

# EMIGRATION AND LABOUR MARKET DYNAMICS IN NIGERIA

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## **Abstract**

*The Nigerian labour market is fraught with high rate of unemployment and sluggish wage adjustment, not explicitly determined by market forces. Wages respond sluggishly to inflation rate, worsening workers' welfare. These and other reasons create push effects for youth emigration from Nigeria. This paper provides empirical evidence on the labour market effects of emigration from Nigeria. 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 coefficients. 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. Nigeria should retain highly skilled workers while channelling remittances to productive use.*

## **1. Introduction**

Labour market of Nigeria is fraught with high rate of unemployment and sluggish wage adjustment not explicitly determined by market forces. More irreconcilable is that unemployment continues to increase in the face of consistent economic growth. Further, wages respond sluggishly to inflation rate, thereby worsening workers' welfare. High unemployment rate could be attributed to the composition of the country's population. Specifically, the youth constitutes more than 60 per cent of total population but less than 30 per cent were able to secure employment (NBS, 2010). Furthermore, young people are confronted with lack of demand for their newly acquired skills, often not matching those required by the demand side of the labour market (IOM, 2010). Also, the country has been experiencing rapid expansion of educational system which directly leads to increase in the supply of educated manpower above the corresponding demand (Okafor, 2011). Finally, the manufacturing absorptive capacity for youth employment appears weak, partly because of lack of technological know-how and largely because of infrastructural challenges.

These and many other reasons tend to create push effect for youth emigration from Nigeria. Although the exact figure of Nigerians abroad is not known, official reports show that 33,677 Nigerians migrated to the OECD-6<sup>1</sup> in 1975 and rose to 59,209 a decade later. By 2000, the figure was almost three times that of 1985 (Docquier, 2011). Observably, the share of emigration in total labour force is very small, but it has been increasing over time particularly among the highly skilled. In particular, the emigration rate of low and high skilled workers was around 0.08 per cent and 2.2 per cent respectively in 1975. But when

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<sup>1</sup> OECD-6 are Canada, the United Kingdom, Germany, France, Australia and the United States

the emigration rate of low-skilled youth stood at 0.08 per cent in 1990 that of the highly skilled rose to 7.8 per cent. Also, the emigration rate of low skilled dropped by 0.02 per cent in 2010, while that of highly skilled rose dramatically to approximately 10 per cent (Docquier, 2011). The continuous increase in the emigration of highly skilled workers tends to create skill shortages in sensitive sectors such as technology and health. The education system still lacks the capacity to replace the skills that leaves the country (IOM, 2009). The resultant effect of this skill shortage paves way for labour union to negotiate for pay rise.

Neoclassical theory of migration predicts that if highly skilled workers emigrate, the resulting increased demand for labour will push wage upwards in the high skilled sector. Whether wage will increase in the low skill sector or not, however, depends on complementarity between high and low skilled workers. Also, whether unemployment will increase or fall depends on the effectiveness of the labour union. Thus, the outcome of emigration on the labour market appears not to be straightforward and therefore requires empirical investigation.

This study seeks to broaden the frontier of knowledge on migration and labour market conditions in Nigeria particularly, and by extension, for the world. It achieves this by adjusting certain assumptions of received theories on the impact of migration on the labour market and examines the empirical evidence in the case of Nigeria. Evidence on how the labour market responds to emigration by levels of skill (that is, high skilled or low skilled) is marginal (see Adepaju, 1991,2006, and 2007; de Haas, 2006; Afolayan 2001, and 2004; and Afolayan et al, 2008, 2009). Observably none of these authors build their discussions on a country specific economic analysis. In the same vein, connections between remittances and the proliferation of the highly skilled have not received adequate attention. Most of the theoretical and empirical works concentrated on the wage dynamics while neglecting employment dynamics in the labour market.

This study examines the case in which emigration may lead to other outcomes in the labour market. Specifically, the objectives of this work is to estimate the determinants of emigration in Nigeria; to investigate the unemployment effects of emigration and to examine the impact of emigration by category (low skill and high skill emigrants) on class of wages (low and high).

It will contribute to the received understanding of migration phenomenon in Nigeria by providing quantitative information relevant to understanding labour market effects of emigration in Nigeria. From a policy perspective, such effects may be far-reaching. Changes in people's decision to increase their market value for the purpose of emigrating can

challenge government's macroeconomic decision. Particularly, this may be in the area of infrastructural facilities and enabling environment that will absorb the skilled youth stayers since not all of them will eventually migrate. If complementarity assumptions hold, then, government will have to do something to discourage emigration of high-skilled labour not only to avert brain drain but also to prevent output loss.

## 2. Background information about unemployment and emigration in Nigeria

### 2.1 Labour force and unemployment patterns

The Nigerian labour market is characterized by excess labour supply, as the production sector is unable to absorb a larger amount of the supply. Federal and State governments are aware of these challenges and have implemented many policy strategies to address the problem. The interventions led to improvement in employment between 1990 and 2000 as employment growth rate rose from 12.7 per cent in 1990 to 33.0 per cent in 2000 (Table 2.1). However by 2000 until 2008 the rate was falling but picked up slightly in 2009. Hence, although employment was increasing, it increased at a decreasing rate. A cursory look at the trend also reveals that Nigerian unemployment rate maintained a single-digit in the 1980s and 1990s but rose to double-digit in the 2000s.

**Table 2.1: Labour force, employment and unemployment rate (1980-2011)**

|                         | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Labour force (million)  | 20.2 | 23.7 | 27.3 | 32.0 | 49.7 | 56.8 | 58.2 | 60.0 | 61.1 | 62.2 | 63.3 | 64.4 |
| Labour force growth (%) |      | 15.8 | 14.3 | 15.8 | 44.2 | 13.4 | 2.4  | 3.0  | 1.8  | 1.8  | 1.8  | 1.8  |
| Employment (million)    | 19.3 | 22.3 | 25.3 | 29.6 | 41.1 | 49.6 | 52.0 | 53.9 | 55.0 | 56.5 | 57.5 | 58.6 |
| Employment growth (%)   | ...  | 14.2 | 12.7 | 15.7 | 33.0 | 18.7 | 4.8  | 3.7  | 2.0  | 2.6  | 1.8  | 1.9  |
| Unemployment rate       | 4.4  | 5.9  | 7.8  | 7.5  | 13.1 | 11.9 | 12.3 | 12.7 | 14.9 | 19.7 | 21.1 | 23.1 |
| GDP growth (%)          | 4.2  | 9.7  | 8.2  | 2.5  | 5.4  | 6.9  | 6.0  | 6.5  | 6.0  | 7.0  | 7.9  | 6.4  |

*Source: NISER and NBS*

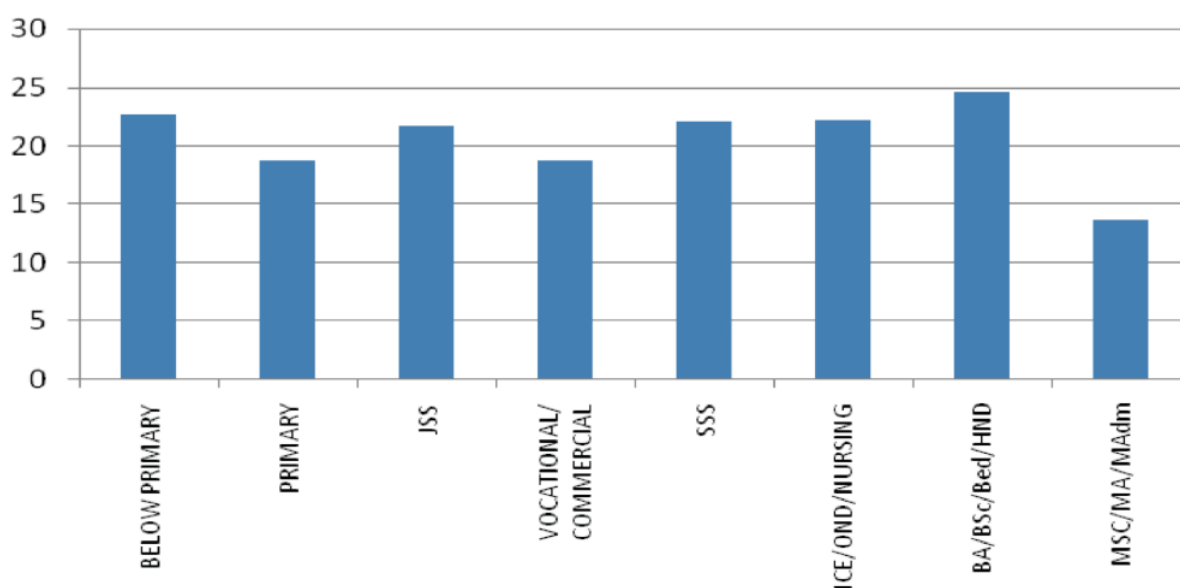
What is disturbing is that the country experienced persistent increase in unemployment when the economy appeared to be doing fine. In particular, when GDP growth rate rose from 2.5 per cent in 1995 to 5.4 per cent in 2000, unemployment rate rose by about the same proportion, from 7.5 to 13.1 per cent over the same period (Table 2.1). Also, when GDP growth rate rose from six per cent in 2006 to seven per cent in 2009, unemployment also rose dramatically from 12.3 to 19.7 in the same period. This trend suggests that increase in GDP appears not to stem unemployment rate or to increase employment rate. Although

ordinarily increased labour force participation can improve aggregate supply and subsequently output, apparently much of the output in Nigeria has been driven by the oil sector rather than through agriculture or manufacturing. This is not to say that increase in GDP does not lead to increase in employment in Nigeria, but the growth rate of employment in the face of increased GDP did not outweigh the growth rate of unemployment.

More disturbing is the fact that unemployment was highest among the youth in the age group 15-24 (35.9%) followed by those aged 25-34 years, at 23.3 per cent. Thus, youth unemployment rate in the recent years was around 30 per cent (NBS, 2011). Apparently new jobs are not being created to absorb the increasing youth population.

Unemployment does not only have the largest share of the youth population, but also accounts for the highly skilled youth (Figure 2.1). Unemployed University and Polytechnic graduates account for 24.6 per cent of all unemployed youth while those with NCE and Nursing certificate constituted 22.2 per cent. This figure surpasses national unemployment rate in that year which was put at 21.1 per cent. Unemployment is also well pronounced among the unskilled workers, as the rate was 22.7 per cent. This pattern clearly shows that the rate at which the production sector employs semi-skilled workers is more than that of highly skilled and unskilled workers. This employment pattern is an evidence of skill mismatch in the sense that the education sector appears not to produce adequate and relevant skill needed by the industrial sector.

**Figure 2.1: Unemployment by Education/Skill Attainment (2010)**



Source: Adapted from NBS Labour force statistics 2010

It can therefore be said that youth are the most unemployed in Nigeria and most of them are highly skilled. Manufacturing sector is unable to absorb the teeming highly skilled youth due to both internal and external economic challenges and the agricultural sector is not attractive to the highly skilled unemployed graduates.

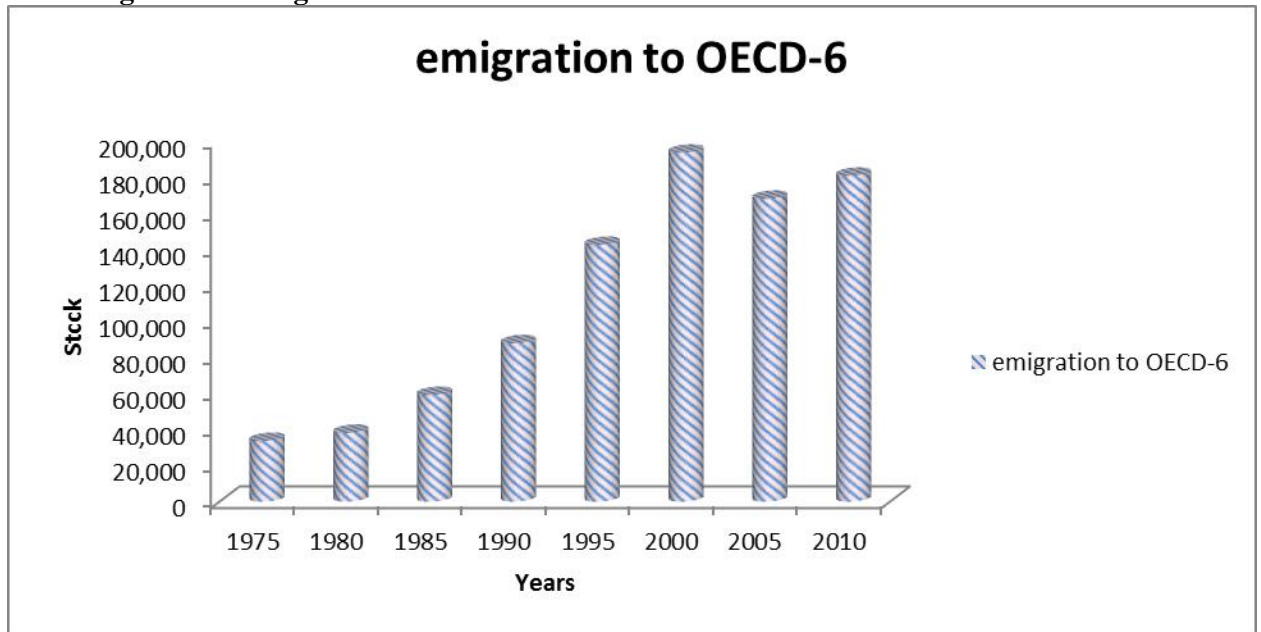
## **2.2 Pattern of emigration in Nigeria**

The actual destination and number of Nigerians resident abroad is not known with certainty, but they are mostly found in Africa and the numbers of emigrants have been rising over time. According to the Global Migration Origin Database and the World Bank (2011), top destination African countries are Sudan, Chad, Cameroun, Benin, Cote d'Ivoire, and Niger while Sudan is the most targeted country. In the OECD countries, the top destination countries include the United States, United Kingdom, Italy, Spain, Canada, Germany, France, Australia, Greece, Portugal, Japan, and New Zealand. Out of these countries, United States and United Kingdom are the most targeted destinations.

Data on emigration from African countries is still elusive but the OECD countries have begun a comprehensive database of immigrants to the member countries. Apart from country-by-country immigration data, the recently released by Docquire (2011) documented immigrant panel data for six OECD countries between 1970 and 2010. Emigration to the six OECD rose from 33.7 thousand in 1975 to 59.2 thousand in 1990 and by 1995 the figure had risen to 142.5 thousand (Figure 2.2). There was a slight decrease in emigration to these countries in 2005 as the figure fell from 193.7 thousand in 2000 to 168.1 thousand in 2005 but quickly rose to 180.9 thousand in 2010.

Clearly these figures are grossly underestimated because it did not account for those who entered these countries by clandestine means. Lucas (2004) has hinted that unofficial immigrants were more than half of official immigrants in the European countries. Be that as it may, it is clear that Nigerian emigrants are on the increase in the OECD countries.

**Figure 2.2: Emigration Trend to OECD-6 Countries**



*Source: computed using Docquire (2011)*

Emigration to the OECD-6 is more of highly skilled than low or medium skilled (Table 2.2). When the emigration rate of low skilled was 0.07% in 1980, the highly skilled was 2.08%. As the emigration of low skilled rose by 0.01% in 1990, that of highly skilled rose by 7.7% and by 2000, when the growth rate of low skilled emigrant rate fell to 0.05%, that of highly skilled rose tremendously to 10.1%. The result from this Table is consistent with the report of IOM (2009) where it was pointed out that the emigration of highly skilled Nigerians remains high and increasing.

**Table 2.2: Emigration stock by skill attainment (1980-2010)**

| YEARS | LOW   | MEDIUM | HIGH   |
|-------|-------|--------|--------|
| 1980  | 0.07% | 0.16%  | 2.08%  |
| 1985  | 0.07% | 0.23%  | 4.13%  |
| 1990  | 0.08% | 0.30%  | 7.74%  |
| 1995  | 0.09% | 0.51%  | 9.25%  |
| 2000  | 0.05% | 0.68%  | 10.13% |
| 2005  | 0.07% | 0.60%  | 9.69%  |
| 2010  | 0.06% | 0.64%  | 9.91%  |

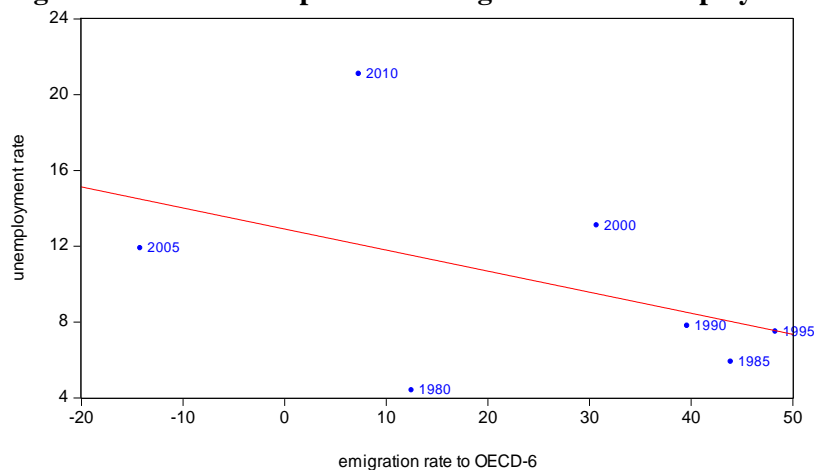
*Source: OECD (2011)*

Meanwhile, the relationship between total emigrations is negative, suggesting that increase in migration, when not disaggregated by skill levels, tends to reduce unemployment (Figure 2.2). In the low wage panel (Figure 2.2: lower panel, left) at higher unemployment rate migration tends to be lower for unskilled migrants. Clearly, unskilled workers are

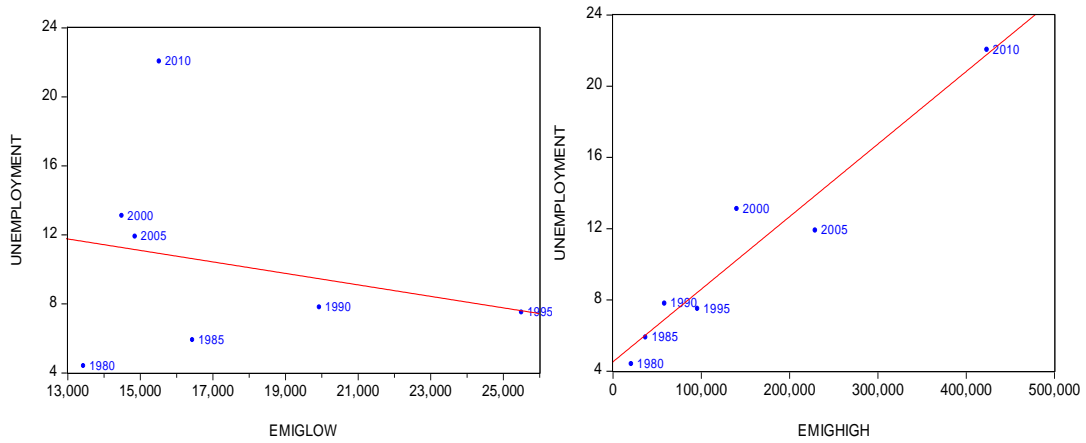
trapped under conditions of unemployment at origin combined with low emigration rates. Differently, the highly skilled show higher unemployment associated with higher emigration rates showing the labour market puts pressure on the highly skilled to find work outside their country of origin. This suggests that emigration of highly skilled workers facilitates unemployment rate while emigration of low skilled workers decreases unemployment in Nigeria. Perhaps one of the reasons why low skill emigrants reduces unemployment is that they actually precipitate low skill wage, thereby discouraging low skill labour to supply their labour.

There is negative and steep relationship between low skilled emigrants and low skilled wages, but there is positive steep relationship between high skill emigrants and high skill wage (Figure 2.3:lower panel). At higher wages, emigration rates are lower for unskilled workers. Dissimilarly, at higher wages, emigration rates are higher for skilled workers. It appears that the skill differential between source and destination economy, which the highly skilled are positioned to take advantage of is high enough to continue to induce emigration at higher wage rates at the source country. Also, emigration of high skilled workers contracts high skill labour market, and mounts pressure on wages to rise.

**Figure 2.2: Relationship between emigration and unemployment**

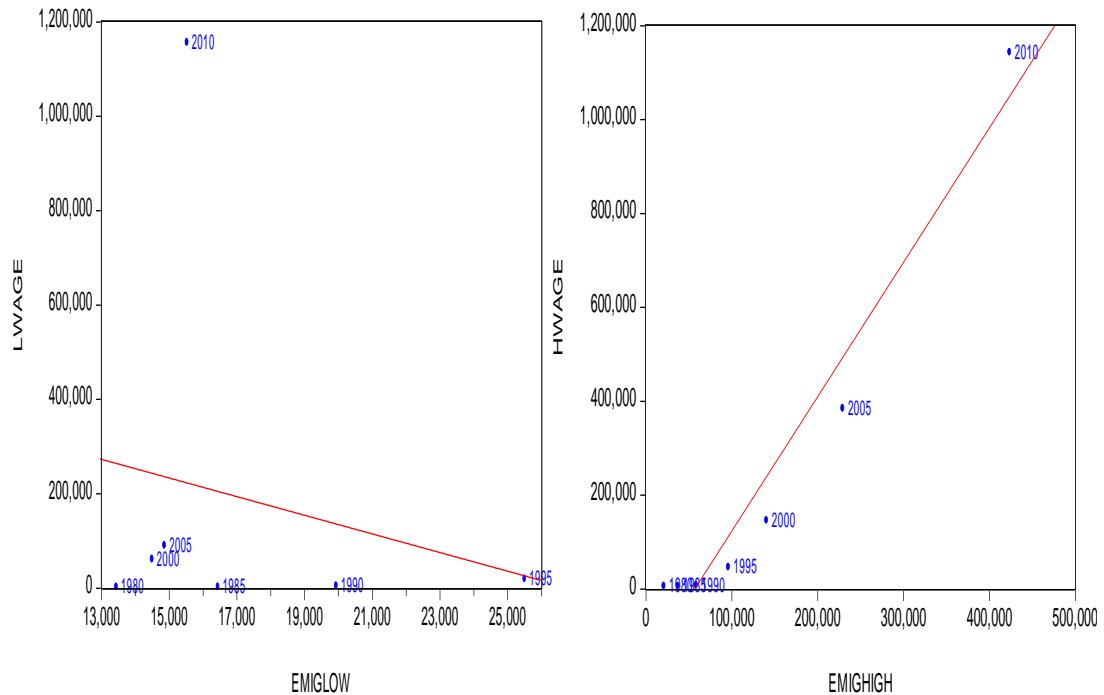






Source: computed using Docquier (2010) and NBS (2011)

Figure 2.3: Relationship between emigration and wages



Source: computed using Docquier (2010) and NBS (2011)

### 3 Theoretical Framework Methodology

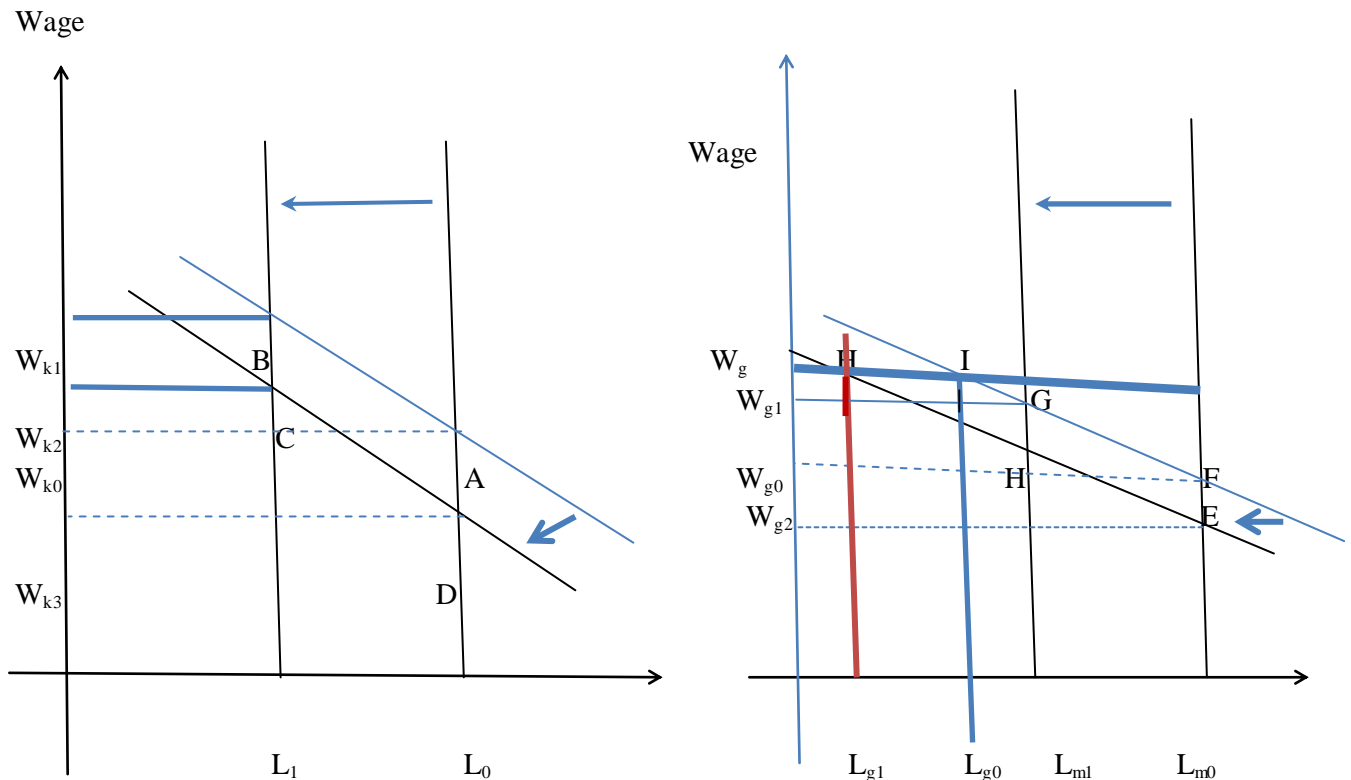
#### 3.1 Theoretical Framework

This study follows a version of the neoclassical macroeconomic theory linking migration with the labour market condition. Kahanec *et al* (2010) developed a model using the neoclassical theory of unemployment that recognizes the influence of labour union in wage and employment determination. However, the model was meant to explain the case of

the country of destination. In order to extend this to the country of origin, Prymachenko (2011) endeavored to transpose the Kahanec *et al* (2010). The labour market of the country of origin is composed of high skilled and low-skilled labour (Figure 3.1). The right panel shows how employment and wages in the high skilled are affected by emigration while the left panel is that of the low skilled counterpart.

High skilled labour market

Low-skilled labour market



**Figure 3.1: The effects of emigration on wages and unemployment**

The market for high skilled labour is at equilibrium at point A where  $W_{k0}$  and  $L_0$  are the wages and employment that clear the market. In the same way,  $W_{g0}$  and  $L_{m0}$  clear the market for low-skilled labour in the absence of a labour union. If a labour union exists, then  $W_g$  and  $L_{m0}$  will be the appropriated wage and employment that will necessitate equilibrium.

Consider first the emigration of high-skilled workers; the first effect is reduction in the supply of high-skilled labour, shrinking the labour market for that category. This leads to leftward shift of the labour supply curve producing  $L_1$ . To ascertain equilibrium, wages need to rise to  $W_{k1}$ . In this case, emigration of the highly skilled will tighten the labour market and wages will increase. However, that is not the end of the story. Given the assumption that high-skilled and low-skilled labour is complementary, demand for low-skilled workers will fall. Under the competitive market assumption, wages fall from  $W_{g0}$  to  $W_{g1}$  and the

equilibrium settles at point E. Thus, emigration of highly skilled will have no employment impact on the low-skilled workers but it will lower the wage rate thereby increasing wage inequality. This will not be the case if there are rigidities in the market in the form of labour union or government minimum wage law. In this case, wage will not change from  $W_g$  but employment will have to fall to  $L_{g1}$  and the equilibrium is at I. Because of the complementarity situation, decrease in low-skilled labour will lead to decrease in demand for high-skilled labour, thereby shifting the demand curve and the equilibrium settles at point C with low wage to keep employment at the initial after-migration level.

Consider now, the emigration of low skilled workers. Under perfect market assumption, wages will rise from  $W_0$  to  $W_{g1}$ . But if union is actively present such that wages are downwardly rigid, then demand has to fall, moving the equilibrium from I to H and hence reducing labour supply, generating  $L_{g0} - L_{g1}$  levels of unemployment. Staying put with the complementarity assumption, labour demand of the highly skilled will necessarily fall, shifting the demand curve downwards and creating declining wages. Thus, the theory predicts that high-skilled workers will benefit while low-skilled are worse off following emigration of highly skilled workers. In this case, either demand falls or wages fall. Conversely, low-skilled are better off while highly skilled are worse off following the emigration of low-skilled labour.

An extension to this theory is same as argued in the introductory section of this paper. That is, according to the new economics of labour migration, the demand for highly skilled workers may create incentives for labour to build their market value, not necessarily for the purpose of being employed in the country of origin rather for emigration. Since there are different constraints to emigration, not all will eventually be granted entry into the country of destination. In this case, emigration may not change the labour market conditions of the highly skilled because of the new supply of workers generated by the probability of leaving. By extension, the situation may likely remain the same in the case of low-skill. What happens to the high-skilled labour market following low-skilled emigration depends on whether there is incentive for people to increase their market value or not. If they increase market value, wages will fall, unemployment will rise and this in turn may create a push effect for emigration.

### 3.2 Methodology

The theoretical framework shows that emigration of different skills affects wages. Meanwhile, we seek to first investigate the drivers of emigration. Standard theories identify income differentials, unemployment, population, human capital and remittances as potential candidates (Lucas, 2005; Stark and Taylor, 1989; Adepaju, 2007; Afolayan et al, 2008; Olubiyi, 2013). Thus, emigration model is specified in equation 1

$$MIG_t = f(GDP_t, (Y_{ht} - Y_{ft}), U_t, REM_t, POP_t, HC_t) \dots \dots \dots 1$$

Where  $MIG_t$  is emigration stock at time  $t$ , GDP is the gross domestic product,  $Y_i$  ( $i = h, f$ ) represent per capita income of Nigeria ( $h$ ) and foreign ( $f$ ), using the US per capita income to proxy foreign;  $U_t$ ,  $POP_t$  and  $HC_t$  stand for unemployment rate, workers' remittances, population and human capital respectively. Tertiary school enrolment was used to proxy human capital. The justification for using the US per capita income is that first, Nigerians are highly concentrated in the US more than any other foreign developed countries. Second, the proxy is commonly used in empirical analysis, particularly in migration.

Following the theoretical framework, the estimable equation of the effects of emigration on the labour market is specified as follows:

$$U_t = f(MIG_t, GDP_t, W_t, X_t) \dots \dots \dots 2$$

The third equation is the wage equation. In this case, we seek to employ the macroeconomic determinant of wages. The macroeconomic determinants identified employment situation, population, economic condition (GDP), government spending and inflation. Putting this in the context of our theoretical framework, equation 3 is generated

$$W_t = f(MIG_t, GDP_t, P_t, IN_t, GOV_t, HI_t) \dots \dots \dots 3$$

Applying logarithmic transformation to equations 1 to 3, the econometric estimation model is provided below:

$$\ln MIG_t = \beta_0 + \beta_1 \ln GDP_t + \beta_2 (Y_{ht} - Y_{ft}) + \beta_3 U_t + \beta_4 \ln REM_t + \beta_5 \ln POP_t + \beta_6 \ln HC_t + \epsilon_t \dots 4$$

$$U_t = \gamma_0 + \gamma_1 \ln MIG_t + \gamma_2 \ln GDP_t + \gamma_3 \ln W_t + \gamma_4 \ln W_t + \gamma_5 \ln IN_t + \gamma_6 \ln GOV_t + \epsilon_t \dots \dots \dots 5$$

$$\ln W_t = \psi_0 + \psi_1 \ln MIG_t + \psi_2 \ln GDP_t + \psi_3 U_t + \psi_4 N_t + \psi_5 GOV_t + \psi_6 HC_t + \varepsilon_t \dots\dots\dots 6$$

To appreciate the intuition of the theoretical framework, equations 4 and 6 are estimated for each skill level.

### 3.3 Technique of estimation

Equations 4 to 6 assume the absence of serial correlation, that is,  $cov(\varepsilon_i, \varepsilon_j) = 0; i \neq j$ . However, in the event where some variables were not readily observed, the existence of serial correlation is not impossible. Another problem in the equation is that the error distribution appears to depend on the regressors' distribution, that is, there is the possibility of heteroskedasticity. Although this problem can be dealt with using appropriate Instrumental Variable (IV), the IV estimates of the standard errors are inconsistent, preventing valid inference. These problems can be partially addressed through the use of heteroskedasticity consistent or "robust" standard errors and statistics. However, the usual approach today is to use the Generalized Method of Moments (GMM), introduced by Hansen (1982). The GMM estimator produces consistent results even in the presence of serial correlation (and heteroskedasticity if the sample is sufficiently large).

However, for GMM to be the appropriate estimation technique, it must satisfy the condition of relevant and valid IV (Baum & Schaffer, 2003). The IV will be relevant if it correlates with the endogenous regressors and at the same time orthogonal to the errors. The validity condition implies that the number of the IV must be greater than or equal to the number of the explanatory variables. The J-statistic, developed by Hansen (1982) gives the value of GMM objective function evaluated using an efficient GMM estimator. If the set of IV is equal to the number of regressors, then the value of J will be zero. Otherwise, J will be greater than zero. The J-statistic behaves like  $\chi^2$  random variable with degree of freedom equals the number of overidentifying restrictions. The GMM specification of equations 4 to 6 is provided below

$$\ln \Delta MIG_t = \beta_0 + \beta_1 \Delta MIG_{t-1} + \beta_2 \Delta GDP_t + \beta_3 \Delta N_{ft} - Y_{ht}) + \beta_4 \Delta U_{tr} + \beta_5 \ln REM_t + \beta_6 \ln POP_t + \beta_7 \ln HC_t + \Delta \varepsilon_t \dots\dots\dots 4$$

$$\Delta U_t = \gamma_0 + \gamma_1 \ln \Delta U_{t-1} + \gamma_2 \Delta MIG_t + \gamma_3 \ln GDP_t + \gamma_4 \ln W_{ht} + \gamma_5 \ln W_{it} + \gamma_6 \Delta N_t + \gamma_7 \ln GOV_t + \Delta \varepsilon_t \dots\dots\dots 5$$

$$\ln W_t = \psi_0 + \psi_1 \ln W_{t-1} + \psi_2 \ln \Delta MIG_t + \psi_3 \ln GDP_t + \psi_4 \Delta U_t + \psi_5 \Delta N_t + \psi_6 \ln GOV_t + \psi_7 \ln HC_t + \Delta \varepsilon_t \dots\dots\dots 6$$

**Table 4.1: Definition of variables and sources of data**

The table below shows the definition of variables and sources of data.

| S/N | Variable         | Definition and measurement  | Source   |
|-----|------------------|---|--|
| 1   | lnMig            | Log of the stock of emigrants. Emigrants are people that stay for a year or more in a country different from their home country. Emigrants in this context are decomposed into high skill and low skill. High skill either possesses higher education or special skill not equally distributed. | Doquier panel data (2011). The dataset stopped at 2010. With the aid of interpolation, we generated for the missing observation from 2011 to 2013. |
| 2   | lnGDP            | Log of gross domestic product at current market price. This is used to proxy the capacity of the economy.   | Computed using data from the World Development Indicators. The World Bank (2014).  |
| 3   | $\ln(Y_f - Y_h)$ | Log of difference in per capita income between the US and Nigeria in nominal terms  | Computed using data from the World Development Indicators. The World Bank (2014).  |
| 4   | U                | Unemployment rate   | Annual Abstract of Statistics, National Bureau of Statistics, various issues.  |
| 5   | lnREM            | Log of Workers' remittances. This is defined as the proportion of emigrants' income sent back home.   | Computed using data from Balance of Payments Yearbook, International Monetary Fund; various issues.  |
| 6   | lnPOP            | Log of total population   | Computed using data from the World Development Indicators. The World Bank (2014).  |
| 7   | lnHC             | Log of human capital. Tertiary school enrollment rate was used as proxy   | Computed using data from the World Development Indicators. The World Bank (2014).  |
| 8   | lnW              | Log of annual wage.   | Computed using Annual Abstract of Statistics, National Bureau of Statistics (Various issues).  |
| 9   | INF              | Inflation rate. Percentage change in consumer price index.  | Computed using data from the World Development Indicators. The World Bank (2014).  |
| 10  | lnGOVT           | Government final consumption  | Computed using data from the World Development Indicators. The World Bank (2014).  |

## 4 Empirical results and discussion

### 4.1 Descriptive analysis of the variables

The average unemployment rate in the period under consideration was 8 per cent while the maximum was 23 per cent. Inflation averaged 20 per cent, but reached a peak of around 75 per cent. Low and high wage grew at an average of 10 per cent and 11 per cent respectively while average growth of highly skilled and low skilled emigrants grew at 11.5 per cent and 9.7 per cent respectively. This is an indication that both highly skilled wage and migration grew faster than low skilled wage and migration. Remittances, government

spending and income differentials grew at an average of 6, 22.4 and 10.3 percentage points respectively.

**Table 4.2: Descriptive Analysis of the variables**

| Variable | Obs | Mean     | Std. Dev. | Min      | Max      |
|----------|-----|----------|-----------|----------|----------|
| u        | 34  | 8.179412 | 6.988032  | 2        | 23       |
| infl     | 34  | 20.08559 | 18.07184  | 5.382224 | 72.8355  |
| hc       | 34  | 6.714453 | 3.673101  | 1.82744  | 13.70145 |
| lngdp    | 34  | 24.79233 | .9945961  | 23.48258 | 26.98056 |
| lnpop    | 34  | 3.970632 | .0108876  | 3.952986 | 3.984925 |
| lnlw     | 34  | 10.09598 | 2.021534  | 7.604427 | 14.48777 |
| lnhw     | 34  | 11.05673 | 2.010006  | 8.615763 | 14.20702 |
| lnmig1   | 34  | 9.742966 | .2145339  | 9.505542 | 10.18236 |
| lnmig2   | 34  | 11.56914 | .9066672  | 9.941624 | 13.08813 |
| lnmigtot | 34  | 12.28315 | .6956356  | 10.98882 | 13.55416 |
| lnydiff  | 34  | 10.27188 | .4283771  | 9.369606 | 10.82252 |
| lnrem    | 34  | 6.04406  | 3.116231  | .8856366 | 9.947024 |
| lngovt   | 34  | 22.39695 | 1.045917  | 20.75577 | 24.46523 |

The correlation matrix presents paired association of variables (Table 4.3). The stars show that the association is significant at 5 per cent level. Beginning with the relationship between migration and some variables, total migration had the strongest relationship with migration of highly skilled workers. The case is different for the low skilled migrants because not only that the association is weak, but also that it is not significant. This suggests that once total migration increases, it is the case of increase in the migration of highly skilled workers. Emigration of the highly skilled has strong and positive relationship with both low and high wage with the former having relatively stronger association. Such association could be possible if employers do not fully replace the departing workers, but chose to raise wages of the existing workers or if the labour union negotiate for pay rise.

**Table 4.3: Correlation Matrix of the variables**

|          | u        | infl     | hc      | lngdp    | lnpop   | lnlw    | lnhw    | lnmig1   | lnmigh  | lnmigtot | lnydiff | lnrem   | lngovt |
|----------|----------|----------|---------|----------|---------|---------|---------|----------|---------|----------|---------|---------|--------|
| u        | 1.0000   |          |         |          |         |         |         |          |         |          |         |         |        |
| infl     | -0.3484* | 1.0000   |         |          |         |         |         |          |         |          |         |         |        |
| hc       | 0.9405*  | -0.2922  | 1.0000  |          |         |         |         |          |         |          |         |         |        |
| lngdp    | 0.9462*  | -0.4455* | 0.8816* | 1.0000   |         |         |         |          |         |          |         |         |        |
| lnpop    | 0.3998*  | -0.3109  | 0.5472* | 0.4730*  | 1.0000  |         |         |          |         |          |         |         |        |
| lnlw     | 0.8383*  | -0.2141  | 0.9408* | 0.8031*  | 0.6504* | 1.0000  |         |          |         |          |         |         |        |
| lnhw     | 0.7926*  | -0.1805  | 0.9212* | 0.7491*  | 0.7168* | 0.9661* | 1.0000  |          |         |          |         |         |        |
| lnmig1   | -0.3947* | 0.3411*  | -0.1992 | -0.4233* | -0.0863 | -0.0507 | -0.0641 | 1.0000   |         |          |         |         |        |
| lnmigh   | 0.8346*  | -0.2542  | 0.9594* | 0.7790*  | 0.6422* | 0.9740* | 0.9590* | -0.0288  | 1.0000  |          |         |         |        |
| lnmigtot | 0.8419*  | -0.2381  | 0.9530* | 0.7881*  | 0.5949* | 0.9644* | 0.9457* | -0.0120  | 0.9909* | 1.0000   |         |         |        |
| lnydiff  | 0.7296*  | -0.1705  | 0.9095* | 0.6492*  | 0.6282* | 0.9349* | 0.9337* | 0.0778   | 0.9730* | 0.9462*  | 1.0000  |         |        |
| lnrem    | 0.7365*  | -0.2015  | 0.8839* | 0.7368*  | 0.7667* | 0.9297* | 0.9487* | 0.0333   | 0.9387* | 0.9333*  | 0.9039* | 1.0000  |        |
| lngovt   | 0.8473*  | -0.4291* | 0.7547* | 0.9351*  | 0.4433* | 0.6814* | 0.6655* | -0.4191* | 0.6544* | 0.6773*  | 0.4924* | 0.6711* | 1.0000 |



Emigration of low skill workers behaved in a completely different way by showing no significant relationship with wages, either low or high. This further suggests how less important is the migration of low skill labour in the Nigerian labour market. Another important relationship is that of migration of each category and unemployment. Total migration and unemployment showed positive and significant relationship while it was negative in the case of low skilled migration. Unemployment and wages are positive and significant. This could be the case if employer found increased wages to be expensive for them to employ more.

Other associations of interest are that of income differential, remittances, human capital and population with their individual associations with migration. Income differential and migration have strong and positive relationship. In the same vein, remittances were strongly and positively related to migration of highly skilled workers while the weak relationship it has with the migration of low skilled workers is not significant. This is evidence that highly skilled emigrants influence remittances behaviour in Nigeria. The result also confirms the brain gain phenomenon. It further answers whether human capital has a relationship with migration or not. It is the case that there is a strong positive and significant relationship between human capital and the emigration of highly skilled labour while such relationship is absent in the case of low skilled emigrants. This outcome provides support for the earlier assumption that migration of highly skilled workers may trigger enrolment rate through remittances in anticipation to emigrate. The positive association between remittances and enrolment validates this possibility.

#### **4.2 Results of the labour market effects of migration.**

Although the major purpose of this work is to investigate how labour market responds to migration of different skills, one of the specific objectives of the paper was to establish the drivers of migration in Nigeria. Table 3 presents the results of how migration of each category responds to factors determining them. The model is well fitted given more than 65 per cent of total variation in migration being explained by the determinants. Also, the test for overidentifying restrictions is in order, suggesting that the instrumental variables are valid. Total migration was significantly driven by all the determinants except the size of the economy, that is, the GDP.

Unemployment impacted positively and significantly on emigration. Although changes in migration category with respect to unemployment are inelastic, it is more inelastic in the case of high skill emigrants. This could suggest that unemployment is more pronounced among the low skilled labour, consistent with the background presented in this paper.

**Table 4.4: Determinants of migration (GMM results)**

|                      | (1)<br>Migration<br>(total) | (2)<br>Migration<br>(High skilled) | (3)<br>Migration<br>(Low skilled) |
|----------------------|-----------------------------|------------------------------------|-----------------------------------|
| UNEMPLOYMENT_RATE    | 0.0492**<br>(3.55)          | 0.0353*<br>(2.71)                  | 0.0390**<br>(2.94)                |
| L.MIGRATION_TOTAL    | 0.314**<br>(2.91)           |                                    |                                   |
| GDP                  | 0.0418<br>(1.27)            | 0.0498**<br>(3.30)                 | -0.0934***<br>(-3.80)             |
| INCOME_DIFFERENCE    | 0.755***<br>(4.95)          | 0.719*<br>(2.57)                   | 0.368**<br>(3.04)                 |
| REMITTANCES          | 0.0896***<br>(5.37)         | 0.0434***<br>(4.27)                | 0.0560***<br>(4.25)               |
| POPULATION           | 5.111***<br>(4.26)          | 0.471<br>(0.82)                    | 7.603***<br>(5.70)                |
| ENROLLMENT           | -0.116**<br>(-3.56)         | -0.0919*<br>(-2.46)                | -0.121**<br>(-3.07)               |
| L.MIGRATION_HIGH_S~L |                             | 0.597***<br>(5.65)                 |                                   |
| L.MIGRATION_LOW_SK~L |                             |                                    | 0.664***<br>(10.87)               |
| _cons                | 19.79***<br>(4.42)          | -5.702**<br>(-3.01)                | 32.16***<br>(5.92)                |
| R-squared            | 0.97                        | 0.99                               | 0.73                              |
| R-squared_Adj        | 0.97                        | 0.99                               | 0.66                              |
| F_Statistic          | 2166.66                     | 8640.67                            | 104.60                            |
| J-test               | 2.27                        | 3.80                               | 2.41                              |
| Observation          | 33                          | 33                                 | 33                                |

t statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Income differential is a motivation for migration to take place. The wider the gap, the more migration is expected to take place. Highly skilled emigrants respond faster to changes in income gap than the unskilled migrants. Thus, the pull effect is stronger in the highly skilled

labour market. This could be possible given the fact that ability to offset migration costs is relatively easier among the highly skilled workers than the low skill counterpart.

Further, the pull effect is stronger since the probability of getting a job abroad is high. Thus the wider the income gap the more both pull and push effect act as motivation for high skilled labour to migrate. Remittances also play an important role in migration situation in Nigeria. Remittances eases migration cost constraints and hence allows some potential migrants to move. The result shows that low skilled migrants respond more to increase in remittances than highly skilled. In the same vein, high population significantly triggers migration in Nigeria and it is the case that low skill migrants respond faster to increase in population than high skill migrants. What this suggests is that low population rate will drastically reduce emigration of low skilled workers. Increase in enrolment also drives emigration.

The result from this table therefore supports the standard migration theory in which unemployment, income differential, remittances and population are identified to be important drivers of migration. However, the degree of response of each of these variables differs across migration category. In particular, highly skilled emigrants respond faster to income differential than any other determinant while low skill emigrants respond faster to population growth. Low skilled emigrants were relatively more sensitive to remittances, unemployment rate and population than high skilled migration.

How does migration affect the labour market in Nigeria? This question is better answered by investigating how wages and unemployment respond to migration of each category. The theoretical framework predicts that increase in the emigration of highly skilled workers may lead to increase or decrease in high skill wages depending on whether high skilled and low skilled workers are complements or not on one hand, and whether labour union is present and active or not on the other hand. The results show that high skilled wage is significantly and positively responded to emigration of high skilled workers (Table 4.5). This suggests that employers tend not to fill the vacuum left by the emigrants and union negotiates for high wage. It may also be the case that labour supply of highly skilled workers actually shrinks, thereby mounting upward pressure on wages.

The framework predicts that if complementarity holds, low skill wage will fall while in the presence of the union, this may not occur, but unemployment will do the necessary

adjustment. The result shows that increase in the migration of highly skilled workers actually increases low skill wage. If the theory is correct, increases in unemployment rate must be facilitated by low skill workers.

**Table 4.5: Labour market effects of emigration (Wages)**

|                      | (1)<br>HIGH-SKILL<br>WAGE | (2)<br>HIGH-SKILL<br>WAGE | (3)<br>LOW-SKILL<br>WAGE | (4)<br>LOW-SKILL<br>WAGE |
|----------------------|---------------------------|---------------------------|--------------------------|--------------------------|
| MIGRATION_HIGH_SKILL | 1.786***<br>(11.30)       |                           | 0.650**<br>(3.54)        |                          |
| L.HIGH_SKILL_WAGE    | 0.253*<br>(2.70)          | 0.632***<br>(5.27)        |                          |                          |
| GDP                  | 0.00544<br>(0.09)         | 0.0880<br>(1.40)          | 0.0466<br>(0.74)         | -0.0101<br>(-0.17)       |
| UNEMPLOYMENT_RATE    | 0.0245*<br>(2.25)         | 0.0795<br>(1.60)          | 0.0405*<br>(2.34)        | 0.0472*<br>(2.45)        |
| INFLATION            | 0.00625**<br>(3.25)       | 0.00157<br>(0.52)         | 0.00467**<br>(3.29)      | 0.00272*<br>(2.48)       |
| ENROLLMENT           | 0.0208<br>(0.46)          | 0.359*<br>(2.49)          | -0.146*<br>(-2.71)       | -0.0627<br>(-2.02)       |
| MIGRATION_LOW_SKILL  |                           | -0.161<br>(-0.49)         |                          | 0.476***<br>(4.34)       |
| L.LOW_SKILL_WAGE     |                           |                           | 0.890***<br>(15.11)      | 1.041***<br>(37.77)      |
| _cons                | -12.33***<br>(-8.24)      | 6.116<br>(1.38)           | -6.824*<br>(-2.67)       | -4.610**<br>(-3.02)      |
| R-squared            | 0.94                      | 0.93                      | 0.99                     | 0.99                     |
| R-squared_Adj        | 0.93                      | 0.92                      | 0.99                     | 0.99                     |
| F_Statistic          | 2935.00                   | 1842.69                   | 5403.62                  | 6704.95                  |
| J-test               | 2.25                      | 2.12                      | 2.47                     | 2.12                     |
| Observation          | 33.00                     | 33.00                     | 33.00                    | 33.00                    |

t statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The unemployment model shows positive effect of low skill wage, albeit insignificant (Table 4.5). This could suggest that there may not be complementarity between low and high skill workers. In fact, the result shows a case of imperfect substitutes. This could occur if employers embark on in-service training for the existing workers and raise the wages but not as much as entry pay for the highly skilled. Another possible reason will be that unemployed highly skilled workers revert to enter the low skill labour market, accepting low skill wage.

Increase in unemployment rate reduces highly skilled wages. This outcome could be explained, among others, by imperfect substitute existing between the two wage categories. In this case, when highly skilled labour emigrates, triggering wage increase, employers may consider the wage increase to be too expensive and employ less. This action will lead to increase

in unemployment of not only the highly skilled but also the low skilled. Thus, what the result shows is that emigration of high skilled workers triggers a rise in high skilled and low skilled wage. Hence both high and low skilled workers benefit from the migration of highly skilled workers with the former being the higher gainer. The implication of this outcome is that emigration of highly skilled worker tends to generate relative income inequality. Other factors determining high skill wage are lagged high skilled wage and enrolment rate.

Emigration of low skilled workers also increases low skill wage but leaves high skilled wage unaffected. This is another evidence to show that there appears to be very weak or no complementarity relationship between low and high skilled labour in Nigeria. Unlike what the theory predicts, emigration of low skilled workers will benefit low skilled labour but high skilled labour remains unaffected. Reasons for this is the absence of market perfection and lack of complementarity between high and low skilled workers.

Other factors necessitating changes in low skill wages are enrolment rate, inflation rate, and unemployment rate and lagged low skill wage. Of these factors, inflation rate is of special interest. The result shows that increase in inflation rate will cause low and high skill wages to sluggishly increase. This suggests that there is not one-to-one increase in inflation rate and wages in Nigeria. As the report shows, a one per cent increase in inflation rate is causes wage rate of high and skill workers by 0.06 per cent and 0.04 per cent respectively. The implication is that increase in inflation rate worsens the welfare condition of workers with the low skill workers being hard hit. Thus increase in inflation rate does not only worsens workers' purchasing power but also widens the welfare gap between low and high skilled workers.

The prediction of the theoretical model is that emigration of highly skilled shrinks the supply of highly skilled workers and, if complementarity holds, low skilled labour market will slack. The result shown does not explicitly capture this scenario because unemployment data were not collected at the disaggregated level. However, the result can be used to detect which of the categories of migration triggers unemployment.

Emigration of highly skilled positively affects unemployment while that of the low skill negatively affects it (Table 4.6). Total migration increases unemployment rate. This result is surprising but the theory shows why this could happen. The foreign demand for highly skilled tends to prop up a large pool of skilled workers of which very few would eventually migrate.

Since the emigration of the highly skilled has raised the wage of this category, with sticky downward rigidity arising from the action of the union, unemployment will increase. As can be seen unemployment is highly sensitive to the migration of high skilled labour. However, migration of low skill worker reduces unemployment rate, suggesting that emigration of low skilled workers contribute to reduction in unemployment rate in Nigeria.

**Table 4.6: Labour market effects of emigration (unemployment)**

|                      | UNEMPLOYMENT<br>RATE | UNEMPLOYMENT<br>RATE  | UNEMPLOYMENT<br>RATE |
|----------------------|----------------------|-----------------------|----------------------|
| MIGRATION_TOTAL      | 3.669***<br>(4.67)   |                       |                      |
| L.UNEMPLOYMENT_RATE  | 0.550***<br>(17.82)  | 0.610***<br>(20.87)   | 0.633***<br>(8.72)   |
| GDP                  | 3.685***<br>(10.17)  | 3.100***<br>(6.59)    | 2.682***<br>(4.79)   |
| HIGH_SKILL_WAGE      | 0.223<br>(1.76)      | 0.124<br>(1.18)       | 0.375<br>(1.74)      |
| LOW_SKILL_WAGE       | -1.046***<br>(-3.74) | -0.887**<br>(-3.23)   | 0.0618<br>(0.24)     |
| INFLATION            | 0.00674<br>(1.28)    | 0.00916*<br>(2.40)    | 0.00105<br>(0.17)    |
| GOVERNMENT_SPENDING  | -1.097***<br>(-4.07) | -0.691*<br>(-2.36)    | -0.826**<br>(-3.72)  |
| MIGRATION_HIGH_SKILL |                      | 2.475***<br>(3.89)    |                      |
| MIGRATION_LOW_SKILL  |                      |                       | -1.927**<br>(-3.62)  |
| _cons                | -99.94***<br>(-9.88) | -79.08***<br>(-13.67) | -30.63*<br>(-2.34)   |
| R-squared            | 0.95                 | 0.96                  | 0.96                 |
| R-squared_Adj        | 0.94                 | 0.94                  | 0.95                 |
| F_Statistic          | 3322.68              | 5872.61               | 1616.41              |
| J-test               | 2.24                 | 2.22                  | 2.58                 |
| Observation          | 33.00                | 33.00                 | 33.00                |

t statistics in parentheses  
p<0.05, \*\* p<0.01, \*\*\* p<0.001

What can be established from these results is that first, emigration of highly skilled workers leads to increase in high and low skilled wage with the former having the upper hand. This is because the two categories of labour are not complementary. However, increase in wages

is 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.

## **5 Conclusion and policy recommendations.**

This paper added to the available evidence on the determinants of migration and provided empirical evidence on the labour market effects of migration in Nigeria. This country is the highest exporter of labour to the developed countries among the sub-Saharan countries and the bulk of the emigration is composed of highly skilled workers. 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 coefficients. It was discovered gross income differentials between source and origin countries contributed significantly to emigration of workers from Nigeria. Further, highly skilled workers gain more from emigration than the low skilled counterparts.

This situation suggests that emigration of highly skilled Nigerians contributes to increase in the income gap in the country, since the predictions of the model show non-complementarity between skills in Nigeria. Not only that, increase in highly skilled workers is partly influential to the unemployment situation in Nigeria. This results more from missing domestic absorption and less migration opportunities for the turn out of educated people entering the labour force. It therefore leads to the conclusion that migration of highly skilled workers not only increases income inequality, but also raises unemployment rate. Emigration of low skilled workers makes low-skilled stayers better off, reduces unemployment rate but leaves highly skilled workers unaffected.

Following this conclusion, it is recommended that job creation that will make wages attractive to highly skilled workers should be put in place to make labour market conditions here closer to those abroad. The labour market of Nigeria tends not to be complementary, but is appears unemployment is more pronounced among the highly skilled workers while wages are rigid downward. Creation of jobs that can absorb highly skilled workers is recommended.

Low skilled workers benefit from the emigration of low skilled labour. What this suggests is that rather than discouraging emigration of these sets of people, government should enter into bilateral and multilateral migration agreement with the immigrating countries to

increase the proportion of low skilled workers that will migrate to their respective countries. Where the ability to pay may be a constraint, this could be mitigated through family contributions, access to credit or through remittances.

Our results show that increase in wages less than compensate for increase in inflation rate with the resultant effect of worsening purchasing power. Our result did not show the source of inflation either from fiscal or monetary stance. But most evidences point to fiscal stance as the source of inflation rate while the monetary authorities do the necessary adjustments. Thus, the monetary authorities should ensure that inflation does not rise faster than wages to the extent that it makes wages worthless.

Remittances and highly skilled migration are strongly, positively and significantly related. This suggests that the high wages caused by these emigrants are compensated for through inflow of remittances. It is now left for the monetary authorities to ensure that this inflow does not lead to inflation, but used in a way as to create employment, particularly for the highly skilled workers.

The result presented is not without shortcomings. First is the data on unemployment. Instead of using disaggregated unemployment rate that would show clearly the effect of migration on unemployment of each category, dearth of data did not allow us to do this. Second is the size of migration stock that is limited to six OECD countries. Our intention was to cover all developed countries, particularly the OECD countries but absence of data did not allow this to take place. The wage categories use was not market determined but predetermined through fiscal policy by the government. Specifically, data on wages used for this analysis were the official wages for the civil servant. This suggests that the wage data is not all encompassing since the private sector appears to have been cut off. Therefore, the response of wages to changes in migration might not be fully captured. However, this may not be the case given the important role government play in the labour market.

First, the Nigerian government dictates the wage while the private sector follows. Second, government has been the highest employer of labour in the country, and so, wages in the private sector will have to be dictated by the one paid in the public sector. To this end, allowing for wage data from the private sector in the model may not significantly change the effect analysis in terms of effect, but it may do so in term so size. The researchers recognize all the



limitations and hope that with better data on migration and wages, the result can be put to robustness check.

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