Agriculture and Non-Agriculture Job Transitions in Nigeria: the Role of Information, Social Capital and individual characteristics

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Abstract:

An understanding of dynamics of the labour market is a major economic issue that interests economists in developing countries like Nigeria but poses challenges in term of data availability and quality. In this paper, we made a good attempt to construct the required data using the LSMS panel data available in Nigeria between 2010 and 2013. To gain insights into how workforce move from one sector to another and identify key determinants of a worker's decision to dissolve a job match and go to engage in another in another sector, we tested within a model if job characteristics, demographic variable, social networks, information and communication factors, space and time variables contribute to switching job from one sector to another. To achieve this, Nigeria LSMS panel data for both 2010/2011 and 2012/2013 were used with multinomial regression analysis. The empirical model results reveal that job characteristics, individual demographic characteristics, social networks, information and communication assets and locations do determine job transition.

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Abstract

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Key words: Unemployment, NEET, transition, jobs, agriculture

1. Introduction

Labour force participation rate in Nigeria is among the lowest in the world and sub-Saharan Africa with attendant high level of poverty, lack of unemployment benefits and poor retirement plan in the country. Between the first and last quarters of 2015 (NBS, 2015), labour force participation rate in Nigeria averaged 72 percent and the trend has hardly changed over the past five years. That is, of the 104.3million economically active individuals, about 76 million are active in the labour market either employed, under-employed or unemployed. This implies that population out of labour force in Nigeria as at the end of 2015 was 28 percent. This includes economic active population that are schooling, discouraged labour force, housewife/ care giver and voluntary retirees. The gender dimension of labour force participation in Nigeria is as will be expected, with more men in labour market than women. Going by International Labour Organization's (ILO) estimates as reported in WDI (World Bank, 2016), about 48.3 percent women as against 63.8 percent men are either employed or unemployed in Nigeria, that is, in labour force. Although these fall short of averages in sub-Saharan Africa 65 percent for men and 77 percent for women, and as well as in developed economies which are within the same range as SSA averages. Thus, there is a large pool (gap) of economic active population which should be in labour force but likely discouraged in Nigeria. For men, two reasons can be adduced to this trend in the country. First is education: because of high level of unemployment in the country in recent years, many youth are forced to stay longer in school with the view to seeking graduate education with the hope of getting employment if they achieve higher degrees. Another reason is emigration, there has been consistent rise in number of able-bodied non-professional and professional young men who leave Nigeria for overseas in search of better life in developed countries. This by far has huge implications on national output, productivity and security.

The job situation in Nigeria is in a state of quagmire. On one side, job loss is increasing as services sector is downsizing as a result of shrink in economy occasioned by falling crude oil price and factories closing because of infrastructure collapse (electricity in particular), and on the other side, new graduates are getting released in thousands to the job market. As Ajakaiye *et al* (2016) report, although agriculture provides most jobs in Nigeria, the proportion is declining. By 2000, agriculture accounted for 51 percent of jobs in Nigeria, however, by the end of 2014 the proportion reduced to 45 percent. Next to agriculture in job provision is the service sector, in fact, services sector is the fastest growing sector in Nigeria economy. Job provided by the sector grew from 24 percent in 2000 to 44 percent in 2014. Most jobs were lost in manufacturing sector, as the proportion of job contributed by this sector fell from 12.3 percent in 1970 to 9.3 percent in 2005 and further nosedived to 6 percent by 2014 (Ajakaiye, et al., 2016). There are two very pertinent questions here - first, which sectors do workforce who leave agriculture and manufacturing sectors go to, that is, are they employed somewhere, become unemployed, retired or back to school? Secondly, where does increased workforce in services sector come from, is it from agriculture, manufacturing or new graduates?

Although the Nigeria economy had a brief recession between 2015 and 2017, between 2005 and 2015, Nigeria witnessed sustained economic growth with annual real GDP increasing by around 7 percent; it was 3.4 percent in 2005 and grew consistently to 6.3 percent in 2014. The non-oil sector has been the main driver of growth, with services contributing about 57 percent, while manufacturing and agriculture, respectively contributed about 9 percent and 21 percent. Over Nigeria's period of high growth since 2001, by contrast, the contribution of agriculture in Nigeria's GDP has declined only marginally. However, one pertinent question in response to strong growth performance is – how have employment and incomes faired during this period? An analysis of the Nigeria General Household Survey (GHS) as reported by the World Bank (2009) reveals that: the number of jobs seems to have grown in line with the labour force while unemployment (both voluntary and involuntary) has remained constant; youth unemployment seems to be on the rise; most jobs have been created in family agriculture; and incomes in family agriculture have almost doubled in real terms and very similar to those in the self-employed non-agriculture sector. The work also reveals that wage employment has declined, as retrenchment in the civil service and the impact of privatization on employment in state-owned enterprises has not been compensated by job creation in new industries. More so, as Nigeria battles growing employment crisis, civil conflicts, violence, and militancy are also worrisome for the country. Although it is not considered officially fragile according to the World Bank and the regional development banks, Nigeria has had a recent history of acute conflict-related violence. According to the data from Armed Conflict Location and Events Dataset (ACLED, 2015), Nigeria has been the third most violent, and suffered the fourth-highest deaths from conflict, among African countries in the last ten years (2003-2013).

Therefore, going by the argument above, one pertinent question about labour market situation in Nigeria is that: is there a formed pattern of transition in labour market in Nigeria and what are the determinants? Thus, this paper seek to achieve two objectives: one, to identify pattern of transition from in labour market and, secondly, to identify key determinants of transitions in the Nigeria labour market.

This paper is guided by job search theory which was made popular by the works of Pissarides (2000) and Petrongolo and Pissarides (2001). But, the study was largely motivated by the Todaro's (1969) intersectoral labour flow model as explained in Bojnec & Dries (2005) and Gullstrand & Tezic (2008). That is, an individual decides to migrate (transition) from one sector, usually rural or agricultural, to another sector, usually urban or non-agricultural, based on an objective function of income maximization. Gullstarnd & Tezic (2008) show that the friction in the labour market can be explained from the point of good and bad job matches. That is, an employer can decide to dissolve a match if the expected marginal physical product of labour from a worker is lower than wage paid to the worker. However, if wages per efficiency unit of worker are the same across sectors, a worker will only dissolve an old match for another match if the expected income is greater than a match in which he is indifferent to. This model was tested

in this paper with a view to identifying patterns of transition in the labour market and identifying key determinants of the transitions.

The rest of the paper is organised into four sections. Section 2 covers the methodology of identifying determinants of transition across sectors while section three describes data used for the analysis. In section four, results are presented in tables and charts along with discussions and lastly, section five provides conclusion of the paper.

2. Methodology

This section provides description of methodology of this paper. The study design focuses on transition from productive sectors of agriculture and non-agriculture to other sectors. In this paper, labour force in employment are those who are engaged in productive activities for at least 20 hours during the reference week. The productive activities could be wage employment, employer, self-employment and working in family or relative business estate, as defined by the Nigeria LSMS survey. Those outside the productive sector of the labour market are the unemployed. Unemployment is measured in Nigeria like many other countries as guided by the ILO as the proportion of the labour force who are not employed, but available for job and searching for job. (Kale and Dogwu, 2014). This paper relaxes the two conditions of 'available' and 'searching' for job in the measure of unemployment by adopting non-employment as used by Gullstarnd & Tezic (2008). Thus, unemployment is measured using NEET (Not in Employment, Education or Training). NEET relaxes the condition of searching for job in the definition of unemployment. That is, individuals in the working age category who is neither in any form of employment, education or training within the reference week are considered to be NEET.

Empirical Analysis and Model Specification

Labour supply behaviour of (un)employed people is modelled here using discrete choice in term of random utility framework. For instance, a self-employed or wage-employed individuals will switch from agriculture to non-agricultural employment, become unemployed, or out of labour force if the expected utility of each of the transition exceeds utility of staying in agriculture. Letting Y_i be an indicator equal to 1 if an agricultural worker could not have a better job match and remains in agriculture, equal to 2 if job search is successful and employed in non-agriculture, equal to 3 if he loses job and become unemployed, and equal to 4 if the person decides not to participate in labour force between t and t + 1. That is, the outcome of job search can be therefore represented with below equation:

$$y_i = X_i^{'}\beta_o + \varepsilon_i \qquad (1)$$

Where y_i is the job search outcome: that is –

y_i = 1 if the individual remained in agriculture,

y_i = 2 if the individual moved to non-agriculture,

y_i = 3 if the individual became unemployed and

y_i = 4 if the individual transferred outside the labour force

Using multinomial logit model as described in (Greene, 2012) and suppose that there are k categorical outcomes and without loss of generality – let the base outcome be 1. The probability that the response for *i*th observation is equal to the *j*th outcome is given as:

$$\Pr ob(Y_i = j) = \frac{\exp(X_i \beta_j)}{\sum_{m=1}^{k} \exp(X_i \beta_m)} \qquad (2)$$

And Xi are the row vector of explanatory variables for the *i*th observation and β_m is the coefficient vector for outcome m. The estimated equations provide a set of probabilities for the J choices, that is, to remain in the present status - unemployed (1), or move to one of j alternatives for a decision-maker with characteristics X_i. The model, however, is unidentified in the sense that there is more than one solution for β_j that leads to the same probabilities for Y = j. A convenient normalisation that solves the problem is to assume that $\beta_0 = 0$. This means that the remaining coefficients β_j measure the change relative to the Y = 1 group. The probabilities are now given by:

$$p_{ji} = \Pr(y_i = j) = \begin{cases} \dfrac{1}{1 + \sum_{m=2}^{k} \exp(X_i \beta_m)}, if \ldots\ldots j = 1 \\ \dfrac{\exp(X_i \beta_j)}{1 + \sum_{m=2}^{k} \exp(X_i \beta_m)}, if \ldots\ldots j > 1 \end{cases} \qquad (3)$$

The explanatory variables in the model are listed in **Error! Reference source not found.** along with their descriptions, variable type, and mean values. The variables are broadly categorized into five themes: Job search behaviour, demographic characteristics, social network or family ties, information and communication variables, location variables and time variables. It should be noted therefore that values of independent variables used in the model are all measured before the transition happens, that is, values for time t were used to analyse the transitions that happen between t and t+1. This is very important because it makes the model to actually estimate coefficients of the explanatory variables as causes rather than consequences of the transition (Meyer, (1999); Johansson, (2000)). Likewise, data sample for this analysis contains people who

were in agriculture engagement in the base year (2010) and employment statuses of the sample were monitored and recorded in subsequent years from year 2011 to 2013.

The X_i are explanatory variables included in the model as shown in Table 1. The variables are categorized as: ***job characteristics***, ***demographic characteristics***, ***social network*** (family ties), ***information sources***, ***location characteristics*** and ***time dimension***.

3. Data

The data for this analysis was sourced from the World Bank Living Standards Measurement Survey (LSMS) General Household Survey (GHS) longitudinal data on Nigeria. In partnership with the Nigeria National Bureau of Statistics (NBS), the panel GHS data collection began in 2010 as a subset of the larger cross-sectional Harmonized National Living Standard Survey (HNLSS) and it is being collected biannually. Each wave of the panels has two rounds of visit: one, during the post-planting season (June-July) and the other during the post-harvest season (February – March). The sample covers 5,000 households and it is representative at zonal and sector (rural and urban) levels. The survey has three questionnaires - agriculture, households and community. The households' questionnaires covers topics such as roster, education, employment, health, assets, subjective poverty, dwelling characteristics, financial capability and ICT, and this provides required variables for the required analysis of this study. The study made use of household data from the first two waves of the survey, that is, 2010/2011 and 2012/2013. Given that there are two rounds of data collection for each wave, the two waves provides this analysis with four (4) panel to work with, although unbalance in time as a result of seasonal dimension and in observations because of attrition.

The study population comprises the working age individuals in Nigeria and the focus of the analysis is on those who are in either agricultural or non-agricultural employment. After trimming observation for attrition, 4,051employed individuals in agricultural sector and 3,737 in non-agriculture by 2010 were tracked annually for the next three years until 2013 and their labour statuses observed for each of the following three years as shown in Table 1.

Table 1: Descriptions of Explanatory Variables in the Model for Determinants of Movement from Agricultural Sector to Other Sectors and a priori expectations

Variables	Variable Type	Description of Variables	Mean Values for labour force in Agriculture at 2010 **(n=4,051)**	Mean Values for labour force in Non-Agriculture at 2010 **(n=3,737)**
Outcome Response	Polychotomous			
Agriculture	Dummy	1 if engaged in agriculture, 0 otherwise	0.65	0.0757

Variables	Variable Type	Description of Variables	Mean Values for labour force in Agriculture at 2010 **(n=4,051)**	Mean Values for labour force in Non-Agriculture at 2010 **(n=3,737)**
Non-Agriculture	Dummy	1 if engaged in non-agricultural sectors, 0 otherwise	0.10	0.7400
Unemployed	Dummy	1 if 'not in employment, education or training', 0 otherwise	0.16	0.1416
Out-of-Labour Force	Dummy	1 if out-of-labour force, 0 otherwise	0.08	0.0426
Explanatory Variables				
Job Characteristics				
Self-employed	Dummy	1 if self-employed, 0 otherwise	0.89	0.73
Hour worked in 7day	Count	No of hours worked in reference 7 days	41.76	46.24
Secondary Job	Dummy	1 if having a secondary job (definition), 0 otherwise	0.22	0.24
Demographic Characteristics				
Age	Discrete	Age of individuals in years as at 2010	40.91	39.82
Age squared	Discrete	Squared value of age	1957.61	1765.92
Female	Dummy	1 if female, 0 male	0.37	0.58
Primary Edu	Dummy	1 if only completed Primary Education, 0 otherwise	0.22	0.22
Junior Sec Edu	Dummy	1 if junior secondary is highest qualification, 0 otherwise	0.05	0.03
Senior Sec Edu	Dummy	1 if senior secondary is highest qualification, 0 otherwise	0.11	0.22
Post-Sec Edu	Dummy	1 if post-secondary diploma is highest qualification, 0 otherwise	0.01	0.09
Degree Edu	Dummy	1 if Degree/HND[1] is highest qualification, 0 otherwise	0.01	0.08
Other Edu	Dummy	1 if any formal Religion certificate is highest qualification, 0 otherwise	0.03	0.03
None Formal Edu (Reference category)				
Married Mono	Dummy	1 if married in a monogamous family, 0 otherwise	0.50	0.59
Married Poly	Dummy	1 if married in a polygamous family, 0 otherwise	0.22	0.21
Others-SDW	Dummy	1 if Separated, divorced or widowed, 0 otherwise	0.08	0.08
Never Married (Reference category)				
Social Network				
Father Edu	Dummy	1 if father has above senior secondary qualification, 0 otherwise	0.01	0.05
Father Occp	Dummy	1 if father's occupation is agriculture, 0 otherwise	0.76	0.63
Mother Occp	Dummy	1 if mother's occupation is agriculture, 0 otherwise	0.57	0.32

[1] Higher National Diploma which is similar to Degree in Nigeria.

Variables	Variable Type	Description of Variables	Mean Values for labour force in Agriculture at 2010 **(n=4,051)**	Mean Values for labour force in Non-Agriculture at 2010 **(n=3,737)**
Mother Edu	Dummy	1 if mother has above senior secondary qualification, 0 otherwise	0.00	0.02
Information and Communication				
Access to Radio	Dummy	1 if has access to Radio, 0 otherwise	0.83	0.88
Access to TV	Dummy	2 if has access to TV, 0 otherwise	0.31	0.64
Owned Mobile Phone	Dummy	1 if owned a mobile phone, 0 otherwise	0.32	0.61
Access to PC	Dummy	1 if has access to PC, 0 otherwise	0.01	0.08
Access to Internet	Dummy	1 if has access to Internet, 0 otherwise	0.01	0.05
Trend Variables				
Year 2012	Dummy	1 if survey in year 2012, 0 otherwise	0.33	0.33
Year 2013	Dummy	1 if survey in year 2013, 0 otherwise	0.33	0.33
Year 2011 **(Reference category)**				
Location Variables				
Rural	Dummy	1 if located in the rural, 0 urban	0.91	0.55
North-East	Dummy	1 if located in North-east zone, 0 otherwise	0.27	0.14
North-West	Dummy	1 if located in North-west zone, 0 otherwise	0.20	0.20
South-East	Dummy	1 if located in South-east zone, 0 otherwise	0.16	0.13
South-South	Dummy	1 if located in South-south zone, 0 otherwise	0.10	0.16
South-West	Dummy	1 if located in south-west, 0 otherwise	0.06	0.20
North-Central **(Reference category)**				

4. Result

This section provides results and discussion of the analysis done in this paper. The results are presented for description of patterns and empirical determinants of transitions. Table 2 describes labour market engagement of working age sample between 2010 and 2013, that is, over four observation times. Using panel average statistics as base figures as presented in Table 14, most working age persons are engaged in Agriculture (29 percent) and closed followed by services (28 percent). These are the two main employers of labour in Nigeria and jointly produce 76 percent of the Nigeria GDP (Alemu, 2015). The least share of working age persons is in mining and

manufacturing (4 percent), working age NEET stands at 21 percent while share of 'out of labour force' is at 17 percent.

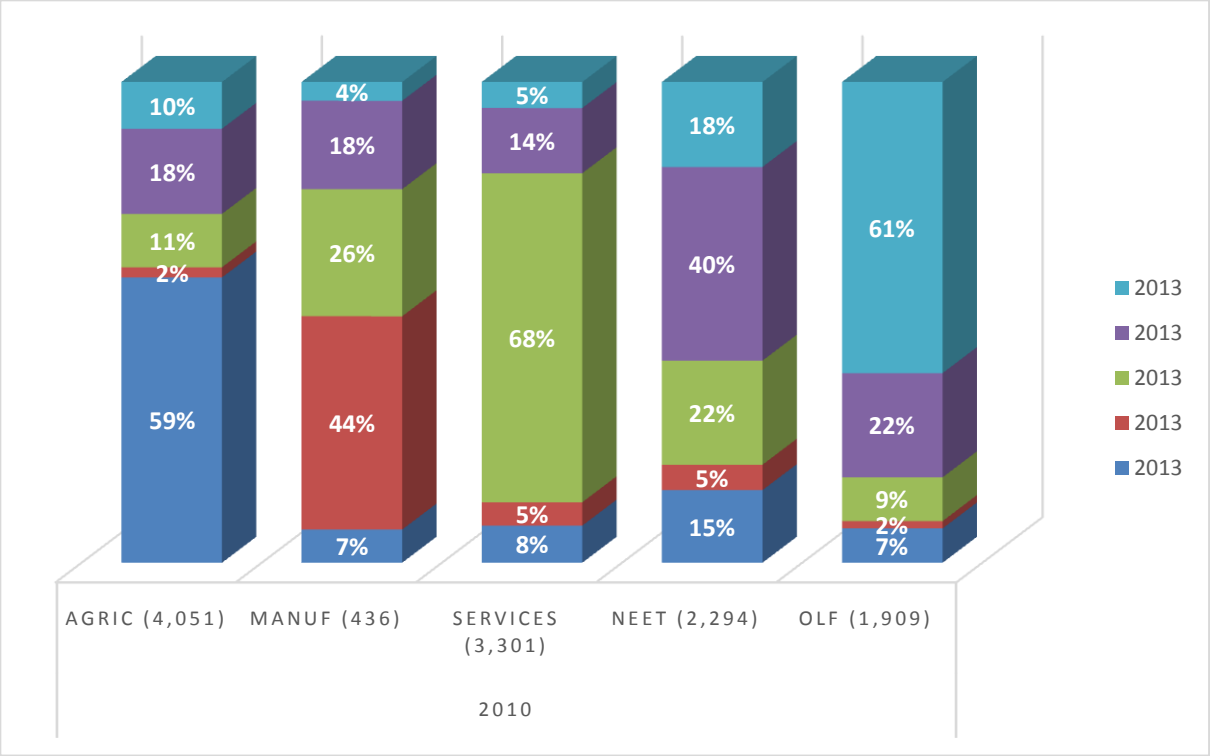
Table 4.1: National Trend of Livelihoods, NEET, OLF between 2010 and 2013

	W1_2010		W1_2011		W2_2012		W2_2013		Panel Average	
	freq	%	freq	%	freq	%	freq	%	freq	%
Agriculture	4051	33.78	3161	26.45	3752	31.10	3186	26.36	14150	29.42
Manufacturing	436	3.64	494	4.13	468	3.88	600	4.96	1998	4.15
Services	3301	27.53	3374	28.23	3139	26.02	3517	29.10	13331	27.72
NEET	2294	19.13	2784	23.29	2548	21.12	2614	21.63	10240	21.29
OLF	1909	15.92	2139	17.90	2159	17.89	2170	17.95	8377	17.42
Total	11991	100.00	11952	100.00	12066	100.00	12087	100.00	48096	100.00

Going by the results in the annex, proportions of working age across sector of labour and out of labour differ across time for various locations and sex in Nigeria.

Transition in Labour Market

This section presents and discusses the dynamism in working age population in general, as it relates to labour engagement, unemployment and OLF engagement. In a bid to weigh dualism theory of labour market within working age individuals in Nigeria, this analysis was done to assess occupational mobility of working age people over time. To achieve this, the analysis was done by looking up for labour status of individuals in from 2010 and compare with 2013. The results are presented in figure 1 below.



In brief, the result of the aggregate analysis as presented in Figure 1 shows about 59 percent workforce in agriculture in 2010 remained in the sector by 2013 while about 11 percent moved over to services sector, only 2 percent moved to mining and manufacturing sectors, 18 percent became NEET and the remaining 10 percent went out-of-labour force either for education, retirement or became physically challenged. After the space of three years, the biggest movement away from agriculture is not into other productive sectors (non-agricultural sectors) but to NEET and OLF. This is largely explained away by poor human capital in form of educational qualification of majority of workforce in agriculture. Also, within the mining and manufacturing sectors, retention rate is about 44 percent, while larger share 26 percent moved to services sector, 7 percent moved to agriculture, 18 percent became NEET and 4 percent as OLF. Of all sectors and productive sectors in particular, service sector has the highest retention rate, which stands at about 68 percent, while 8 percent moved to agriculture, 5 percent to mining and manufacturing, 14 percent became NEET and 5 percent either went back to study or retired.

The category of NEET - labour force not in employment, education or training, as expected, has the lowest rate of retention (40 percent) within space of three years, although the rate is still on a high side[2]. The result from Figure 1 shows that largest movement away from NEET to productive sectors is recorded with services sector (22 percent), followed by agriculture (15 percent) and least recorded with mining and manufacturing (5 percent). However, a considerable share of NEET person went out-of-labour force, which is most likely for education or training to enhance their human capacity for better employability.

[2] There are many women who are inactive NEET because they are housewives or discouraged labour force.

There is considerable high retention rate in OLF group for a period of 3 years between 2010 and 2013. This is very understandable given either as students it may take longer than three years to get done with training, or as retirees and physically challenged they may never go into labour force. As expected, the largest share of movement away from OLF is recorded with NEET (22 percent), which is a transition status for most OLF before they moved into workforce in the productive sectors. Also, about 9 percent of OLF moved to services sector, 7 percent moved to agriculture and 2 percent to mining and manufacturing sectors.

On the flip side, apart from agricultural sector itself, NEET is the largest contributors of labour force to agriculture, followed by services, manufacturing and OLF. Manufacturing and mining are the largest contributor of workforce to services sector, followed by NEET, agriculture and OLF. Services and NEET are the largest source of labour force to mining and manufacturing, while OLF is the single largest source of NEET, followed by agriculture, mining and manufacturing.

Aggregate Determinants of Transition of workforce from Agriculture to Other Sectors

Table 3 presents the results of the estimated model for transition from agricultural sector to other sectors. The diagnostic statistics shows that the Wald chi square is significant at 1 percent which implies the model is well fitted. The discussion of the results is provided along the three blocks of transitions. The discussion begins with transition from agriculture to NEET, followed by transition to Non-agricultural sector and ends with transition from Agriculture to OLF, and organised along the themes of explanatory variables.

Job Characteristics

The result shows two job characteristics determine job loss from agriculture, which are: ***'Hour worked in 7 days'*** and having a ***'secondary job'.*** Both variables are significant at 1 percent and have negative effect on flowing from agriculture to unemployment. That, is probability of moving to NEET (unemployment) reduces with hours of work within a week. Relating to marginal effect at mean (42 hours), an extra hour of work reduces probability of losing job from agriculture by 0.1 percent point and having a secondary job on the other hand reduces it by 6 percent point. Thus, workforce in agriculture who work longer hours (or full time) per week or do secondary job are less likely to become unemployed. This result is also supported by Bojnec and Dries (2005)'s findings which shows that becoming unemployed from agricultural sector reduces with hour of work in a week. Therefore, the more the time an agriculture employee or self-employed commits to her job the longer she will stay employed in the sector. Likewise, having a secondary job besides agriculture is a very good job security strategy particularly during the off-season period which will guarantee employment even when agriculture is at its lowest ebb. Furthermore, Hour worked in 7 days (a week) and having a secondary job are significantly

and negatively related to moving out-of-labour force from agriculture. At the margin and a mean working hour of 42, an hour increase in working hours in agriculture reduces likelihood of moving to either retirement of go for further education by less than 1 percent point and having a second job reduces it by 2 percent point. This shows that people who commit more hours to agriculture or have a second job will less likely leave the sector anytime soon.

Further, having a secondary job is highly significant and positively related to switch from agriculture to non-agriculture. The marginal effect estimate shows that having secondary job increases likelihood of switching from agricultural job to non-agricultural job by 11 percent point. It is most likely that most of the secondary jobs being held by people in agriculture are non-agriculture jobs and they will have grown experiences in them. This will largely facilitate movement from agriculture to well-paid non-agricultural jobs that is less subjected to seasonal tide. This is also consistent with Bojnec and Dries (2005), although additional job was not significant but has a positive relationship with moving from agriculture to non-agriculture.

Social Network:

Having a higher educated father (***Father Edu (>Sec)***) is significant and positively related to moving from agriculture to NEET. The reverse is that, having less educated father reduces the chances of moving from agriculture to become unemployed. This is possible given that most uneducated are in agriculture and if one and one's father is in agriculture there is less likely of losing job. Likewise, having a father whose occupation is in agriculture (***Father Occp (agric=1))*** like one's is significant at 1 percent and reduces likelihood of transition from Agriculture to OLF by 2 percent. Like the previous discussion, this shows that there is less chance that people who work in agriculture or in the same farm with their fathers will leave the sector (farm) either for further education or become unemployed. The reluctance to leave family farm or agriculture is usually enshrined in generational transfer of knowledge, succession and inheritance of farm land, and issues of household food and livelihood security (Garner & de la O Campos, 2014).

Just like the case of father, the result shows that having mother in agricultural sector (***Mother Occp (agric=1)***) is significant at 1 percent and reduces the probability of moving to non-agricultural sector from agriculture by 3 percent point. In the same sense, having educated mother (***Mother Edu (>Sec)***) is significant and increases the likelihood of moving from agriculture to non-agricultural sectors by 26 percent. This shows that people with educated mother are likely to switch job from agriculture to non-agriculture. Most educated people are not in agriculture and this means that the family social capital can likely be leveraged on to move from agriculture to non-agriculture with higher wages.

The location (geopolitical zones and sector) and time variables contribute significantly to transition of workforce from agriculture to other sectors as shown in the result. Likewise, demographic variables of age, educational levels, sex and marital statuses, and information and communication variables have significant effect on transition from agriculture to other sectors.

Table 3: Aggregate Estimated Model Result for Movement from Agriculture to Unemployment and Other Sectors

	Non-Agric.		NEET		OLF	
	Coef/SE	dy/dx	Coef/SE	dy/dx	Coef/SE	dy/dx
Self-employed (D)	0.135	0.0105	0.00989	-0.000279	-0.0263	-0.00147
	(0.153)		(0.111)		(0.130)	
Hour worked in 7day	-0.00406	-0.000129	-0.0125***	-0.00138	-0.0137***	-0.000420
	(0.00302)		(0.00258)		(0.00397)	
Secondary job	1.002***	0.112	-0.394***	-0.0554	-0.471**	-0.0173
	(0.0832)		(0.0860)		(0.183)	
Age	-0.00170	0.000983	-0.0544***	-0.00583	-0.130***	-0.00445
	(0.0172)		(0.0142)		(0.0203)	
Age squared	-5.32e-05	-1.76e-05	0.000614***	6.58e-05	0.00164***	5.66e-05
	(0.000185)		(0.000150)		(0.000208)	
Female	0.661***	0.0390	1.021***	0.122	0.525***	0.0108
	(0.104)		(0.0800)		(0.117)	
Primary Edu	0.150	0.0104	0.0491	0.00161	0.401***	0.0153
	(0.1000)		(0.0849)		(0.118)	
Junior Sec Edu	0.238	0.0185	-0.107	-0.0203	0.748***	0.0370
	(0.202)		(0.162)		(0.172)	
Senior Sec Edu	0.585***	0.0506	0.279**	0.0239	0.313**	0.00798
	(0.124)		(0.108)		(0.151)	
Post-Sec Edu	0.828***	0.0711	0.613**	0.0628	0.714**	0.0228
	(0.267)		(0.254)		(0.349)	
Degree Edu	0.553*	0.0394	0.459	0.0437	0.935***	0.0418
	(0.333)		(0.366)		(0.326)	
Others Edu	0.720***	0.0639	0.421**	0.0392	0.470*	0.0130
	(0.195)		(0.180)		(0.266)	
Married Mono	0.0879	0.0198	-0.312**	-0.0235	-2.281***	-0.0960
	(0.173)		(0.149)		(0.166)	
Married Poly	-0.0547	0.00646	-0.507***	-0.0473	-2.363***	-0.0539
	(0.188)		(0.159)		(0.211)	
Others MS	-0.0502	0.00464	-0.507***	-0.0481	-1.629***	-0.0336
	(0.227)		(0.195)		(0.246)	
Father Edu (> Sec)	0.323	0.0138	0.718**	0.0987	0.381	0.00842
	(0.339)		(0.308)		(0.365)	
Father Occp (agric=1)	-0.0360	-0.000906	-0.0277	-0.000243	-0.444***	-0.0177
	(0.120)		(0.111)		(0.146)	
Mother Occp (Agric=1)	-0.385***	-0.0331	0.101	0.0170	-0.00109	0.000756
	(0.0968)		(0.0875)		(0.141)	
Mother Edu (>Sec)	1.827**	0.263	0.311	-0.0185	0.921	0.0226
	(0.831)		(0.909)		(0.875)	
Access2Radio	0.156	0.0129	0.0691	0.00876	-0.404***	-0.0180
	(0.123)		(0.0849)		(0.131)	
Access to TV	0.307***	0.0241	0.0721	0.00307	0.286***	0.00928
	(0.0916)		(0.0747)		(0.104)	
Owned Mobile phone	0.463***	0.0384	0.157**	0.0136	-0.157	-0.00796
	(0.0870)		(0.0748)		(0.112)	
Access to PC	1.583***	0.203	0.174	-0.0269	1.351***	0.0604
	(0.299)		(0.464)		(0.341)	
Access to Internet	-0.763*	-0.0416	-0.501	-0.0424	-1.297***	-0.0261
	(0.443)		(0.523)		(0.424)	
Year 2012	0.355***	0.0338	-0.362***	-0.0476	0.345***	0.0139
	(0.0991)		(0.0775)		(0.112)	
Year 2013	0.813***	0.0706	0.0785	-0.00567	0.617***	0.0205
	(0.0942)		(0.0690)		(0.108)	
Rural	-0.794***	-0.0755	-0.310***	-0.0239	-0.231	-0.00321
	(0.114)		(0.120)		(0.174)	
North-East	0.880***	0.0590	1.213***	0.165	-0.135	-0.0148
	(0.129)		(0.103)		(0.145)	

	Non-Agric.		NEET		OLF	
	Coef/SE	dy/dx	Coef/SE	dy/dx	Coef/SE	dy/dx
North-West	0.683***	0.0470	0.874***	0.109	-0.0313	-0.00867
	(0.139)		(0.117)		(0.146)	
South-East	0.518***	0.0506	-0.0440	-0.0117	-0.190	-0.00813
	(0.154)		(0.121)		(0.166)	
South-South	0.567***	0.0620	-0.347**	-0.0440	-0.186	-0.00703
	(0.171)		(0.146)		(0.189)	
South-West	0.191	0.0275	-0.850***	-0.0804	-0.412	-0.0109
	(0.176)		(0.207)		(0.253)	
Constant	-2.881***		-0.290		1.901***	
	(0.367)		(0.277)		(0.356)	
Observations	11,988	Wald chi2(96) = 2367.49***		Pseudo R2 = 0.1524		

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Aggregate Determinants of Transition of Workforce from Non-agricultural Sector to Other Sectors

Table 4 presents the result of the estimated model for movement of labour force out of non-agricultural sectors to other sectors in the labour market. The result's diagnostics statistics of Wald chi square value of 2140.93 is significant at 1 percent. This shows that model is well fitted. The discussion of result is presented according to the themes of the explanatory variables.

Job Characteristics:

Two job characteristics – 'Hour worked in 7 days' and having a 'secondary job', show significant relationship with transition from non-agricultural sectors. Specifically, 'hours worked in 7 days' is significant at 1 percent and reduces likelihood of moving from non-agricultural sector to agricultural sector or going back to school. At the margin, this implies that putting in an extra hour above average hours in 7 days (46 hours) reduces likelihood of leaving non-agricultural engagement for agriculture or going out-of-labour force. This implies that people who put more than full hour (40) of labour into non-agricultural jobs are less likely to leave for another sectors or going out of labour force. In other words, those who are fully engaged or committed, through labour hours, to non-agricultural job will stay in the job for a long period. Moreover, having secondary job is significant and have positive relationship with transition to agriculture but negative relationships with transition to NEET and OLF. At the margin, a switch from doing a single job in non-agricultural sectors to having second job increases likelihood of transition to agriculture by 2.2 percent point, but reduces likelihood of transition to NEET by 1.8 percent and to OLF by 0.7 percent. This implies that most of the secondary jobs of people (workforce) in non-agricultural sectors are in agriculture and as they grow experience in it, they are likely to switch to agriculture eventually. This is well supported by the findings of Ofuoku & Ekine (2015), which confirms people in service and mining sectors in Nigeria are involved in

agriculture as retirement plan. Likewise, because of income and risk diversification through having secondary jobs, people in non-agriculture who have secondary job are less likely to become unemployed or go out-of-labour force.

Social Network

There is significant relationship between father's education and transition from non-agricultural job to become unemployed. The result shows that there is 4.5 percent point chance that a worker in the non-agricultural sector who has an educated father will become unemployed at some point. However, workers in non-agricultural sectors who have mothers who are engaged in agriculture are very random. The result shows that having a mother who is engaged in agriculture increases chance of worker in non-agricultural job to move to either agriculture, become unemployed or go out of labour force.

Table 4: Aggregate Estimated Model Result for Transition from Non-Agricultural Sector to Other Sectors

	Agric.		NEET		OLF	
	Coef/SE	dy/dx	Coef/SE	dy/dx	Coef/SE	dy/dx
Self-employed (D)	0.134	0.00296	0.118	0.0115	-0.00456	-0.000438
	(0.133)		(0.115)		(0.156)	
Hour worked in 7day	-0.0125***	-0.000302	-0.00206	-0.000134	-0.0166***	-0.000323
	(0.00344)		(0.00251)		(0.00438)	
Secondary job	0.686***	0.0223	-0.163*	-0.0178	-0.361**	-0.00665
	(0.106)		(0.0855)		(0.174)	
Age	-0.0211	-0.000240	-0.0669***	-0.00639	-0.173***	-0.00332
	(0.0222)		(0.0155)		(0.0229)	
Age squared	0.000433*	7.46e-06	0.000723***	6.72e-05	0.00241***	4.64e-05
	(0.000240)		(0.000181)		(0.000245)	
Female	-0.934***	-0.0284	0.710***	0.0733	0.0355	-0.000367
	(0.136)		(0.0922)		(0.141)	
Primary Edu	-0.106	-0.00237	-0.153	-0.0157	0.315	0.00738
	(0.150)		(0.0996)		(0.195)	
Junior Sec Edu	-0.232	-0.00552	-0.194	-0.0212	0.960***	0.0316
	(0.277)		(0.281)		(0.246)	
Senior Sec Edu	-0.526***	-0.0117	-0.0728	-0.00681	0.319	0.00747
	(0.181)		(0.123)		(0.207)	
Post-Sec Edu	-0.551**	-0.0105	-0.504***	-0.0434	0.163	0.00497
	(0.229)		(0.186)		(0.307)	
Degree Edu	-0.595**	-0.0116	-0.268	-0.0241	0.0268	0.00142
	(0.287)		(0.214)		(0.344)	
Others Edu	-0.650**	-0.0126	-0.125	-0.0134	0.758***	0.0229
	(0.298)		(0.166)		(0.284)	
Married Mono	-0.679***	-0.0128	-0.788***	-0.0718	-2.546***	-0.0755
	(0.221)		(0.136)		(0.163)	
Married Poly	-0.633***	-0.0114	-0.734***	-0.0594	-2.586***	-0.0293
	(0.240)		(0.147)		(0.228)	
Others	-0.836***	-0.0136	-1.440***	-0.0936	-2.264***	-0.0215
	(0.301)		(0.203)		(0.280)	
Father Edu (> Sec)	-0.477	-0.0110	0.387**	0.0453	0.390	0.00811
	(0.553)		(0.188)		(0.284)	
Father Occp (agric=1)	-0.0964	-0.00251	0.0113	0.00139	0.0283	0.000592
	(0.125)		(0.0902)		(0.161)	

	Agric.		NEET		OLF	
	Coef/SE	dy/dx	Coef/SE	dy/dx	Coef/SE	dy/dx
Mother Occp (Agric=1)	0.710***	0.0196	0.223***	0.0199	0.397**	0.00751
	(0.106)		(0.0852)		(0.161)	
Mother Edu (>Sec)	-0.345	-0.00801	0.178	0.0195	0.309	0.00677
	(0.634)		(0.311)		(0.385)	
Access2Radio	0.200	0.00456	0.0350	0.00267	0.149	0.00268
	(0.166)		(0.117)		(0.206)	
Access to TV	-0.521***	-0.0138	-0.169*	-0.0156	-0.151	-0.00236
	(0.132)		(0.0921)		(0.163)	
Owned Mobile phone	-0.0111	-0.000118	-0.0284	-0.00255	-0.139	-0.00278
	(0.133)		(0.0967)		(0.148)	
Access to PC	-0.155	-0.00266	-0.355*	-0.0316	-0.408	-0.00640
	(0.305)		(0.210)		(0.268)	
Access to Internet	-0.830**	-0.0157	0.294	0.0350	0.148	0.00264
	(0.418)		(0.262)		(0.315)	
Year 2012	1.239***	0.0333	0.896***	0.0927	1.221***	0.0258
	(0.134)		(0.0896)		(0.171)	
Year 2013	1.071***	0.0297	0.463***	0.0420	1.176***	0.0268
	(0.135)		(0.0921)		(0.170)	
Rural	1.747***	0.0514	0.370***	0.0310	0.299**	0.00399
	(0.156)		(0.0802)		(0.142)	
North-East	0.178	0.00345	0.299**	0.0318	0.374*	0.00757
	(0.171)		(0.122)		(0.213)	
North-West	0.194	0.00145	0.829***	0.100	0.541**	0.00933
	(0.164)		(0.107)		(0.222)	
South-East	-0.819***	-0.0151	-0.254*	-0.0214	-0.699***	-0.0105
	(0.181)		(0.144)		(0.262)	
South-South	-0.154	-0.00308	-0.236*	-0.0224	-0.0332	-6.11e-05
	(0.173)		(0.141)		(0.216)	
South-West	0.0317	0.00187	-0.309**	-0.0299	-0.303	-0.00517
	(0.197)		(0.141)		(0.236)	
Constant	-2.995***		-0.700*		0.811*	
	(0.531)		(0.386)		(0.465)	
Observations	11,094	Wald chi2(96) = 2140.93***		Pseudo R2 = 0.1706		

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5. Summary and Conclusion

On aggregate, agriculture has retention rate of 3 in 5of its workforce between the space of 4 years, and largest of the transition are into unemployment (18 percent) and out of labour force. Within the productive sectors, mining and manufacturing have the lowest retention rate, and larger share of transition happened to services sectors. Services sectors have the highest retention rate at 68 percent and about largest transition was to unemployment. Transition from unemployment is about 3 in 5 on aggregate and most people got engaged in services sectors. Also, it is very key to note that - apart from agricultural sector itself, NEET is the largest contributors of labour force to agriculture, followed by services, manufacturing and OLF.

Manufacturing and mining are the largest contributors of workforce to services sector, followed by NEET, agriculture and OLF. Services and NEET are the largest source of labour force to mining and manufacturing, while OLF is the single largest source of NEET, followed by agriculture, mining and manufacturing.

Workforce in agriculture who work longer hours per week or do secondary job are less likely to become unemployed. Workforce in agriculture that do secondary job are more likely to leave the sector for non-agricultural jobs. Compared to men, the chances are higher for women to leave agriculture to become unemployed, followed by becoming engaged in non-agriculture. People in agriculture with low levels of education have high likelihood of pursuing education while those with high or higher education are more likely to move to non-agricultural sectors from agriculture and least likely to go back to school. People in agriculture who are from farming families are less likely to become unemployed or go back to school. Workforce in agriculture that have access to PC are more likely to go for more education while those that have access to internet are more likely to stay. Workforce in agriculture and in rural areas are less likely to move out of the sector. Workforce in agriculture from these North-east, North-west, South-east and South-south are very likely to change job to non-agricultural if compared living North-central. Furthermore, workforce in agriculture are most vulnerable to unemployment in North-east, followed by North-west, North-central, South-east, South-south and South-west the least.

Workforce who put more than full hour (40) of labour into non-agricultural jobs are less likely to leave for another sectors or going out of labour force. People in non-agricultural job who hold secondary jobs are more likely to take agricultural job as retirement job. Moreover, young people in non-agricultural sectors within the average age are less likely to become unemployed or go for further education while older folks are will either become unemployed or retire after some years. Workforce in non-agricultural with higher education are very unlikely to leave non-agricultural sectors for agriculture or become unemployed. Furthermore, vulnerability to unemployment (NEET) from non-agricultural sectors is highest in North-west zone, followed by North-east, North-central, South-east, South-south and least with South-west in that order.

Thus, it can be deduced that agriculture is a major source of seasonal unemployment in rural areas in particular, and women are most of the victims of this post-harvest unemployment, and social capital arising from occupational status and educational level of parents is a key determinants of labour market chances of workers in Nigeria.

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Annex

Table 5 : Urban Trend of Livelihoods, NEET, OLF between 2010 and 2013

	W1_2010		W1_2011		W2_2012		W2_2013		Total	
	freq	%	Freq	%	freq	%	freq	%	freq	%
Agriculture	352	10.33	304	9.00	274	7.99	248	7.24	1178	8.64
Manufacturing	131	3.85	132	3.91	162	4.72	174	5.08	599	4.39
Services	1564	45.92	1582	46.82	1591	46.37	1715	50.07	6452	47.30
NEET	630	18.50	598	17.70	656	19.12	596	17.40	2480	18.18
OLF	342	22.24	325	21.58	292	18.95	285	18.60	1244	20.34
Total	1538	100.00	1506	100.00	1541	100.00	1532	100.00	6117	100.00

Table 6: Rural Trend of Livelihoods, NEET, OLF between 2010 and 2013

	W1_2010		W1_2011		W2_2012		W2_2013		Total	
	freq	%	Freq	%	freq	%	freq	%	freq	%
Agriculture	3699	43.09	2857	33.33	3478	40.28	2938	33.92	12972	37.65
Manufacturing	305	3.55	362	4.22	306	3.54	426	4.92	1399	4.06
Services	1737	20.23	1792	20.90	1548	17.93	1802	20.80	6879	19.97
NEET	1664	19.38	2186	25.50	1892	21.91	2018	23.30	7760	22.52
OLF	1180	13.74	1376	16.05	1411	16.34	1478	17.06	5445	15.80
Total	8585	100.00	8573	100.00	8635	100.00	8662	100.00	34455	100.00

Table 7: Male Trend of Livelihoods, NEET, OLF between 2010 and 2013

	W1_2010		W1_2011		W2_2012		W2_2013		Total	
	freq	%	Freq	%	freq	%	freq	%	freq	%
Agriculture	2533	43.44	1900	32.75	2323	39.61	1975	33.62	8731	37.36
Manufacturing	103	1.77	110	1.90	123	2.10	157	2.67	493	2.11
Services	1463	25.09	1635	28.18	1493	25.46	1679	28.58	6270	26.83
NEET	724	12.42	943	16.25	757	12.91	906	15.42	3330	14.25
OLF	1008	17.29	1214	20.92	1169	19.93	1157	19.70	4548	19.46
Total	5831	100.00	5802	100.00	5865	100.00	5874	100.00	23372	100.00

Table 8: Female Trend of Livelihoods, NEET, OLF between 2010 and 2013

	W1_2010		W1_2011		W2_2012		W2_2013		Total	
	freq	%	Freq	%	freq	%	freq	%	freq	%
Agriculture	1518	24.64	1261	20.50	1429	23.04	1211	19.49	5419	21.92
Manufacturing	333	5.41	384	6.24	345	5.56	443	7.13	1505	6.09
Services	1838	29.84	1739	28.28	1646	26.54	1838	29.58	7061	28.56
NEET	1570	25.49	1841	29.93	1791	28.88	1708	27.49	6910	27.95
OLF	901	14.63	925	15.04	990	15.97	1013	16.30	3829	15.49
Total	6160	100.00	6150	100.00	6201	100.00	6213	100.00	24724	100.00