EFFECT OF IMMIGRANTS ON WAGE AND COST IN THE NIGERIAN CONSTRUCTION INDUSTRY 1980-2020

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Abstract

This study examines the effects of immigrants on wage and cost in the Nigerian construction industry, from 1980- 2020. The objectives are to; examine the effect of immigrants on wage in the Nigerian construction industry, ascertain the effect of immigrants on cost in the Nigerian construction industry and investigate the impact of immigrants on the Nigerian construction industry growth and performance. The study employed the econometric and statistical techniques; Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, Co-integration Test, Vector Error Correction Model (VEC), Impulse response analysis in VEC models and Granger Causality. Based on the above econometric and statistical techniques conducted, it was observed that there is a significant effect of immigrant's on wage in the Nigerian construction industry. Our results indicated significant positive effect of immigrants on cost in the Nigerian construction industry within the sample period. Furthermore, there is significant effect of immigrants on the Nigerian construction industrial growth performance and bidirectional nature of causality relationship between the variables in the model within the sample period 1980-2020. The empirical results do support that increase in the supply of labour resulting from immigrant's, caused wages decline in the Nigerian construction industry and as well, support that the cost of building decreased as result of increase in stock of immigrants' labours that leads to 21% decrease in cost in Nigeria construction industry. Based on these findings, the researcher recommends that; Yes wage for native's worker in the construction industry declined by a relatively small amount, the societal effects of reduced wages and prices for all purchasers should be considered in the conversation. The construction industry should uphold the fact that these immigrant's laborers are substitutes for native's worker in the construction industry, yet it doesn't avoid the likelihood that they are supplements also. Nigeria construction industry should take advantage of presence of the immigrant's workers, and expatriates' companies in the industry to gain transfer of knowledge and advance in the construction technical knowhow.

Keywords; Effect, Immigrants, Wage, Cost, Nigerian and Construction Industry.

Introduction

Worldwide integration has resulted in the movement of people from one country to another and from one region and continent to another. This has also resulted in the exchange of goods and services and cross-pollination of ideas across regions. The reason for the movement of people is to seek for better opportunities which are not hitherto available in their own country. The International Organization for Migration (IOM), estimated that the immigrants that are in Nigeria has almost tripled in the last 20 years, from 477,135 in 1991 to 971,450 in 2005, 920,118.00 in 2010 having 41.99% increase from 2005, 1,199,115.00 in 2015, with 30.32% increase from 2010, then 720,958 in 2017 and 1,011,158 in 2018 having 40.25% positive growth from 2017, 54,157.00 in 2019 with 55.95% decrease from 2018 and 66,056.00 in 2020 with 21.97% increase from 2019 (IOM, 2019). The number of immigrants has increase to 1.3 million in 2021 (United Nations Development Programme (UNDP, 2021).

This study draws focus especially for the highly skilled immigrants working with the Nigerian construction industry. According to the most recent data, immigrants are significantly overrepresented in occupations like general managers (2.73%), corporate managers (0.89%), and professionals (0.43%), but less so in administrative positions like customer service clerks (0.21%). The majority of immigrants employed as professionals, technicians, and similar jobs are from Europe and Asia countries having 47.37% of the immigrant's population in Nigeria. Immigrants are active forces shaping new realities and related societal reactions both at home and in host nations, in the broadest sense (National Manpower Board, 2019).

10 years after Independence, there was an "oil boom" that increased demand for construction services as well as building activity. Foreign businesses have dominated the industry since the 1960s and 1970s, generating revenue for the government and jobs for the general public. There are problems to the fact that these enterprises usually import resources and even skilled labor rather than using locally produced products and promoting local content. The construction sector's post-rebasing statistics paints a significantly more upbeat picture since more recent building activity have been included and prices have been suitably deflated. The amount of operations carried out across all economic sectors in Nigeria has significantly changed throughout time. The actual GDP for the year 2010, which was N54, 612,264.18 million, was boosted by the construction industry by N1, 570,973.47 million, or 2.88%. In 2011, the construction industry had growth of 21.30%, reaching N1, 905,574.90 million. In 2012, the construction business had a closing value of N2, 188,718.59 million due to a 14.86% decrease in its growth rate; as a result, its contribution to GDP that year was 3.05%, or N1, 989.46. While the real GDP was increasing by about 3 to 4 %

against each of the followings years; 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 were recorded as N63,218.72, N67,152.79, N69,023.93, N67,931.24, N68,490.98, and N69,810.02 million respectively. These figure records construction sector's percentage share to GDP were as; 2.78%, 2.61%, 2.53%, 2.69%, 2.52% and 2.67% while real values were N2,272.38, N2,568.46, N2,680.22, N2,520.85, N2,545.99, N2,605.29, N2,652.54 and N2,448.72 million respectively (CBN, 2020).

Unexpectedly, the research does not address a similar set of critical questions: Do immigrants aid the Nigerian construction sector, and if so, where do these advantages originate from? The lack of any thoughtful discussion of the benefits of immigration is perplexing since costs and benefits must be weighed carefully before we can determine whether immigrants are advantageous or disadvantageous for the Nigerian building sector. As a result, immigration increases the market's size. It can bring about a variety of new interactions between employees and businesses, allowing for the free acquisition of information by both parties. Because of this, the external influences brought on by immigration may result in rising returns on the total output even when production technology at the firm level has constant returns to scale, (Mathew, 2016). Meanwhile, the microeconomic objectives focus on price, cost, and economic unites, the current international trading global development has been concerned on immigrants stocks and it effect or influence in the residing country.

Over the years in Nigeria, mainly the federal government has majorly financed contract on construction infrastructures. Thus, construction contract value approved by the federal executive council (FEC) and financed by Nigeria's Government for year 2010 to 2018 runs in billion is of naira. The total expenditure for the 2010 was N3, 525.10 billion, given 57.09% to construction works contract, with real share value of N1, 619,244.84 billion. Meanwhile, the total expenditure increased to reach N3,841.70, N4,004.46, N4,043.06, N4,368.64, N4,892.36, N5,762.70, N7,138.90 and N5,675.20 billion's of Naira in the following years; 2011, 2012, 2013, 2014, 2015, 2016, 2017 and 2018 respectively. The total expenditure increased for the 2011 to 2018 resulted to 195.9%, 83.3%, 92.19%, 116.3%, 114.6%, 98.67%, 119.4% and 150.17% respectively to contract on construction works with real share value of N5.557289155 N2.080929763, N2.280203608, N2.662155728, N2.342427785, N1.712218231, N1.67252658 and N2.646074147 billion in Nigeria (Bureau of Public Procurement annual report, 2019 and Central Bank of Nigeria Statistical Bulletin, 2020). Meanwhile, the efficient and effective use of such resources in construction contracting operations in Nigeria has been controlled by large numbers of immigrant-owned expatriate enterprises with few indigenous

companies. The report also highlights the lack of human resources available to indigenous businesses for planning, designing, building, and sustaining the scale and number of government-conceived projects (Idoro, 2009).

The weakness of the home-grown Construction Companies in the early stage of construction sector in Nigeria which is characterized by wage, cost and time overrun, too much risk, construction management lapses and funding has shifted the sole responsibility of executing a civil construction and industrial work in the country to their foreign firms which come in with their immigrants owned labours. For instance, the record figure of foreign construction firm immigrants owned labours working in construction sector in Nigerian increased from 2010 to 2018 as; [154,835, 159,207, 165,380, 256,265, 320,625, 559,520, 378,413, 214,380, and 217,802] respectively. This has huge cost implications to both the Nigerian Construction Industry Sectors and the economy at large, which includes mainly capital flight, cost and wages. This underscored the need to investigate on the effect of immigrants on wage and cost in the Nigerian construction industry from 1980 to 2020 with following objectives; to examine the effect of immigrants on wages in the Nigerian construction industry, to ascertain the effect of immigrants on costs in the Nigerian construction industry and to investigate the impact of immigrants on the Nigerian construction industrial growth performance.

Literature Review

The marginal theory of distribution states that a producer will never pay more for a factor of production than the value of its marginal product since doing so would increase his costs more than his revenue would increase. This gives us the marginal productivity theory of wages when it is applied to labor. Thus, the following arguments have led to criticism of this theory: (i) that it is too theoretical a concept, because it doesn't seem to match what actually occurs. (ii) It is typically impossible to determine the quantity or value of the marginal product of labor, or any other factor of production, in practice. (iii) The manufacturing process currently in use may be completely disrupted by the employment of one man more or one less. (iii) That the quality of the other factors of production used, particularly capital, has a significant impact on how productive labor is rather than only on its own effort and efficiency. (v) The hypothesis holds that an entrepreneur will hire less labor overall the higher the wage. Lord Keynes claimed that the theory was only applicable under static circumstances; hence lowering the wage rate during a trade downturn would not necessarily result in an increase in the demand for labor. In any event, perfect competition, a requirement that does not exist, is the only circumstance in which the marginal productivity of labor theory is relevant (Hanson (1972). A different strategy for addressing the issue of pay determination, according to Hanson

(1972), view salaries as a price for labor and thus, like all other prices, to be set by the interaction of market forces of supply and demand. With this, it is possible to conceive of factor markets as well as commodity markets, the price of a factor of production then depending on the demand for it in relation to its supply. Therefore, talking on wage, it is necessary to consider the labor market.

Nnadi and Alintal (2017) stated that construction industry refers to a much diversified sector that mostly comprises of craft, professional, and industrial services related to the construction, destruction, renovation, and maintenance of built environments. Construction markets frequently break down into three major sub-sectors: civil construction (such as building roads and bridges, water treatment plants, and other infrastructure), industrial construction (such as building oil and gas platforms and mining infrastructure), and residential and commercial construction (e.g., single-family dwellings, office buildings, condominium developments). From a professional, administrative, technical, and manual standpoint, the industry encompasses a bewildering diversity of job categories and skill sets, from carpenters, electricians, steel fixers, and general laborers to architects, engineers, and project managers. Additionally, the size, makeup, and market reach of construction firms can all be very variable. Arowojolu, Ankeli, Odewande & Olaniyi. (2013), argued that the large-scale flight of people with technical skills or expertise, often known as "Human Capital Flight," is typically prompted by war, a lack of opportunity, political instability, or health dangers. Since immigrants typically take the portion of the value of the government-sponsored training with them, skilled labor migration is typically seen as an economic expense. It is similar to capital flight, which describes the same flow of monetary capital.

To Aremu (2008), skilled labor migration is not a recent phenomenon, but it has caused significant worry in recent years. Trained labor migration, as defined by the United Nations, is the one-way flow of highly skilled individuals from poor nations to industrialized ones that primarily helps the latter. According to Answers.com (2011), skilled labor migration refers to the departure of highly educated or bright individuals from a given nation. When a highly qualified professional decides to relocate to another country, he or she does so for one or more justifiable political or economic reasons, including the need for peace and security for themselves and their families, job satisfaction, education, better pay conditions, and a higher standard of living. Countries and centers of academic excellence that provide these attractions have attracted the most professional immigrants, who have in turn made significant contributions to humankind's scientific and technical improvement as well as to the economic success of their host nations. Many talented Nigerians were forced to leave the nation because of

the state of affairs in an effort to find more favorable climates where they could make a life (Anekwe, 2003). Gedamu, in his paper "Reasons and Consequences of Brain-drain" (Gedamu, 2002), breaks down the causes of brain drain into three categories: unemployment and low wages; political unrest in the home nations; and economic stagnation, as a result, people lose faith in their government and their chances for a better life in the future. In a piece titled "Brain Drain: Causes and Economic Consequences for Africa and the Evolution of Theories of Brain-Drain and Migration of Skilled Personnel, cited factors that contribute to skilled labor migration, including colonial history, economic and political failures, globalization, and integration of the global economy. Reaffirm that "the country that invests in human resources is not the one that enjoys the return of his investment," which is consistent with the aforementioned sentiments. In contrast, the receiving nation receives competent people without having to pay for their training, so it can budget for the West and help the wealthier western countries grow, which makes the rich nations richer and the impoverished ones poorer. Ezzeddine (2011) pointed out that high level of unemployment in the migrant home country in comparison to the host country constitutes incentive for labour to migrate to another country. Toksöz, Erdoğdu and Kaşka (2012) gave five reasons why people migrate from home country to host country. They are: "(i) political unrest and turmoil in the neighboring countries, (ii) relationships based on power and self-interest can equally led people to migrate alongside trade and finance, (iii) due to global economic inequality, labour supply and demand is not determined only within national borders but also beyond them, (iv) when the need for skilled labour arises, governments of nations are also encouraging regular migration of skilled labour and (v) high levels of unemployment and low income rates in the country of origin, personal debts, financial needs of families and seeking better life standards".

Related research

Emmanuel Tayo Adu, Anjiba D. Lamptey-puddicombe and Okonkwo, Chibuzo Steven (2020) studied on the Assessment of Factors Responsible for High Cost of Labour in Construction Projects in Uyo, Nigeria. The study employed field survey of 57 consultants, 44 contractors and 37 labour operatives is conducted with the aid of structured questionnaire. Data are analysed using mean score, one-way analysis of variance at 0.05 level of significance and Gabriel`s post hoc test. The study reveals that the general economic climate, shortage of manpower, standard of living, transportation cost, distance and required skill are the first five significant factors responsible for high cost of labour of construction projects. The result also reveals that there is no significant difference among respondents` perception of the factors responsible for high cost of labour (p-value). The study recommends that

government should improve on the economy and be resilient in its efforts to diversify from hydrocarbon-based economy to other productive engagements in ensuring viable and sustainable growth of the economy for its citizenry.

Gui Ye, Yuxin, Liming, Houli Xie, Yuan Fu and Jian (2019), presents an analysis on the impact of migrant workers on total factor productivity (TFP) in Chinese construction industry covering 2008 to 2015. The study employed Solow Residual Approach is applied to conduct the analysis through comparing two scenarios, namely the scenario without considering migrant workers (Scenario A) and the scenario with including migrant workers (Scenario B). The results indicate that migrant workers have a significant impact on TFP; during the surveyed period, they improved TFP by 10.42% in total and promoted the annual average TFP growth by 0.96%. Hence, they concluded that the impact of migrant workers on TFP is very significant, whilst the main reason for such impact is believed to be the improvement of migrant workers' quality obtained mainly throughout learning by doing.

Borjas, Freeman, and Katz (2019) used multiple cross-sectional approaches to analyze decennial U.S. census data from 1960 to 1990. They find that the measured impact of immigration on wages is highly sensitive to the period studied, as well as to the level of geographic aggregation chosen. Not only the magnitude but also even the direction of the effect varies. These inconsistent results lead them to conclude that studies exploiting geographic: variations in immigration are unreliable. d'Artis and Patrizio (2018) studied the long-term social, economic and fiscal effects of immigration into the EU: The role of the integration policy. They employed simulation and substitution model by introducing a split labour market. Their simulation results suggest that, although the refugee integration, for example, by the providing language and professional training, is costly for the public budget, in the medium to long-run, the social, economic and fiscal benefits may significantly outweigh the short-run refugee integration costs. Depending on the integration policy scenario and policy financing method, the annual long-run GDP effect would be 0.2% 1.6% above the baseline growth.

Okoye (2018) examined the occupational health and safety risk-level of common building construction trades in Nigeria. Peter employed a structured questionnaires administered to the selected sits construction workers of different trades in Anambra State, Nigeria since is a site-based survey research. He also subjected the collected data to quantitative risk analysis using mean value method and risk prioritization number. In his study, he discovered that masonry, carpentry (including form-workers and roofing's), and iron-bending and steel-fixing are common building trades that do associate with higher chance of risks; whereas electrical fittings and installations, paintings, tailings, and

plumbing's are medium chance risk buildings trades. He also identified that the rates of occurrences and magnitude of impacts of different safety risks factor differs across the building trades, off which can be attributes to those differences in their activities and mode of operations in different building trades. Base on his findings, He recommended that a multi-risks administrative structure and controls systems for construction industrial personnel's on industrial constructions sites because of the frequency of risks that do occur and the impacts of the risks severity differ across trades. Pierre M´erel and Zach Rutledge (2017) examined the effect of immigration on native workers: evidence from the United State (US) construction sector. The study employed panel data at the metropolitan area-year level of aggregation constructed from US Census and American Community Survey data. they found that a 10 percentagea point increase in the share of immigrant workers reduces annual earnings of US-born construction workers by at least 4.1%, with workers in immigrant-prone trades experiencing earnings reductions in excess of 7.2%. the study partial identification strategy relies on the assumptions that the share of immigrants across all economic sectors in a market is positively correlated with construction-specific labor demand shocks about location and year effects, but less so than the share of immigrants in construction.

Okoye, Okolie and Ngwu (2017) examined the relationships between the effectiveness of safety intervention programmes and implementations strategies in the Nigeria construction industries. They employed Pearson's product of the moment correlation method and the data obtained from the good structural questionnaires administered to the selected sits construction worker and stakeholder among the chosen state in Nigeria. They observed from their studies that the effectiveness of safety intervention programmes for construction sites accident preventions are significantly relates to the communication and correspondence implementations strategies. This is inconformity with that of the principle of social ecological theories. They also in the study found that communication and correspondence for development strategies developed a multilevel safety intervention implementations strategy for construction industries in Nigeria.

Olanipekun and Nunayon (2017), studied on An Investigation into the use and Construction Professionals` Preference for Migrant Craftsmen in Construction Project Delivery in Ondo State. The author's social survey strategy was adopted and questionnaire was used as an instrument to gather relevant data from practicing construction professionals in Ondo State. The data were compiled and analyzed using SPSS 17.0. Their results show that migrant craftsmen from three major countries in West Africa namely Togo, Benin and Ghana were used on construction sites and they were commonly employed in the

trades of tilling and interlocking. They also observed that the dexterity of indigenous craftsmen (MS=4.20) was the major factor influencing the use of migrant craftsmen in these trades; cutting corners and rushing work while performing their responsibility, not keen on improving their training, alcoholism and drug abuse were ranked by the respondents as major factors militating against the use of local craftsmen. The result also indicates that the use and preference for Migrant craftsmen would increase unemployment rate for local craftsmen.

Yalley and Dadzie (2017) examined the factors influencing the dominance of expatriate contractors in Ghana. The researchers employed primary date questionnaires investigation. The results revealed that local contractors perform extremely poor due to the inappropriateness of organizational structure. The results of the study support the conclusion that lack of competent skill workers in the local construction industries and unfavorable government policies relating to procurement of works have negatively affects the full participation of local contractors in international competitive bidding, which results in the dominance of foreign contractors in Ghanaian construction industry. Mathew (2016) in his study on the effect of immigrant labour on wages and price levels in the construction industry in Finland. Using a fixed-effects regression model to analyze longitudinal individual data on workers in the construction industry between 2004 and 2010, he find that wages in a given occupation decline by 0.7% when the proportion of immigrants increases by 10%, and also that decreased wage levels are passed on to consumers in the form of lower house prices.

Hui and Mi Zhou (2016), examined foreign labor increase impact on the wages of local residents in China. They made used of the weighted OLS to analyze the floating population's influence. Survey data from China General Social Survey 2008 open database (CGSS2008) with sample of 6000, the city samples are 3982, 2018 rural samples. The data used in the study is the laborer sample data group by the education and experience from city to city.

Olusola, Olatunji, Ayodeji, Oke and Omoregie, (2016) examined the effect of construction project performance on economic development of Nigeria from 1990 to 2015.the study employed a survey design, with a total of 74 construction professionals were sampled and data were analyzed using related descriptive tools. The study revealed that the major factors affecting project performance include; project design cost, cost of reworks, unavailability of resources, average delay in regular payment, quality of equipment and raw materials and unavailability of competent staffs to handle construction process. Also, findings revealed that the areas where construction project performance have

more effect on economic development are; improvement in technology, extension of infrastructures, increase in employment opportunities and government expenditure. The study further recommends that human resources in the construction industry should be developed through proper and continuous training programs about construction projects performance. Also, elements required for better performance in construction have to be fully integrated into every construction projects in Nigeria.

Ebenezer and Omolola (2015), investigated on emigration and labour market dynamics in Nigeria from 1980 to 2011. A neoclassical migration theory that is similar to the Stolper-Samuelson factor price equalization outcome was employed, using generalized method of moments to estimate the coefficient. The empirical results show emigration of highly skilled workers leads to increase in high and low skilled wage with the former preponderant. Implicitly, the two categories of labour are not complementary. Rising wages are accompanied by increase in unemployment. Emigration of low skilled workers increases low skill wage, decreases unemployment but has no wage effect on high skilled workers. Ojo, Olukayode & Deji (2014) examined the Multiculturalism in the Nigerian construction industry: a comparative study of foreign and indigenous firms. The aim of the paper was to compare the organizational culture and performance of the Foreign Construction Firms with the Indigenous Construction Firms. Questionnaires, simple percentage and mean score analysis were employed by the researchers. Their Results showed that both categories of firms shared some aspects of organizational cultures but they differ in performance.

Arowojolu, Ankeli, Odewande and Olaniyi (2013), carried out appraisal of skilled labour migration in Nigerian construction industry. A survey research design was employed for the research and the research objectives were achieved through the use of percentile and relative importance index method of data analysis. They observed that there was an external economic pull on the Nigerian Construction Industry as a result of better wages, political stability, social stability, health insurance etc.

Sonia, Mario and Dili (2011), investigated on the Migration and Remittances Household Surveys in Sub Saharan Africa. They made use of cross-sectional survey that covered six countries African countries. Base on the survey data used, the study results show that there is a low rate of returns from the migrants: the shares of immigrants that returns were only 3 per-cent in Nigeria, 9 percents in Senegal, and 25 percent in Burkina

Faso. The majority of those that returned to Burkina Faso and Nigeria came back in less than four years. In contrast, in Senegal two-thirds of returnees had spent 15 or more years abroad.

Sabrina and Miroslaw (2010) examined immigration and construction: an analysis of the impact of immigration on construction project costs. The study employed survey of 896 construction workers on projects of the company sponsoring the research between the time period of September 2006 and February 2007. Sixty-six surveys were discarded due to incomplete information. All surveys were voluntary and anonymous; names, addresses, or other personal information were not collected. The results of this research reveal approximately 55% undocumented and "quasilegal" immigrant workers in construction in the Washington, D.C. metropolitan area, with an estimated 22% being truly undocumented. Again, because random sampling of the immigrant population of construction workers across the geographic region is not possible, a representative sample could not be drawn from this data. Extrapolation of the quantitative survey results to the universe of construction workers in the Washington, D.C. metropolitan area requires judgment. Thus, the conclusions drawn from the survey data are provisional; however, they are strongly supported by this and other research.

Longhi and Nijkamp (2010), investigated on Joint impacts of immigration on wages and employment: review and meta-analysis. The study employed a simultaneous equations regression approach to the meta-analysis of wage and employment effects. Again using 129 effect sizes, they find that the observed local wage and employment effects are very small indeed. Generally, they observed that the employment impact was more pronounced in Europe than in the United States. Thus, controls for endogeneity show a somewhat more negative impact. Wage rigidity increases the magnitude of the employment impact on the native born. To them, the demarcation of the local labour market in terms of geography and skills matters also.

Bernt and Oddbjørn (2010), researched on the immigration and wages: evidence from construction in Norwegian covering eight-year period 1998 through 2005. They employed Individual panel data regression model. Individual panel data reveal that; substantially lower wage growth for workers in trades with rising immigrant employment than for other workers. Selective attrition from the sector masks the causal wage impact unless accounted for by individual fixed effects. For low and semi-skilled workers, effects of new immigration are comparable for natives and older

immigrant cohorts, consistent with perfect substitutability between native and immigrant labor within trade. Finally, their results present evidence that immigration reduces price inflation, as price increases over the sample period.

Methodology

Theoretical Framework

The study main interest is on the effect of immigrant's on wage and price in the Nigerian construction industrial growth. Thus, because of the relationship knowledge between immigrant's inflows and the construction industry in Nigeria which the researcher wishes to explored, the study is therefore guided or coordinated on migration theory postulated by Harris Todaro model and Solow growth model. Todaro migration theory assumed that migration is mainly economic remarkable situation that is observed to exist of which the immigrant as a person should be rational in his/her decision making notwithstanding the available urban unemployment. Another assumption in this theory is that migrations occurred in reaction to urban-rural expected income difference rather than the real earnings. The basic perspective knowledge of the theory is that immigrants look at alternatively the different labor market chances available to the migrants both at urban and rural sectors and then make a rational decision on the one that stratify and maximizes their total actual dreams and then migrate. Furthermore, the potential and actual workers evaluate their anticipated earnings for a specific time period in the city country presently in vicinity, and they migrate if the previous is greater than the latter that is the (changes between returns and cost of migration). The idea also presupposes that the person choosing to move is trying to make the standard of living for his or her degree of education or skill attainment in the metropolitan center of their choice. The immigrant is also aware of the slim possibilities of finding paid employment right away and the likelihood that they would be unemployed or underemployed for a while (Todaro and Smith (2009). We take into account the following mathematical formulation of the fundamental Todaro model to further illustrate these conceptual presumptions. V(0) represents the discounted present value of the anticipated "net" urban-rural income stream over the immigrant's time horizon; $Y_{\mu}(t)$ and Yr(t) represent the average real income of people employed in the urban and rural economies, respectively; and n represents the number of time periods in the immigrant's planning horizon; and r represents the discount rate reflecting the immigrant's degree of time preference, then the decision to migrate. Therefore; $V(0) = \int_{t=0}^{n} [p(t)Y\mu(t) - Yr\,(t)]\, e^{-rt}\, dt - C(0)$ is either positive or negative, where p(t) is the likelihood that an immigrant will have found employment in a city at the average income level during period t, and C(0) is the cost of migration Todaro and Smith (2009).

Model specification

Todaro and Smith (2009) Framework is jointed with Solow theory of aggregate production APF in modeling this paper. The aggregate production function assumes that "unconventional inputs" may be incorporated in the model in order to represent their contribution to economic and its sectors growth in addition to the "conventional inputs" of labor and capital utilized in the neoclassical production function.

Where K, L, and A represent the quantities of capital stock, labor stock, and total factor productivity (TFP), respectively, and Y represents the economy's overall production (GDP) at time t. Given constant technology, the level of economic output will rise with any increase in labor and/or capital.

The model looks at capital, labor/population growth, and technological advancement to analyze long-term economic growth (Agenor (2005). Symbolically, the extended Solow growth model is shown below;

Q = F (K, L, T) .. 3.1

To account for the growth performance of the construction industry sector, equation 3.1 above was adjusted by expression of construction industry's growth performance, increasing human capital and labour, along with technical advancement as follows:

Q = F (K, L, W) Where: Q is the output of the construction industry performance (CIOP). L is labour, served as a stand-in for the labour force participation rate. It is the percentage of people who are employed or actively looking for work. A positive direct relationship between labour and output is implied by all growth theories; hence it is predicted to have a positive sign with construction industry growth. The stock of immigrant labour in the Nigerian construction industry (SIML) and the proportion of native labor in the construction industry (SNIL) are the two categories of labour we used in this study. K is a capital proxy that accounts for costs in the construction industry in Nigeria, and it is anticipated to be positive because the accelerator hypothesis contends that an increase in the rate of output (growth) will necessitate an increase in capital stock. Technology (T) is a proxy for rewarding the pay of the labour force. Since increased electricity production is essential for the expansion of industry, wage is anticipated to be positive. The model for this study is provided, symbolically, by:

CIOP = F (SIML, SNIL, CACI, WAGE)… (3.3)

Where CIOP is the construction industrial output performance in Nigeria, SIML is the stock of immigrants labours, SNIL is the share of natives labours, CACI is capital which represent the costs in the construction industry, while WAGE is the technical change factor representing wage. The share of immigrants has the purpose of accounting for the possibility that immigrants are either more or less

productive than natives.

The mathematical specification of the study's model is as follows:

$$CIOP_t = \beta_0 + \beta_1 SIML_t + \beta_2 SNIL_t + \beta_3 CACI_t + \beta_4 WAGE_t + \mu_t \ldots (3.4)$$

Where β_1SIML (stock of immigrants labours) > 0, β_2SNIL (share of natives labours) > 0

β_3CACI (costs in the Nigerian construction industry) > 0, β_4WAGE (wage in the Nigerian construction industry) > 0

In order to create the following system of equations, we formed the VECM in these manner.

$$\Delta CIOP_t = \sum \lambda_k v_{kt-1} + \sum_{s=1}^{p} \alpha_{1,s} \Delta CIOP_{t-s} + \sum_{s=1}^{p} \alpha_{2,s} \Delta SIML_{t-s} + \sum_{s=1}^{p} \alpha_{3,s} \Delta SNIL_{t-s} + \sum_{s=1}^{p} \alpha_{4,s} \Delta CACI_{t-s} + \sum_{s=1}^{p} \alpha_{5,s} \Delta WAGE_{t-s} + \zeta_{1t} \quad (3.6a)$$

$$\Delta SIML_t = \sum \lambda_k v_{kt-1} + \sum_{s=1}^{p} \beta_{1,s} \Delta CIOP_{t-s} + \sum_{s=1}^{p} \beta_{2,s} \Delta SIML_{t-s} + \sum_{s=1}^{p} \beta_{3,s} \Delta SNIL_{t-s} + \sum_{s=1}^{p} \beta_{4,s} \Delta CACI_{t-s} + \sum_{s=1}^{p} \beta_{5,s} \Delta WAGE_{t-s} + \zeta_{2t} \quad (3.6b)$$

$$\Delta CACI_t = \sum \lambda_k v_{kt-1} + \sum_{s=1}^{p} \delta_{1,s} \Delta CIOP_{t-s} + \sum_{s=1}^{p} \delta_{2,s} \Delta SIML_{t-s} + \sum_{s=1}^{p} \delta_{3,s} \Delta SNIL_{t-s} + \sum_{s=1}^{p} \delta_{4,s} \Delta CACI_{t-s} + \sum_{s=1}^{p} \delta_{5,s} \Delta WAGE_{t-s} + \zeta_{3t} \quad (3.6c)$$

$$\Delta WAGE_t = \sum \lambda_k v_{kt-1} + \sum_{s=1}^{p} d_{1,s} \Delta CIOP_{t-s} + \sum_{s=1}^{p} d_{2,s} \Delta SIML_{t-s} + \sum_{s=1}^{p} d_{3,s} \Delta SNIL_{t-s} + \sum_{s=1}^{p} d_{4,s} \Delta CACI_{t-s} + \sum_{s=1}^{p} d_{5,s} \Delta WAGE_{t-s} + \zeta_{4t} \quad (3.6d)$$

$$\Delta SNIL_t = \sum \lambda_k v_{kt-1} + \sum_{s=1}^{p} \beta_{1,s} \Delta CIOP_{t-s} + \sum_{s=1}^{p} \beta_{2,s} \Delta SIML_{t-s} + \sum_{s=1}^{p} \beta_{3,s} \Delta SNIL_{t-s} + \sum_{s=1}^{p} \beta_{4,s} \Delta CACI_{t-s} + \sum_{s=1}^{p} \beta_{5,s} \Delta WAGE_{t-s} + \zeta_{2t} \quad (3.7e)$$

Where r and p are the appropriate optimal lag lengths, ζ_{it} are mistakes that are presumed to be white noise, and nk, t-1 represents residuals from the co integrating equations.

Analysis of the impulse response function (IRF) from VEC model with long-run constraints identifying near-unit roots for;

$CIOP_t = (\Delta CIOP_t\ ;\ U_t)$. Share of native's labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and wage.

Where $CIOP_t$ is the construction industrial output performance in Nigeria) and U_t is the is the stock of immigrants labours, $A(SIML) = \lambda(CIOP)^{-1} (CACI_2\ \gamma WAGE)$

and β_0 =

Aggregate construction industrial output performance in Nigeria (CIOP), the stock of immigrant laborers (SIML), costs in the Nigerian construction industry (CACI), and wage = $(\varepsilon^s_t,\ \varepsilon^d_t)$ can all be used to interpret the structural shocks at time $\varepsilon_t = \beta_0 e_t$.

The moving average matrix $A(1)^{-1}B0^{-1}$ has a smaller triangular structure since the long-run identifying restriction states that demand shocks ε^d_t do not have a long-run impact on output. As a result, under this identifying limitation, the structural model's matrix of long-run multipliers, $B(1) = B_0A(1)$, is similarly lower triangular.

Method of Data Analysis

The study employed the following econometric analytical techniques such as; stationary test, co integration test, granger causality test, VECM impulse response function and that of statistical tools; t-statistic, f-statistic, R-square statistic value, autocorrelation or serial correlation, and homoscedasicity test to see check assumptions and condition for a good fit result is meant. Most specially, (t-test, f-test and R^2 statistical value) are anchored to test if the null hypotheses stated in chapter on of this study should be rejected or accepted.

Granger – Causality between (SIML, SIML, COST and WAGE) in the Nigerian construction industry will be test based on the model below.

$$\begin{vmatrix} 1 & -b_{12}^{(0)} \\ -b_{12}^{(0)} & 1 \end{vmatrix}$$

$$SIML_t = \sum_{i=i}^{n} \beta_i SIML_{t-i} + \sum_{j=i}^{n} \lambda_i COST_{t-j} + \sum_{u=i}^{n} \lambda WAGE + U_{1t} \quad ...(3.11a)$$

(COST ← SIML)

$$COST_t = \sum_{i=i}^{n} \beta_i COST_{t-i} + \sum_{i=i}^{n} \lambda_i SIML_{t-j} + ... + U_{2t} \quad ...(3.11b)$$

(WAGE ← SIML)

$$WAGE_t = \sum_{i=i}^{n} \beta_i WAGE_{t-i} + \sum_{i=i}^{n} \lambda_i SIML_{t-j} + ... + U_{3t} \quad ....(3.11c)$$

Empirical Results

Stationary Tests Results

Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tools were employed in this study to dispense the irregular trends in the data and to remove the far of unrealistic forecast and predications resulting from the study model. Below is the table for the stationary test.

Variables	PP Statistic at level	PP Statistic at 1st difference	Order of Integration	5% critical value	ADF Statistic at level differ	ADF Statistic at 1st difference level	Order of Integration	5% critical value
CIOP	-3.05	-6.37	I(1)	-3.53	-3.21	-5.79	I(1)	-3.53
	-1.89	-6.13	I(1)	-3.53	-1.65	-6.13	I(1)	-3.53
CACI	-2.27	-5.17	I(1)	-3.53	-2.24	-5.19	I(1)	-3.53
SIML	-0.43	-5.07	I(1)	-3.53	-0.43	-5.03	I(1)	-3.53
SNIL	-3.33	-13.38	I(1)	-3.53	-0.37	-7.08	I(1)	-3.53

Obtained: *researchers extracted from E-view 9.0 Estimation output (2021).*

In the table above, the PP and ADF unit root statistic result, shows that these variables, construction industrial output performance (CIOP) in Nigeria, stock of immigrant's labours, (SIML) share of natives labours in the Nigerian construction industry (SNIL) costs in the Nigerian construction industry (CACI) and wage respectively were not stationary at level form. Because both the ADF and PP t-statistic value in real term (i.e. [3.053607PP], [3.000807ADF] CIOP and [1.890164 PP] [0.538023ADF] CACI, [2.270212PP], [2.240252ADF] SIM, [0.430005PP], [0.433456ADF] SNIL, [3.325665PP], [0.374691ADF] WAGE) were less than the 5% critical value [3.529758].

Whereas these variables; construction industrial output performance (CIOP) in Nigeria, stock of immigrants labours, (SIML) share of natives labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and wage respectively becomes free from the unit root problem at integrated order one I(1). Their ADF and PP t-statistic values in real term (i.e. [6.368573PP], [5.796343ADF] CIOP and [6.126026PP] [6.126026ADF] CACI, [5.173669PP], [5.196471ADF] SIM, [5.067995PP], [5.025188ADF] SNIL, [13.37774PP], [7.076458ADF] WAGE) were higher if compare with 5 percent critical figure [3.529758]. In summary, the stationarity result concord to the assumption and condition for the estimation of Vector Error Correction Model which demanded that the variables must be free from unit root problem at same first order of integration. Therefore, without any far we then processed in estimation of our VECM model.

Cointegration Test

Having test and confirmed that data employed in this study were all free from unit root problem, we then test for long run interferes among the dependent (CIOP) variable and independent [CACI, SIML, SNIL, WAGE] variables. The test compared Trace statistic values, 5 percent

Critical Value and that of probability value of the variables, see result below.

Eigen-value	Trace-Statistic	5% Critical-Value	Probability value
0.918730	257.9671	69.81889	0.0000
0.846577	167.6080	47.85613	0.0000
0.788786	100.1239	29.79707	0.0000
0.532124	44.14806	15.49471	0.0000
0.372984	16.80420	3.841466	0.0000
Eigen-value	**Max Eigen-Statistic**	**5% Critical-Value**	**Probability value**
0.918730	90.35912	33.87687	0.0000
0.846577	67.48402	27.58434	0.0000
0.788786	55.97588	21.13162	0.0000
0.532124	27.34387	14.26460	0.0003
0.372984	16.80420	3.841466	0.0000

Source: *researchers extracted from E-view 9.0 Estimation output (2021).*

Looking at table, we observed four properties tool of co-integration result namely; Eigen-value, trace-statistic max eigen-statistic and the probability value. These properties indicated four co-integrating equations with significant Probability values. These co integrating variables [(CIOP), (CACI), (SIML), (SNIL) (WAGE)] were statistically significant since their trace statistic are higher as compared with 5 percent critical-value respectively. Also, the Maximum Eigen value of the variables are all proved the same significantly significant since their max-Eigen statistic are (i.e. CIOP [90.35912 >33.8768], CACI [67.48402 > 27.58434] and SIML [55.97588 > 21.13162], SNIL [44.14806>15.4947] and WAGE [16.80420 >3.841466] higher when view along with 5 percent critical-value, this could be confirmed with their probability values as it valued [0.0000] respectively. Simply put, there is four indicated co integrating eqn(s) among the variables.

Vector Error Correction Estimates Result for model 1: Construction of Industry Output Growth Performance in Nigeria

Vector Error Correction Estimates Result for model 1: Construction of Industry Output Growth Performance in Nigeria

	CointEquation
Co-integrating Equation:	1
CIOP(-1)	1.000000
CACI(-1)	-0.192545
	(0.02584)
	[-7.45081]
SIML(-1)	-0.012803
	(0.00078)
	[-16.3449]
SNIL(-1)	0.000472
	(7.9E-05)
	[5.96551]
WAGE(-1)	3.28E-05
	(4.4E-06)
	[7.47467]
C	-4.907474

Error-Correction:	D(CIOP)	D(CACI)	D(SIML)	D(SNIL)	D(WAGE)
Coint-Eq1	-0.024530	0.158656	126.5758	758.9093	1220.78
	(0.02691)	(1.25774)	(15.7772)	(490.773)	(5040.51)
	[-0.91170]	[0.11096]	[8.02271]	[1.54635]	[2.22334]
D(CIOP(-1))	0.873133	-9.046287	33.89791	-2559.926	17159.64
	(0.11331)	(5.71780)	(66.4421)	(2066.78)	(21227.0)
	[7.70583]	[-1.58213]	[0.51019]	[-1.23861]	[0.80835]
D(CIOP(-2))	-0.000880	0.026693	0.321759	9.367029	-26.64319
	(0.00076)	(0.03859)	(0.44838)	(13.9476)	(143.249)
	[-1.15068]	[0.69177]	[0.71760]	[0.67159]	[-0.18599]
D(CACI(-1))	0.000931	-0.553231	9.637646	-71.60785	260.9251
	(0.00487)	(0.24562)	(2.85420)	(88.7841)	(911.862)
	[0.19133]	[-2.25235]	[3.37666]	[-0.80654]	[0.28615]
D(CACI(-2))	-0.008617	0.225584	0.354067	-28.54548	-834.1643
	(0.00432)	(0.21782)	(2.53117)	(78.7358)	(808.659)
	[-1.99623]	[1.03563]	[0.13988]	[-0.36255]	[-1.03154]
D(SIML(-1))	-0.000579	0.025923	0.209518	3.871809	-80.05788
	(0.00018)	(0.00890)	(0.10343)	(3.21725)	(33.0429)
	[-3.28104]	[2.91255]	[2.02576]	[1.20345]	[-2.42285]
D(SIML(-2))	-0.000128	-0.003836	0.389642	6.762600	41.92125
	(0.00019)	(0.00971)	(0.11280)	(3.50885)	(36.0378)
	[-0.66497]	[-0.39517]	[3.45424]	[1.92730]	[1.16326]
D(SNIL(-1))	8.36E-06	0.002093	-0.039199	0.270047	-2.809499
	(1.6E-05)	(0.00078)	(0.00910)	(0.28302)	(2.90673)
	[0.53868]	[2.67289]	[-4.30836]	[0.95418]	[-0.96655]
D(SNIL(-2))	2.61E-05	-0.000689	-0.002650	0.038778	4.000955
	(1.6E-05)	(0.00082)	(0.00956)	(0.29728)	(3.05323)
	[1.60361]	[-0.83814]	[-0.27731]	[0.13044]	[1.31040]
D(WAGE(-1))	3.61E-06	-4.00E-06	-0.005464	-0.033771	-0.433908
	(1.2E-06)	(6.2E-05)	(0.00072)	(0.02247)	(0.23079)
	[2.92953]	[-0.06442]	[-7.56391]	[-1.50288]	[-1.88010]
D(WAGE(-2))	2.85E-06	0.000114	-0.003971	-1.85E-05	-1.314468
	(1.5E-06)	(7.7E-05)	(0.00089)	(0.02782)	(0.28577)
	[1.86720]	[1.48701]	[-4.43966]	[-0.00067]	[-4.59970]
C	-0.125712	4.042557	28.52015	767.2439	-7320.625
	(0.09157)	(4.62076)	(53.6942)	(1670.24)	(17154.3)
	[-1.37287]	[0.87487]	[0.53116]	[0.45936]	[-0.42675]

R-squared	0.855004	0.665281	0.870593	0.375603	0.558945
Adj. R-squared	0.793659	0.523669	0.815844	0.111435	0.372345
Sum sq. resids	5.382304	13705.80	1850687.	1.79E+09	1.89E+11
S.E. equation	0.454085	22.95966	266.7963	8299.102	85236.33
F-statistic	13.93770	4.697021	15.90153	1.421836	2.995418
Log likelihood	-16.78474	-165.7914	-258.9958	-389.6177	-478.1303
Akaike AIC	1.514986	9.357444	14.26294	21.13777	25.79633
Schwarz SC	2.032119	9.874576	14.78007	21.65490	26.31346
Mean dependent	0.538076	0.679717	59.07421	60.85079	253.8228
S.D. dependent	1.001624	33.26681	621.7090	8804.133	107588.1

Determinant resid covariance (dof adj.)	6.17E+23
Determinant resid covariance	9.26E+22
Log likelihood	-1274.363
Akaike information criterion	70.49280
Schwarz criterion	73.29393

Source: *researchers' extracted from E-view 9.0 Estimation output (2021).*

T-critical values using 5 percent is equal to α /2$t_{0.025}$ which is 1.569 referencing N-K. N means number within the observations period, K is 40 years as it stand while K becomes numbers of parameter involved which is 5; therefore, 40 - 5 = 35, we than have (5; 35). This now implies our

degree of freedom for checking t-statistical significance level. On the other hand, f-critical value is K-1with N-K value. In the VECM results above, k-1 is 5-1while k-n is 40 - 4 which is 35. Therefore, the degree of freedom in checking f-statistical significance level is (4: 35), by this we than have the F0.05 to be 3.32 Gujarati (2005).

The above table presented two results namely; long-run and short-run equations estimated on the stock of immigrant's labours, (SIML), share of native's labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and (WAGE) on the dependent Nigerian construction industrial output performance (CIOP). The table is divided into two; the upper side of the table represents the short run estimate equation without error correction value while the lower parts of the table represent the long run estimate equation with error correction estimation value. Short-run coefficients of the vector error corrections model (VECM) regression is presented in table above. It shows that the past values of construction of industrial output performance in Nigeria is statistically significant and also positively influenced the current values of construction of industrial output performance at lag one and as well negatively influence the current values of construction of industrial output performance at lag two in Nigeria from 1980 to 2020 observation period. The results further disclosed as follows; one of these independent variables [costs in the Nigerian construction industry (CACI) and stock of immigrant's labours] at lag one have a negative relationship with the construction industrial output performance in Nigeria at the short run by [-0.192545CACI, and -0.012803SIML] at 5% level of significance respectively during the periods of the study.

The short run coefficients of share of natives labours in the Nigerian construction industry (SNIL) and (WAGE) at lag one have a positive relationship with the construction industrial output performance in Nigeria by [-0.000472SNIL, and 3.28E-05WAGE]. The implication directs as follows; a unit increases on the value of the two coefficients', implies both in volume and values positively on construction industrial output performance in Nigeria at 5% level of significance respectively, within the study periods. the table revealed that the sign born by the dependent/constant coefficient [i.e., construction industrial output performance (CIOP) is negative [-4.907474], it implies that if all other variables being held constant, the dependent (CIOP) variable will stand at 5 percent approximately in the short run. Moreover, the table shows VECM constant value is [0.125712], being negative and statistically significant is an indication of power of adjustment to the equilibrium in the existing relationship between immigrant on wage and costs of construction industrial output performance in the study area. Vector error correction

transmission indicates it will take about 12 years for the model to adjust back to the equilibrium after a shock in the short run.

The short run signs of the parameters β_2 to β_5 estimated of were in line with the theoretical assumption and expectations for the lag one (i.e. (-1)) estimate results. Meanwhile, the long run estimate equation shows that the coefficients of share of native labours in the Nigerian construction industry and wages both at lag one and two. While the costs in the Nigerian construction industry (CACI) at lag one (-1) only, is statistically significant and affected positively on the construction industrial output performance in Nigeria within the study observation. Again, stock of immigrants labours, (SIML) both at lag one and two, have positive sign and will influence positively to Nigerian construction industrial output performance within the study period. However, results further indicated as thus:

- One percent increase in costs in the Nigerian construction industry (CACI) will lead to 55% decrease at lag one and 22% increase at lag two in the construction industrial output performance.
- A unit increase on share of native labours in the Nigerian construction industry will by 27% at lag 1 and 3% at lag 2 leads to increase in construction industrial output performance in Nigeria.
- Whereas, one percent increase in wages will by 43% at lag 1, and 1% at lag 2 leads to decrease in construction industrial output performance in Nigeria.
- Meanwhile, one percent decrease in the stock of immigrant's labours, (SIML) will by 20% at lag 1 and again 38% at lag 2 leads to increase on construction industry performance output growth in Nigeria under study periods 1980 to 2020.

T-test: In short run equation result, coefficients in the model shows significant to the study as compared with calculated t-value and 5 percent critical value. In other words, form the short run regression estimate, the stock of immigrants labours (SIML), share of natives labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and (WAGE) were [7.45081CACI (-1), [16.3449SIML (-1), [5.96551SNIL(-1) and [7.47467WAGE(-1)], whereas the t-value tabulated which stood at [1.569]. Meanwhile, long run equation results show that the share of native's labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and (WAGE) were statistically significant at 5% level of significance at lag 1 and 2. However, the t-statistic value of these variables were [2.25235D(CACI(-1)), [2.67289D(SNIL(-1)), 1.60361D(SNIL(-2)),

[1.88010D(WAGE(-1)), 4.59970D(WAGE(-2)), [2.02576 (SIML (-1)) and [3.45424] (SIML (-2)) respectively. Based on this, we conceded that these variables are statistically significant to Nigerian construction industrial output performance (CIOP) the dependent variable during the period of the study 1980 -2020 since their t-statistic valve were greater than the tabulated t- value is 1.569.

F-Test: The result shows the group power and its influence of independent factors (i.e., stock of immigrant's labours (SIML), share of native's labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and WAGE on the dependent variable [i.e. Nigerian construction industrial output performance (CIOP)]. The calculated f- value is [13.93770] whereas f-value from four figure table is [3.32]. Thus, looking at the f-Cap value 13.93% is cleared that 13.93% is higher in value compare to 3.32%. This implies that all the independent factors impacted strongly on the Nigerian construction industrial output performance (CIOP)] is statistically significant. Computed adjusted R^2 value showed [793659] which implies 79% of total variations in the dependent variable (i.e., Nigerian construction industrial output performance (CIOP)) in the long run resulting from the changes in the independent determents such like; stock of immigrant's labours (SIML), share of natives labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and (WAGE). Whereas 20% out of hundred percent uninfluenced changes is accounted by variables not included in the model but have been taken care by the error term in the model.

Impulse shock Responses on Construction of Industrial Output Performance in Nigeria Impulse response function

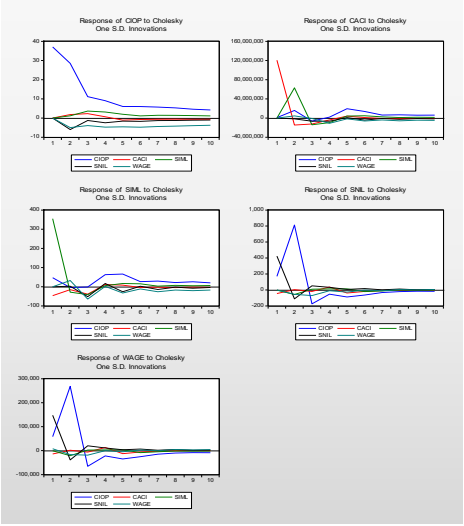

Figure 4.1Source: *researchers' extracted from E-view 9.0 Estimation output (2021).*

Figure 4.1 presented IFR system equation on these variables (i.e. construction industrial output performance (CIOP), stock of immigrant's labours (SIML), share of natives labours in the Nigerian construction industry (SNIL), costs in the Nigerian construction industry (CACI) and WAGE) examined on structural shock of decomposed and standard deviation system in VECM. Viewing the combine graph standard error of 10 period's cholesky degrees

of freedom adjustment with lower and upper interval bound confidence of 95 percent, raveled that graph of cost in the Nigerian construction industry (CACI), stock of immigrant's labours (SIML), share of natives labours in the Nigerian construction industry (SNIL) and WAGE) are consistent and positive which implies that the system equations are stable. However, since [CACI, SIML, SNIL and WAGE] responses on CIOP slopes all showed a stable system equation, it implies zero shock. Again it simply saying that; shock of the variables and short run value in system equation surely moves to long run equilibrium value. From the figure 4.1 displayed above, we observed that time path movement over the whole period were consistent as the graphs line stayed in the 95 percent bound confident interval. Meanwhile, the displayed movement in all these variables [i.e., CACI, SIML, SNIL and WAGE] response graphs lines tock similar direction. They all step up showing the movement or deviating from short run equilibrium for the construction industrial output performance (CIOP) and then step steady on the line to rise, but after an unanticipated decreases in [CACI, SIML, SNIL, WAGE and CIOP] declined to zero to confirmed that stability of the system equations within the 95 percent bound interval confidence.

Vector Error Correction Results for Model 2: the Effect of Immigrants on Cost in the Nigerian Construction Industry

Dependent variable: CACI			
	CointEq1	D(lag(-1))	D(lag(-2))
C ACI(-1)	1.000000	0.553231	0.225584
	-25.48747	(0.24562)	(0.21782)
		[-2.25235]*	[1.03563]*
SIML(-1)	0.066494	- 0.270047	-6.762600
	(0.00312)	(0.10343)	(3.50885)
	[21.3337]*	[-2.02576]*	[-1.92730]*
SNIL(-1)	-0.002452	-0.013277	-4.000955
	(8.0E-05)	(0.28302)	(3.05323)
	[-30.7801]*	[0.95418] *	[-1.31040]*
WAGE(-1)	-0.000171	0.433908	2.85E-06
	(2.1E-05)	(0.23079)	(1.5E-06)
	[-7.95243]*	[1.88010]*	[1.86720]*
CIOP(-1)	-5.193603	0.873133	-0.000880
	(0.56008)	(0.11331)	(0.00076)
	[-9.27297] *	[7.70583]*	[-1.15068]*
C	-4.042557	28.52015	767.2439
	(4.62076)	(53.6942)	(1670.24)
	[-0.87487]	[0.53116]	[0.45936]
R-Squared	0.665281	0.870593	0.375603
Adj. R-squared	0.523669	0.815844	0.111435
Sum. sq. reside	13705.80	1850687.	1.79E+09
S.E. equation	22.95966	266.7963	8299.102
F- statistic			
Log likelihood	4.697921	15.90153	1.421836
Akaike AIC	-165.7914	-258.9958	-389.6177
Schwarz SC			

Source: Researchers' Extract from E-view 9.0 Estimation output (2021).

CointEq1, co-integrating equation one which denotes for the short run result of the VECM, while D(lag(-1)) and D(lag(-2)) are the error correction equation at lag one and two for all the variables. In the table, * denotes t-statistic in parentheses.

The co-integrating equation short run result of the VECM CoinEqi showed that the constant variable cost in the Nigerian construction industry (CACI) is negative valued at [-25.48747]. The implication is that holding all the independent factors constant, const in the Nigerian construction industry will steady at 25 percent at the short run. The explanatory variables coefficients under co-integrating equation short run result showed that share of natives labours (SNIL), WAGE, and Nigerian construction output performance

(CIOP) respectively, have negative relationship with the constant variable (i.e. cost in the Nigerian construction industry (CACI)]. It implies that decreases in [(SNIL), WAGE and CIOP)] will lead to a declined in the cost in the Nigerian construction industry (CACI) by [-0.01$_{SNIL}$, -0.1$_{WAGE}$ and -5.1$_{CIOP}$] at the short run. Meanwhile, the stock of immigrants' labor in the Nigerian construction industry (SIML) reported positive relationship with the dependent variable. In other words, unit increases in (SIML) will to increase in the cost in the Nigerian construction industry (CACI) by [0.06$_{SIML}$]. Thus, the t – statistic [21.3337$_{SIML}$, -1.92730$_{SNIL}$, -7.95243$_{WAGE}$ and 9.27297$_{CIOP}$] of these variable were all significant in the short run.

Error correction equation at lag one and two Colum's showed that coefficients of SIML and SNIL have a negative relationship with the depend variable cost in the Nigerian construction industry (CACI). While coefficient of CIOP at lag two alone was reported negative whereas at lag one was positive. The implications of these negative responses of these variables are as follow; first, shilling increase in the inflows of immigrants and natives labours in construction industry in Nigeria will lead to [(27 lag $_{(-1)}$, 6.8 lag $_{(-2)\ SIML}$), (0.01 lag $_{(-1)}$, 4 lag $_{(-2)\ SNIL}$) and 0.0 lag $_{(-2)\ CIOP}$] cents decrease on cost in the Nigerian construction industry (CACI). Whereas the coefficients of Wage at lag one and two and CIOP coefficient at lag one have positive relationship with the constant variable (CACI). In other words, a unit wage and Nigerian construction output performance (CIOP) respectively will lead to [(43 lag $_{(-1)}$, 2.8 lag $_{(-2)\ WAGE}$) and (78 lag $_{(-1)\ CIOP}$)] cents increase on cost in the Nigerian construction industry (CACI). The t- statistic of error correction equation for these variables are [(2.02576$_{SIML\ (-1)}$, 3.45424$_{SIML\ (-2)}$), [1.88010$_{WAGE\ (-1)}$, 1.86720$_{WAGE\ (-2)}$) and [7.70583$_{CIOP\ (-1)}$] were statistically significant to the study within the observation time. Meanwhile, the explanatory variable all have the signs in line with the theoretical assumption. The coefficient of determination adjusted square R^2 (0.523669) have a good fit to the study since 52 percent variation on the dependent variable (CACI) is as a results of influence/impact from these explanatory variables. In the same view, the F-statistic reported [22.95966], which is 22.95 percent total joint influence of the variables implying significant in the model.

Vector Error Correction Model 3: The Effect of Immigrants on Wage in the Nigerian Construction Industry

Constant variable: WAGE

	CointEq1	D(lag(-1))	D(lag(-2))
WAGE(-1)	1.000000	0.553231	0.225584
	-149438.5	(0.24562)	(0.21782)
		[-2.25235]*	[1.03563]*
CIOP(-1)	30451.21	0.873133	0.350885
	(3178.99)	(0.11331)	(0.44838)
	[9.57891]*	[7.70583]*	[0.71760]
SIML(-1)	-389.8695	-0.209518	-6.762600
	(25.0800)	(0.10343)	(3.50885)
	[15.5450]*	[-2.02576]*	[-1.92730]*
SNIL(-1)	14.37483	0.270047	-0.002093
	(2.25268)	(0,28302)	(0.00078)
	[6.38121]]*	[0.95418]	[-0.83814)
CACI(-1)	-5863.215	-0.553231	0.225584
	(716.024)	(0.24562)	(0.21782)
	[8.18857] *	[-2.25235]	[1.03563]
C	-7320.625		
	(17154.3)		
	(-0.42675]		
R^2	0.558945		
Sum. R^2. Reside.	1.89E+11		
S.E. Equation.	85236.33		
F- Statistic.	22.995418		
Log likelihood.	-478.1303		
Akaike AIC.	25.79633		
Schwarz SC.	26.31346		

Source: Researchers' Extract from E-view 9.0 Estimation output (2021).

Table is of two sides. First is the vector error correlation (VECM) co-integrating short run equation denotes CointEq1, the second is the long run VECM result which denote D(lag(-1) and D(lag(-2). Examining the co-integrating short run aspect of the table, we observed that coefficients of CIOP and SNIL post a positive relationship with the dependent variable WAGE. Meaning that, a unit increase in these variables (CIOP and SNIL) will lead to [30, 14] cents increases on the Wage levels in Nigerian construction industry at the short run. Whereas, coefficients of SIML and CACI post a negative relationship with WAGE the dependent variable. It implies that shilling inflows of stock of immigrants' labor in the Nigerian construction industry (SIML) and cost in the Nigerian construction industry (CACI) will lead to [38_{SIML} and 58_{CACI}] cents decrease on wage. Again, VECM CoinEqi showed that the constant variable that is (WAGE) reported negative valued at [-149438.5]. The implication is that holding all the independent factors constant, wage in the Nigerian construction industry will steady at 14 percent at the short run. Meanwhile, the t – statistic [9.57891_{CIOP}, 15.5450_{SIMIL}, -6.38121_{SNIL} and 8.18857_{CACI}] of these variable were all significant in the short run. Error correction equation Colum's showed that coefficients of COIP at lag one and two, while SNIL at lag two and CACI at lag one have a positive relationship with the depend variable wage in the Nigerian construction industry (WAGE). This implies that at the long run, a unit increase in these variable (COIP, SNIL and CACI), will lead to [[(78 $lag_{(-1)}$, 35 $lag_{(-2)\ COIP}$), (27 $lag_{(-1)\ SNIL}$) and 22 $lag_{(-2)\ CACI}$] cents increases on wage in the Nigerian construction industry. While coefficient of SIML at lags one, two whereas SNIL at lag one and CACI at lag two alone post a negative relationship with the dependent variable (i.e., wage in the Nigerian construction industry (WAGE). The implications of these negative responses of these variables are as

follow; first, shilling increase in the (inflows of immigrants and natives labours, SNIL and CACI)) in construction industry in Nigeria will lead to [(20 lag $_{(-1)}$, 6.7 lag $_{(-2)\ SIML}$), (0.02 lag $_{(-2)\ SNIL}$) and 55 lag $_{(-1)\ CIOP}$] cents decrease on wage in the Nigerian construction industry (WAGE). The t-statistic of error correction equation for these variables are [(7.70583$_{CIOP\ (-1)}$, (2.02576$_{SIML\ (-1)}$, 1.92730$_{SIML\ (-2)}$) and [2.25235$_{CACI\ (-1)}$] were statistically significant to the study within the observation time. Meanwhile, the explanatory variable all have the signs in line with the theoretical assumption. The coefficient of determination adjusted square R^2 (0.558945) have a good fit to the study since 52 percent variation on the dependent variable (WAGE) is as a results of influence/impact from these explanatory variables. In the same view, the F-statistic reported [22.995418], which is 22.99 percent total joint influence of the variables implying significant in the model. The result summary as:

- One percent increase in the stock of immigrants labours will lead to decrease of 20% at lag one, and 6.7% on wage in the Nigeria construction industry.
- One percent increase on construction of industrial output performance leads to 55% increase on wage in the Nigeria construction industry.
- Whereas, a percent increase on cost in Nigerian construction industry will lead to 35% decrease in wage in the Nigeria construction of industry.

Post-diagnostic Tests Result
Autocorrelation VECM test Result

Lags	LM Stat	Probability Value
1	42.03374	0.0178
2	36.67254	0.0620
3	51.37399	0.0014
4	59.99453	0.0001
5	29.68818	0.2362
6	33.09174	0.1288
7	48.16701	0.0036
8	32.28121	0.1500
9	34.91747	0.0897
10	53.34109	0.0008
11	41.76302	0.0191
12	39.91965	0.0297

Source: Researchers' Extract from E-view 9.0 Estimation output (2021).

This test is condition to test if they exists auto or serial correlation problem to this VECM equation two employed. However, viewing table 4.4.1 above, we observed that the LM-statistic values were examined using ten lags, and almost the lags of LM-statistic value were statistical significant as is proven by the pro-value in the table. We therefore

conclude that there is no presence of serial correlation in the model.

VECM Residual Heteroskedasticity

Joint test: No Cross Terms (Only Levels and Squares)		
Chi-sq	df	Prob.
427.8655	330	0.0002

Source: Researchers' Extract from E-view 9.0 Estimation output (2021).

Viewing the VECM Residual Heteroskedasticity results in table 4.4.2, we concluded that there is no occurrence of homoscedasticity of constant variance in the model since the p-value [0.0002] of the Chi-square statistic value [427.8655] showed statistically significant within 330 degrees of freedom at 5 percent level of significance.

Table: 4.7; Causality Test

Null Hypotheses	Observation	F-statistic	P-value
CACI does not granger cause CIOP	39	2.83918	0.0724
CIOP does not granger cause CACI		0.16978	0.8446
SIML does not granger cause CIOP	39	14.2761	0.0006
CIOP does not granger cause SIML		0.26639	0.6088
SNIL does not granger cause CIOP	39	7.82769	0.0016
CIOP does not granger cause SNIL		17.1015	0.0016
WAGE does not granger cause CIOP	39	3.91918	0.0552
CIOP does not granger cause WAGE		7.51715	0.0094

Source: Researchers' Extract from E-view Estimation output (2021).

Granger causality results reported a bidirectional causal relationship among these variables; construction industrial output performance (CIOP) and share of natives' labours in Nigerian construction industry (SNIL), wage in construction industry (WAGE) and construction industrial output performance (CIOP) since their f-statistic values were statistically significant at 5 percent level of significance. This was also confirmed by their probability values showing almost zero in the table. In other words, the past values of share of natives labours in Nigerian construction industry (SNIL) and wage in construction industry does granger causes the present value of construction industrial output performance (CIOP) and in turn, the past values of construction industrial output performance (CIOP) granger causes the present values of share of natives labours in Nigerian construction industry (SNIL) and wage in construction industry within 39 period of observation respectively.

Same granger causality result also post a directional causality relationship among the following variables; stock of immigrant's labor(SIML), costs in the Nigerian construction industry (CACI) and the construction industrial output performance (CIOP). Having viewed table 4.7, we observed that the f-statistic value of CACI and SIML showed statistically significant while that of CIOP were insignificant to the study, which were confirmed by the probability value. Based on their f-value statistic and p-value, we conclude that the past value of stock of immigrant's labor (SIML) and costs in the Nigerian construction industry (CACI) does grange causes the present value of construction industrial output performance (CIOP) while on the other way, the present value of construction industrial output performance (CIOP)

does not in any way granger causes the present values of stock of immigrant's labor (SIML) and costs in the Nigerian construction industry (CACI) within in the study period.

Evaluation of Hypotheses

Null Hypothesis One: There is no significant effect of immigrant's on wage in the Nigerian construction industry from 1980 to2020**.**

Hypothesis and objective one of this study is evaluated using t-statistic values of the employed variables in vector error correction model result in table 4.5. The t- statistic value of stock of immigrant's labor in the Nigerian construction industry (SIML) both the short and long run were; [$15.5450_{SIMIL,}$ ($2.02576_{SIML\ (-1)}$, $1.92730_{SIML\ (-2)}$)] while the critical value at 5 percent level of significance is [1.569]. Based on this, we concluded to reject the null hypothesis one of this study and accept the alternative hypothesis one that said; there is a significant effect of immigrant's on wage in the Nigerian construction industry within the period of the study. This implies that; inflows of immigrant's lead to 15 percent decrease on wage at the short run, while 2 percent decrease in wage at the long run in the construction industry in Nigeria.

Null Hypothesis Two: There is no significant effect of immigrant's on Cost in the Nigerian construction industry from 1980 to 2020.

Employing the t-statistical value in table 4.4, we then examine the hypothesis and objective two of this study. We compare the short and long run t-values [$21.3337_{SIML,}$ ($2.02576_{SIML\ (-1)}$, $3.45424_{SIML\ (-2)}$)] and the critical 5 percent value significance [1.569] and we observed that the t-values are greater than the 5 % critical value. We then reject the null hypothesis two and accept the alternative hypothesis two of this study that said "there is a significant effect of immigrant's on cost in the Nigerian construction industry with the study period. However, this implies that inflows of immigrant labours in the construction industry in Nigerian resulted about 21% decrease in short run and [2: 3] % at the long run in the Nigerian construction industry from 1980to 2020 period.

Null Hypothesis three: Immigrant's has no significant impact on the Nigerian construction industrial growth performance from1980 to 2020.

Considering vector error correction model in table 4.3 t- statistic value, figure 4.1 results and granger causality table 4.7 results; we reject the null hypothesis three of this study. First, the t-value both short and long run lag one and two were [$16.3449_{SIML,}$ ($2.02576_{SIML\ (-1)}$, $3.45424_{SIML\ (-2)}$)] greater than the 5 percent critical value [1.569]. Secondly, figure 4.1 impulse response of the immigrants labour on construction industry results showed the time path of construction output growth performance (the dependent variable). It also post shock from the stock of immigrants labour proving that system equation is stable as the

independent variables declined to zero. We then conclude that the inconsistence in the construction industrial output growth performance at short run value will surely converge to equilibrium, being stable at the long run. Finally, the granger causality test raveled that the past value of stock of immigrants labour (SIML) does granger causes the present value of construction industrial output performance (CIOP) while the past value of construction industrial output performance (CIOP) does not granger causes the present value of stock of immigrants labour (SIML). Therefore we conclude that "there is about [16% and 3%] significant impact of immigrant's on the Nigerian construction industrial growth performance from 1980 to 2020.

Conclusion

The study examines the effect of immigrants on wage and cost in the Nigerian construction industry, using 1980 to 2020 periods. Because of Nigeria being a developing country that arose the need for more infrastructural construction work by the construction industry sector in Nigeria. This background also attracted the flows of both foreign construction companies and individual immigrants, which result to a significant increase in the supply of labour to existing one in the Nigerian construction industrial sector. This increase in the supply of labour resulted by the immigrant's caused wages decline in the Nigerian construction industry. Our study finds that a 3% increase in stock of immigrants labours in the Nigerian construction industry cause and affected a 38% decrease in wages in the construction industry in Nigeria within the period of the study 1980-2020. Consequently, the declined in the construction industry wages as we observed from the empirical results of the study, could say to become a difficult effect for the native workers already working in the industry. However, the decrease in wage did have other effects to both the Nigerian construction industry and the whole of the country economy as follows; first, the cost of building decreased for the companies in the construction industry. This was confirm by the empirical result of the study "One percent increase in stock of immigrants labours leads to approximately 21% lead to a decrease in cost in Nigeria construction industry at lag one and as lead 20% decrease in cost in Nigeria construction industry at lag two. Secondly, construction industry being a competitive market, the decrease both in wage and cost should cause and effected prices in the industry to decrease as well, as this proving the total effect of immigrants wage and cost in the Nigerian construction industry under the period of the study. Thus, this could lead to price of housing in capital state of the country to be lower than what it would otherwise be if the immigrants had not taken place in the construction industry in Nigeria. Assuming that the benefit of lower housing costs for all residents of the capital state outweighs the disadvantage of lower wages for those working in the construction industry,

this suggests that the net effect of work-based migration is positive, without taking into account the effects on public finances (i.e., in the form of tax receipts or expenditure in the form of benefits).

Policy Recommendations

1 Nigerian construction industry labor market should recognize that they need highly-skilled immigrates and adjust their policies accordingly since wage losses to the natives due to stock of immigrates is roughly equal to the gains from immigration.

2 Nigerian construction industry should see Inflows of immigrant's workers, expatriates a means to increase competition with the indigenous companies since this will induce task specialization of natives and under certain plausible conditions, ultimately raise the demand for all workers in the construction industry. Since one of the study findings raveled decrease in cost in Nigeria construction industry.

3 Nigeria construction industry should take advantage of presence of the immigrant's workers, and expatriates' companies in the industry to gain transfer of knowledge and advance in the construction technical knowhow as the study found a positive effect of immigrants on the Nigerian construction industry growth performance.

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