of all selected building materials combined together and the rate of housing development with the aid of the computer software package called the Statistical Package for Social

Science (SPSS), while correlation analysis (using Spear's Correlation Coefficient) was employed to determine the degree of association between the price of building materials and the rate of housing development. This paper sets level of statistical significance at 5%. Hence, for any value of probability (P) from 0.00 to 0.05 there is significance in the test but for values greater than 0.05 there is no significance in the test.

## RESULTS AND DISCUSSION

The data collected for this study are presented in table 1.

**Table 1: Data on Building Materials Prices and Rate of Housing Development.**

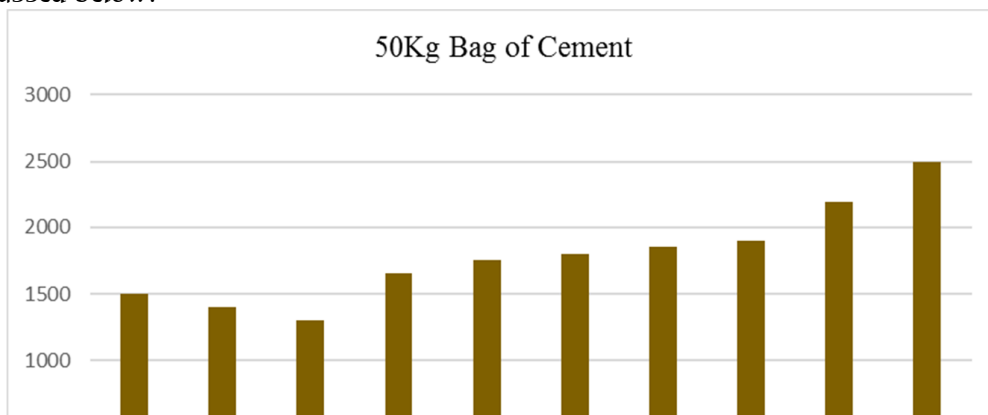
Year	50Kg Bag of Cement (₦)	Gravel (per ₦/Trip)	Sharp Sand (per ₦/Trip)	12mm High Tensile Reinforcement Bar (₦/Kg)	20 Liter Gallon of Emulsion Paint (₦/ gallon)	10 Gallon of Texcote Paint (₦/ gallon)	4 Liters of Gloss Paint (₦/ gallon)	Corrugated G.I Roofing Sheet (₦/Bundle)	Rate of Housing Development in Lokoja (Number)
2008	1,500.00	11,900.00	10,500.00	2,300.00	2,400.00	4,550.00	1,700.00	9,000.00	495.00
2009	1,400.00	10,800.00	10,550.00	1,770.00	2,420.00	4,550.00	1,800.00	9,500.00	395.00
2010	1,300.00	11,950.00	10,600.00	1,250.00	2,500.00	5,000.00	2,200.00	8,000.00	320.00
2011	1,650.00	12,000.00	10,650.00	1,280.00	2,700.00	5,000.00	2,250.00	10,500.00	360.00
2012	1,750.00	12,500.00	10,600.00	1,650.00	2,800.00	5,500.00	2,300.00	11,000.00	342.00
2013	1,800.00	13,000.00	10,500.00	1,700.00	2,900.00	4,400.00	2,400.00	10,200.00	220.00
2014	1,850.00	13,200.00	11,000.00	1,750.00	2,400.00	4,200.00	2,500.00	13,000.00	210.00
2015	1,900.00	13,500.00	11,000.00	1,800.00	2,400.00	4,100.00	2,600.00	17,000.00	197.00
2016	2,200.00	14,000.00	13,500.00	3,000.00	3,000.00	4,800.00	3,500.00	26,000.00	180.00
2017	2,500.00	22,000.00	15,000.00	2,800.00	3,000.00	4,900.00	3,600.00	27,000.00	150.00

- Source: i. Author's Market Survey (2018)  
ii. Kogi State Ministry of Works, Housing and Urban Development

Table 1 shows the data collected on four concrete materials (cement, gravel, sharp sand and reinforcement bar), three painting materials (emulsion paint, texcote paint and gloss paint), roofing sheet and the rate of Housing Development expressed in terms of number of houses approved manually for development by the Kogi State Ministry of Works, Housing and Urban Development Board Lokoja for a ten years period.

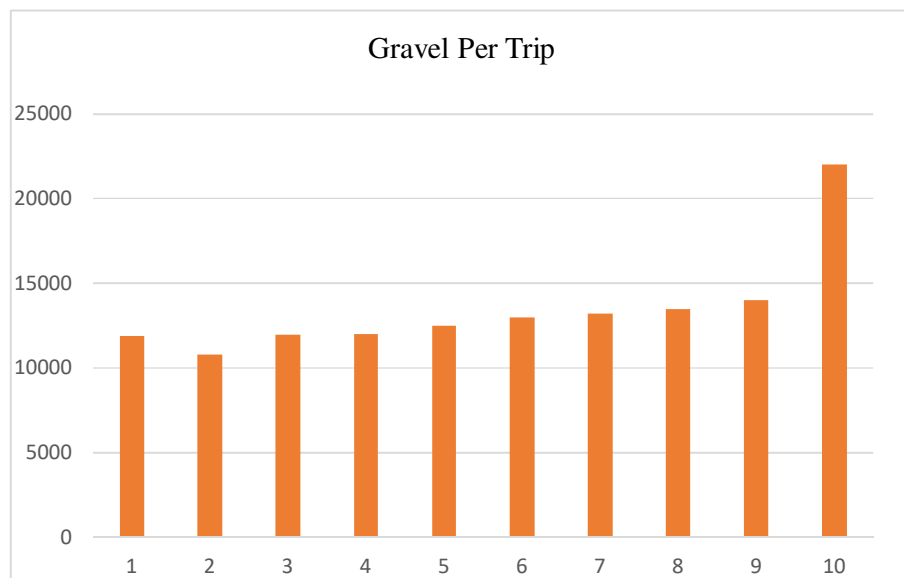
### Result for Inferential Analysis

Bar chart was used to carry out the descriptive analysis of data collected for the study, the bar graphs show the pattern of prices of building materials studied and the line graph shows the rate of Housing development for a ten years period (2008 – 2017). These bar graphs and line graph showing trend analysis are presented and discussed below.



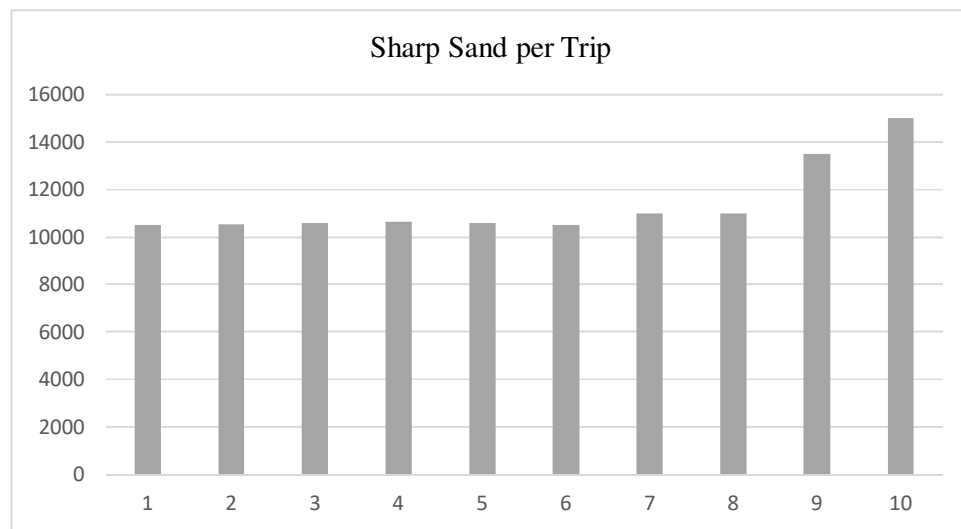
**Fig 1.1: Trend Analysis for Price of Cement from (2008 – 2017)**

Above shows the trend of the prices of the cement for the period under review (2008 – 2017). It was shown from the graph that the price of cement dropped annually for the three years and this was followed by annual increase for the next three years (i.e. the seventh to nine year) shows further annual increment in the price of cement and the tenth year shows an increase in the price of cement. This therefore, implies that the price of cement fluctuates over the period under review on the average.



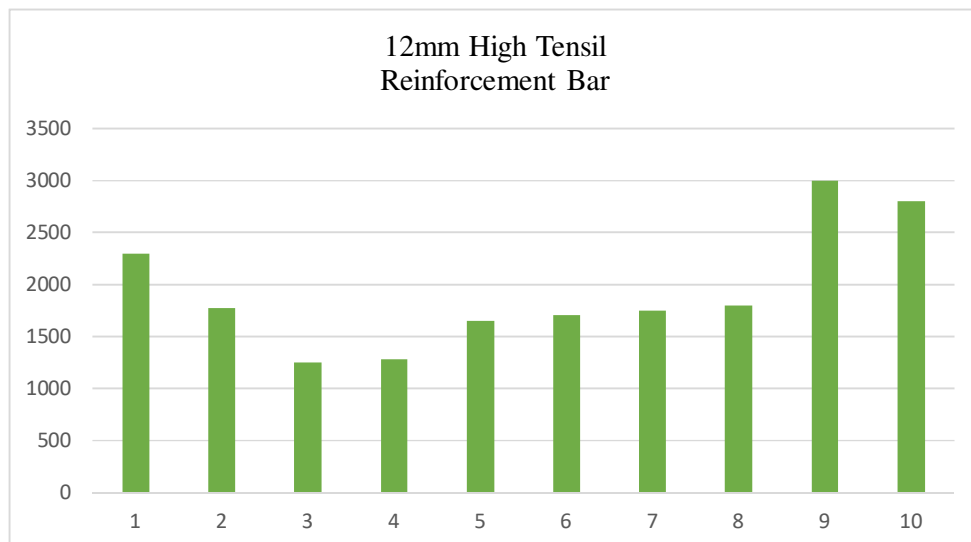
**Fig 2.2 Trend Analysis for Price of Gravel from (2008 – 2017)**

It was observed from the trend analysis of the price of gravel for a ten year period (2008 – 2017) in fig 2 that the price of gravel increase over the period under review except during the second year (2009) where there is decrease in the price of gravel. The trend pattern of the price of gravel differs from that of cement significantly.



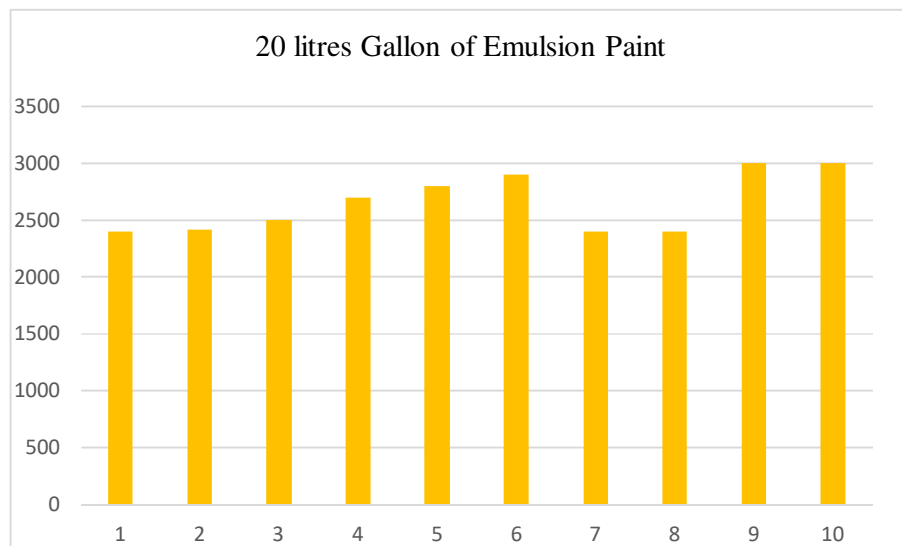
The trend in the price of sharp sand was observed to show annual increment over the study period (2008 – 2017) in fig 3. Except during the fifth and sixth years where a decrease in the price of sharp sand was observed respectively.

The trend pattern of the price of sharp sand gives a similar result with that of gravel.



**Fig 4.4 Trend Analysis for Price of 12mm High Tensile Reinforcement Bar from (2008 – 2017)**

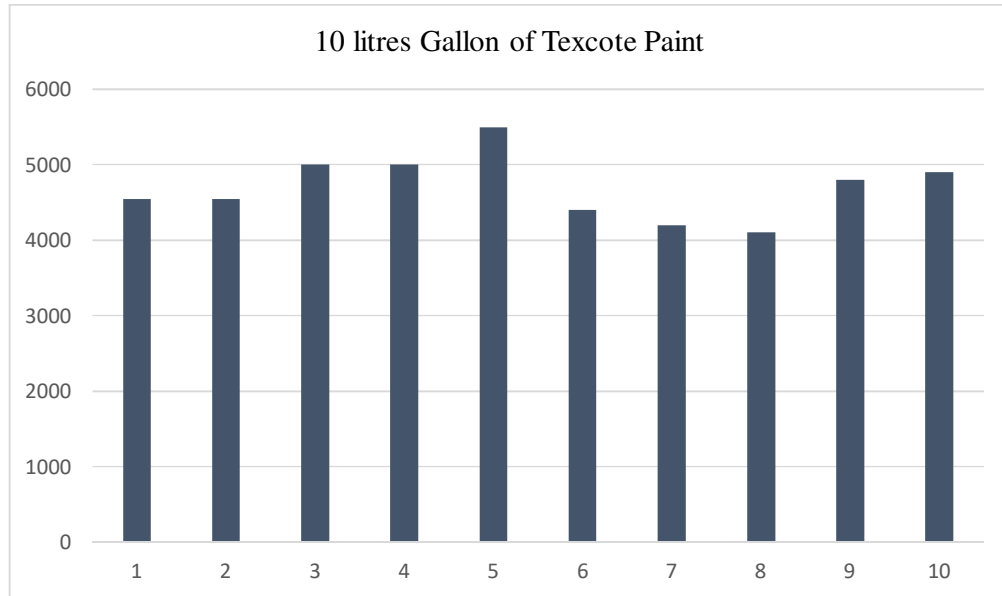
The price of high tensile reinforcement bar from figure 4 was observed to show annual increase in the first year and this was followed by annual decrease from the second year up to fourth year before an annual increase in the fifth year and was followed up to eight year. Finally a wider annual increase was observed in the ninth and tenth year. This trend pattern implies that an average price of high tensile reinforcement bar fluctuate over the study period (2008 – 2017). This show a trend pattern similar to that of the price of cement.



**Fig 5.5: Trend Analysis for price of 20litre Gallon of Emulsion Paint from (2008 – 2017)**

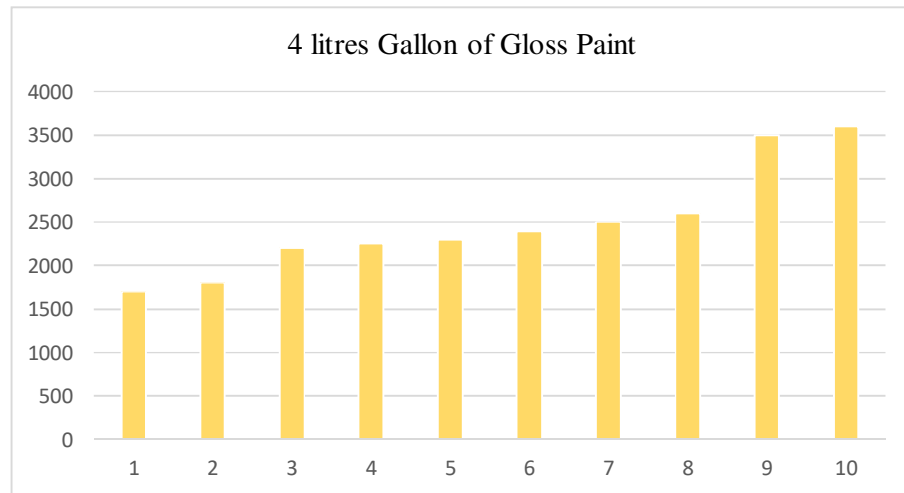


A different trend pattern was observed for the price of emulsion paint from that of the price of cement, sharp sand, gravel and reinforcement bar. It was observed from fig 5 that the price of Emulsion paint shows an annual increase from second year followed up to fifth years. The price of Emulsion paint remains constant from seventh to eighth year. Similar noticed was observed from the ninth to tenth year.



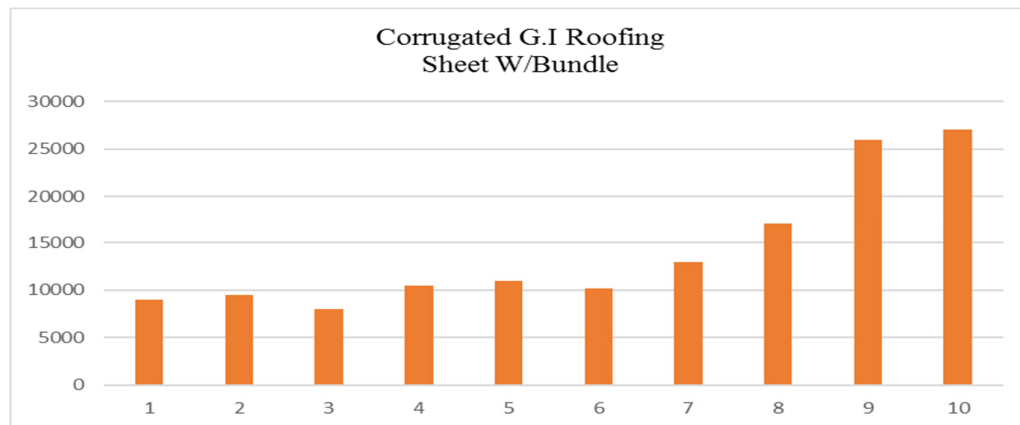
**Fig 6: Trend Analysis for price of 10litre Gallon of Texcote Paints from (2008 – 2017)**

Fig 6 show a constant price of texcote paint for a period of years before annual increase in the price of texcote paint for the fifth year. The price decreases from the sixth to eight year. There is an annual increase in the ninth to ten year. This shows a fluctuating trend in the price of texcote paint.



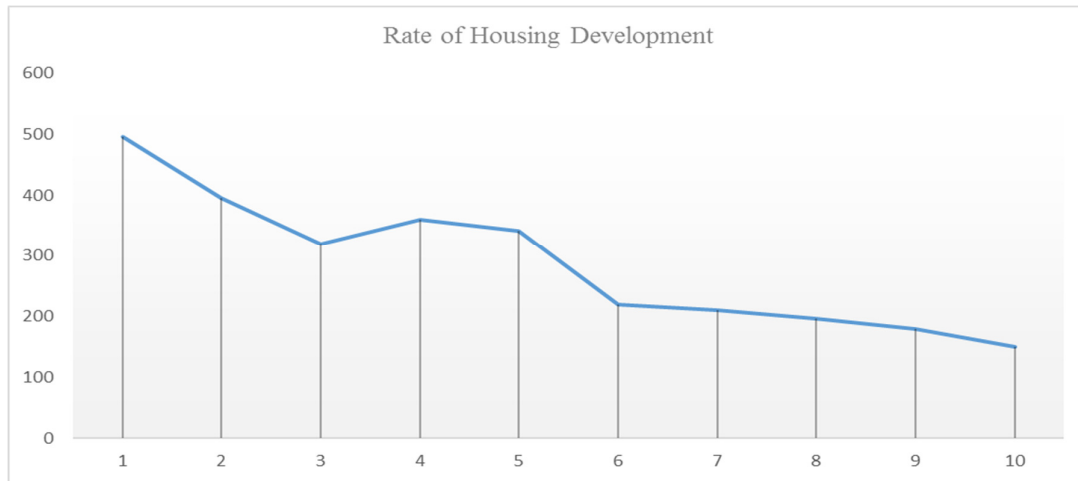
**Fig 7: Trend Analysis for Price of 4liters Gallon of Gross Paint from (2008 – 2017)**

Figure 7, shows the trend of the price of gloss paint during the period of review (2008 – 2017). It was observed that throughout the period under the price of gloss paint increased on annual basis. This trend pattern is unique and different from that of other building material studied. This implies that a consistent trend pattern was noticed for the price of gloss paint.



**Fig 8: Trend Analysis for Price of Corrugated Galvanized Iron Roofing Sheet from (2008 – 2017).**

It was observed that the price of roofing sheet increases annually from (first to second year) and decrease at the third year. A fluctuating pattern was equally observed from fourth to sixth year. Finally an annual increase in the price of roofing sheet was noticed again from seventh to tenth year. This pattern is also different from the ones observed for other building materials studied.



**Fig 10: Trend Analysis of the Rate of Housing Development**

Figure 10 is a line graph of the trend analysis showing the rate of housing development for the ten-years (2008 – 2017) period studied. It was observed that there was a constant annual decrease in the rate of housing development from the first to fifth year (2008 – 2010) and there was a rapid increase in the rate of housing development in the fourth year (2011). This was followed by another constant and annual decrease in the rate of housing development from the fifth to tenth year (2012 – 2017). This implies that the trend pattern of the rate of housing development significantly differs from the one observed for the building materials studies over the period under reviews.

### RESULT FOR INFERENCE ANALYSIS

It was discovered from the inferential analysis that all the building materials showed a weak and non-significant relationship with the rate of housing development with  $R^2$  values ranging from 0 to 48% except for the prices of sharp sand and texcote paint which shows significant but weak relationship with the rate of housing development. The prices of five of the building materials (gravel, sharp sand, emulsion paint, texcote paint and gloss paint) however showed strong correlation (degree of association) with the rate of housing development with the correlation coefficient values ranging from 51%/0.51 to 69%/0.69 while the prices of three building materials (cement, reinforcement bar and roofing sheet) show very weak correlation with the rate of housing development with the correlation coefficient values ranging from 0.4%/0.004 to 22%/0.22. the findings slightly differs from that of Olakotan (2006) because in this case only two or one concrete materials (sharp sand) showed significant and weak relationship with the rate of housing development while in the study of Olakotan (2006) there existed a strong and significant relationship between three concrete materials (cement, gravel and sand) and the rate of housing development. The inferential analysis also revealed that positive correlation exist between the prices of four

building materials (reinforcement bar, emulsion paint, gloss paint and roofing sheet) and the rate of housing development implying that there is a tendency for increase in the prices of reinforcement bar, emulsion paint, gloss paint and roofing sheet respectively to be accompanied by a corresponding increase in the rate of housing development and decrease in the prices of reinforcement bar, emulsion paint, gloss paint and roofing sheet respectively will be accompanied by a corresponding decreases in the rate of housing development. It was also discovered that negative correlation exists between the prices of four building materials (cement, gravel, sharp sand and texcote paint) and the rate of housing development implying that there is tendency increase in the prices of cement, gravel, sharp sand and texcote paint respectively to be accompanied by a decrease in the rate of housing development and decrease in the prices of cement, gravel, sharp sand and texcote paint respectively will be accompanied by an increase in the rate of housing development. This also slightly differs from the finding of Olakotan (2006) where positive correlation was observed between the prices of cement and sand respectively and rate of housing development, where negative correlation was noticed between the prices of gravel and reinforcement bar respectively and the rate of housing development as compared with the findings of this study where negative correlation was observed between the prices of each of the concrete materials and rate of housing development except for the prices of reinforcement bar. A combination of the prices of all the building materials also showed a non-significant but very strong relationship and very strong correlation with the rate of housing development with  $R_2$  and  $R$  values of 93% and 96% respectively. A similar relationship of a non-significant but very strong relationship and very strong correlation was observed between the prices of all concrete materials and all painting materials respectively with the rate of housing development with the  $R_2$  and  $R$  values of 72% & 56% and 85% & 75% respectively. This finding is similar to that of Olakotan (2006) where combination of the prices of the building materials showed a non-significant but strong relationship with the rate of housing development. It is evident from the findings of this studying that the trend in the prices of building materials and rate of housing development in Lokoja, Kogi State has changed from what the trend used to be from 1995 to 2005 as studied by Olakotan (2006). The summery of inferential analysis discussed above given in table 2.



Effects of Economic Recession on the Current Prices of Selected Building Materials on the Rate of Housing Development in Kogi State From (2008 – 2017)

**Table 2: Results Summary for Inferential Analysis**

Analysis No	Variables		Type of Model	Observations	Inferences						
	X	Y		Regression Equation	R/R <sup>2</sup> (%)	F Cal	F Tab	P Value	Strength of Relationship	Remark	Action on Hypothesis
1	Price of Cement	Rate of Building Development	Linear (Simple)	$Y = 533.267 - 0.115X$	22/5	0.410	5.32	0.540	Weak	NS	Accept Ho
2	Price of Gravel	Rate of Building Development	Linear (Simple)	$Y = 3193.651 - 0.241X$	51/26	2.786	5.32	0.134	Weak	NS	Accept Ho
3	Price of Sharp Sand	Rate of Building Development	Linear (Simple)	$Y = 1461.107 - 0.104X$	65/43	5.978	5.32	0.040	Weak	SS	Accept Ho
4	Price of Reinforcement Bar	Rate of Building Development	Linear (Simple)	$Y = 353.149 + 0.006X$	3/0.1	0.007	5.32	0.935	Weak	NS	Accept Ho
5	Price of Emulsion Paint	Rate of Building Development	Linear (Simple)	$Y = 808.655 + 0.191X$	59/32	4.322	5.32	0.071	Weak	NS	Accept Ho
6	Price of Texcote Paint	Rate of Building Development	Linear (Simple)	$Y = 182.199 - 0.135X$	69/48	7.407	5.32	0.026	Weak	SS	Accept Ho
7	Price of Roofing Sheet	Rate of Building Development	Linear (Simple)	$Y = 363.186 + 0.000X$	0.4/00	0.000	5.32	0.082	Weak	NS	Accept Ho
8	Price of Gloss Paint	Rate of Building Development	Linear (Simple)	$Y = 646.116 + 0.157X$	58/33	3.948	5.32	0.991	Weak	NS	Accept Ho

9	Combined Building Material Prices	Rate of Building Development	Multiple	$Y = 17049.745 + 0.286X1 - 1.363X2 - 0.285X3 - 0.273X4 - 0.274X5 - 0.004X6 + 0.536X7 - 0.003X8$	96/93	1.712	4.41	0.533	Strong	NS	Accept Ho
10	Price of Concrete	Rate of Building Development	Multiple	$Y = 5312.140 + 0.301X1 - 0.380X2 - 0.104X3 + 0.118X4$	85/72	3.224	4.41	0.116	Strong	NS	Accept Ho
11	Price of Paints	Rate of Building Development	Multiple	$Y = 1228.018 + 0.175X1 - 0.340X2 + 0.154X3$	75/56	2.536	4.41	0.153	Strong	NS	Accept Ho

## CONCLUSIONS

From the analysis carried out and findings from this study, the following conclusions were reached:

1. There is a constant annual decrease in the rate of housing development over the study period on the average, implying that the trend pattern of the rate housing development significantly differs from the areas observed from the building materials studied over the period under review.
2. All the building materials showed a weak and non-significant relationship with the rate of housing development with  $R_2$  values ranging from 0 to 48% except for the prices of sharp sand and texcote paint which show significant but weak relationship with rate of housing development.
3. The prices of five of the building materials (gravel, sharp sand, emulsion paint, texcote paint and gloss paint) however showed strong correlation (degree of association) with the rate of housing development with the correlation coefficient values ranging from 51%/0.51 to 69%/0.69 while the prices of three building materials (cement, reinforcement bar and roofing sheet) showed very weak correlation with the rate of housing development with the correlation coefficient values ranging from 0.4%/0.004 to 22%/0.22
4. There is tendency from increase in the prices of reinforcement bar, emulsion paint, gloss paint and roofing sheet respectively to be accompanied by a corresponding increase in the rate of housing development and decrease in the prices of reinforcement bar, emulsion paint, gloss paint and roofing sheet respectively will be accompanied by a corresponding decrease in the rate of housing development.
5. There is a tendency for increase in the prices of cement, gravel, sharp sand and texcote paint respectively to be accompanied by a decrease in the rate of housing development and decrease in the prices of cement, gravel, sharp sand and texcote paint respectively will be accompanied by an increase in the rate of housing development.
6. Finally, the rate of housing development can be estimated by employing the prices of sharp sand and the price of texcote paint respectively.

## RECOMMENDATIONS

The following recommendations were made from the findings of this research:

1. The cost of housing development escalates as the price of major building materials like reinforcement bar, paints and roofing sheets increase, it is therefore imperative that policy makers should explore the possibility of using increase in price of materials like these to integrate developmental pressures.



2. Detailed data should be maintained on the charges overtime in the prices of materials like cement; reinforcement bar and roofing sheet to enable policy makers have a workable and implementable development plan for Kogi town.
3. Policy maker should use changes in prices of sharp sand and texcote paint to solve the problem of annual decrease in the rate of housing development has noticed from trend analysis.

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