



Investigation on the Influence of Building Materials Price Fluctuation on Cost of Building Products in Nigeria

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Volatility in the fluctuation of prices of building materials has made price forecast on the cost of the materials less reliable in building project management in Nigeria. In the light of this, the study examines the causes of the constant increase in the prices, as well as the implication of the price fluctuation on building projects in the study area. Survey research designs used to gather information for the study are non-parametric in nature. Data were analyzed using chi-square and likert scale to rank the various factors involved in the price fluctuation, as well as the effects of the variation on building projects respectively. Other analytical tools are price index for the rate of changes in the prices of the materials from time to time on average, and simple regression analysis for the relationship between changes in the average price of building materials and the average house rent within the last ten years. Findings reveal that inflation, force of demand and supply, and exchange rate, as economic factors among others are the most significant ones responsible for the building materials price fluctuations in the study area. Difficulty in forecast and planning, project cost overrun, as well as shortage and high cost of accommodation however, are found as the most common effects of the building materials price fluctuations. Besides, the mean un-weighted aggregate price index, and the mean house rent index for each of the successful year are discovered to be 11.02% and 8.73% respectively. Increase in the aggregate price of the building materials however caused approximately a proportional increase in the house rent, especially in the

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early part of the period. The variables therefore have a positive and linear relationship with the regression model of $Y=5776+0.98x_i$, as derived from Equ.6. It is therefore recommended that research, development and improvement on local material resources be encouraged by the government and the construction stakeholders with legislative instruments against the importation of the basic building materials in Nigeria. Nevertheless, an appropriate framework designed with the aggregate building materials price indices, the model relationship between the effect of change in the aggregate price of the building materials and the consequent change in the residential house rent should be adopted in the management of building projects; for effective forecast and planning of the projects towards sustainable delivery in the study area.

Keywords: Price fluctuation of building materials; cost of building products; causes and effects of the fluctuation; price indices and their relationship and affordable houses.

1. INTRODUCTION

Housing has been the concern of individuals, families, groups, and government since the dawn of urban civilization. Problems in housing development has often been associated with land acquisition problem, low income of the individuals, high cost of building materials, statutory regulation, and so on [1]. It is usually a situation of either the government has failed in meeting up with its obligations or that the individuals have remained incapacitated for sometimes in breaking through various bureaucracies in land acquisition processes and building development approval procedures.

Building as the major component of housing consists of many work activities and diverse construction materials. The multiple nature of work activities in building production inform the many work trades that exist in building. Thus, the associate tradesmen to the various work trade make use of different types of building materials to form the bulk volume of the building. In both local and the international markets, prices of building materials continue to rise surprisingly. The term fluctuation in economic analyses is frequently used to explain the up and down movements of prices of goods and services over a period of time [2]. The increasing cost of building materials as an integral element of economic goods according to [3] is the key challenge perceived to affect the performance of construction industry and its projects over time. Hence, the cost variation of many construction projects often affects significantly the total cost of the projects because of the abnormal fluctuations in prices of building materials over a short period of time.

Bourne L [4] Observed that about 65% of the total housing expenditure goes for the purchase of building materials; hence it contributes as the largest single input in housing development.

According to system resource constraint theory, the price of materials depends on the resources and market constraints. This condition is confirmed by [5], which states that the demand and supply of building materials contribute to the trends in price conditions of the materials.

The high cost of construction materials as the largest single input resource in the industry is discovered in the course of the study to be slowing down the growth of housing development in Nigeria. Fluctuation in the increasing rate of prices of construction materials eventually has led to the worst scenario of this condition; where forecast of cost of building works with current value of a project is hardly estimated with bigger confident interval. Total Cost of productions run out of estimated budget within a stipulated interval of time resulting to time overrun, abandonment or poor quality delivery of the project. This challenge is evident in [6]; he affirmed that price of the material has multipliers effects on housing development, while many projects were not completed on time due to the increasing cost of construction materials. Besides [7], on the other hand noted that cost of building materials poses a significant threat to both the industry and the people aspiring to own houses.

Following the fluctuation and continuous increase in price of the construction materials notwithstanding many previous studies and other efforts made in this regard, the study seeks to explore the effect of variations in cost of building materials on cost of housing development in the study area. To this end, factors responsible for the high cost and fluctuation of the materials were determined.

Rates of fluctuation on prices of the selected building materials were also examined; while the implication of fluctuation on costs of the materials

on affordability of building products were assessed.

2. RESEARCH METHODS AND PROCEDURES

The study adopted survey research design method in gathering data from the field in Owerri, Imo State, Nigeria. The data obtained are in quantitative form for deductive reasoning towards arriving at findings that address the problem of the study. Information from the respondents are targeted with structured questionnaires while price fluctuations on the basic materials over a period of time are through market price survey; with strong emphases on rate of variation on the prices of some basic building materials, and causes and effects of building material price fluctuation on production cost of building. The targeted audience includes some building professionals and project managers of some selected construction firms as major stake holders in the study. These sampled professionals in the built environment includes; the Architects, Builders, Quantity surveyors and Project managers in the study area.

Random method of sampling was used to collect data from the field. System approach was used to elicit information from the building professionals, while purposeful approach was used for the project managers. The instrument of data collection used was administered and retrieved through mobile electronics applications.

Data obtained from the field survey were analyzed using non parametric tools like likert scale, Chi-square, Price Index and Simple Regression to rank the various factors responsible for the building materials price fluctuations, the effects of the variation on the cost of buildings, rates of changes in prices from time to time; and the relationship between changes in prices of the building materials and the house rent on average respectively from 2010 to 2019 in Owerri. Besides, rates of increase in cost of the materials over time were examined.

The respective methods of analyses are therefore expressed in the following forms. They are:

$$\text{Likert Scale} = \text{MS} = \sum_{i=1}^5 \frac{(FxS)}{N} = \frac{5f_1+4f_2+3f_3+2f_4+f_5}{f_5+f_4+f_3+f_2+f_1} \quad \text{Equ.1}$$

Where MS is Mean Score,

F = Frequency of Sample,
S = Weighted Score,
N = Total Sample Number.

Thus, the Building Materials Management Ranking Index (RI) is expressed as;

$$\text{RI} = \sum_{i=1}^5 \frac{(FxS)}{5N} \quad \text{Equ. 2}$$

$$\text{Chi-square } (X^2) = \sum_{i=1}^k \sum_{j=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \quad \text{Equ. 3}$$

(for test of independence)

Where; X^2 is the Chi-square,

O = Observed Frequency in the Sample,
E = Expected Frequency if H_0 is true,
K = the number of category of variables.

For the use of contingency table in test of independency, the expected frequency (E) therefore is expressed as follows:

$$E_{ij} = \frac{R_i \times C_j}{N} \quad \text{Equ. 4}$$

Thus, if $X^2_{1-\alpha(r-1)(c-1)}$ calculated is less than the critical value at 95% confidence interval, the H_0 is accepted, otherwise it is rejected and, the H_a accepted to confirm the independency or otherwise of one group of variables on the others in the study area.

Price index, which explains the rate of change in price of a material, product or any service rendered within a defined period of time, is therefore presented in the form:

$$\text{Aggregate Price Index } (P_i) \text{ in } \% = \frac{\Sigma P_n}{\Sigma P_o} \times \frac{100}{1} \quad \text{Equ. 5}$$

Where;

ΣP_n is the aggregate price of the materials involved at a later year,
 ΣP_o - The aggregate price of the materials involved at the initial year.

Therefore, the Mean un-weighted aggregate price index becomes;

$$\bar{P}_i = (\Sigma P_n / \Sigma P_o \times 100 / 1) / N - 1$$

Simple Regression was used to explain the nature and amount of relationship that exists

between the dependent variable (y) and independent variable (x) in the study. It is therefore expressed as follows:

$$Y = b_0 + b_1X_i + E \quad \text{Equ. 6}$$

Where;

Y is the objective function (the model of the relationship),

b_0 - the intercept,

b_1 - coefficient of the independent variable (slope),

X_i - the independent (predictor) variable,

E – the error probability.

Consequently, b_0 and b_1 in Equation 6 were therefore applied in these forms:

$$b_1 = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{n\sum x_i^2 - (\sum x_i)^2} \quad \text{Equ. 7}$$

$$b_0 = \bar{Y} + b_1 \bar{X}_i \quad \text{Equ. 8}$$

Coefficient of determination (r^2) using sum of squares (SS) is expressed as:

$$r^2 = \frac{SSR}{SST} \quad \text{Equ. 9}$$

Where; SSR and SST are presented in the forms:

$$SSR = \sum y_i^2 - \frac{(\sum y_i)^2}{N} \text{ and, } SST = \frac{\sum x_i y_i}{1} - \frac{(\sum x_i \sum y_i)}{n}$$

Finally, elasticity of the average coefficient in the regression model of linear relationship is therefore expressed as:

$$\bar{E} = \frac{b_1 x \bar{X}}{\bar{Y}} \quad \text{Equ. 10}$$

3. DATA PRESENTATION, ANALYSES AND DISCUSSION OF FINDINGS

In assessing of the factors involved in price fluctuation of building materials in the study area, inflation, force of demand and supply, and exchange rate rank first, second and third respectively as the most significant economic conditions that affect the market price of building materials. They have the corresponding mean scores and index values of 3.96 and 0.79, 3.86 and 0.77, as well as 3.58 and 0.72 respectively. In the study of economics, inflationary economy pushes prices of essential commodities and

services up leaving too much money to be chasing limited available goods and services. Thus, when the demand therefore is high and low supply the price continues to rise.

Besides, a high exchange rate for local currency also contributes to increase in the prices of the affected construction materials especially in the market. Such is the case in our society.

Table 2 shows the examination of levels of implications of the various Effects of price variations of building materials on cost of building project management. Difficulty in forecast and planning is discovered as the most significant effect of building materials price variation, with mean score and index value of 4.17 and 0.83 respectively. Project cost overrun, and shortage and high cost of accommodation however follow as second and third in rank with the matching mean scores and index values of 3.96 and 0.79, and 3.78 and 0.76 respectively.

In Table 3 is shown the relationship between the aggregate price of the basic building materials and average house rent of the most sought residential house in different periods in Owerri. It explains the effect of the aggregate price variation of the building materials on the average house rent of two bed room flat in the study area.

In Table 4, X^2 is 136.59; while $X^2_{1-\alpha(r-1)(c-1)}$ from the table is 46.05. Note that since X^2 calculated is greater than the critical X^2 tabulated, H_0 therefore is rejected for H_a to be accepted, that levels of acceptance is not independent (dependent) on the Economic Factors causing fluctuation in Building Material Prices in the study area.

According to 5.0, X^2 is 116.52; while $X^2_{1-\alpha(r-1)(c-1)}$ from the table is 46.05. Since X^2 calculated at 116.52 is greater than the critical X^2 at 46.05, H_0 is therefore rejected, and H_a accepted. Hence, the severity is not independent (dependent) on the Effect of building material Fluctuation on the Cost of Building Productions in the study area.

In Table 6 is contained the un-weighted aggregate price indices, and average house rent indices of the respective years in the study area, with their cumulative effect from 2011 to 2019. The nature of progressions of the corresponding indices of aggregate building materials and the average house rent respectively from 2011 to 2019 are computed according to Equ.5, and shown in Fig. 4.

Table 1. Severity levels of factors responsible for building material cost fluctuation

S/N	Economic factors responsible for material price fluctuation	(5)	(4)	(3)	(2)	(1)	Total	MS	Rank	Index	Rmk
1	Amount of money in circulation	26	13	13	15	5	72	3.56	4 th	0.71	
2	Crude oil price	13	15	13	17	14	72	2.94	8 th	0.59	
3	Energy cost	24	15	5	15	13	72	3.31	6 th	0.66	
4	Exchange rates	29	15	5	15	8	72	3.58	3 rd	0.72	
5	Forces of demand and supply	24	30	5	10	3	72	3.86	2 nd	0.77	
6	Import duty	24	10	15	13	10	72	3.35	5 th	0.67	
7	Inflation	34	10	20	7	1	72	3.96	1 st	0.79	
8	Transportation cost	13	7	40	10	2	72	3.26	7 th	0.65	
Total		187	115	116	102	56	576				

Source: Field Survey, Ikechukwu (2020)

Table 2. Severity levels of effects of building materials price variations on building project management

S/N	Effects of Material Cost Fluctuation	(5)	(4)	(3)	(2)	(1)	Total	MS	Rank	Index	Rmk
1	Abandonment of Project	13	7	40	10	2	72	3.26	5 th	0.65	
2	Decrease in Quality of Works	20	15	10	13	14	72	2.63	8 th	0.53	
3	Delays in Projects	9	17	20	15	11	72	2.97	7 th	0.59	
4	Difficulty in Forecast and Planning	30	15	3	19	5	72	4.17	1 st	0.83	
5	Increase in Unemployment	14	13	20	17	8	72	3.11	6 th	0.62	
6	Project Cost Overrun	34	10	20	7	1	72	3.96	2 nd	0.79	
7	Shortage and High Cost of Housing Accommodation	27	22	8	10	5	72	3.78	3 rd	0.76	
8	Constant Conflict Between Clients and Contractors	21	14	17	11	9	72	3.38	4 th	0.68	
Total		168	113	138	102	55	576				

Source: Field Survey, Ikechukwu (2020)

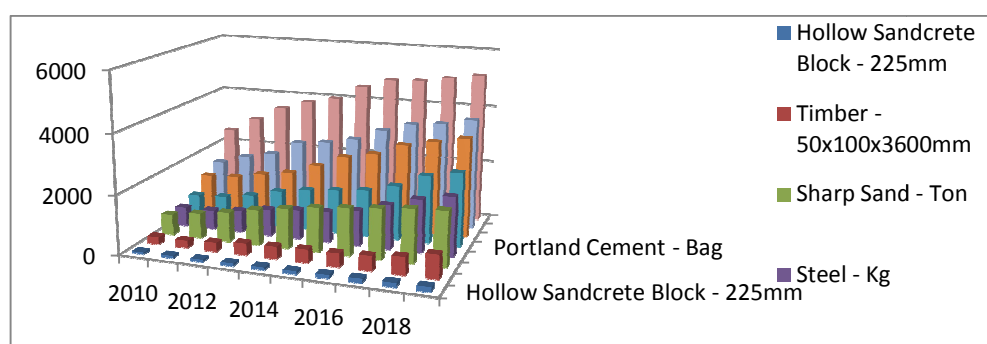


Fig. 1. Price Variations of the Basic Building Materials in Owerri from 2010 -2019

Source: Field Survey, Ikechukwu (2020)

Table 3. Relationships between the aggregate price of the basic building materials and average house rent of the residential buildings at different periods in Owerri

S/N	Year	Basic building materials									House rent for two bed room flat
		Cement (Bags)	Steel (Kg)	Timber (2x4x12)	Sand (Ton)	Granite (Ton)	Emulsion paint	Long span alum. (0.5mm)	Sandcreteblocks (150x225 x450mm)	Total value	
1	2010	800	650	250	700	2500	1250	1500	70	7720	#12,000
2	2011	850	650	250	850	3000	1300	1800	80	8680	#15,000
3	2012	1000	750	300	1000	3500	1500	2000	85	10135	#16,000
4	2013	1250	900	400	1200	3800	1650	2500	90	11790	#18,000
5	2014	1400	1000	420	1350	4000	2000	2600	100	12670	#18,000
6	2015	1500	1050	450	1500	4500	2400	2800	110	14510	#20,000
7	2016	1600	1200	450	1600	4800	2600	3200	125	15775	#22,000
8	2017	1850	1500	500	1700	4850	3000	3500	140	17640	#22,000
9	2018	2300	1800	600	1800	5000	3200	3600	150	18550	#24,000
10	2019	2500	2000	800	1850	5150	3400	3800	160	19660	#25,000

Source: Field Survey, Ikechukwu (2020)

Table 4. X² Contingency table for test of independent of levels of acceptance on economic factors involved in the fluctuation of building material prices

S/N	Economic factors causing fluctuation in building material prices	Weight of acceptance	Observed frequency (O)	Expected frequency (E)	O-E	(O-E) ²	(O-E) ² /E
1	Amount of money in circulation	5	26	23.4	2.6	6.78	0.29
		4	13	14.4	-1.4	1.96	0.14
		3	13	14.5	-1.5	2.25	0.16
		2	15	12.8	2.2	4.84	0.38
		1	5	7	-2	4	0.57
2	Crude oil price	5	13	23.4	-10.4	106.16	4.62
		4	15	14.4	0.6	0.36	0.63
		3	13	14.5	-1.5	2.25	0.16
		2	17	12.8	4.2	17.64	1.38
		1	14	7	7	49	7
3	Energy cost	5	24	23.4	0.6	0.36	0.02

		4	15	14.4	0.6	0.36	0.63
		3	5	14.5	-9.5	96.25	6.22
		2	15	12.8	2.2	4.84	0.38
		1	13	7	6	36	5.14
4	Exchange rates	5	29	23.4	5.6	31.36	1.34
		4	15	14.4	0.6	0.36	0.63
		3	5	14.5	9.5	96.25	6.22
		2	15	12.8	2.2	4.85	0.38
		1	8	7	1	1	0.14
5	Forces of demand and supply	5	24	23.4	0.6	0.36	0.02
		4	30	14.4	15.6	243.36	16.90
		3	5	14.5	-9.5	96.25	6.22
		2	10	12.8	-2.8	5.84	0.61
		1	3	7	-4	16	2.29
6	Import duty	5	24	23.4	0.6	0.36	0.02
		4	10	14.4	-4.4	15.36	1.34
		3	15	14.5	0.5	0.25	0.02
		2	13	12.8	0.2	0.04	0.01
		1	10	7	3	9	1.29
7	Inflation	5	34	23.4	10.6	112.36	4.80
		4	10	14.4	-4.4	15.38	1.34
		3	20	14.5	5.5	30.25	2.09
		2	7	12.8	-5.8	33.64	2.63
		1	1	7	-6	36	5.14
8	Transportation cost	5	13	23.4	-10.4	106.16	4.62
		4	7	14.4	-7.4	54.76	3.80
		3	40	14.5	25.5	650.25	44.84
		2	10	12.8	-2.8	7.84	0.61
		1	2	7	-5	25	3.57
Total X² (Calculated)							136.59

Source: Field Survey, Ikechukwu (2020)

The mean un-weighted aggregate price index, and the mean house rent index for each of the successful year therefore, are calculated as 11.02% and 8.73% respectively.

The effect of changes in the price of the aggregate building materials on the residential house rent is positive and linear as seen in Fig. 4. From the beginning, in 2010, increase in the aggregate price of the building material resulted to higher proportional increase in the average house rent, until 2012. From 2012 to 2013 change in the price of the aggregate building materials caused equal and proportional change in the house rent. From 2013 changes in the prices of the building materials attracted a slightly lesser proportional change in the house rent. From 2016, the increase in the aggregate price of the materials however, caused significant lesser proportional change in the house rent continuously.

Nevertheless, the positive and linear relationship of the variables is seen to be fairly proportional to one another on average. The linear and positive relationship between the aggregate price variations of the materials and the average rent variations of the residential buildings is shown in Fig. 5.

Where;

b_1 is calculated according to Equ. 7. Hence, $b_1 = 0.98$,

b_0 is calculated according to Equ. 8. Hence, $b_0 = 5,775.58$.

Using Equ. 6, the model is therefore obtained as $\bar{Y} = 5776 + 0.98x_i$

The coefficient of determination (r) for strength of relationship existing between the two categories of information was determined using the sum of squares (SS) according to Equ. 9. Hence, $r = 0.97$. This explains that the percentage of the change in the house rent that can be influenced by the building materials price fluctuation is 97% of the relationship between the variables (x and y).

The economic importance of the coefficient of the regression is very critical in any study. It measures the average change in the dependent (y) variable as a result of a unit change in the independent (x) variable, as

confirmed by Iwuagwu [8]. On the other hand, elasticity of the average coefficient of regression model measures the average percent change in the house rent as a result of change in the aggregate price of the building materials, since there is a linear relationship between the x and y variables in the study.

Substituting for the coefficient of elasticity (E) in Equ.10, the elasticity is obtained. Hence, $\bar{E} = 0.70$

It means therefore that 1% increase in the aggregate price of the building materials leads to the average house rent increase by 0.70% in the study area.

4. SUMMARY OF FINDINGS

In the course of the study, findings reveal that inflation, force of demand and supply, and exchange rate as economic factors among others are the most significant causes of the building materials price fluctuations that affect the market prices of building products in the study area.

On the other hand, it shows that difficulty in forecast and planning, project cost overrun, and shortage and high cost of accommodation however are found as the most common effects of the building materials' price fluctuations.

The mean un-weighted aggregate price index, and the mean house rent index for each of the successful year therefore, are discovered as 11.02% and 8.73% respectively. Increase in the aggregate price of the building materials however caused approximately a proportional increase in the house rent but, a visible lesser proportional change in the house rent in the later years.

Nevertheless, the positive and linear relationship of the variables is seen to be fairly proportional to one another on average, with the regression model of $Y = 5776 + 0.98x_i$, as derived from Equ. 6.

The Elasticity of the average coefficient of the regression model measures 0.70 percent change in the house rent as a result of 1 percent change in the aggregate price of the building materials, in the study.

Table 5. X² Contingency Table for Test of Independent of Impact Level on the Effect of Building Materials Price Fluctuation on Building Project Management

S/N	Implication of price fluctuation of building materials on building	Weight of Impact	Observed Frequency (O)	Expected Frequency (E)	O-E	(O-E) ²	(O-E) ² /E
1	Abandonment of Project	5	13	21	-8.0	64	3.05
		4	7	14.1	-7.1	50.41	3.58
		3	40	17.3	22.7	515.29	29.79
		2	10	12.8	-2.8	7.84	0.62
		1	2	6.7	-4.7	22.1	3.30
2	Decrease in Quality of Works	5	20	21	-1.0	1.0	0.05
		4	15	14.1	0.9	0.81	0.06
		3	10	17.3	-7.3	55.29	3.08
		2	13	12.8	0.2	0.04	0.01
		1	14	6.7	7.3	55.29	7.95
3	Delays in Projects	5	9	21	-12	144	6.86
		4	17	14.1	2.9	6.41	0.60
		3	20	17.3	2.7	7.29	0.42
		2	15	12.8	2.2	5.84	0.38
		1	11	6.7	4.3	16.50	2.76
4	Difficulty in Forecast and Planning	5	30	21	9.0	81.00	3.86
		4	15	14.1	0.9	0.81	0.06
		3	3	17.3	-14.3	205.49	11.82
		2	19	12.8	6.2	36.44	3.00
		1	5	6.7	-1.7	2.89	0.43
5	Increase in Unemployment in the Built Environment	5	14	21	-7.0	49.00	2.33
		4	13	14.1	-1.1	1.21	0.09
		3	20	17.3	2.7	5.29	0.42
		2	17	12.8	4.2	17.64	1.38
		1	8	6.7	1.3	1.69	0.25
6	Project Cost Overrun	5	34	21	13	169	8.05
		4	10	14.1	-4.1	16.81	1.19
		3	20	17.3	2.7	7.29	0.42
		2	7	12.8	-5.8	33.64	2.63
		1	1	6.7	-5.7	32.49	4.85
7	Shortage and High Cost of Housing Accommodation	5	27	21	6.00	36.00	1.71
		4	22	14.1	7.9	62.41	4.43
		3	8	17.3	-9.3	86.49	5.00
		2	10	12.8	-2.8	7.84	0.61
		1	5	6.7	-1.7	2.89	0.43
8	Steady Conflict Between Clients and Contractors	5	21	21	0.00	0.00	0.00
		4	14	14.1	-0.1	0.01	0.00
		3	17	17.3	-0.3	0.09	0.01
		2	11	12.8	-1.8	3.24	0.25
		1	9	6.7	2.3	5.29	0.79
Total X² (Calculated)							116.52

Source: Field Survey, Ikechukwu (2020)

Table 6. Aggregate Un-weighted Building Materials Price and Two Bedroom Flat Average Rent Indices

S/N	Year	Aggregate materials price	Price indices	%	Cumulative index value	Average rent for two bedroom flat	Rent indices	%	Cumulative index value
1	2010	7720	100	-	-	12000	100	-	-
2	2011	8680	112.44	12.44	112.44	15000	125	25	125
3	2012	10135	116.76	16.76	129.20	16000	106.67	6.67	131.67
4	2013	11790	116.33	16.33	145.53	18000	112.50	12.50	144.17
5	2014	12760	108.23	8.23	153.76	18000	100	0	144.47
6	2015	14510	113.71	13.71	167.47	20000	111.11	11.11	155.28
7	2016	15775	108.72	8.72	176.19	22000	110	10	165.28
8	2017	17640	111.82	11.82	188.01	22000	100	0	165.28
9	2018	18550	105.16	5.16	193.17	24000	109.09	9.09	174.37
10	2019	19660	105.98	5.98	199.15	25000	104.17	4.17	178.54

Source: Field Survey, Ikechukwu (2020)

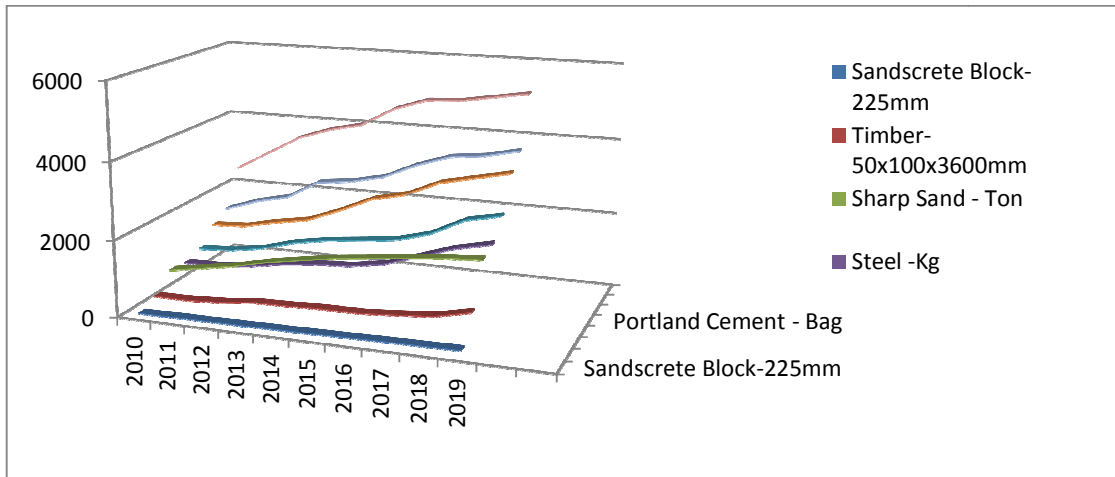


Fig. 2. Price variations of the basic building materials in Owerri from 2010 -2019
 Source: Field Survey, Ikechukwu (2020)

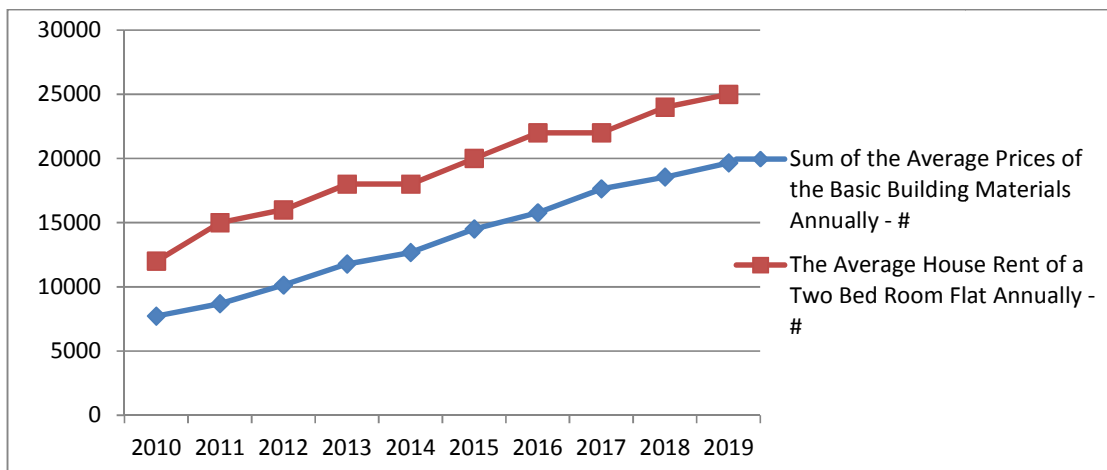


Fig.3. Aggregate material price and the rent variations in Owerri from 2010-2019
 Source: Field Survey, Ikechukwu (2020)

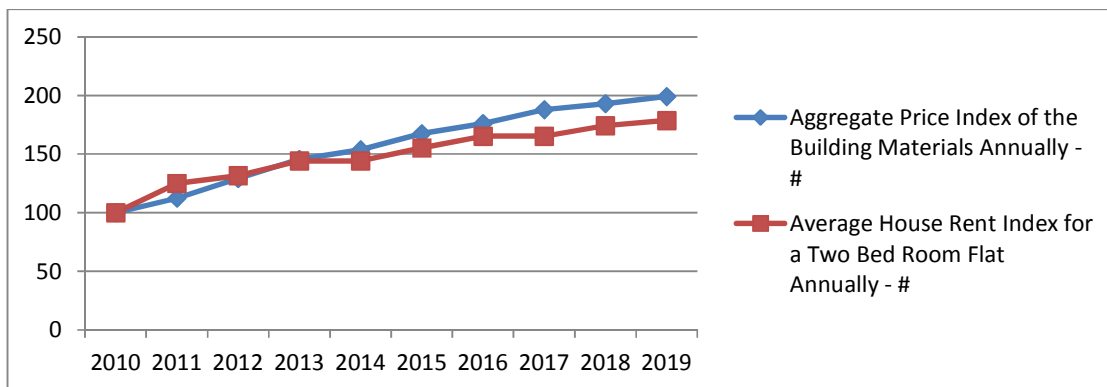


Fig.4. Aggregate material price and the rent indices in Owerri from 2010-2019
 Source: Field Survey, Ikechukwu (2020)

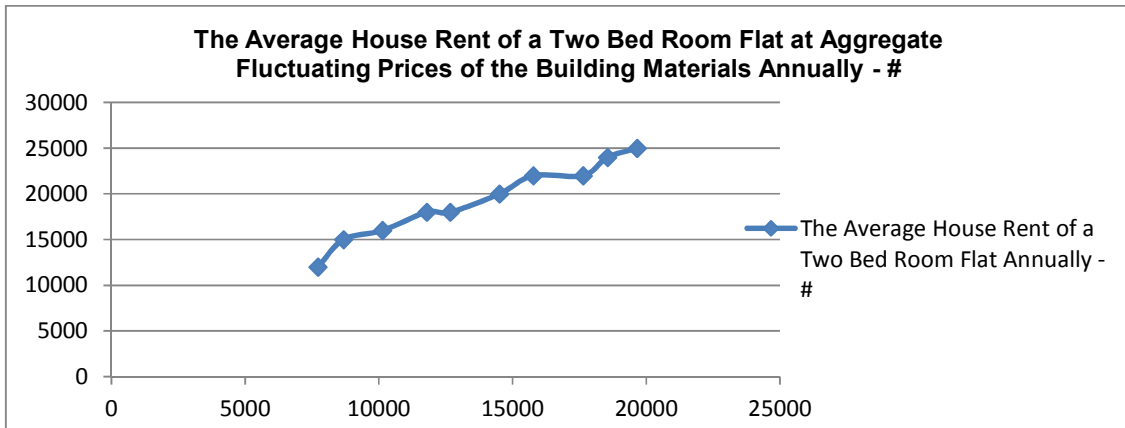


Fig.5.The Effect of Aggregate Material Price Fluctuations on the Rent of the Residential Buildings in Owerri from 2010-2019

Source: Field Survey, Ikechukwu (2020)

5. CONCLUSION

In the light of the findings, locally sourced materials when developed will generate employment, increase the gross domestic product of the area, promote availability of the building materials; as well as clamp down the rate of importation of such materials in the nation towards reducing significantly variation in the prices of the building materials. By this development, when the materials are economically available, supply will increase with decrease in demand hence; the cost of building development and products are reduced and affordable.

Consequently, to address the problem of the study, the government and the construction stakeholders should as a matter of urgency review and enforce with the legislative backup research, development and improvement on local material resources; to ensure adequate availability and reduction in importation of the building materials in Nigeria.

Appropriate framework designed with price indices of the basic building materials should be adopted in the management of building projects for effective forecast and planning of the projects towards sustainable delivery in the study area.

Finally, the model relationship between the effect of change in the aggregate price of the building materials and the consequent change in the residential house rent should be adopted for use in the study area to always predict or balance the effect of changes in any of the variables.

COMPETING INTERESTS

Author has declared that no competing interest exists.

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