

## IMPACT OF MONEY ON PRICE DIRECTION OF BUILDING MATERIALS IN ABUJA

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The mechanism for the expansive birthing of developmental infrastructure to service human settlement need is construction. This research evaluates practitioner's insight on money supply and demand for money among other tested macroeconomic indicators as it impacts building materials prices direction in Abuja Nigeria. The study made use of quantitative research technique. Prices of selected building materials obtained from Federation of Construction Industry's quarterly publication. Statistical data on macroeconomic indicators were obtained from the official gazette of the Central Bank of Nigeria and Nigeria Bureau of Statistics. Multiple linear regression analysis was used to establish the relationship between Money Supply and Prices of Building Materials. Result revealed the demand for money with mean item score (MIS) of 4.38 and demand for goods with MIS of 4.94 as the most critical factors causing change in money supply and demand for money respectively. The coefficients of determination ( $R^2$ ) were very high for the selected building materials. Sandcrete block was the most significant factor with  $R^2$  value of 0.967 (97%) which means that the percentage variation in the prices of building materials could be explained by money supply. While the P-values confirmed that money supply has high negative impact on prices of building materials with cellotex ceiling board value of 0.000 as the highest while demand for money has a statistically negligible impact. The finding will alert practitioners on how money supply causes variation in prices of building materials and assist them in the planning and control of the rising prices of building materials. It will also bring to awareness that demand for money triggers money supply which significantly affect the procurement of building in Nigeria.

**Keywords:** Money Supply (M1), Demand for Money and Building Materials Prices

### INTRODUCTION

Construction is the expansive mechanism for the birthing of development supporting infrastructure in other to meet up human settlement need. This includes the extraction and utilization of materials (raw, semi-processed and finished), and components within construction project cycle which runs from feasibility to the construction stage, the management and operation of the built environment (Ibironke, 2013; TradingEconomics, 2017). Ebekozi (2015) affirmed the industry to be a prime motivator of any economy while in Nigeria; it represents 18 percent of the capital investment. In his study, he revealed a highly positive correlation of 95 percent between Foreign Direct Investment and construction sector which indicates that a unit change in the Foreign Direct Investment inflow into the construction sector will result to 3 percent increase in the construction sector

The World Bank attributed the industry to account for between 3 to 8 percent of the Gross Domestic Product (GDP) in developing countries, Nigeria inclusive. Gross Domestic Product from Construction in Nigeria has a record low of ₦369,190.91 Million in the third quarter of 2010 it reached an all-time high of ₦740,204.22 Million in the second quarter of 2015. From 2010 to 2016 with averaged ₦548,030.67 Million until the third quarter of 2016 when it decreased to ₦543,808.12 Million from ₦693,744.65 Million it was at the second quarter of 2016 (RANK, 2017).

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Cost of construction through a general discovery of studies is affected by huge number of issues fundamentally demand and supply. However, Odediran et al in Isa et al (2013) posited that in Nigerian Construction Industry in the recent past, many projects have been subjected to cost and time overruns. Considering the relationship between construction industry and the national economy, it becomes necessary that the cost of construction be within the reach of the average citizen. Conversely, a few economic indicators are very trivial to the overall cost of construction. Some of which include; money supply, demand for money, inflation rate, interest rate charged on loan and exchange rate of one local currency to other currencies in the world amongst others.

The construction industry in Nigeria has played a significant role over the decades, valued at about \$3.15 billion, the industry continues to grow and this is based on the construction knowledge acquired from the British in the 1940s and 1960 (Isa et al., 2013). This growth over the years has a catalytic effect on the economy.

This relationship between the construction industry and the economy of Nigerian nation makes the industry responsive to the economic situation in the country and the economic policies of the government. Thus, when the economy is stable and strong, the construction industry will be highly active since the government and society will have much money to spend and vice versa. Some of the economic factors that could influence construction activities include: exchange rate, inflation rate, international monetary policies etc (Oladipo and Oni, 2012). Majority of the building materials and components incorporated into construction or parts of the material, ingredients required for the manufacture of the materials are sourced from overseas. Local building materials account for a total of 37 percent of materials in the Nigerian market, imported materials stands at 23 and 40 percent for both combined local and imported products. Price differences of up to 3 percent to 15 percent exist between local and imported materials (Anonymous, 2014) and this brings to closer attention the issue of foreign exchange and its inherent problems in construction industry and the need for local sourcing of building materials. It must thus be realized that the danger of reliance on foreign construction materials has significant effect on internal productivity and also kills the desire to develop local alternatives (Oladipo and Oni, 2012).

In the building construction sector, material as an indispensable resource constitute about 60 percent of the total cost of building (Omange and Udegbe, 2000). Many projects were not completed to time due to the cost of materials which have been on the increase perhaps nearly on daily basis. According to Onwioduokit (2000), the International capital flow to a domestic economy are influenced by money supplied, the size of domestic market, capital utilization, debt service ratio, inflation rate, exchange rate, interest rate, government policies, output, credit to the private sector, per capital income, credit rating, world interest rate among others.

In spite of the past studies on the cost of building materials in Nigeria, and much that has been published about the causes, effects and implications of the rise in cost on the construction industry; nearly everyone's literature (Mogbo, 2002; Jagboro and Owoeye, 2004; Njoku, 2007; Mekson, 2008; Oladipo and Oni, 2012; ReseachClue.com, 2015) has concentrated efforts on using distance, exchange rates, interest rates and inflation as parameters of measurement. Base on the foregoing, the significance of cost to construction project success, and the Nigerian government present economic recession which was adjudged a product of lack of adequate economic statistics (TradingEconomics, 2017), hence the need for regular update of economic statistics and the need for accuracy in tender price prediction. In the light of the above, this study intends to give information on the impact of Money Supply and Demand for Money (Macroeconomic Indicators) on the price direction of building materials in Abuja, North Central geo-political zone of Nigeria. This study then is aimed at finding out the impact of macro-economic indicators on prices of building materials.

## LITERATURE REVIEW

### Money supply

The money supply or money stock is the total amount of monetary assets available in an economy at a specific time. Money supply data are recorded and published, usually by the government or the central bank of the country. Public and private sector analysts have

long monitored changes in money supply because of the belief that it affects the price level, inflation, the exchange rate and the business cycle (TradingEconomics, 2017).

Money supply is the total stock of money circulating in an economy. The circulating money involves the currency, printed notes, money in the deposit accounts and in the form of other liquid assets (Economicstimes, 2017). Valuation and analysis of the money supply helps the economist and policy makers to frame the policy or to alter the existing policy of increasing or reducing the supply of money. The economist then periodically publishes the money supply data based on the monetary aggregates set by them. The valuation is important as it ultimately affects the business cycle and thereby affects the economy (Economicstimes, 2017).

Aziz (2013) advocated a non-interventionist approach which is targeted as a pre-specified path for the money supply independent of economic conditions of any government. Though in actual practice, this might involve regular intervention with open market operations (or other monetary-policy tools) to keep the money supply on target. This however corroborated the assumption of Charles (2011) that when government buys bonds in an open market operation, this automatically increases the supply of money, it causes the "price" or opportunity cost of holding money to fall.

The relation between money and prices is historically associated with the quantity theory of money. There is strong empirical evidence of a direct relation between money-supply growth and long-term price inflation, at least for rapid increases in the amount of money in the economy. For example, a country such as Zimbabwe which saw extremely rapid increases in its money supply also saw extremely rapid increases in prices (hyperinflation). This is one reason for the reliance on monetary policy as a means of controlling inflation (Ahmed and Suliman, 2011).

Ahmad and Sajad (2011) related the rate of money supply growth to the rate of increase in monetary base. In other words, an increase in the rate of growth of monetary base implies an increase in the rate of volume of money supply. This also indicates that an increase in the rate of money supply results in an increase in the rate of inflation, therefore Money creation cause higher inflation.

Ahmed and Suliman (2011) in their analyses regarding the causal relationship between money supply and prices suggested that the causation runs from money supply to prices, but price level does not cause money supply

Money supply have significant inverse effects on inflationary pressure, while real output growth and foreign price changes have direct effects on inflationary pressure (Akinbobola, 2012). He also stated that the possible justification for the inverse effect of money supply on price level is that inflation may not be due to aggregate demand pressure but rather due to hiccups in the supply chain of goods both from the domestic and foreign supply outlets.

### **Money supply and change in Interest rate**

One of the implications of money demand is that if government wishes to keep the interest rate constant, it must increase the supply of money at the same rate as the increase in nominal Gross Domestic Product. For example, suppose that nominal Gross Domestic Product is growing at a rate of 8 percent per year, consisting of 3 percent real growth and 5 percent inflation. To prevent the interest rate from changing, government must keep the money supply growing by 8 percent per year. If it does this, then both supply and demand are increasing at the same rate so that the equilibrium interest rate is unchanged. If the money supply were to grow faster than 8 percent then the supply curve would be shifting to the right faster than the demand curve, and then the intersection of the two would occur at a lower interest rate. Conversely, if government slowed money growth to below 8 percent, the interest rate would rise. It is seen then, that in a dynamic economy in which output and prices are both changing, the effect of the money supply on the interest rate will depend on the relative growth rates of money and income. Thus, by increasing the supply of money, government can push the interest rate down, and by reducing the supply of money it can push interest rates up (Charles, 2011).

### **Demand for money**

Trading Economics (2017) defined demand for money as the desired holding of financial assets in the form of money: which may be cash or bank deposits. It also refers to the demand

for money narrowly M1 (non-interest-bearing holdings), as a result of trade-off regarding the form in which a person's wealth should be held.

In macroeconomics, motivations for holding one's wealth in the form of money can roughly be divided into the transaction motive and the asset motive. These can be further subdivided into more micro economically founded motivations for holding money.

According to Yandem (2011), demand for money refers to the amount of money people wish to hold or the function determining this. In other words, it is referred to as the desire to hold cash. The demand for money arises from two important functions of money; medium of exchange and the store of value. The study of the demand for money is not restricted to the money market, but also involves other market such as the commodity, capital and foreign exchange market.

Charles (2011) suggested that since holding money is voluntarily, the quantity of money supplied by the government of any nation must be equal to the quantity demanded by money holders. As always, the demand for a good or service depends in part on its price or cost. He also noted that the cost of holding money is an opportunity cost over time, because the alternative is investing those funds to earn interest. What one gets in return for giving up interest income is the liquidity that money provides. Everyone balances the opportunity cost of holding money with the value of that liquidity. He further identified three primary motives for holding money as follows:

- To settle and complete transactions (since money is the medium of exchange).
- As a precautionary store of liquidity, in the event of unexpected need.
- To reduce the riskiness of a portfolio of assets by including some money in the portfolio, since the value of money is very stable compared with that of stocks, bonds, or real estate. These three motives for holding money he referred to as the transactions motive, the precautionary motive, and the portfolio motive respectively.

### **Demand for Money and change in Interest rate**

In general terms, suppose hypothetically, a construction firm XYZ choose to hold ₦1,000 of their ₦50,000 in the form of money that with the interest rate at 20 percent in their cash register or bank account. If the interest rate now drops to 5 percent it shows clearly that the opportunity cost of holding money reduced, there will be increase money holdings and reduction in bond holdings. After all, it now costs the XYZ only 5 kobo per year to hold an extra Naira instead of 20 kobo, while adding to their holdings of money will give them more of the services that holding money provides. As a result of the interest rate falling from 20 percent to 5 percent XYZ might well decide to increase their money holdings, say from ₦1,000 to ₦1,500. XYZ would accomplish increase in their money holdings by selling bonds worth ₦500 and keeping the money they would be paid.

Yandem (2011) posited that the amount of money demanded by the XYZ would change if their income increased. XYZ would demand more money (at a given level of interest rates) primarily because their transactions and precautionary demands would increase at their new higher level of spending. An increase in their wealth would increase their portfolio demand for money. Even an extension or expansion of business horizon could affect their demand for money. For example, a firm which does building and heavy engineering construction will have a greater precautionary demand for money than another firm who does only building. It can then be seen that a firms' demand for money depends on the interest rate, their income, and wealth, among perhaps many other variables. Households are also holders of money, at home, in their wallets and saves, for essentially the same basic reasons as firms (Charles 2011; Yandem, 2011). Adding up the demand for money by all households and firms we have the total demand for money in the economy and that demand will be most importantly a function of the interest rate, income, and wealth in the economy (TradingEconomics, 2017)

The demand for any good or service is usually pictured in economics as a function of its price, holding income and other factors constant. In the case of holding money, the "price" is the opportunity cost of holding one dollar for one year, the interest rate. As this hypothetical demand for money has been drawn, the demand for money is ₦600 billion when the interest rate is 5 percent, but only ₦150 billion when it is 20 percent. This inverse relationship between the interest rate and the demand for money just reflects the fact that

when the opportunity cost of holding money is low, people will want to hold more of it, and when it is high people will want to hold less of it (Yandem, 2011).

The money demand plays a vital role in conducting an influential economic policy since it is considered a critical component of the transmission mechanism of monetary policy. In less developed countries, the stability of money demand is the major concern of policymakers (Bubshait, and AL-Juwairah, 2002). They also pointed out that majority of studies found that the demand for money function is unstable and monetary aggregates lost their influence in the conduct of monetary policy. From monetary view, a stable money demand function is an essential factor in determining the formulation and the conduct of an effective monetary policy which has predictable effects on inflation and real output (Serletis, 2013).

Anonymus (2015) asserted that interest rate tend to change whenever there is a shift in the demand for money. By a shift in the demand for money we mean a change in the quantity demanded at any given interest rate. As already surmised, the demand for money depends on nominal income and wealth. It will also be affected by fluctuations in the volume of transactions of assets. Heavy trading on the stock exchanges or rapid turnover in the real estate market, for example, will both increase the quantity of money demanded simply because these transactions are settled in the medium of exchange, money.

## RESEARCH METHOD

In order to achieve the aim of the study, structured questionnaires were administered to respondents (Professionals such as Chartered Economists, Bankers and Quantity Surveyors) to assess money supply among other macroeconomic indicator. Secondary data were collected on prices of selected building materials and money supply over a period of eight (8) years (from 2009 to 2016) from annual official gazette of the Central Bank of Nigeria and Statistical bulletin from Nigeria Bureau of Statistics. Random sampling technique was adopted for this study, a total of 133 questionnaires was administered out of which 53 were returned. This represent 39 percent which is considered adequate for this survey. A five point Likert scale rating were used to elicit respondents' opinion on the importance of the money supply and demand for money. The mean item score (MIS) was used to analyse the respondents' opinions. Multiple linear regression analysis was used also to establish the impact and relationship between the Macroeconomic Indicators and Prices of Building Materials.

## RESULTS AND DISCUSSION.

Table 1 shows the respondents' assessment of the effect of the macro – economic indicators on the prices of building materials, the rating which fell within 4.96 for import and 1.92 for external debt service. The five most significant indicators are import, change in pump prices of petroleum products, money supply, demand for money and inflation. This corroborated the view of Arayela (2002) that the modern building industry lays much emphasis on the procurement of sophisticated building materials and techniques that are expensive and energy consuming. In so doing investment is heavily in the importation of these ever-dynamic materials.

Table 1. Macro-Economic Indicators Affecting Prices of Building Materials

Indicators	Mean	Rank
Import	4.96	1
Change in pump prices of petroleum products	4.94	2
Money supply	4.88	3
Demand for money	4.88	3
Inflation	4.76	5
Exchange rate	4.73	6
Interest rate	4.67	7
Export	4.67	7
Gross domestic product	3.96	9
Growth of credit	3.96	9
Unemployment	2.73	11
External reserve	2.65	12
External debt service	1.92	13

Table 2 illustrates the respondents rating of the factors that cause change in demand for money. It fell between 4.94 (demand for goods) and 1.53 (turnover in real estate). The factors identified are all critical but the most critical of them are demand for goods, high level of importation, supply of petroleum products, changes in the quantity of money in circulation and change in nominal income.

**Table 2 Factors Causing Change in Demand for Money**

Factors	Mean	Rank
Demand for goods	4.94	1
High level of importation	4.88	2
Supply of petroleum products	4.80	3
Change in the quantity of money in circulation	4.76	4
Change in nominal income	4.75	5
Lending interest rate	4.66	6
Trade liberalization	4.62	7
Level of technology	4.30	8
Changes in taste	4.15	9
Supply of goods	4.15	9
Market monopoly	4.08	11
Labour productivity	3.96	12
Change in the prices of substitutes	3.92	13
Import tariff	3.92	13
Deregulation of the economy	3.90	15
Variation in the naira value	3.88	16
Level of industrialization	3.82	17
Oil subsidies	3.80	18
Industrial capacity utilization	3.75	19
Trade restriction	3.37	20
Fluctuation in the volume of transaction assets	3.27	21
Salaries and wages	3.26	22
Heavy trading on the stock exchange	3.20	23
Taxation policy	2.94	24
Downsizing of labour force	2.90	25
Political climate	2.80	26
Per capital income	2.67	27
Bal of payment	2.25	28
Debt servicing	2.25	28
Turnover in real estate market	1.53	30

Source: Author's field result (2017)

In Table 3, the respondents rating of the factors that cause changes in money supply fell between 4.86 for demand for money and 1.00 for rediscount rate. The most critical factor causing change in money supply are rated as demand for money, value of money in circulation, foreign exchange rate, Deregulation of interest rate and level of foreign exchange. This consisted with the suggestion of Charles (2011) that the quantity of money supplied by the government of any nation must be equal to the quantity demanded by money holders. This is due to the fact that the most critical of all factor is demand for money. He further stated that by increasing the supply of money, government can push the interest rate down, and by reducing the supply of money it can push interest rates up.

**Table 3 Factors Causing Change in Money Supply**

Factors	Mean	Rank
Demand for money	4.86	1
Volume of money in circulation	4.76	2
Foreign exchange rate	4.61	3
Deregulation of interest rate	4.57	4
Level of foreign exchange	4.00	5
Credit constraints	3.88	6
Government economic policies	3.84	7
Level of investment	3.84	7
Change in government	3.80	9
Change in national income	3.57	10
Size of domestic market	3.09	11
Per capital income	2.94	12
Stock exchange	2.90	13
Inflation	2.88	14

Minimum rediscount rate	2.01	15
Salaries and wages	2.00	16
Rediscount rate	1.00	17

Source: Author's field result (2017)

In Table 4. The coefficient of determination ( $R^2$ ), which is widely accepted as an indication of how well a model fits the population as opined by Chan (1999), was very high. The coefficients of determination are 97 percent for timber, 95 percent for Sandcrete block; Ceramic tiles; granite and texcote paint, 94 percent for reinforcement and sharp sand, 92 percent for cellotex ceiling board and cement while 91 percent is for single core electric cable. This implies that these percentages of the variation in the prices of selected building materials could be explained by money supply and demand for money. This confirmed the opinion of Oladipo and Oni (2012) that for every change in macroeconomic indicators; there is the likelihood that prices of building materials will change.

Table 4 Summary of Regression Showing the Relationship between Prices of Materials (Dependent Variables and Macroeconomic Indicators (Independent Variables)

VARIABLES	A	b <sub>1</sub> (Money SS) X <sub>1</sub>	b <sub>2</sub> (Money DD) X <sub>2</sub>	R	R <sup>2</sup>	F
Sanderete Block	126.352	0.006	-0.011	0.983	0.967	87.874
Timber	728.501	0.064	-0.043	0.982	0.964	81.398
Cellotex Ceiling Board	6792.712	0.597	-1.796	0.974	0.948	55.244
Texcote Paint	-3994.235	2.641	-2.805	0.972	0.944	50.715
Granite	843.224	0.210	-0.383	0.970	0.940	29.901
Sharp sand	645.892	0.082	-0.132	0.962	0.926	39.6100
Single Core Electric Cable	1866.985	0.338	-0.735	0.948	0.899	26.810
Ceramic Tiles	2436.624	0.641	-1.451	0.914	0.835	15.168
Cement	541.508	0.054	0.212	0.913	0.834	15.019
Reinforcement	97068.657	26.542	-53.025	0.901	0.812	12.984

Source: Author's field result (2017)

Table 5a showed the validation of the extent of money supply and demand for money on determination of the prices direction of the selected building materials. It confirmed further from the P-values that money supply impacted sharp sand, granite, sandcrete block, timber, cellotex ceiling board, single core electric cable, texcote paint and ceramic tiles.

While demand for money had a significant effect on cellotex ceiling board and ceramic tiles only.

Table 5a. Summary of t-Statistics

Variables	Money Supply		Demand for Money	
	t-stat	sign	t-stat	sign
Cement	0.679	0.563	0.696	0.513
Sharp sand	3.567	0.012	-1.484	0.188
Granite	4.366	0.005	-2.067	0.084
Sandcrete block	5.612	0.001	-2.446	0.050
Reinforcement	2.464	0.049	-1.277	0.249
Timber	3.815	0.009	-0.665	0.531
Cellotex ceiling board	8.378	0.000	-6.535	0.001
Single core electric cable	3.838	0.009	-2.166	0.074
Texcote paint	3.404	0.014	-0.938	0.385
Ceramic tiles	3.010	0.024	-1.767	0.128

Source: Author's field result (2017)

Table 5b. illustrates the respondent's assessment of the impact of the macro-economic indicators on prices of building materials. The rating generally is 3 for High impact, 2 for Low impact and 1 for No impact. The ones with critical impact on prices of building materials are money supply, change in pump price of petroleum product, import, demand for money, and interest rate. Though inflation impacts the prices of building materials, its impact is rated as not so critical in prices of materials.

Table 5b: Impact of macro-economic indicators on prices of building materials

Indicators	Mean	Rank
Money supply	2.98	1
Change in pump prices of petroleum products	2.94	2
Import	2.92	3
Demand for money	2.84	4
Interest rate	2.73	5
Exchange rate	2.69	6
Gross domestic product	2.12	7
Inflation	1.92	9
External reserve	1.88	9
Growth of credit	1.83	10
External debt service	1.61	11
Unemployment	1.11	12
Export	1.04	13

Source: Author's field result (2017)

In all, the respondent's rating and statistical significance on the assessment of impact of macroeconomic indicators on price direction of building materials, money supply had higher level of impact on greater percentage of the materials under study. This is because there is strong empirical evidence of a direct relation between money supply growth and long-term price inflation. Therefore, building materials and components incorporated into construction or parts of the material ingredients required for the manufacture of the materials are impacted upon by money supply policies (increase or decrease in volume or money supply) as money creation causes higher inflation. This buttresses the suggestion of Ahmed and Suliman (2011) in their study of causal relationship between money supply and prices that the causation runs from money supply to prices, but price level does not cause money supply.

## CONCLUSION

From the results of this study, it can be concluded that: money supply is the most critical macroeconomic indicator influencing prices of building materials while demand for money is less critical despite been assessed as the most critical factor causing money supply and its most affected on its own by demand for goods. Therefore, prices of building materials required for the manufacture of the materials are responsive to any (slight upward) change in the money supply. Any variation also in demand for money (either slight or major) as a factor has statistically negligible impact as touching price direction therefore money supply is the macroeconomic indicator that has direct impact on price direction of building materials in Abuja, Nigeria.

## RECOMMENDATIONS

This study had shown how money supply and demand for money impacts on the prices of the selected building materials. It is therefore suggested that Government should maintain money supplied into the economy to neutralize interest rate in Nigeria, reduce import duties charged on materials used in the building industry. This will have positive effect on the prices of building materials in that it will encourage procurement of building and finally encourage increase in quality local production and encourage/enforce patronage to meet up to demand for goods (building materials) in Nigeria.

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