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Article

Pragmatic Assessment of Post Covid-19 Measures on Construction Markets in Nigeria

Amaka Chinweude Ogwueleka * and Fortune Samuel Okon

Department of Quantity Surveying, University of Uyo, 520103 Uyo, Nigeria

Abstract: The lockdowns and restrictions imposed due to covid-19 have introduced severe supply chain bottlenecks in the construction process. These have worsened the formulation of demand and supply mechanism, and as such led to huge spike in building materials' prices. The study assesses the impact of Covid-19 measures on the cost of building materials in the construction industry in South-South region of Nigeria. Data were collected from 269 construction professionals using a quantitative survey. The findings reveal the most important economic factors affecting the cost of building materials as inflation rate, exchange rate, and interest rate. The most significant challenges associated with the rising cost of building materials were also fluctuation in construction cost, increase in final cost of building projects, and risk of project abandonment. It concludes that cost is an important aspect of project execution, therefore effective mechanisms and polices should be put in place to manage these economic factors in order to mitigate or eliminate the rising cost of building materials. The study provides insight to project practitioners and government policy makers on areas to focus on in order to tackle the rising cost of building materials.

Keywords: building materials; the construction industry; rising cost; economic factors; covid-19

1. Introduction

The unprecedented scale of containment measures employed across the globe, including lockdowns, restrictions on movement and other non-pharmaceutical interventions have pushed the global economy into the worst recession since the Great Depression (UNDP, 2021) [1]. The construction industry has also witnessed negative drastic shift due to those lockdowns and restrictions. These have introduced severe supply chain bottlenecks in the construction process resulting in the scarcity of a wide variety of critical construction materials, as well as, increased material prices at an unprecedented rate. COVID-19 has however, exacerbated the issue of both demand and supply for nearly 18 months. There was a slowdown in the production of materials due to national and international lockdowns. The spread of the virus also impacted the ability of raw materials providers to harvest or mine and now, as we emerge from the pandemic, there has been a huge spike in demand leading to price spikes.

When it comes to Nigeria, the decision of lockdown was being made by the Federal Government of Nigeria. Due to this lockdown situation, almost every commercial activity suffered the effects of COVID-19 pandemic. During the pandemic, construction sector was seriously affected because the nature of construction activities mostly requires physical appearance on site. However, due to the restrictions placed by the Government, all the

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* Corresponding: Amaka Chinweude Ogwueleka (amakaogwueleka@gmail.com)

construction activity and most of the business activity came to stand still across the country and the globe. In this situation, the consequences like reverse migration, disruption of the supply chain, and many others affected the ongoing construction contracts. This led to spike in the cost of building materials. The rising cost of building materials is a menace to both the construction industry, property developers and potential house owners (Anosike, 2021; Makson, 2020) [2, 3]. Any increase in the prices of building materials will have multiplier effects on the industry and participants (Jagboro and Owoeye, 2004) [4]. Building materials cost can actually comprise half (50%) of the total cost of construction project (Caldas et al, 2015) [5]. Therefore, increased cost of building materials has posed as great concern to the Nigerian construction industry. Still in the process of recovering from the 2016 recession, the onslaught of the twin impact of a decline in oil prices and the COVID-19 pandemic plunged the Nigerian economy back into a recession - its deepest in over four decades with real GDP contracting for two consecutive quarters by 6.1 percent and 3.6 percent in Q2 and Q3 of 2020, respectively (National Bureau of Statistics, 2020) [6].

The aim of this research is to assess the impact of Covid-19 measures on the cost of building materials in the construction industry in South-South region of Nigeria. In order to achieve the aim, the following objectives were considered: (a) to examine the effect of economic factors on the cost of building materials, and (b) to identify the challenges associated with the rising cost of building materials. This study will provide insight on the economic factors that have significant effect on the cost of building materials after covid-19 lockdown in order to propose possible ways to combat their effects.

2. Review of Related Literature

According to Ivanov, (2020) [7], some of the loss supply chains that negatively impacted projects may be lost forever or may take a longer time to recover. For construction projects, the likely impacts of this pandemic are identified as time and cost overruns, poor health and safety, interruptions in the supply of materials and equipment, material shortage, reduced labourers' productivity due to increased security measures, labour loses and poor-quality output (Gamil and Alhagar, 2020; Kahn etal., 2020; Amri and Marey-Pérez, 2020) [8 – 10]. There is no doubt that these are challenging effects on the cost of building materials in construction projects.

2.1. The Effect of Economic Factors on the Cost of Building Materials

The cost of building materials is generally affected by several factors especially the demand and supply. Where the demand is higher than supply, it causes scarcity which leads the rise in cost. It is therefore important to keep the cost of building materials within the reach of consumers, by ensuring the national economy plays a positive role in regulating cost of building materials. If the prices of building materials are affordable, then most people can easily commence their building projects. There are a large number of factors affecting the cost of building materials, but the study is limited to assess the economic factors based on the research aim. Economic factors involve fundamental data about a market and how they influence performance. These economic factors that can affect the cost of building materials are exchange rate, interest rate, monetary policy, fluctuation, global demand, importation, inflation rate, external debt, price stability, local market disruption, currency devaluation, and local taxes and charges (Borku and Yenialem, 2022; Danso and Obeng-Ahenkora 2018; Asaolu and Ogunmakinwa, 2011; Akanni, Oke, and Omotilewa 2014; Zhou and Zhao, 2013) [11–15]. They are discussed as follows:

(1). Exchange Rate

Instability in the foreign exchange rate is one of the macro-economic factors that affect a country’s ability to trade in the international markets, as well as, price levels of goods and services (Waitimu, 2018) [16]. The foreign exchange market remains the largest traded market globally. The huge volume of transactions provides arbitrage opportunities for participants with rapid swing of currency values. Over a period of times, the Nigeria has not been finding the realistic exchange value for Naira. It is simply difficult because Nigeria has been a net importer, whose external earnings derive largely from one product, which is crude petroleum oil (Adedipe,

2004) [17]. This instability has also affected the cost of building products.

(2). Interest Rate

The building market is a capital intensive, which requires huge fund to operate. Most of suppliers and owners may not be able to finance for the supply of materials, likewise the manufacturers. Most of them opt to financial assistance from loan facilities Deregulated interest rate is believed to be critical for both economic stabilization and development (Ahmed, 2003) [18]. The implication covers the relationship between interest rate and investment. The developmental role of interest rate is possible because of the interlocking linkage existing between the financial and real sectors of economies. It is therefore through this linkage that the effect of interest rate on the financial sector is transmitted to the real sector (Acha and Acha, 2011) [19]. High interest rate will reduce the profit of building merchants, hereby forcing them to repay the loan out of their pockets. This will make construction projects more expensive due to increased cost of building materials, and thereby reduce housing demand and lower growth in the industry.

(3). Monetary Policy

This is a measure designed to regulate the supply of money and credit conditions in an economy. Price stability emerges as an important aspect of monetary policy, thus necessary for any healthy condition. This is achievable where currency can conserve its own value over time hereby resulting in reduction of purchasing power. In the construction industry, monetary policies cannot directly provide infrastructure but it can boost local production by ensuring availability of long-term credit and lower interest rates to building merchants (Ononugbo, 2012) [20].

(4). Fluctuation

Fluctuation is mostly provided for in construction contracts, and usually occurs from the effects of inflation. Fluctuation involves a situation where the cost of acquiring a particular good may change during the course of a project. The prevailing unpredictable price fluctuations of materials, labour, and equipment can make developers to sustain losses, and thereby hamper sustainability of building projects (Iya and Aminu, 2014) [21].

(5). Global Demand

Here, the law of supply and demand applies. The pandemic has caused high rate for housing projects and delay in manufacturing/supplying of the building materials. The pricing of construction products is highly sensitive to the forces of supply and demand. When demand is high, construction pricing increases due to risks. Most contractors are willing to pursue riskier projects at reduced pricing to keep their businesses moving forward.

(6). Importation

The cost of importation including the tariffs incurred is usually built up to the pricing of imported material. Statistics obtained from the Raw Materials Research and Development Council (RMRDC) showed that between 2010 and 2015, Nigeria spent N13.6 trillion importing raw materials, especially building materials, that could have been sourced locally if some more rigorous work had been put into its import substitution strategy (Nwannekanma, 2010) [22].

(7). Inflation Rate

Inflation can be defined as a rise in the price level of goods and/or services (Prichett et al., 2011) [23], whereas inflation in economy can be referred to as quantitative measure of the rate at which the purchasing power of goods and services decreases over time (Chen, 2019) [24]. In the construction industry, the increase in inflation rate will cause price increase of materials, labours, and machinery which result in deviation of the initial and final cost of a project. It can also create volatility in economic growth and affect labour market and

consumer price index (Elfahham, 2019) [25].

(8). External Debt

This is a major source of public receipts; most countries borrow to boost economic growth and alleviate poverty. It becomes a burden when a country is unable to meet its debt obligation. In Nigeria, debt service burden has militated against the rapid economic development and worsened civil activities (Audu, 2004) [26]. This has left the nation little or not enough resources to fund the budget and provide infrastructure facilities.

(9). Price Stability

This implies that there are no major fluctuations or deflation in the prices of goods for a given period of time. Where there is a shift between supply and demand, then price instability may occur. It is therefore important to avoid significant variations in prices because this will affect an economy's financial stability of a nation. In the Nigerian construction industry, projects that would have lifted the standard of living are either abandoned or did not commence due to lack of funds or rising cost of construction materials (Onashile, 2008) [27].

(10). Local Market Disruption

Disruption can be referred to a process when market entrants come with new products which replace the existing conventional products (SpringgHR Newsletter, 2020) [28]. Here, local market disruption may occur when new innovations and technologies are introduced and they replaced the existing ones. In this era, the construction industry is embracing new technological breakthroughs and disruptions, which are towards gaining competitive advantage over others. These new technologies are focused on enhancing productivity, greater cooperation, and project completion on time and budget with improved profit margin (Samal, 2021) [29]. These disruptions are no longer optional but the questions are, "are they affordable?" and "who is going to adapt, succeed, and get away from the competition?"

(11). Currency Devaluation

It refers to a deliberate reduction in the value of the naira in relation to another country's currency within the scope of fixed exchange rate management system (Emiedafe, 2015) [30]. The aim of currency devaluation is create enabling environment for businesses to produce locally and achieve more foreign exchange. In November 2014, the Nigerian government devalued the Naira from N155/$1 to N168/$1, and later to N199/$1 but this has created negative effect of increased importation rate which has resulted in closure of many industries due to inability to import raw materials. The construction industry is not left out, because most of their resources are sourced overseas.

(12). Local Taxes and Charges

Federal government in Nigeria has unilaterally increased value added tax on goods for purposes of raising additional revenue. This was approved and ordered by the implementation of 2019 Fiscal Policy Measure which takes effect from July 1, 2019. Tax treatment of investors in housing projects can have a significant impact on their willingness to invest (Warsame et al. 2013 citing DiPasquale, 1999) [31].

2.2. Challenges Associated with the Rising Cost of Building Materials

The building materials sector has a critical role to play towards the development of national economy. Therefore, rising in cost of any building materials will pose a significant threat to the economy, and also affect the construction industry and individuals aspiring to engage in housing development. It is therefore, important to note that building materials account for 50 to 60 percent of total project cost and also control about 80 percent of its schedule (Idoro and Jolaiya, 2010) [32]. The rising cost will not only affect demand but also the profit. After the recent lockdown in Nigeria due to Covid-19 pandemic, there have been massive built up demands on

contractors in public sector to meet milestones and deadlines of construction projects across the country. This has led to several challenges within the industry, which has hindered infrastructural development. Developers are not also willing to undertake new projects, and ever if they do, this will raise the cost of delivering government-financed infrastructure and exacerbate overall inflationary pressures. Previous studies have revealed several challenges associated with rising cost of building materials and they are displayed in Table 1 against the cited authors.

Table 1. Challenges associated with the rising cost of building materials against cited authors.

S/N	Challenges	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
a.	Unemployment rate	√									√		√			
b.	Poor workmanship	√				√	√		√		√					
c.	Inhibited innovations in construction methods	√				√	√		√							
d.	Risk of project abandonment	√	√		√		√			√			√			
e.	Shortage of housing projects	√		√			√				√		√			
f.	Fluctuation in construction cost	√	√		√		√			√	√					√
g.	Unavailability of materials											√		√		√
h.	Delay in project completion					√	√		√	√					√	√
i.	Increase in final cost of building projects						√								√	
j.	Hindered economic growth							√				√				
k.	Increased rental value									√				√		
l.	Increased cost of labour											√				
m.	Low profit margin														√	
n.	Uneven impact on credit profiles															√

1=Akanni et al. 2014 [14]; 2=Jagboro & Owoeye, 2004[33]; 3=Windapo et al. 2004[34]; 4=Ibrahim et al. (2014) [35]; 5=Hwang & Tang (2012) [36]; 6=Alabi & Fapohunda, (2021) [37]; 7=O'Halloran (2021) [38]; 8=Taylor (2013) [39]; 9=Aibinu & Jagboro (2002) [40]; 10=Adibe et al. (2022) [41]; 11= Chaluvadi (2021) [42]; 12=Okezie (2022) [43]; 13=Ayeyemi (2022) [44]; 14= Designingbuildings (2022) [45]; 15=ScopeGroup (2022) [46].

3. Methodology

(1). Research Methods

The study assesses the impact of Covid-19 measures on the cost of building materials in the construction industry in South-South region of Nigeria, therefore gathering information about the effect of economic factors on the building cost and also challenges associated the rising cost so as to propose possible ways to minimize their effects. The required data can be quantified, so the study adopts field survey methodology through questionnaire design. The use of questionnaire as a field survey is relatively ease to obtain standard data that are appropriate to achieve the research aim (Ogwueleka, 2011) [47]. A questionnaire is developed from the literature on economic factors that influence the cost of building projects and challenges associated with the rising cost of building projects. The questionnaire comprises of three sections.

Section I – General information covers the demographic of respondents including occupation, work experience, type of building work, and education. This will assist to generalize the research findings.

Section II – The effect of economic factors on the cost of building materials is to examine how the identified economic factors have influenced the cost of building materials. Twelve (12) economic factors identified in the literature scan are used as parameters to gather data from respondents. A five-point scale is adopted to measure the identified economic factors with a scale of 1=not important to 5=most important.

Section III – Here, the challenges associated with the rising cost of building materials are examined in order to identify the highest contributors to the hike prices of building materials. To achieve this, a total number of fourteen (14) challenges were identified in the literature review and adopted for this study. The respondents are

asked to rank the identified challenges using a five-point scale of 1=not significant to 5=most significant.

To ensure the questions are clear, relevant, and free of ambiguity, a pilot survey was conducted using a selected group of construction professionals in the industry and teaching community. The professionals acknowledged that the questionnaire is not complicated and adequate to achieve the research aim. Based on their suggestions, the questions were adopted for field survey.

(2). Research Population and Sample Size

The target population of this study includes constructional professionals practicing in South-South region of Nigeria. These professionals include Architects, Quantity surveyors, Builders, and Engineers. The South-South region of Nigeria comprises of six states and it is strategically located at the point where the Y tail of the River Niger joins the Atlantic Ocean through Gulf of Guinea. Though a relatively small stretch of land, the south of the country provides the economic mainstay of the economy: oil. In addition to oil and gas, the region equally contributes other key resources, with potential huge investment opportunities in construction projects. The study is restricted to three states in the region, which are Akwa Ibom, Rivers, and Cross Rivers states. The lists of construction professionals were collected from the regulatory bodies including Architects Registration Council of Nigeria (ARCON), Council of Registered Engineers in Nigeria (COREN), Quantity Surveying Registration Board of Nigeria (QSRBN) and the Council of Registered Builders in Nigeria (CORBON). The total population is 964.

According to Kothari (2004) [48], sampling techniques is a process of selecting a member of individuals or objects from a population to represent the entire population. The statistical sample size "η" of the respondent was calculated from the population of 282 Architects, 159 Quantity Surveyors, 186 Builders and 337 Engineers, who are registered with their respective regulatory government bodies in the study area. The formula used by Al-Sedairy (1994) [49] was adopted in the calculation of the sample size for each occupation. A total number of 276 questionnaires are administered to 73 Architect, 61 Quantity Surveyors, 65 Builders and 77 Engineers. Due to the heterogeneous nature in the south-south region of Nigeria, the purposive sampling method was adopted in this study

(3). Questionnaire Distribution

A total number of 276 questionnaires were sent out either through in person or online survey. For the online survey, the questionnaires were published through Google Form. The field survey was conducted from 7 November to 3 December 2022. First, the respondents were given three weeks to respond and second, additional one week was also given to those who did not respond earlier. Contact information for each respondent was derived from the group platforms and an introductory note was sent to each respondent to indicate his or her willingness to participate. All the contacted persons gave positive response and the questionnaire was distributed. A number of 269 valid questionnaires were returned back and computed for data analysis. The response rate is 97 percent.

4. Data Analysis and Discussion

4.1. Demographic Data of the Respondents

This section presents the findings from Section I of the questionnaire survey, which attempts to collect the demographic information of the respondents. Descriptive statistics were used to calculate the proportion of categorical variables. This section is important because it provides the readers with a basic understanding of the respondents and how to generalize the research findings. Table 2 displays the demographic profiles of respondents. The results show that 27 percent of respondents were Architect, 22 percent were Quantity surveyors, 23 percent were Builders, and 28 percent were Engineers. This implies that opinions of all professional roles are equally represented. Under the education level, 45 percent of respondents have Master's degree or above while 33 percent have minimum qualification of Bachelor's degree. This reveals that 78 percent of respondents have university certificates, which shows that majority of them have good understanding

of the studied constructs. The study also reveals that 69 percent of respondents have more than 11 years of work experience, it implies that majority of them have ample experience in the field of study. The findings from the type of construction work reveals that 68 percent of respondents have worked in building projects, 11 percent have worked in heavy engineering projects, while 21 percent have participated in civil engineering works.

Table 2. Demographic profiles of respondents.

Demographic data	Sample size (n)	% of respondents
Professional roles		
Architect	73	27
Quantity surveyors	61	22
Builders	65	23
Engineers	77	28
Education		
Master's degree and above	121	45
Bachelor's degree	88	33
Diploma or high certificate	60	22
Construction experience		
1-5 years	25	9
6-10 years	60	22
11-15 years	78	28
16-20 years	62	23
Above 20 years	44	18
Type of construction work		
Building projects	182	68
Heavy engineering works	31	11
Civil engineering works	56	21

4.2. Economic Factors Influencing the Cost of Building Materials

The data gathered from the questionnaire instrument for section II regarding the level of importance of the economic factors influencing the cost of building materials are presented in Table 3. Based on the data in Table 3, mean is calculated and demonstrated in Table 4 showing the factors prioritised from highest to lowest mean. The results reveal that inflation rate is ranked first with a mean score of 4.56; exchange rate is ranked second with a mean score of 4.43 and followed by interest rate which is ranked third with a mean score of 4.29. The least ranked is currency devaluation with a mean score of 2.67.

The study conducted by Musarat et al. (2021) [50] on the role of inflation and how it affects the economy and the construction industry reveals that inflation rate has been overlooked in the aspect of construction budgeting. Cost overrun has become inevitable due to high inflation rate. The findings show that there exists a strong relationship between the inflation rate and the construction industry. It is therefore important to note that high inflation rate will automatically result in increased prices of building materials, consultation fees, machinery hiring rates, and other inputs. Each project participant bears the burden including the client. When the profit margins of existing works reduce, the price of bids definitely increases. Major building materials markets in some parts of Nigeria have witnessed a surge in prices, while manufacturers are transferred the burden of rising cost of raw materials to their customers (The Guardian, 2021) [51]. The report reveals that prices of essential building components have increased in prices by over 15 percent in one month as of April, 2021.

Exchange rate is ranked second as the most important economic factor influencing the cost of building materials. This is in line with the study conducted by Obaedo and Oseghale (2020) [52] on the impact of exchange rate on prices of selected construction materials in Edo state, Nigeria. The study examined the trend in naira exchange rate values and selected construction materials over a period of 5 years. The findings reveal that there exists a strong positive correlation between naira exchange rate and construction material prices. It further recommends that new monetary policy should be developed to ensure exchange rate stabilizations. Exchange rate plays an important role in any economy. A rise in exchange rate will make exports cheaper and imports more expensive. Majority of raw materials needed in manufacturing building products are being imported from overseas, therefore a rise in exchange rate will affect the cost of those building materials and also the economic growth.

The Guardian (2023) [53] reports that the CBN plans to raise the interest rate to 18 percent with purpose of combating inflation. This will directly push the external rate upward between 28 to 32 percent for commercial bodies. This will have a multiplier effect on building developers because building materials will increase and likewise, the building cost and negotiation fees will also increase. The intention of increase interest rate so as to control inflation may be effective to some extent. It is like a two-edged sword, which can exacerbate supply chain issues and affect the cost of building materials. Higher interest rate will negatively impact on the total construction cost, more especially during post pandemic era.

Table 3. Respondents' level of importance of the identified economic factors.

Economic factors	Not important (+1)		Less important (+2)		Important (+3)		Highly important (+4)		Most important (+5)	
	N	S	N	S	N	S	N	S	N	S
Exchange rate	0	0	0	0	25	75	102	408	142	710
Interest rate	0	0	0	0	36	108	120	480	113	565
Monetary policy	0	0	0	0	78	234	82	328	109	545
Fluctuation	0	0	72	144	192	576	5	20	0	0
Global demand	0	0	45	90	101	303	109	436	14	70
Importation	0	0	79	158	182	546	7	28	1	5
Inflation rate	0	0	0	0	4	12	111	444	154	770
External debt	0	0	78	156	191	573	0	0	0	0
Price stability	0	0	56	112	170	510	26	104	17	85
Local market stability	0	0	69	138	180	540	18	72	2	10
Currency devaluation	0	0	88	176	181	543	0	0	0	0
Local taxes charges	0	0	10	20	90	270	120	480	49	245

N represents the number of respondents that express the level of importance on the economic factors represents the score that is equal to the N multiplied by the weightings from (+1) being 'Not important' to (+5) being 'Most important'.

Table 4. Prioritised economic factors influencing the cost of building materials.

Economic factors	Mean	Rank
Inflation rate	4.56	1
Exchange rate	4.43	2
Interest rate	4.29	3
Monetary policy	4.12	4

Cont.

Economic factors	Mean	Rank
Local taxes charges	3.77	5
Global demand	3.34	6
Price stability	3.01	7
Local market stability	2.83	8
Fluctuation	2.75	9
Importation	2.73	10
External debt	2.70	11
Currency devaluation	2.67	12

4.3. Challenges Associated with the Rising Cost of Building Materials

The section III represents the challenges associated with the rising cost of building materials. The data are gathered through questionnaire survey based on the ranking of level of significance of these identified challenges. The results of rankings are presented in Table 5 and their means are calculated and prioritised from highest to lowest as shown in Table 6. From the results, it shows that fluctuation in construction cost is the highest ranked with a mean score of 4.88. The second highest ranked is increase in final cost of building projects with a mean score of 4.74, followed by risk of project abandonment as the third ranked with a mean score of 4.67. The least ranked is inhibited innovations in construction methods with a mean score of 3.20.

The process of awarding contract to the lowest responsive bidder may have directly contributed to the high rise of fluctuation in construction cost. The bidders may find it difficult to foresee the future increases in material costs at the time of quoting the price. The provision of claims relating to price escalation in the contract document is a pre-requisite for a successful contract tender. Notwithstanding, fluctuation in construction cost has also recorded dramatic contract losses and defaults, delays, and litigation due to lack of acceptable mechanism for computing the price fluctuation (Jayasinghe et al., 2015) [54]. Costs that fluctuate unpredictably may have negative effects on the overall construction cost. In most cases, firms may fail to recover all because clients are compensating for the prices of production costs and not the full profits (Paulmakesh and Makebo, 2022) [55].

Building materials are used for construction of building projects from foundation level to the final completion. The building materials account for 50 to 60 percent of the total construction cost (Adedeji, 2012) [56]. The literature scan revealed that the construction industry has witnessed dramatic rise in the building materials. It is therefore important to note that increase in final construction cost of a project can be greatly influenced by the availability of materials and the fluctuating cost. Housing sector is an important tool to stimulate economy growth in developed countries, for example, in USA and Canada, housing sector contributes between 30 to 70 percent of the Gross Domestic Product (GDP) (Onyejiaka, 2018) [57]. Therefore, risk of project abandonment due to the rising cost of building materials will negatively hamper the contributions of housing sector and also create environmental nuisance such as hideouts for thieves and drug dealers, flooding, and many others. Many projects were either not completed on time or abandoned due to the rising cost of materials (Idoro and Jolaiya, 2021) [32].

Table 5. Respondents' level of significance of the identified challenges associated with the rising building cost.

Challenges	Not significant (+1)		Less significant (+2)		Significant (+3)		Highly significant (+4)		Most significant (+5)	
	N	S	N	S	N	S	N	S	N	S
Unemployment rate	0	0	10	20	134	402	120	480	5	25
Poor workmanship	0	0	15	30	145	435	107	428	2	10

Cont.

Challenges	Not significant (+1)		Less significant (+2)		Significant (+3)		Highly significant (+4)		Most significant (+5)	
	N	S	N	S	N	S	N	S	N	S
Inhibited innovations in construction methods	0	0	23	46	170	510	76	304	0	0
Risk of project abandonment	0	0	0	0	17	51	55	220	197	985
Shortage of housing projects	0	0	0	0	56	168	78	312	135	675
Fluctuation in construction cost	0	0	0	0	4	12	25	100	240	1200
Unavailability of materials	0	0	0	0	102	306	56	224	111	555
Delay in project completion	0	0	0	0	121	363	103	412	45	225
Increase in final cost of building projects	0	0	0	0	10	30	50	200	209	1045
Hindered economic growth	0	0	2	4	125	375	120	480	22	110
Increased rental value	0	0	0	0	40	120	75	300	154	770
Increased cost of labour	0	0	0	0	112	336	95	380	62	310
Low profit margin	0	0	0	0	23	69	67	268	179	895
Uneven impact on credit profiles	0	0	0	0	82	246	97	388	90	450

N represents the number of respondents that express the level of importance on the economic factors.S represents the score that is equal to the N multiplied by the weightings from (+1) being ‘Not important’ to (+5) being ‘Most important’.

Table 6. Prioritised identified challenges associated with the rising cost of building materials.

Identified challenges	Mean	Rank
Fluctuation in construction cost	4.88	1
Increase in final cost of building projects	4.74	2
Risk of project abandonment	4.67	3
Low profit margin	4.58	4
Increased rental value	4.42	5
Shortage of housing projects	4.29	6
Unavailability of materials	4.03	7
Uneven impact on credit profiles	4.03	7
Increased cost of labour	3.81	8
Delay in project completion	3.72	9
Hindered economic growth	3.60	10
Unemployment rate	3.45	11
Poor workmanship	3.36	12
Inhibited innovations in construction methods	3.20	13

5. Conclusions

The study assesses the impact of Covid-19 measures on the cost of building materials in the construction industry in South-South region of Nigeria. The paper is focused on providing insight of economic factors that have significant effect on the cost of building materials after covid-19 lockdown and also the challenges associated with the rising cost in order to propose possible ways to combat their effects. From the literature review, twelve (12) economic factors and fourteen (14) challenges associated with the rising cost of building materials were identified and adopted for the study. The research findings reveal that inflation rate, exchange

rate, and interest rate as the most important economic factors affecting the cost of building materials. The most significant challenges associated with rising cost of building materials were identified as fluctuation in construction cost, increase in final cost of building projects, and risk of project abandonment.

Cost is any important aspect in project execution and this should not be overlooked. Economic factors are drivers of construction cost, in which if they are properly managed, thus can assist to stabilise the fluctuating cost. Fluctuating cost are associated with several challenges and these can be mitigated or eliminated through effective mechanisms and policies. The study provides insight to project practitioners and government policy makers on areas to focus on in order to tackle the rising cost of building materials.

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Conflicts of Interest

The authors declare no conflict of interest.

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